

United Nations Development Programme
Country: Brazil
PROJECT DOCUMENT



Project Title:	Sustainable Land Use Management in the Semi-arid Region of Northeast Brazil (Sergipe) - BRA/PNUD/13/G42/2014
UNDAF Outcome(s):	Incorporating sustainable development, green economy and decent labour paradigms into national public policies
UNDP Strategic Plan Environment and Sustainable Development <u>Primary Outcome:</u> Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded <u>Output 1.3.</u> Solutions developed at national and sub-national levels for sustainable management of natural resources, ecosystem services, chemicals and waste	
UNDP Strategic Plan <u>Secondary Outcome:</u> Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded <u>Output 1.4.</u> Scaled up action on climate change adaptation and mitigation across sectors which is funded and implemented	
Expected CP Outcome(s): Capacities for integrating sustainable development and productive inclusion for poverty reduction.	
Expected CPAP Output(s): Low-carbon strategies with LECRDS concept adopted in Brazil and widely disseminated	
Executing Entity/Implementing Partner: United Nations Development Program (UNDP)	
Implementing Entity/Responsible Partners: Department to Combat Desertification (DCD) of the Secretariat for Extraction and Sustainable Rural Development (SEDR) of the Ministry of Environment (MMA) and the Sergipe State Secretariat of Environment and Water Resources (SEMARH)	

Brief Description

This project will address land degradation (LD) in the state of the Sergipe in the Brazilian Northeast with a view to scaling up to the entire Semi-arid region. It is designed to optimize and coordinate existing programs to engender sustainable land management (SLM), reverting land degradation in a state where 74.2% is susceptible to desertification (ASD) and only 13% the original Caatinga vegetation remains. It will strengthen the state environmental governance framework to better address the main drivers of land degradation and desertification, focusing primarily on the escalating conflict of land uses and unsustainable agriculture practices where LD is causing soil erosion, soil nutrient depletion, damaging hydrological system integrity and undermining ecosystem services. Key elements that will be strengthened include land use planning and appropriate environmental licensing and oversight to avoid, reduce and mitigate LD. Through strengthened institutional and smallholder capacities and facilitation of access to funding, uptake of SLM practices will be increased and on-the-ground actions will be tried and tested in the Alto Sertao Sergipe (SAS), where LD is highest. This territory is a state priority and is targeted nationally in a program to reduce hunger and poverty. By reducing LD and maintaining vital ecosystem services, the project will improve livelihoods in an area with high poverty and social hardship, particularly in agrarian reform settlements. Strategic action at the national level through the Department to Combat Desertification in the Ministry of Environment's Secretariat of Extraction and Sustainable Rural Development and the National Commission for Combating Desertification will enable this state's SLM governance model to be disseminated to other states, thereby facilitating replication across the entire Brazilian Semi-arid region and evoking further global environmental benefits the middle and long term.

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Total resources required US\$:	21,148,208
Total allocated resources:	
GEF	3,815,192
Government	12,483,040*
NGO	2,125,734*
Private Sector	2,424,242*
UNDP	300,000
*Parallel funding	

Agreed by (Government): _____

Date/Month/Year

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List of Acronyms and Abbreviations

ABC - Brazilian Cooperation Agency
ADEMA - Administração Estadual do Meio Ambiente; State Environmental Administration (Sergipe)
AFS - agro-forestry system
ANA - National Water Agency (MMA)
ANATER - National Agency of Technical Assistance and Rural Extension
APL - Local Productive Cluster
APP - Area of Permanent Preservation
ASA - Semiarid Network (NGO)
ASD - Areas Susceptible to Desertification
ASF - Upper São Francisco
ATER - Technical Assistance and Rural Extension
BANESE - Bank of the State of Sergipe
BBZ - zero-base dam
BNB - Bank of the Northeast
BNDES - National Bank of Economic and Social Development
CAR - Rural Environmental Registry
CBD - Convention on Biological Diversity
CBHSF - São Francisco River Watershed Committee
CEF - Federal Savings Bank
CEMA - State Environment Council
CFAC - Centro de Formação em Agropecuária Dom José Brandão de Castro; Dom José Brandão de Castro Agriculture and Livestock Training Center
CHESF - São Francisco Hydro-Electric Company
CODEVASF - São Francisco and Parnaíba Valleys Development Company (MI)
COHIDRO - Water Resources and Irrigation Development Company
CONAMA - National Environment Council
CONERH - State Water Resources Council
CPATSA - Agriculture and Livestock Research Center for the Semiarid Tropics
CSO - Civil Society Organization
CTASS - Territorial Commission of the Alto Sertão of Sergipe
CTF - Federal Technical Registry of Potentially Polluting Activities and Users of Environmental Resources
DAP - Declaration of Eligibility for PRONAF
DCD - Department to Combat Desertification and Land Degradation (SEDR-MMA)
DNOCS - National Department of Public Works Against Droughts (MI)
EEG - Environment and Energy Group (UNDP)
EEZ - Ecological and Economic Zoning
EFA - Family Farmer School
EIA/RIMA - Environmental Impact Assessment/Report on Environmental Impact
EMBRAPA - Brazilian Agricultural Research Corporation (MAPA)
EMDAGRO - Agriculture and Livestock Development Corporation
ES - ecosystem services
FAO - Food and Agriculture Organization
FBB - Bank of Brazil Foundation
FIDA -; International Fund for Agricultural Development
FNE - Northeast Constitutional Finance Fund
FNMA - National Environment Fund
FUNBIO - Brazilian Fund for Biodiversity
FUNDECI - Scientific and Technological Development Fund
FUNDEMA - Sergipe Environmental Defense Fund
G20 - twenty wealthiest countries
G77 - developing countries
GEB - Global Environmental Benefit
GIS - Geographic Information System

GOB - Government of Brazil
 GPCD - Standing Working Group to Combat Desertification (Sergipe)
 IABS - Brazilian Institute for Development and Sustainability
 IADB - Inter-American Development Bank
 IBAMA - Brazilian Institute of Environment and Renewable Natural Resources (MMA)
 IBGE - Brazilian Institute of Geography and Statistics (MP)
 ICMBio - Chico Mendes Institute of Biodiversity Conservation (MMA)
 IEM - Integrated Ecosystem Management; Manejo Integrado de Ecossistemas
 IFAD - International Fund for Agricultural Development
 IICA - Inter-American Institute for Cooperation on Agriculture
 INCRA - National Institute of Colonization and Agrarian Reform (MDA)
 INPE - National Institute of Space Research
 INRM - Integrated Natural Resource Management
 INSA - National Semi-arid Institute (MCTI)
 IPCC - Intergovernmental Panel on Climate Change
 LADA - Land Degradation Assessment for Dryland Areas
 LECRDS - Low-Emission and Climate-Resilient Development Strategies
 LR - Legal Reserve
 MAPA - Ministry of Agriculture, Livestock and Supply (GoB)
 MCTI - Ministry of Science, Technology and Innovation (GoB)
 MDA - Ministry of Agrarian Development (GoB)
 MDIC - Ministry of Development, Industry and Foreign Trade (GoB)
 MDS - Ministry of Social Development and the Fight against Hunger (GoB)
 MF - Ministry of Finance (GoB)
 MI - Ministry of National Integration (GoB)
 MMA - Ministry of Environment (GoB)
 MMC - Movement of Peasant Women
 MME - Ministry of Mines and Energy (GoB)
 MONA - Natural Monument
 MP - Ministry of Planning, Budget and Management (GoB)
 MRE - Ministry of External Relations (GoB)
 MS - Ministry of Health (GoB)
 MST - Movimento dos Trabalhadores Sem Terra; Landless Workers Movement (NGO)
 NCCD - National Commission to Combat Desertification
 NGO - non-governmental organization
 NTFP - Non-Timber Forest Products
 OEMA - State Environmental Agency
 OSC - Organização da Sociedade Civil; Civil Society Organization
 P1+2 - One Land Two Waters Program
 PIMC - Program for Social Training and Multiplication for Coexistence with the Semi-arid: One Million Cisterns
 PACTO - A World for Children and Adolescents in the Semi-arid
 PAD - Fresh Water Program (MMA)
 PAE - State Action Plan to Combat Desertification and Mitigation of the Effects of Drought (Sergipe)
 PAF - Administrative Fiscal Process
 PAM - Municipal Action Plan to Combat Desertification and Mitigation of the Effects of Drought
 PAN - National Action Program to Combat Desertification and Mitigate the Effects of Drought
 PMFS - Sustainable Forest Management Plan
 PNATER - National Policy for Technical Assistance and Rural Extension
 PNC - National Program of Capacity-Building for Environmental Managers and SISNAMA Council Members
 PB - Policy Board
 POF - Family Budget Survey
 PPA - Pluri-year Plan
 PPG - Project Preparation Grant

PRONAF - National Program to Strengthen Family Agriculture
 PRONESE - Sergipe Sustainable Development Agency
 REDD - Reduction of Emissions from Deforestation and Forest Degradation Rede CLIMA - Brazilian Research Network on Climate Change
 RESAB - Semiarid Education Network
 RIOD - International Network of NGOs on Desertification
 RTA - Regional Technical Advisor
 SAF - Agro-forestry system
 SAF - Secretariat of Family Agriculture
 SAGI - Secretariat of Information Evaluation and Management
 SAP - Early Warning System for Drought and Desertification
 SAS - Sergipe's Alto Sertão SASAC - Society for Socio-Environmental and Cultural Support
 SE - Sergipe
 SEAGRI - State Secretariat of Agriculture and Agrarian Development (Sergipe)
 SEBRAE - Brazilian Service to Support Micro and Small Business
 SEDETEC - State Secretariat of Economic Development and Science and Technology (Sergipe)
 SEDR - Secretariat of Extractivism and Sustainable Rural Development (MMA)
 SEFAZ - Finance Secretariat (Sergipe)
 SEIDES - Secretaria de Estado da Inclusão, Assistência e Desenvolvimento Social; State Secretariat for Inclusion, Assistance and Social Development (Sergipe)
 SEINFRA - Sergipe State Secretariat of Infrastructure (Sergipe)
 SEMARH - State Secretariat of Environment and Water Resources (Sergipe)
 SEPLAG - State Secretariat of Planning, Budget and Management (Sergipe)
 SEPLAN - State Secretariat of Planning and Budget (Sergipe)
 SEPMULHERES - Special Secretariat for Policies for Women
 SFB - Serviço Florestal Brasileiro; Brazilian Forest Service (MMA)
 SFM - Sustainable Forest Management
 SGP- Small Grants Program; (GEF)
 SICAR - National Rural Environmental Registry System
 SIE - State Inspection System
 SIF - Federal Inspection System
 SIM - Municipal Inspection System
 SIRHSE - Sergipe Water Resources Information System
 SL/WM - Sustainable Land and Water Management
 SLM - Sustainable Land Management
 SMCQ - Secretariat of Climate Change and Environmental Quality (MMA)
 SRH - Superintendency of Water Resources (Sergipe)
 SRHU - Secretariat of Water Resources and Urban Environment (MMA)
 SSP - Secretariat of Public Security
 STAP - Scientific and Technical Advisory Panel (GEF)
 SUASA - Single System of Attention to Agricultural Sanitary Standards
 SUDENE - Superintendency of Development of the Northeast
 TFR - Total Fertility Rate ToR - Terms of Reference
 TQ - Terra Quilombola; Maroon Land
 TT - Tracking Tool; Ferramenta de Monitoramento
 UC - Conservation Unit
 UFS - Federal University of Sergipe
 UNCCD - United Nations Convention to Combat Desertification
 UNDAF - United Nations Development Assistance Framework
 UNICEF - United Nations Children's Fund
 UNILAB - University of International Lusophone African-Brazilian Integration
 WOCAT - World Overview of Conservation Agriculture Techniques

ZNLD - Zero net land degradation

SECTION I: ELABORATION OF THE NARRATIVE

PART I: SITUATION ANALYSIS

PART I.A. CONTEXT

1.1. Environmental Context in Brazil

1. With an area of 8,515,767 km², Brazil, the largest country in South America, covers half the continent. The five regions are the North (Amazon), Northeast (NE), Southeast, South and Center-West. The country's wide variety of landscapes includes coastal mountain ranges, highland savannas, the semiarid region and the Amazon rainforest, among others, which are located in the country's six biomes: the Amazon, Cerrado, Caatinga, Atlantic Forest, Pantanal and Campos Sulinos (**Pampa**). The Atlantic Forest and the Amazon biomes have dense tropical forests. 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 is the only biome entirely within Brazil, is also subject to periodic droughts lasting several years.

2. Significant changes in land use are under way in most regions, while large areas remain with original vegetation, mainly in the North. For Brazil as a whole, 41% of the original plant cover has been cleared, but there are strong regional differences. Over the centuries, more than 90% of the Atlantic Forest has already been cleared, while clearing in the Amazon (20% overall to date) and Cerrado (50% overall to date) has been responsible for most of Brazil's emissions of greenhouse gases in recent decades. Most of the Amazon is in protected areas including conservation units, indigenous lands and areas protected by the Forest Code, i.e. Legal Reserves (LR), which are 80% of rural properties, and Areas of Permanent Preservation (APPs), which are defined on each rural property according to drainage (between 30 and 500 meters on each side of streams and rivers) and topography (hilltops and slopes between 25° and 45°). The proportions of LR, areas that cannot be cleared, are much lower (20%) in the other biomes, especially the Caatinga, the Cerrado and the Pampas, which have received little international attention or national priority (e.g. they are not constitutional national heritage biomes). Only 3.27% of the NE is in protected areas (conservation units) and only 1.26% is in strict conservation units.

Land Degradation in Brazil and in Sergipe

3. Brazil contains semiarid and dry sub-humid areas, according to the UNCCD classification, both of which are considered Areas Susceptible to Desertification (ASD). As defined in Brazil, these ASD, which correspond closely to the Caatinga biome, occupy an area of 1.34 million km² and are home to 17% of Brazil's population over 11 states, nine of which are in the Northeast (Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia, from north to south) and two in the Southeast (Minas Gerais and Espírito Santo). The region has the world's greatest concentration of population in semiarid areas and is home to 85% of the country's poor. ASD are defined based on three criteria: annual precipitation under 800mm; an aridity index of 0.5 or lower (based on the balance between rainfall and evapotranspiration) and a drought risk index higher than 60%. The ASDs can be subdivided into the semiarid area (63% of their land area with 64% of their population) and the dry sub-humid area (37% of their land with 36% of their population). As a result of LD, ASDs had lost 41% of their natural vegetation by 2002 and an estimated additional 3% between 2002 and 2008. In many ASDs, soil losses are estimated at between 11 and 15 t/ha/year on degraded land without vegetation cover. This is leading to increasing nutrient and water losses over large land extensions. In spite of such natural and anthropogenic stress, Caatinga vegetation is remarkably resilient when water is available and it can sustain frequent harvests when properly managed.

4. This project is focused on the state of Sergipe, which represents on a workable scale the issues facing Brazil's other ASDs. With an area of 21,918 km², Sergipe is Brazil's smallest state, although it is comparable in size to Israel and larger than El Salvador and 74 other countries of the world. The neighboring states, which share similar ecological and socioeconomic characteristics, are Alagoas to the north, Pernambuco to the west and Bahia to the west and south. The state is composed of three strips: 1) a semiarid northwestern strip, known locally as *Alto Sertão Sergipano* (herein abbreviated SAS), a region with high risk of desertification and acute land degradation problems; 2) a central strip (*Agreste*) running along the north to south axis of the State that contains sub-humid dry areas at risk of desertification processes and has moderate levels of land degradation and 3) a narrow coastal strip (*zona da mata* or Atlantic Forest) with no desertification risk. A total of 74.2% of Sergipe's land area, covering 16,269 km² in 49 of the 75 state municipalities, is classified as being areas susceptible to desertification (ASD). This is in part due to climatic and edaphic conditions. Average temperatures in Sergipe, which is located along 10° and 11° South Latitude, range from 26° to 32° Celsius. Sergipe has erratic precipitation levels, as in much of the NE, typically below 700 mm per year and a dry season lasting seven to eight months, although there is considerable variation among years. The state has high and increasingly frequent drought incidence. Water deficits are significant and inland river courses are irregular and intermittent, with the exception of the São Francisco River, which extends for 2,814 km. between its source in Minas Gerais and its mouth between Sergipe and Alagoas. Sergipe is part of the lower Sao Francisco river basin. The entire basin is considered International Waters (IW). This major river provides water for energy generation and irrigation. In Sergipe, it supplies 70% of the water for the state capital, Aracaju. Of the six river basins present within the state, only the Sergipe river, which originates in the SAS area and flows east to the state capital, Aracaju, is entirely within the state boundaries. The soils in the SAS are litholic and regolithic neosoils, planosoils, luvisoils, red and yellow argisoils, which are suited for pasture and some agriculture with potential for irrigation.

5. Inland and in all of the ASD, the dominant vegetation type is the xerophytic Caatinga (meaning "white woods" in Tupi-Guarani), found only in Brazil, interspersed with isolated small patches of Cerrado (savanna woodland). There are three types of Caatinga: i) Shrub Caatinga, also known as steppe savanna, dominated by shrubs and a herbaceous strata of grasses with only a few individual trees under 4 m, being the most common Caatinga in Sergipe and in SAS; ii) Shrub-Arboreal Caatinga, with shrubs and trees not exceeding 6 m and tree crowns touching in most areas, allowing for full soil cover; and iii) Arboreal Caatinga comprised primarily of individual trees with an average height of 8 m forming a closed canopy, allowing complete soil cover, with few individual shrubs. The Cerrado in Sergipe is characterized by the relatively open savanna categories of *campo limpo* (natural grassland without scrub) and *campo sujo* (natural grassland with low scrub). As recently as 2003, 17% of the original vegetation remained, but a 2010 forest diagnosis indicates that this level had dropped to 13%. Large forest blocks are rare. The largest blocks are the Grota do Angico Natural Monument (MONA), a state protected area of 2,183 ha. created in 2007 along the São Francisco River in the municipalities of Canindé do São Francisco and Poço Redondo, and the Rio São Francisco Natural Monument, a federal protected area of 26,736 ha. created in 2009 farther north in Pernambuco, Alagoas and Sergipe, with about one third of its area in Canindé de São Francisco. A total of 90% of Sergipe's forest land is concentrated in forest patches of sizes greater than 500 ha. Many of these are located in the southern part of the ASD and along the São Francisco River in the northwest part of the state, where new land reform settlements are being established on land that belonged to large estates considered idle or unproductive before being expropriated for official reasons of "social interest". The remaining 10% of Sergipe's forest land is made up of small patches that are predominantly smaller than 50 ha. Over the whole state, there are also countless small fragments, windbreaks, alleys, green fences, rows, thickets, coppices and isolated trees that, while not constituting forests, perform important environmental and socioeconomic functions.

6. Despite the broad classification of LD established in the National Action Plan (PAN), more detailed data on land degradation in the entire state is patchy. However, vegetation cover is a clear

indicator, as its loss is one of the major anthropogenic drivers of land degradation. The above figures indicate the gravity of vegetation loss and it is not surprising that land degradation levels are also high. The highest levels of LD are found in the northwestern part of the state called Alto Sertão Sergipano (herein abbreviated SAS), a territory which covers 4,908 km² over seven municipalities, almost all of which is classified as semiarid. Table 2 summarizes the existing and potential land degradation levels for the six largest municipalities of the SAS, although there is considerable local variation within the largest municipalities (Canindé do São Francisco, Poço Redondo and Monte Alegre).

Table 1. Area of Municipalities in SAS

Municipality	Area
Canindé de São Francisco	902.25
Gararu	654.99
Monte Alegre	407.41
Nossa Senhora da Glória	756.49
Nossa Senhora de Lourdes	81.06
Poço Redondo	1,232.12
Porto da Folha	877.30
Total	4,911.62

Table 2. Land Degradation in SAS: Existing and Potential Levels

Municipality*	Existing Land Degradation			Potential Land Degradation		
	Soil	Vegetation	Erosion	Soil	Vegetation	Erosion
Canindé S.F.	Accentuated	Severe	Accentuated	Severe	Severe	Severe
Gararu	Accentuated	Severe	Accentuated	Accentuated	Severe	Accentuated
Monte Alegre	Moderate	Severe	Moderate	Accentuated	Severe	Accentuated
N.S. de Glória	Moderate	Accentuated	Moderate	Accentuated	Severe	Accentuated
Poço Redondo	Accentuated	Severe	Moderate	Accentuated	Severe	Accentuated
Porto da Folha	Accentuated	Severe	Accentuated	Accentuated	Severe	Accentuated

*Data not available for Nossa Senhora de Lourdes.

**Land degradation index: absent < slight < moderate < accentuated < severe.

Source: Panorama da Desertificação em Sergipe, <http://www.mma.gov.br>, cited in PAE-SE (SEMARH 2012:31).

7. It is not clear how climate change will affect each part of the ASD, but Land Use, Land Use Change and Forestry (LULUCF) are clearly linked to changes in temperature and precipitation even at the regional level. The IPCC predictions about climate change indicate losses in the productivity of food crops in NE Brazil such as beans, corn and manioc. Their nutritional quality can also decrease because of higher sugar content and lower protein content. Inland, higher temperatures due to climate change will certainly increase evapotranspiration and dryness, as foreseen by the IPCC, affecting both the soil and reservoirs, tending to intensify water deficiency. The El Niño effect is expected in 2014. However, higher sea surface temperatures in the nearby Atlantic Ocean may also increase atmospheric moisture and its transport inland, leading to more precipitation, possibly on a seasonal basis. This rainfall may benefit Caatinga vegetation, which is under constant stress but reacts very quickly to availability of water, with explosive growth, also benefiting populations of native fauna dependent on the vegetation and necessary for pollination and seed dispersal, i.e. ecosystem functions.

1.2. Socio-Economic Context

8. Brazil, the world's fifth largest country, is a developing country that is emerging as one of the world's largest economies, with GDP of US\$2.33 trillion 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 Dialogue Forum (India, Brazil and South Africa). It participates in both the G20 and the G77 plus China. Growth was relatively strong during the recent economic crisis, but slowed to 1% per year in 2013. The industry and service sectors have grown, but agriculture and livestock, now integrated with agro-industry, which provides inputs and processes outputs, remain a mainstay of the economy, producing food and providing tax revenues from exports. In 2010, the population of Brazil was 190,732,694, which is almost half the total for South America, projected to be 404,630,715 in 2013. Currently, 85% live in officially urban places, which include many small towns in the interior. The rural population is concentrated in the Northeast, one of Brazil's five macro-regions. Fertility has declined to a Total Fertility Rate (TFR) of 1.64, well below the replacement level, and consequently the age structure is growing older.

9. Brazil's economic, social and environmental achievements have put the country in a position of international leadership, but serious problems remain. The Human Development Index (HDI) grew from 0.590 in 1990 to 0.726 in 2010, a level ranked 85th in the world. In contrast to its economic and demographic importance, Brazil stands out worldwide for its regional and income inequality, between the extremes of the poor Northeast and the more wealthy Southeast. Overall, income inequality fell from 0.594 in 2001 to 0.521 in 2011, a 50-year low. The statutory minimum wage underwent real increases. Government policies have combated extreme poverty with family stipends and the Brazil without Misery initiative, which now includes socio-productive inclusion (job training, opportunities for self-employment and promotion of productive activities for the poor) in addition to the cash transfers. Well-focused social programs include rural worker retirement, the Family Stipends Program (PBF), "Zero Hunger" for food security, "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. Government also purchases food (PAA) and provides school lunches (PNAE). During droughts in semiarid areas, there are drought stipends, water tank trucks and harvest insurance. Such social programs save lives (millions of people died in past droughts, but none died due to the recent drought), avoid out-migration and alleviate pressure on land, although they do not avoid the death of cattle during droughts. They also increase local consumer demand. At the state level, the "Greater Fairness in Sergipe" works with cash transfers, productive inclusion and access to public services.

10. Brazil has made rapid progress in addressing gender disparities. Illiteracy among both men and women is becoming residual and there are more women than men in universities. Women participate in the labor force and in social movements. Few special efforts are needed to increase their participation at the community level. 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 and the level of participation in the executive and legislative branches is low. There are also problems with domestic violence.

11. In 2010, Sergipe had a population of 2,068,017, including 1.4 million inhabitants living in absolute poverty (average household income of up to 0.5 minimum wage), the vast majority of whom are in extreme poverty with the average household income being less than 0.25 of the minimum wage. In 2010 the SAS had 137,926 inhabitants, of which more than half (74,478 or 54%) were classified as rural (Table 3). The ASDs, including those in Sergipe, and especially in the SAS, have some of the worst human development indices of the NE region based on indicators such as poverty, education and mortality rates (Tables 2, 3, 4 and 5). Illiteracy rates in the semiarid areas are high, 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. As in Brazil's NE in general, few people have secondary schooling, much less higher education. The percentage of people living in houses with insufficient water and sewage ranges from 9.53% in Nossa Senhora de Lourdes to 19.24% in Gararu. 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, compared to 0.70 for Brazil. The NE is a stronghold of gender discrimination as compared to the rest of Brazil, where women have made significant advances, although change is under way. There are more women than men

in urban areas and more men than women in rural areas of the NE. The state government has established a Special Secretariat of Policies for Women (SEPMULHERES).

Table 3. Urban and Rural Population, by municipality, SAS, 2010

Municipality	Urban	Rural	Total	% Urban
Canindé S.F.	14,063	10,623	24,686	56.97
Gararu	2,832	8,573	11,405	24.83
Monte Alegre	8,043	5,584	13,627	59.02
N.S. Glória	21,617	10,880	32,497	66.52
N.S. Lourdes	3,291	2,947	6,238	52.76
Poço Redondo	8,538	22,342	30,880	27.65
Porto da Folha	9,955	17,191	27,146	36.67
Total	68,339	78,140	146,479	46.65

Source: Compiled from IBGE.

Table 4. Human Development Index, by dimension and municipality, SAS, 2013.

Municipality	Education	Longevity	Income	HDI	Family Development Index
Canindé S.F.	0.435	0.741	0.566	0.567	0.55
Gararu	0.422	0.783	0.544	0.564	0.52
Monte Alegre	0.431	0.726	0.539	0.553	0.54
N.S. Glória	0.456	0.750	0.591	0.587	0.54
N.S. Lourdes	0.532	0.719	0.560	0.598	n.d.
Poço Redondo	0.376	0.760	0.519	0.529	0.51
Porto da Folha	0.462	0.739	0.537	0.568	0.55

Source: Compiled from IBGE and MDS/SAGI, 2010.

Table 5. GDP, GDP per capita, absolute and extreme poverty, by municipality, SAS, 2010

Municipality	GDP	GDP per capita (R\$)	Absolute Poverty	Extreme Poverty
Canindé S.F.	1,184,079	270.17	64.04%	58.15%
Gararu	74,571	236.06	56.25%	48.77%
Monte Alegre	83,687	229.30	64.24%	58.11%
N.S. Glória	340,204	316.84	54.93%	49.76%
N.S. Lourdes	38,483	261.29	n.d.	n.d.
Poço Redondo	175,908	202.24	55.52%	47.72%
Porto da Folha	173,441	226.66	56.71%	50.64%
Total	2,070,373			

Source: IBGE; IBGE POF 2008.

Table 6. Education indicators, by municipality, SAS, 2010

Municipality	Children Age 5-6 in school	> 18 with Complete primary school	Age 18-20 Complete high school
Canindé S.F.	97.71	28.28	9.63
Gararu	94.01	26.34	15.40
Monte Alegre	95.23	27.58	15.18
N.S. Glória	94.91	32.69	20.55
N.S. Lourdes	100.00	37.17	23.04
Poço Redondo	88.89	22.24	16.56
Porto da Folha	95.90	31.57	20.11

Source: Compiled from IBGE.

Table 7. Population by sex and infant mortality, by municipality, SAS, 2010

Municipality	Male	Female	Total	Sex Ratio	Infant Mortality
Canindé S.F.	12,293	12,393	24,686	992	29.2
Gararu	5,811	5,594	11,405	1039	22.0
Monte Alegre	6,900	6,727	13,627	1026	32.3
N.S. Glória	16,076	16,421	32,497	979	27.5
N.S. Lourdes	3,151	3,087	6,238	1021	33.6
Poço Redondo	15,767	15,113	30,880	1043	25.8
Porto da Folha	13,883	13,263	27,146	1047	29.6
Total	73,881	72,598	146,479	1018	28.6*

Source: Compiled from IBGE.

Note: *Unweighted average of deaths under 1 year of age per thousand live births.

12. Small-scale family farming on areas less than 100 ha. makes up a large part of Brazilian food production and takes up about 40% of the total production area of the eight states which correspond to most of the semiarid region of the Northeast (1.5 million rural establishments over a land area of 16.9 million ha). In Sergipe, there were 98,360 rural establishments in 2006, with average area of 15.1 ha., but median area of only 2.4 ha. The main crops of small farmers in the ASD are cassava (87%), beans (70%), maize (46%) and various vegetables, cultivated mainly in lowland depressions on deeper alluvial soils and on sloping land. Cactus (*palma*) is also planted to provide succulent animal fodder during dry periods and droughts.

13. Land reform settlements are changing the region's historical pattern of highly concentrated land tenure, characterized by latifundia and minifundia and the highest Gini index among regions in Brazil, equal to 0.839 in 2008. Sergipe in particular is carrying out an extensive agrarian reform program to establish landless workers in settlements. Some of the redistribution is market-assisted through subsidized loans. The settlements provide land for peasants and the landless, including squatters and sharecroppers and their descendants. They also provide land for women, not just for men, as is also done in the case of cash transfers, thus empowering women. Ethnicity is mixed, with no clear lines of separation. The agrarian reform settlements in Sergipe are concentrated in the SAS, which has one of Brazil's largest concentrations of such projects. As can be seen in Table 8, there are 95 projects in the SAS with 4,827 families, mostly in Canindé do São Francisco and Poço Redondo, but none in Nossa Senhora de Lourdes. The total area of the settlement projects in this territory is 99,475 hectares, which means an average of 21 ha per family. The largest settlement is Jacaré-Curituba, with 5,742 ha and 807 families. Many settlements are new: 34.7% were established after 2010. Most (69.5%) of the settlements are managed by the National Institute of Colonization and Agrarian Reform (INCRA), the federal agency connected to the Ministry of Agrarian Development (MDA), while others are managed by the state.

Table 8. Agrarian Reform Settlements in SAS, 2013.

Municipality	ARS	PA	PE	Ha	Families	H/ARS	H/F	F/ARS
Canindé S.F.	30	14	16	34271	1581	1142	22	53
Gararu	7	7	0	5696	205	814	28	29
Monte Alegre	10	8	2	4173	172	417	24	17
N.S. Glória	12	9	3	9061	385	755	24	32
Poço Redondo	30	22	8	42470	2274	1416	19	76
Porto da Folha	6	6	0	3804	210	634	18	35
Total	95	66	29	99475	4827	1047	21	51

Key: ARS - Agrarian reform settlements; PA - Federal projects; PE - State projects; Ha - Hectares; H/ARS - Average hectares per settlement; H/F - Average hectares per family; F/ARS - Average families per settlement.

Source: Compiled from INCRA data.

14. The large agricultural estates in the semiarid Northeast are a heritage of the region's highly skewed land tenure. Of all properties in the Northeast, the largest 1.4% occupy nearly 40% of the total area. The 5% of the largest landholdings occupy 61.4% of the 1,480,400 ha. of rural properties in Sergipe. They are used primarily for cattle-raising. The large estates produce corn, fruits for export, tobacco, coconuts, castor beans, *jatropha* and herbaceous cotton, as well as soybeans for the production of biofuels, primarily in the sub-humid areas. Sugarcane is the traditional crop near the coast. In areas with more rainfall, there is also reforestation with pine and eucalyptus to provide charcoal for steel production or cellulose for pulp and paper.

15. The rural and small-town inhabitants of Brazil's backlands or outback, known as *sertão*, have singular cultural characteristics of strength in the face of adversity and resilience under pressure. They now have increased expectations and seek autonomy supported by cooperatives, partnerships and other networks. Having one's own land creates a vested interest in maintaining sustainability and avoiding degradation for present and future generations, stimulating community empowerment at the local level.

16. The economy in Sergipe is based on services, public administration, industry and agriculture and there is also petroleum offshore. The capital city has 27.6% of the state's population (571,149/2.068.217) and 38.5% of its GDP. Public administration depends to a large extent on federal funding. The main agricultural crop is sugarcane grown on large plantations near the coast, while the main activity in the ASD is livestock. Traditionally, subsistence farming was common with the production of crops such as cassava, beans, rice, sweet potatoes and squash, but most of the rice consumed now comes from southern Brazil. Increasingly maize has become important, especially for poultry feed, and now represents 35% of Sergipe's annual crops, with increased expansion into the ASDs including Alto SAS. Livestock production is mostly concentrated on cattle raising, with 1 million head state-wide in 2008, although goat and sheep production is growing fast, with 170,000 animals in 2008, mainly for meat, but with growing rates of milk production. The SAS produces 46% of the milk in Sergipe. Much of the cattle herd was lost in the 2010-2013 drought and will take years to replace. With 55% of the population in rural areas, family-based agriculture plays an important role. There are 12,833 agricultural families, including two small *quilombola* settlements (TQ, hinterland communities founded by descendants of slaves) and one small official indigenous (Xokó) territory (TI) on an island in the São Francisco River in Porto da Folha. In 2003, an estimated 88% of the registered properties (6,720) in the SAS were mini-holdings less than 70 ha. These covered 34.8% of the area of rural holdings. Smallholdings (70-280 ha) represented 9% of the total number of holdings and 23% of the area; medium (280-1,050 ha) represented 2.4% of the holdings and covered 24% of the area and large (>1.050 ha) represented 0.5% of the number of holdings covering 18.1% of the area. The large areas are concentrated almost exclusively in two municipalities with irrigation projects.

17. In an increasingly mercantile economy, the non-agricultural sectors are relevant to livelihoods of settlers and farmers in general because they constitute markets for their products as well as providing permanent, temporary or seasonal off-farm employment and income. Economic diversification and pluri-activity to include more sustainable products of higher value such as honey, jellies, jams, pickles, fruit pulp (for juice) and dried fruits decrease pressure for clearing leading to land degradation. They can be made feasible or strengthened by organization of value chains for specific products and local productive clusters (APLs) consisting of combinations of complementary value chains and relevant institutions, as promoted by the Ministry of Development, Industry and Foreign Trade (MDIC) and the Brazilian Service to Support Micro and Small Business (SEBRAE). One strategic new sector in the whole region is ecological, rural and historical tourism. While the beaches along the coast are the main destination for tourists coming to Sergipe, the visitors buy food products and handicrafts from the interior and significant numbers visit the canyons of the São Francisco River and historical sites like the Grota do Angico and Piranhas, a town across the river in Alagoas.

1.3. Institutional Framework

18. The main government institutions responsible for environment in Sergipe are the State Environmental Administration (ADEMA), which is within the state Secretariat of Environment and Water Resources (SEMARH), and the state office of the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), which is the federal environmental agency under the Ministry of Environment (MMA). Within MMA, desertification is the mandate of the Department to Combat Desertification (DCD) of the Secretariat of Extractivism and Sustainable Rural Development (SEDR). Protected areas are the mandate of the Chico Mendes Institute of Conservation of Biodiversity (ICMBio). Sustainable forest management falls under the auspices of the MMA's Secretariat of Biodiversity and Forests (SBF), which deals more with conservation, and the Brazilian Forest Service (SFB), also in MMA, which deals more with use of forests for both timber and non-timber forest products (NTFPs). Water resources are under the auspices of the National Water Agency (ANA) and watershed committees. For the SAS, the relevant committee is the São Francisco River Watershed Committee (CBHSF). The Sergipe, Japarutuba and Piauí rivers also have committees, while others such as Vaza Barris and Real are planned. Environmental agencies are subject to decisions by the National Environment Council (CONAMA) and a State Environment Council (CEMA), both of which are deliberative bodies involving civil society participation. There is a State Water Resources Council (CONERH). Within the National Environment System (SISNAMA), states and municipalities can define regulations that are more restrictive, but not more flexible than higher-level standards. Most decisions about licensing have been decentralized to the states.

19. There are national (NCCD) and state commissions to combat desertification. The NCCD is composed of representatives of 11 federal ministries (Environment, National Integration, Planning, External Relations, Science and Technology, Education, Agrarian Development, Social Development, Cities, Mines and Energy and Agriculture, Livestock and Supply), 6 federal agencies (BNB, SUDENE, DNOCS, CODEVASF, ANA and EMBRAPA) and 11 states, as well as 1 representative of municipal governments, 2 of the private sector and 11 of civil society organizations. The state commission in Sergipe is called the Standing Group to Combat Desertification (GPCD). Some municipalities, including five in the SAS, are now developing Municipal Action Plans (PAMs) against desertification. The state agencies participate in the Brazilian Association of State Environmental Agencies (ABEMA), while the municipal agencies participate in the National Association of Municipal Environmental Agencies (ANAMMA).

20. Within Sergipe, the most relevant other sectoral secretariats include the State Secretariat of Economic Development and Science and Technology (SEDETEC), which works with economy and technology. The State Secretariat of Infrastructure (SEINFRA) is responsible for public works. Its sanitation company (DESO) seeks universal coverage of water supply. Rural development is the responsibility of the State Secretariat of Agriculture and Agrarian Development (SEAGRI). Social policies are carried out by the State Secretariat for Inclusion, Assistance and Social Development (SEIDES). Budgeting is under the auspices of the State Secretariat of Planning, Budget and Management (SEPLAG, until recently SEPLAN). The SAS and seven other groups of municipalities in Sergipe are Citizenship Territories, which have Territorial Commissions, like the Territorial Commission of the Alto Sertão of Sergipe (CTASS).

21. At the federal level, agricultural development is the responsibility of the Ministry of Agriculture, Livestock and Supply (MAPA) for agribusiness and the Ministry of Agrarian Development (MDA) for family farmers. Water for irrigation in most of the NE is provided by the São Francisco and Parnaíba Valleys Development Company (CODEVASF), which is connected to the Ministry of National Integration (MI). INCRA, under MDA, is the federal agency responsible for agrarian reform settlements. MDA's Secretariat of Family Agriculture (SAF) develops federal policy for the sector, including

extension, credit and gender. Rural extension has been the responsibility of the states, namely the Agriculture and Livestock Development Corporation (EMDAGRO) in the case of Sergipe, mainly outside land reform settlements, although private organizations are also contracted with federal funds for specific areas. INCRA also works with Technical, Social and Environmental Advice (ATES) with a more integrated approach. In the SAS, the rural extension services are provided under government contract by the Dom José Brandão de Castro Agriculture and Livestock Training Center (CFAC), with field offices in Poço Redondo and Canindé do São Francisco. The National Agency of Technical Assistance and Rural Extension (ANATER) was created in December of 2013 to work together with the Brazilian Agricultural and Livestock Research Corporation (EMBRAPA), the federal agricultural and livestock research agency under MAPA, joining extension and research, which had been carried out separately. The agency has not yet become functional at the field level. EMBRAPA's Coastal Plains research center, located in Aracaju, also works in the ASDs with sustainable agricultural systems and alternatives to contour curves involving organic matter in the soil. EMBRAPA's Semiarid research center (CPATSA) is located in Petrolina, up the São Francisco River in Pernambuco. The EMBRAPA Soils research center, located in Recife, Pernambuco, is also involved in research in Sergipe. The Low-Carbon Agriculture (ABC) program, which promotes low-emission agricultural initiatives that have synergy with prevention of land degradation, such as integrated crop-livestock systems and zero tillage, is the responsibility of MAPA and various banks.

22. Smallholders with Declarations of Eligibility (DAPs) for the National Program to Strengthen Family Agriculture (PRONAF) can access programs of government purchasing of their products for institutional markets such as school lunch programs which can give preference to local family farmers. DAPs are not nearly as common in the Northeast as in the South and Southeast. The Bank of the Northeast (BNB) works with micro-credit. Small businesses are supported by the Brazilian Service to Support Micro and Small Business (SEBRAE), connected to the Ministry of Development, Industry and Foreign Commerce (MDIC).

23. Rural credit in Sergipe is provided by the Bank of the Northeast (BNB), the Bank of Brazil (BB) and the Bank of the State of Sergipe (BANESE), while the National Bank of Economic and Social Development (BNDES) funds large enterprises. All bank credit is controlled by the Ministry of Finance (MF) and the various official banks, within limits established by the Central Bank, the National Monetary Council and the Basel rules regarding bank risks. Government budgeting is controlled by the executive and legislative branches at the federal, state and municipal levels, while public expenditures, which are now transparent, are subject to audits by the National Audit Court (TCU) and State Audit Courts (TCE). The accounts of civil society organizations that receive public funds are under increasing government control by the Office of the Comptroller General (CGU) and other agencies.

24. Social development through the *Brasil Sem Miséria* program, including both cash transfers and socio-productive inclusion (see paragraph 9), is primarily the responsibility of the Ministry of Social Development and the Fight against Hunger (MDS). In 2014, MDS will begin a study of poverty in the Semiarid Region with support from the World Bank. The municipalities of the region are involved in administration of the study.

25. There are various civil society networks that embrace or could include SLM in their activities. The Semiarid Association (ASA), the focal point for civil society in the NCCD, has 700 members in the Caatinga (see www.asabrasil.org.br). The National Agroecology Network (ANA) includes many organizations in the region (see www.agroecologia.org.br). Women play important roles in these organizations and the Movement of Peasant Women (MMC) maintains that feminism is inseparable from agroecology (see www.mmcbrazil.com.br). There are also a Brazilian Network on Desertification in the Semiarid established between MMA and MCTI in 2010 and an International NGO Network on

Desertification (RIOD). Further details about the various institutional responsibilities are found in the Stakeholder Participation Plan.

1.4. Policy, Legal and Planning Framework

26. While social policies are favorable to the poor, this section describes the main policies related to land use, sustainable land management and the relevant sectors for this project (agriculture, livestock rearing), many of which constitute obstacles to be overcome. It covers the main environmental legislation that is relevant to the issues of SLM, which for this project includes soil, crops, flora, fauna and water. It should be noted that sustainable management of natural resources through extraction contributes to SLM by decreasing the pressure for deforestation. Direct use of natural resources has the advantages of providing additional income, security for livestock and food security for smallholder farmers. It is also important because it provides more immediate financial return and allows for payback of credit, making SLM more economically feasible in the short term. However, there are many regulatory limitations to wild collection and marketing of any such non-agricultural products.

27. There are three levels of government in the Federative Republic of Brazil: national; state and municipal. Every state and municipality is fully responsible for planning, executing and monitoring its expenditures. States and municipalities depend to large extent on federal financial transfers of tax revenues. Municipalities are directly responsible for urban affairs, within city limits, while the federal government is responsible for the rest of the territory, the rural areas. A process of decentralization has been under way since the new Constitution approved in 1988. Minimal environmental standards for land use policies are defined at the federal level, but individual states have the flexibility to develop specific standards tailored to their needs, as long as they are as restrictive or more restrictive than federal standards. In many environmental matters, the three levels share responsibilities. Few among Brazil's municipalities have capacity to issue environmental licenses. Brazilian environmental legislation dating from 1981 and regulated by CONAMA Resolution 237 of 1991 provides that environmental licenses are required for the construction, installation, expansion or operation of any activity that uses environmental resources or is considered to be actually or potentially degrading/polluting to the environment. This ranges from activities at the farm level to major public construction works. There are three stages, from Previous License (LP), to Installation License (LI) to Operation License (LO). The latter two may be combined in one. There must also be Annual Operative Plans (POAs). Specific licenses are required for forest management and alternative use of forest land according to Sustainable Forest Management Plans (PMFS) as well as transport of wild or domestic animals (GTA).

28. Until recently, use of renewable natural resources such as agricultural projects and forest management were the responsibility of state environmental authorities (OEMAs) a priori except when areas are equal to or greater than 50,000 hectares; when the impacts are considered regional (two or more states); when the property or project area covers more than two states; and when a rural settlement is established by a federal agency, in which case IBAMA was responsible for the process. IBAMA maintains a Federal Technical Registry (CTF) of On July 13, 2013, Resolution 458 of the National Environment Council (CONAMA) did away with the requirement for licensing for agrarian reform settlements, but passed the responsibility on to the settlers themselves, individually. The state of Sergipe established a simplified process and licensed 37 settlements. Municipalities with environmental units can establish licensing processes for works that have impacts falling entirely within the municipal territory. Complementary Law 140 of December 8, 2011, requires municipal environmental management without omission or juxtaposition, but needs to be implemented. Few municipalities have environmental systems with secretariats, councils and funds.

29. The requirements for obtaining licenses vary, being more stringent for large companies and/or those with greater environmental impacts. They require proof of ownership of the land and land use

information, including the Legal Reserves (LR) and Permanent Preservation Areas (APP) defined according to the new Forest Law of 2012, which cannot be cleared. The new code (Law 12.651) still requires definition of detailed rules and regulations. For forest management, an individual or community Sustainable Forest Management Plan (PMFS) authorizing the extraction of forest timber production must also be prepared, signed by an authorized professional and approved by the government agency. Oversight of compliance with licensed land uses falls under the respective jurisdictions of those emitting the license. Failure to comply with agreed conditions may trigger administrative, civil and even criminal liability, subject to various penalties ranging from simple fines to indemnification and suspension, although legal definitions are subject to interpretation and enforcement is weak. The Military Police and the State Secretariat of Public Security (SSP) have an Environmental Platoon to provide enforcement of environmental law.

30. Given shared responsibilities in land use governance, the licensing process is complex in Brazil and requires a sophisticated system to ensure that it is complementary. A new registry includes time-bound commitments in terms of action to comply with set-asides and restoration of degraded areas that have been illegally cleared. Fines for past and present incompliance can be in the form of farmer paid action channeled to restoration as part of a program for environmental restoration. The ambiguous but critical issue of legal norms regarding use of LRs and APPs as established in the new Forest Code approved on May 12, 2012 (Law 12.651) is undergoing definition of details. Normative Instruction of May 6, 2014, established a time limit of one year for compliance with the Rural Environmental Registry (CAR). The Ministry of Environment (MMA) purchased satellite images to pass on to the states. All property owners must register the location of the areas designated as LR or APP as well as all remaining areas of natural vegetation. All the information will be included in an electronic database called the National System of Rural Environmental Registry (SICAR). Under the new law, a national Program for Environmental Regularization (PRA) of land will be set up to increase compliance with environmental regulations regarding forest reserves. The new system will provide valuable data for baselines and indicators regarding coverage of native vegetation and recovery.

31. Food products are subject to numerous and complex federal, state and municipal regulations and inspection systems regarding health, taxes, labor, legal organization of associations etc. Labor and social security legislation are not appropriate for family farmers and their associations, since employees lose their rights to special rural retirement that does not require individual contributions. The health regulations are particularly difficult for small farmers to comply with. The National Sanitary Surveillance Agency (ANVISA), connected to the Ministry of Health (MS) and similar state agencies have rigorous standards. Animal products, including honey, have to comply with federal standards as defined in the Federal Inspection System (SIF). There are also State Inspection Systems (SIE) and Municipal Inspection Systems (SIM) and an attempt to integrate them in a Single System of Attention to Agricultural Sanitary Standards (SUASA). Animals and forest products must have previous authorization for transportation outside the rural property. Inappropriate and unworkable controls can block agricultural and extractive production and marketing by poor smallholders or make them illegal.

PART I.B: BASELINE SITUATION

1.5. Threats and Root Causes

32. The ASD of NE Brazil has always been subject to periodic drought. The main anthropogenic drivers of land degradation in the ASD of the NE in general and in the SAS, where most of Sergipe's remaining Caatinga vegetation is located, are deforestation, driven principally by large and small scale agriculture, and the use of unsustainable farming and ranching practices. Overharvesting of wood (generally without clearing) is a second driver of deforestation. To a lesser extent hunting and new development projects also drive land degradation, Climate change is an additional factor that is increasing land degradation per se and also exacerbating the pressures from anthropic drivers.

Agriculture and livestock as drivers of land degradation

33. Deforested land is used for crops and pasture in both large and small properties, including Sergipe's agrarian reform settlements, which are concentrated in the project target area- SAS. There are 95 land reform settlements in the seven municipalities in the SAS occupying 995 km², and corresponding to 20.3% of the total area of these municipalities. New settlements are planned. Small-scale agriculture is concentrated in land reform settlements. The crops planted by small farmers include manioc, fruits and vegetables, as well as cactus to feed cattle during droughts and dry spells. Their livestock includes cattle, goats and chickens.

34. **Small-scale family farming** is mainly rain-fed, with limited use of modern technology and inputs. When land is available, fields are left fallow to recover soil productivity. This involves regeneration of the Caatinga, which is remarkably resilient. Under these conditions, slash-and-burn agriculture is sustainable. However, such traditional farming practices are becoming increasingly unsustainable due to various factors: a) when plots are too small, fallow times, which should be more than five years, are reduced, without leaving sufficient time for the soil to recover its productivity; b) uncontrolled use of fire can cause deforestation, kill off juvenile trees and damage soil properties; c) cultivation on slopes without the adoption of soil conservation techniques leads to soil erosion and sedimentation of streams and rivers. Research shows that sediment production on dry land with native vegetation is 83.34 kg/ha while it is 329.58 kg/ha on cleared land. In new settlements, additional deforestation is inevitable and cannot be entirely prevented, but the Legal Reserves and Areas of Permanent Preservation can be maintained and the need for new clearing can be reduced by increasing productivity on land already cleared, sustainable use of the standing Caatinga and recourse to non-agricultural sources of income.

35. In many cases and especially where land is limited unsustainable practices are used to prepare deforested land for production. Excessive tillage, associated with poor ground cover and poorly managed irrigation, are the main triggers of processes of degradation in Sergipe's Alto Sertao. Excessive plowing and continuous disking at the same depths in the soil preparation process causes disruption of lower layers. This transformation reduces the rate of water infiltration into the soil and root development of crops, affecting the potential productivity of agricultural systems. Introduction of exotic species of grass for pastures is also used to improve productivity of meat, milk and hides, however this depletes soil nutrients. The tall grass dries out quickly and burns much more intensely than native species. The National Space Research Institute (INPE) registered 185 fires in Sergipe in 2013. Inappropriate practices leave the soil exposed to heat and wind. Rainfall is often torrential and exposed soil is very vulnerable to surface erosion and formation of gullies. Rapid runoff reduces infiltration to feed springs and wells with groundwater, as well as reducing evapotranspiration that provides more rain farther inland. Soil loss following removal of vegetation has led to the depletion of seed banks, making recovery of native plant cover slow. Clearing and increased use of pesticides have also resulted in reduced populations of pollinators, further reducing recovery times

36. **Large-scale commercial agriculture** is primarily cattle-raising, both for beef and milk. Native vegetation is typically completely removed for the establishment of planted pastures, which cause soil compaction and erosion. There is also excessive and inappropriate use of herbicides, which increase productivity, but lead to negative effects on animal health and soil microbiology. There has been a recent increase in milk production using more productive European breeds of cows that are not as resistant to drought and harsh conditions, leading to problems with pest control and inappropriate use of chemicals. Still, although the NE has 19.0% of Brazil's dairy cattle and more family farmers in Sergipe have cattle than plant beans, manioc or corn, it produces only 11.0% of the milk. This gap in productivity requires more pasture land per liter.

37. The main commercial crops for large scale agriculture include corn (maize) and cotton. Irrigation is more common in large scale farming in northern Sergipe where there is an abundance of water from the São Francisco River but is being increasingly used on large scale to cover multiple farms. However use of irrigation schemes for water on large estates can have negative impacts on LD. Drip irrigation is far preferable to micro-aspersion, which is preferable to macro-aspersion or flooding, but costs much more. Within the SAS large-scale irrigation projects are currently limited to projects in two municipalities involving 333 farms covering 3,980 hectares. One third of this area (1,360 ha) is based on irrigation with macro-aspersion, which causes salinization and alkinization of the soil, making it unsuitable for crops other than saltbush (*Atriplex* genus). Such irrigation will increase when the planned Xingó Canal transposition to the south of the São Francisco through Bahia into Sergipe becomes a reality. The 306 km of this canal, the largest investment ever in water in Sergipe, to be built by the São Francisco and Parnaíba Valleys Development Company (CODEVASF), can provide benefits for human consumption, crops, livestock and industry, but the infrastructure can also have negative impacts in the five municipalities through which it passes in the SAS, depending on the irrigation practices adopted. Irrigation will be controlled by INCRA. In Canindé do São Francisco, it is administered by the Water Resources and Irrigation Development Company (COHIDRO). While micro-aspersion or drip irrigation are less damaging, these more modern techniques lack adequate soil conservation practices. Outside the best irrigation projects, irrigation by direct flooding of the soil is practiced. In extreme cases, excessive flooding has caused runoff channels and gullies, increased soil erosion, the collapse of stream and river beds, siltation of river courses and reduced soil quality. Erosion nearby in Ceará has been measured at 52,114 kg/ha in experimental conditions.

38. Agriculture at various scales is being increasingly mechanized with tractors dragging modern ploughs replacing traditional ploughs using animal traction. This mechanization is associated with increased maize planting, reduced land preparation time and less crop rotation. Reduced soil quality means lower productivity (yields) of crops. Little use of contour lines results in deeper furrows and increased surface runoff, soil erosion, compacting and loss of infiltration capacities. More runoff means less evapotranspiration and less rainfall farther inland. High use of herbicides, pesticides and fertilizers without proper management is also contributing to soil degradation and reduction of pollination. More than 200 pesticides are in use in the Semiarid region.

Over exploitation of wood

39. Wood harvesting is ubiquitous in the entire Northeast region. One third of the energy matrix is firewood, with 25 million m³ per year. Firewood is used by 70% of families for cooking. The extraction of 25 million m³ of wood to provide energy for industries such as gypsum and ceramics production and for commercial and residential purposes, feeding 40% of the energy matrix of the region, has caused negative impacts, although it could be sustainable. In states where Caatinga vegetation is still extensive, work undertaken by UNDP/FAO over the past 20 years has shown that sustainable management of Caatinga for fuelwood is feasible and regenerated forest can reach the same volume and species composition after 15 years. However, in the case of Sergipe, where large forest remnants cover only 13% of the total area, management for conservation, regeneration and restoration is required. In Sergipe, there are 80 brick and tile industries using fuelwood to manufacture bricks and tiles from raw clay. As the industrial sector expands due to urbanization and construction of brick and tile houses in rural areas, pressures for fuelwood extraction will continue to rise. Strengthened oversight is required to ensure that extraction from remaining forest is controlled. In the semiarid areas, encroachment into existing forest reserves still occurs especially during the dry season and between harvests, when wood extraction and sale complements household income. Encroachment on Legal Reserves and Areas of Permanent Preservation is linked to weak enforcement of the law, which was not taken very seriously in the past.

40. Wood is also harvested for fence posts. For example, just to separate the existing 4,827 lots in settlements in the SAS with an average of 20 hectares with perimeters of 1,800m would require nearly

9,000 km of fencing. With an average of 1.5 m. between posts, this would amount to 6 million fence posts. Since they need to be replaced every 5 years, the demand in this estimate is an average of 1,200,000 new fence posts per year. Subdivision of lots to separate livestock from crops increases the number needed, as does the requirement to keep livestock out of the areas protected by the Forest Code, the Legal Reserves (LR) and Areas of Permanent Preservation (APP). Electrified fences with only a few thin posts work for cattle, if there is electric power available, but they do not work for goats.

Hunting

41. Hunting, mostly for purposes of supplementing protein from other sources, is practiced as a result of low income levels and limited livestock productivity. It disturbs the ecological balance by reducing populations of species that play key roles in avoiding or remediating land degradation through maintenance and recovery of ecosystems. For example, many species of birds and mammals are essential for seed dispersion and armadillos help control termites and leaf-cutting ants, which attack crops and gardens.

Infrastructure development

42. As the economy of Sergipe grows, new development projects (roads, dams, other infrastructure works and tourism development) are adding to the pressures being exerted on the land from the agricultural and fuelwood extraction sectors. The Juscelino Kubitschek highway through the SAS to the São Francisco River canyons, a major tourist attraction, and on to Bahia provides improved access. The royalties from the Xingó hydroelectric project have generated a construction boom in Canindê. The new Xingó Canal through five municipalities of the SAS will generate opportunities and challenges. This all leads to increased land use conflicts and exacerbates LD. In the face of these multiple land uses, the management approach being adopted is fragmented and based on a sector-specific lens, rather than multi-sectoral and integrated.

Climate change

43. In the current context of intensification of desertification processes, global climate change presents new challenges. The ASD has just undergone the longest drought in 50 years. Global warming may have a strong influence on desertification process and expanding the areas of occurrence, intensifying aridity and thus worsening the environmental problems of the region. According to the Intergovernmental Panel on Climate Change (IPCC) scenarios the Brazilian semiarid region is considered to be the most vulnerable region in South America, subject to increases in annual average temperature between 4° and 6°C. If current trends continue, by 2050 the Brazilian semiarid region may expand and become arid. The areas with dry sub-humid climate may become semiarid and areas with sub-humid moist climate may become dry sub-humid. There is growing concern in Brazil about such scenarios, although plans, programs and projects implemented by the three levels of government (federal, state and municipal) have not yet taken them into due consideration. At the regional level of the NE rainfall is more concentrated in time and space, corroborating the current trend toward both seasonal dryness and intense flooding. If these scenarios continue, current ASD will suffer in terms of production capacity, creating more poverty and more migration. Dealing with these climate change scenarios and more intense desertification processes will require efforts to improve the harmonization of the various actions undertaken in the ASD by government agencies and non-governmental organizations. While there has been progress in the development of programs such as PAN-Brazil and PAE-SE, these should be complemented with new actions to respond satisfactorily to the needs of local governments and the social groups that are directly impacted.

1.6. Baseline Analysis

44. In line with Brazil's drive to promote sustainable socio-economic growth to reduce extreme poverty, Sergipe has taken steps to address low human development indices and is increasingly aware of the links between these and LD. Through a participatory process in 2011, with support from the Inter-American Institute for Cooperation on Agriculture (IICA), the State Action Plan to Combat Desertification and Mitigation of the Effects of Drought - Sergipe (PAE-SE) was developed following the same five thematic areas of the national action plan. Within these, the PAE-SE identifies 90 actions and provides an initial mapping for funding through existing and planned sector programs that incorporate some elements needed to address LD. These and more recently planned investments constitute a baseline for the proposed project that has an estimated cost of US\$121.5 million.

45. Of this total, **US\$28.35 million** will be channeled to strengthen land use governance. As part of Brazil's agrarian reform, many new settlements have been created in the SAS. Land tenure regularization is vital for increasing buy-in for SLM and for access to diverse funding sources. In the baseline, this program will continue with an estimated expenditure of US\$2.67 million. The state is will direct an estimated **US\$13.24 million** for licensing in the agrarian reforms and other landholdings in ASDs (staff recurrent costs, actual licensing and some enforcement). However, these do not include specific guidance on SLM nor identify the different LD levels and complexities of managing conflicting land use in increasingly degraded areas where actions in one site may have negative synergies with those in surrounding areas.

46. To advance coordination of land use across different levels of governance and sectors, Sergipe is taking steps to improve integrated water and environmental permit processes. This includes the development of the Waters of Sergipe program starting in 2013 with state and World Bank resources **and a total budget of US\$115 million**. A component will involve institutional strengthening for improving water management, strengthen the Sergipe River watershed committee and develop a state-level EEZ. An estimated **US\$10.36 million** will be invested in this and the coordination work. These present opportunities on which to build but require expanding to better include LD issues, include other priority ASDs and ensure close coordination with PAN-SE priorities. At the national level, an estimated US\$2.081 million will be spent on supporting a knowledge network for SLM in ASD that is relevant to Sergipe, and support to states in the development and early implementation of PAEs that will enable exchange of lessons learned and offer a channel for replication.

47. An estimated **US\$93.15 million** will be invested in the baseline in activities that offer opportunities for increasing links between poverty reduction and combating desertification. This includes actions in the above-mentioned Waters of Sergipe program through components for developing more modern, sustainable and efficient irrigation methods for farmers to reduce pressure on scarce water resources and rehabilitation of environmental protection areas such as riparian forests degraded by years of inappropriate or non-existent environmental management (**US\$21.87 million**). Through further state allocation of resources within the Greater Fairness in Sergipe program (*Sergipe Mais Justo*), support will be provided to small farmers in sustainable use, agro-ecological practices and the provision of seeds (**US\$12.04 million**). This will be complemented with the recently approved Dom Távora program, in part funded by the International Fund for Agricultural Development (IFAD), which will develop value chains, identify and mobilize producers' groups, identify and formulate business plans, provide technical assistance to implement these and provide training on business (**US\$39.79 million**). It will be carried out in the poorest municipalities, amongst which 41 are in the ASD, but it will focus mainly on business plans and extension and does not include specific uptake and dissemination of SLM practices or cover the seven municipalities of the SAS, where desertification processes are most severe.

48. As part of this total US\$93.15 million baseline, investment will be made for SLM finance and incentives in Sergipe estimated at **US\$17.27 million**. This includes insurance for harvest losses and a number of national programs that execute resources at the state level, including the school food and food acquisition programs and other programs associated with the flagship plan Brazil without Misery (*Brasil sem Miséria*) that aims to increase per capita income for families under extreme poverty conditions; provide access to public services (such as water and electricity) for social well-being and expand work opportunities and income. There is substantial focus on the NE region of Brazil, including Sergipe. The ministries that define the goals, programs and priorities under this plan are coordinated at the national level through an inter-ministerial group set up to determine the application of resources for implementing the plan (US\$2,015 million). The resources are implemented directly by states with the participation of civil society (e.g. the NGO network ASA implements the water-safety program), however, increased coordination with state priorities and resources is needed.

1.7. Long-Term Solution And Barriers To Its Achievement

49. Despite this extensive baseline there is a risk that sector actions will be fragmented, will following a uni-sectoral vision and will not be optimized for addressing the increasing LD resulting in loss of ecosystem services and worsening of socio-economic parameters Sergipe's ASD . The long-term solution to mitigating land degradation is to implement a multi-sectoral, landscape level management approach that takes into consideration the multiple pressures on soil and land resources from various sectors. This solution will depend upon strong inter-sectoral and inter-agency cooperation, a strengthened governance framework, and increased uptake of SLM as a result of financial and human resources channeled toward the promotion of SLM and where appropriate, SFM. The achievement of this long-term solution is undermined by two main barriers: 1) limited existing governance framework to promote SLM in Sergipe and 2) uptake of SLM in Sergipe impeded by capacity and funding issues. The project has been designed to address these two main barriers and is detailed in the next section Project rational and design options. (Part II of this document)

Barrier 1: Limited governance framework to promote SLM in Sergipe

50. The limited existing **governance framework** and structures to promote, disseminate and implement sustainable land management practices restrict the ability to implement existing and new measures to reduce multiple pressures on land. Knowledge is not consolidated and incorporated in practice. While there has been remarkable progress, the federal, state and municipal responsibilities overlap, sectoral approaches lack sufficient integration and the roles of the private sector and civil society are undergoing change as consultation and participation continue to be strengthened.

51. Planning and Policy: The PAE-SE provides an adequate description of existing programs and state-level priorities to reduce LD, but is lacking in detail regarding comprehensive baseline measurements, a full delineation of institutional roles and responsibilities and procedures for sector interventions or coordination among sectors and funding needs. While it is multi-sectoral, participatory and legitimate, it does not specifically use a multi-sectoral lens to analyze LD causes, impacts and solutions. This limits its utility as a planning tool to guide decision making for these purposes.

52. While the Sergipe State Forest Program has considerable convergence with other state-level programs and plans, the various programs do not consistently promote SLM practices. The other sectoral programs include irrigation, rainwater catchment and storage, credit, insurance and social programs, among others. Some programs intended for social protection can have adverse and unexpected environmental effects, such as the existence of insurance to cover harvest losses, which has led to increased high-input corn cultivation that does not adhere to SLM principles. Inappropriate use of water

for irrigation has contributed to salinization. On the other hand, government stipends, water, electricity, housing, furnishings, rural pensions and various kinds of government services (school lunches, cisterns, health, social security etc.) reduce the pressure on the land to produce food or generate monetary income to meet needs through the market.

53. The Standing Group to Combat Desertification (GPCD) can be a key actor at the level of Sergipe if it increases its capacity to involve and influence state government agencies outside the environmental area as well as federal and municipal agencies. Its responsibilities also overlap with the State Environment Council (CEMA) and State Water Resources Council (CONERH) and a new state forest council. The National Commission for Combating Desertification and Mitigation of Effects of Drought (NCCD), created in April of 2007, could help promote multi-sectoral approaches at a higher level.

54. Land use planning would help control land use, particularly in areas at risk of desertification, but such planning has not been undertaken at the scale required to control land degradation in Sergipe. A federal level Ecological-Economic Zoning (EEZ) Plan exists. Some work is also being carried out on the São Francisco River Basin, which includes most of the SAS, by the National Water Agency (ANA). SEMARH and the World Bank will be carrying out an EEZ for Sergipe. There is need for specific recommendations and guidance to include the INRM and SLM lens. There are no plans to produce a specific detailed EEZ of the SAS, which has been identified as the LD priority in Sergipe. Such EEZ is costly and not easy, but it would be useful to better plan and oversee the licensing processes effectively. So far, productive activities have proceeded without due regard to soil type, land degradation status and future risk, or social and economic criteria. Furthermore, coordinated inter-sectoral landscape level action has not been carried out at the state level with the key stakeholders. Since such detailed zoning takes years to complete and is very costly, work must begin as soon as possible based on existing knowledge, which has advanced significantly in recent years. Planning to prepare for the 306 km Xingó Canal through five of the seven municipalities is an urgent need.

55. The Secretariat of Planning (SEPLAN), which is responsible for the formulation and management of the state's participatory planning, including the four-year Pluri-Year Plans (PPA) and annual budgets of approximately US\$3.4 billion per year, makes budgetary decisions on a sector-by-sector basis with little consideration of environmental impacts. There is insufficient integration to guarantee due incorporation of concerns with desertification in the new PPA for 2016-2019.

56. Institutional limitations within SEMARH translate into a situation in which licensing and oversight of land use changes and vegetation suppression is not based on consideration of LD hotspots or SLM criteria or broad understanding of the multiple pressures on the land and available alternatives. The 2013 National Environmental Council (CONAMA) Resolution (458) simplifying licensing procedures for land reform settlements allows state governments to establish specific conditions for licensing, consistent with national norms. The planning of Areas of Permanent Preservation (APP) and of Legal Reserves (LR) must be undertaken in accordance with the recently approved Forest Law, which does not contemplate LD criteria. It is not clear yet what uses can be made of such areas; new regulations are pending and will certainly require revision as new knowledge and experience are acquired. There are no clear directives to speed up approval of sustainable practices in different ecosystems of the Caatinga, with various types of plant cover. Knowledge of how to prepare management plans is scarce and consultants are expensive. Procedures and suitable SLM practices to link with the different types of licenses are often unclear to those involved, so that appropriate submissions are difficult to make and thus to be approved.

57. Oversight of land use regulations is also limited by insufficient capacity within SEMARH, IBAMA and municipalities and insufficient understanding on the part of all concerned about alternative practices and existing instruments for control, oversight and extension. The applications are often incomplete or inconsistent and the licensing agencies have insufficient personnel to meet the burgeoning demands from

new settlements and new regulations. Under the new Forest Law, which replaced the former Forest Code in 2012, the Rural Environmental Registry (CAR), identifying geo-referenced Legal Reserves (LR) and Permanent Preservation Areas (APPs), is still in the early stages of implementation and will stretch state resources for land use regulation even further. It requires constant updating of registered data whenever there is change on the ground. Implementation is delayed because of serious legal issues about confidentiality of information at the individual property level and technical issues about scale, remote sensing, design of polygons, uploading etc. There is an urgent need to set up and strengthen state capacities so that the Registry can be effective and incorporate SLM principles, thereby optimizing the Environmental Regularization Program (PRA) foreseen in the new Forest Law as a tool for combating land degradation. The general principles need to be translated into concrete criteria.

58. At the national level, the procedures for the issuance of licenses under the federal domain require tailoring to take into account SLM criteria and practices. Some initiatives can be taken regarding oversight of land use at the state level in Sergipe. At the municipal level, despite Brazil's policy of decentralization, which promotes the increased assumption of environmental responsibilities by municipalities, the latter are ill-equipped to take on these new functions, including licensing and oversight of activities within their boundaries, especially the small municipalities in the interior which lack sufficient scale and the necessary financial and human resources. There is no mechanism as yet for cooperation among such municipalities. The government land settlement projects do not receive sufficient support from the National Institute of Colonization and Agrarian Reform (INCRA) or the state agency. The situation is even worse with regard to post-licensing inspections.

59. Finally, replication, up-scaling and mainstreaming of positive small-scale experiences of civil society organizations and others in the promotion of SLM at the project level is limited due to insufficient information dissemination, contributing to incomplete knowledge base on appropriate practices for Sergipe. The information dissemination that occurs is mostly in literature with a much broader geographical scope, even for the tropics and subtropics around the world, but this information needs to be made more readily available in the SAS in appropriate formats and language.

Barrier 2: Uptake of SLM impeded by knowledge/capacity and finance issues

60. Uptake of SLM practices is limited. Previous individual initiatives to demonstrate SLM practices and identify best-bet land uses in different socio-economic scenarios include those carried out with the UNDP GEF project on the Caatinga "Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga" Many practices were identified in the first and second National Meetings on Confronting Desertification (ENED) in Juazeiro, Bahia, in 2010 and in Campina Grande, Paraíba, in 2013. Irrigation techniques are well-known, but many other SLM techniques have not been tried, tested and diffused. Wide variety of possibilities are listed in Annex V.2 of Section VII however, most of these practices remain at a small scale and few have been tested on the ground in SAS. Promising practices include rotation of pastures, redistributing the herd among different parcels according to their productivity (Voisin), integrated crop-livestock systems, silvopastoral agro-forestry, 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 fruits (like *umbu*, *licuri*, *mangaba*, *caju*, *murici* and *maracujá boi*), nuts and fibers, as well as medicinal plants, wildlife management, ecotourism and handicrafts with wood. However, most of these practices remain at a small scale and few have been tested on the ground in SAS. The Semiarid Association (ASA) "One land and two waters" (P1+2) project works 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." Some technologies are for families and others are for communities.

61. The seeds that are the mainstay of family farming are disappearing because of replacement of native seeds by commercial seeds that need to be purchased or acquired through government programs. Delays in acquisition prevent planting during the rainy season and jeopardize productivity. Recently, social movements and non-governmental institutions have set up their own agrobiodiversity seed banks in settlements and rural communities. Such local seed banks can restore and conserve landraces and traditional varieties and genetic heritage adapted to semiarid conditions.

62. Knowledge of what is technically and economically feasible and works well in local conditions in Sergipe is limited. The main lack of knowledge is with regard to costs and the return on investment, which considerations are critical for poor smallholders, on the one hand, and for lenders of credit, on the other. Limited uptake of SLM practices is in part due to the limited technical and operational capacity of state-level extension services, which are the responsibility of EMDAGRO and non-profit organizations under government contract, while needs are growing constantly. The state agency must compete for federal funds of the Ministry of Agrarian Development. The national system of rural extension, extinguished in 1991, is only now being reestablished. Most of the government staff have received training in conventional Green Revolution agronomy or forestry and lack experience in areas such as agro-ecological principles and small-farmer business promotion. They are now older and less willing to go deep into the field. New training is not well organized or formalized. Although the National Semiarid Institute (INSA) and various other federal institutes (IFs) provide training for sons and daughters of small farmers, access is limited. As a result, SLM practices receive little emphasis in mainstream extension services. Furthermore, lack of analysis of economic feasibility, effectiveness and sensitivity of the various practices makes uptake by farmers, technical assistance by extensionists and approval of credit by banks more difficult.

63. Financial incentives to promote uptake of SLM are limited, both because many of the financial instruments do not specifically target such actions and because many stakeholders lack capacity to access existing instruments. Funds available from different agencies such as MDS and MDA are not integrated and channeled to combat desertification. Substantial amounts of funding are available, for example through programs associated with the Brazil Without Misery plan and the Citizenship Territory of Alto Sertão, but SLM criteria are not integrated into the process of accessing the funds. The Constitutional Fund of the Northeast (FNE) and loans from the national development bank (BNDES) are mostly for big business. The Bank of the Northeast (BNB) has a micro-credit program called Credi-Amigo for urban and rural areas, but in the SAS it only has branches in Gararu and Nossa Senhora da Glória. One of the nine specific subprograms of the Climate Fund is for Combating Desertification. Some of the existing funds can be used to support projects that are not adapted to the different Caatinga ecosystems and to the levels of land degradation and that may even facilitate land conversion for unsustainable agriculture, animal husbandry and other practices. Such funding and other financial instruments that could be used for SLM activities in Sergipe are underutilized as access is complex and costly, and project proposal quality is low. This is due to institutional weakness in project development and also to low project preparation capacity within civil society and farmer organizations (see Part IV, Annex V.1 on sources of credit and funding).

64. Availability of credit is also constrained by budget restrictions related to Brazil's current macroeconomic situation, with many competing demands for limited government funds. The margin to maneuver with regard to use of credit is limited by controls of the Central Bank and the National Monetary Council. Some kinds of project do not fit into existing sectoral divisions of credit institutions. The banks are not prepared to carry out the required technical analysis of some kinds of innovative projects because they lack the parameters for evaluation following existing rules and regulations. The

investments are costly and can take time to pay back the initial costs. Many small farmers resist taking out loans because they are reluctant to become indebted. Furthermore, it is often difficult to provide collateral and guarantees. Many co-signers on loans have themselves become ineligible for new credit because of previous default.

65. Environmental licensing is increasingly becoming a barrier to access to credit. As mentioned, the process in the federal environment agency (IBAMA) and the state environmental agency (ADEMA) is slow as regards both preparation and processing. It is clear that there are insufficient staff and qualifications, while demand has mushroomed. Collective arrangements are difficult to establish. Post-licensing monitoring is practically inexistent. Recently the process has become more complicated because of requirements for CAR and PRA, which are idealistic, but difficult to put into practice by smallholders.

66. Access to markets is also a significant barrier. There are few structure value chains for small farmers to market conventional products or products of sustainable use of biodiversity. In Sergipe, there has been practically no investment in agro-industries to process products of sustainable use of biodiversity like *umbu*, as has been done in parts of Bahia, or in organization of value chains and local productive clusters. This limits the marketing and sale of smallholder products from sustainable land use management.

1.8. Stakeholder Analysis

67. The analysis of stakeholders and their relevant roles are presented in Table 9.

Table 9. Stakeholders and relevant roles.

STAKEHOLDER	RELEVANT ROLES
Department to Combat Desertification (DCD), Secretariat of Extraction and Sustainable Rural Development (SEDR), Ministry of Environment -MMA.	DCD/SEDR/MMA is charged with the implementation of the UNCCD in the country, as the technical focal point for the Convention. It is responsible for the design, development, legal framework and integration of public policies in order to guarantee sustainability in actions and activities to combat desertification and land degradation in ASD. DCD will facilitate the promotion of uptake of SLM practices with support from various government agencies. The Project will be technically coordinated by DCD through its National Technical Director and the National Technical Coordinator who will work with the Project Management Unit. This implementing partner is key to all Outputs and will participate in the Project Advisory Committee (PAC).
Sergipe State Secretariat of Environment and Water Resources (SEMARH)	SEMARH plays a key role in the state environmental governance and licensing processes. It has strong buy-in and support from other sectors and levels of government. Consequently, SEMARH is a key stakeholder for this project due to its responsibilities in sustainable development of Sergipe and as a member of NCCD. The main state environmental programs are under its umbrella, which includes the implementation of PAE-Sergipe, which promotes SLM adoption in Sergipe. In this way, the project will carry out institutional strengthening of SEMARH in licensing and oversight processes. It is a relevant player for all Outputs, participating at the PAC.
National Commission to Combat Desertification (NCCD)	NCCD is the consultative and deliberative collegiate body that decides on the implementation of the national policy to combat desertification and mitigate the effects of drought. Due to its competence and as a member of the Project Advisory Committee Committee, the NCCD will contribute to the project as a consultative forum and decision-making instance for creating consensus on combating desertification, empowering social stakeholders involved and including minority groups. Moreover, NCCD will support the design of new guidelines, methodologies and related regulations regarding licensing procedures and adoption of SLM under the national framework in partnership with DCD, CONAMA, SFB and IBAMA. It is particularly relevant in the implementation of Outputs 1.3, 1.4, 2.1, 2.2 and 2.3, participating at the PAC.

STAKEHOLDER	RELEVANT ROLES
Standing Interagency Task Force to Combat Desertification (GPCD)	GPCD is responsible for the coordination of actions to combat the causes and effects of desertification in Sergipe as foreseen in the PAE/SE. Its mandate includes the development and implementation of projects which provide financial and technical support for increasing capacity for sustainable coexistence with drought. GPCD will promote networking among state stakeholders as a forum for consensus building and strengthening of SLM adoption in Sergipe, working as a channel for flow of information and lessons learned in the project to the NCCD. Moreover, the GPCD will support the formulation of seven municipal plans to combat desertification in SAS, being a key stakeholder for Output 1.1.
Brazilian Institute for Environment and Renewable Natural Resources (IBAMA)	IBAMA is the authority responsible for implementation of the National Environmental Policy (NEP) and other environmental policies relating to federal responsibilities for environmental licensing regulation, environmental quality, authorization for use of natural resources and environmental inspection, monitoring and control, subject to the guidelines issued by the MMA. In this way, IBAMA will be responsible for assistance in monitoring and supervision of project activities supporting the development of methodological guidelines, regulations and resolutions, as well as providing technical inputs relating to supervision and monitoring to promote the adoption of SLM in ASD. It is a relevant stakeholder for (Outputs 1.3, 1.4, 2.1, 2.2 and participates at the PASC.
Brazilian Forest Service (SFB)	SFB is mandated to promote economic and sustainable use of forests in Brazil. It will be responsible for encouraging and supporting the adoption of SLM as a strategy to combat desertification and promote the sustainable use and conservation of forestry resources in ASD, providing technical support for implementation of the National Forest Inventory in Sergipe and supporting training for SLM practices. It is a relevant player for Outputs 1.3, 1.4, 2.1, 2.2 and 2.3.
Public Environmental Funds	The public environmental funds are tools to support the implementation of environmental public policies in the country (see Part IV, Annex V.1. These funds play a key role in the implementation of project field activities to enhance and encourage the adoption of SLM in Brazil's ASD as a strategy for recovery of environmental quality of degraded areas and sustainable management of landscapes. Concerning the project activities, the environmental funds will play an important role supporting project interventions in Sergipe. Moreover, they will encourage and support the development of studies and projects about combating desertification as a tool for adaptation and increased resilience of communities to climate change, as well as sensitivity assessment to enhance of SLM, APLs, Supply Chains, PES and other instruments that promote sustainable use of environmental resources and sustainable rural development in ASD. They are particularly relevant for Output 2.3.
Sergipe Environmental Agency (ADEMA)	ADEMA is the Sergipe State Authority (linked to SEMARH) responsible for environmental licensing and monitoring of activities with potential for causing environmental impacts and pollution. It is responsible for the implementation of CAR and related activities in Sergipe. As a member of the Project Technical Committee, ADEMA will undertake actions to collaborate in the design of procedures for licensing of SLM (alternative use and forest management), providing guidance for optimizing and strengthening procedures for licensing and monitoring. Consequently, ADEMA will embrace project outcomes and lessons learned in the processes of licensing, monitoring and oversight of projects applying SLM, and take part in training activities of its staff. It is a relevant stakeholder for Outputs 1.1, 1.2, 1.3, 2.1 and 2.2) and participates at the PAC.
Sergipe State Secretariats (SEAGRI, SEDETEC)	The Sergipe government institutions that have responsibility for supporting rural development will be involved as stakeholders in the project. They will work in partnership with the other stakeholder to encourage the development of sustainable local production arrangements (APLs) and business plans in the ASD incorporating SLM guidelines resulting from the project, to support scientific-technical development related to project activities and to support the training of stakeholders. Furthermore, they will be urged to absorb the project outcomes in decision-making processes. These institutions are relevant for all outputs.

STAKEHOLDER	RELEVANT ROLES
Alto Sertão Municipal government environmental authorities (*See list in next column)	Municipal authorities are responsible for environmental management at the local level, which includes encouraging the adoption of practices that promote sustainable economic, social and environmental development, and tracking and monitoring activities with potential for environmental impact and pollution. In the project activities, the environmental authorities of municipal governments will facilitate and support the implementation of project activities, develop local action plans to combat desertification and consolidate/strengthen their Environmental Systems (councils, regulation and environmental funds). In parallel, they will encourage the participation of members of the GPCD as a state-level consultative forum on desertification and support the development of technical capacity on desertification and LD. They are relevant for most of projects Outputs: 1.1, 1.2, 1.3, 2.1, 2.2. : * Canindé do São Francisco, Monte Alegre de Sergipe, Nossa Senhora da Glória, Nossa Senhora de Lourdes, Porto da Folha, Poço Redondo, Gararu)
Banking Institutions	The Banking institutions (federal, regional and state banks) with activities in rural development at all four scales of the project are relevant stakeholders. They will be partners in supporting the development of arrangements to increase the supply of financial resources for adoption of SLM in ASD. Moreover, they will have substantial tasks in preparation of bank staff to evaluate proposals for SLM for rural credit programs, training of technicians and ATER agencies in designing projects involving SLM and stimulating the capillarity of the credit system in all municipalities to support SLM, among others (see Annex V.1 Sources of Credit and Funding). Relevant for Outputs 1.4, 2.2, 2.3.
Research, Education and Extension Institutions	The main federal and state research, educational and extension institutions in ASD (UFS, IFS, EFA, UNILAB, EMBRAPA, INSA) are key stakeholders in formation and training activities of the project. They will support the development of studies on SLM and combating desertification in ASD, support the creation of methodological guidelines for SLM and promote the flow of technical and scientific information and traditional knowledge. In parallel, the institutions will participate in project forums to promote the uptake of project outcomes and best practices by the academic community in its research, education and extension, seeking socio-environmental inclusion of project stakeholders through extension activities of the institutions. These institutions are relevant for Outputs 1.3, 2.1 and 2.2. The UFS participates at the PAC.
Agrarian Reform Institutions	INCRA (Federal) and PRONESE (State) are responsible for the implementation of and support for agrarian reform and related activities for promotion of sustainable territorial development with inclusion via income and rights. In this project, they will absorb project outputs and outcomes in the planning of new settlement projects, support project activities carried out in agrarian reform settlements and strengthen capacity-building activities in coordination with the technical assistance and rural extension services. They are relevant for Outputs 1.1, 1.4, 2.1, 2.2 and 2.3. INCRA participates at the PAC.
Technical Assistance and Rural Extension Institutions (ATER Institutions)	The ATER institutions are essential strengthening family farming and expansion of agribusiness, promoting food security through technical assistance and rural extension, research and diffusion of sustainable social-inclusive practices. They will assess the training needs and credit for rural farmers, facilitate dialogue with the grassroots stakeholders (settlers and other rural communities) and develop new strategies for monitoring of ATER projects. In parallel, they will be responsible for supporting the training and qualification of ATER services and for collaboration in the project activities, in particular at field sites, in order to promote a synergy with ATER actions in the state and supporting the adoption of the SLM strategy to promote sustainable rural development so as to avoid land degradation. It is particularly important for Output 2.1 and 2.2.
Civil Society Organizations	The CSOs are represented in this project by ASA (Semiarid Network). They will support the strengthening of civil society for building participatory processes for sustainable development and coexistence with the semiarid based on cultural values and social justice. Moreover, they will support the implementation of the project at field sites, coordination among key social stakeholders for project implementation and the training of network members on SLM in order to guarantee the dissemination of good practices and lessons learned generated by the project. They are involved in most of project's Outputs, namely, Outputs 1.3, 1.4, 2.1, 2.2 and 2.3

STAKEHOLDER	RELEVANT ROLES
Local Communities	The Local Communities and Rural Settlements of ASD are the most important stakeholder of the project as its ultimate beneficiaries. They will be involved in the implementation of field-level project activities and in the monitoring and maintenance of SLM plans. In parallel, they will benefit from training on SLM practices as well as training to facilitate access to credit and other financial instruments, improving the adoption of SLM. Moreover, they will have an important role to play in promoting replication of SLM practices to combat land degradation in ASD which includes participation in the NCCD and GPCD forums. Fundamental for project's undertaking on Outputs 1.2, 1.3, 2.1, 2.2 and 2.3
Public Prosecutors of the State of Sergipe (MP-SE)	As Public Prosecutors, the MP-SE is responsible for ensuring effective respect of public authorities and services for the rights guaranteed in the Constitution, taking the necessary measures to guarantee them. It will strengthen the implementation of Environmental Systems in the seven SAS municipalities and participate in the organization of forums for exchanging knowledge, in particular on the experiences of SLM, PES and community empowerment. MP-SE will participate at Outputs 1.1, 2.1, 2.2 of the project

PART II. STRATEGY

2.1. Project Rationale, Design Principles And Strategic Considerations

68. The project has been designed to address the two main barriers that are preventing sustainable land management, that is, an insufficient governance framework to promote SLM in Sergipe and the capacity and finance issues that are limiting the uptake of sustainable practices in the state. It will do so by strengthening the state environmental governance framework to better address the main drivers of land degradation and desertification, focusing primarily on the escalating conflict between land uses of smallholders that adopt best practices and unsustainable agriculture practices in degraded agro-ecological landscapes where LD is already high causing soil erosion, soil nutrient depletion, damaging hydrological system integrity and undermining ecosystem services.

69. This requires initiatives at the various levels of government, involving different sectors, international cooperation, the private sector and civil society. To some extent, the solutions in Sergipe depend on changes in the broader regional, national and international context. The pioneer work undertaken in Sergipe in the project can also contribute to such changes far beyond the borders of Sergipe, in 10 other states. The global and national concerns with sustainability, climate and poverty provide many opportunities for scaling up and mainstreaming. In order for the various stakeholders to buy into this approach, concrete details are needed on what to do and how to do it. The economic and social benefits must be made clear and the costs must be affordable. The solutions must also be legally and politically feasible in the existing situation and clarification that SLM decreases costs in the short-, medium- and long-term is needed.

70. Specifically, the project will address governance issues regarding licensing and oversight, multi-sectoral approaches, strengthening the capacity and integration of institutions working with desertification, improving access to credit for SLM and developing capacities of civil society, including women. These will have long-lasting effects in Sergipe and provide examples for replication across the NE region. Likewise, the introduction, testing and dissemination of SLM technology in the target area of Sergipe's Alto Sertao (SAS) will have multiplier effects over time and space, reaching the entire state and the rest of the region.

71. Key elements that will be strengthened are land use planning, environmental licensing and oversight and improvement of land use to avoid, reduce and mitigate LD in areas susceptible to

desertification (ASD). Through strengthened institutional and farmer capacities and facilitation of access to existing funding sources, uptake of SLM practices will be increased principally in the area of highest risk of LD in the state – the Alto Sertão. This has been identified as a state priority and constitutes a Citizenship Territory, an area targeted in national programs to reduce hunger and poverty. By reducing LD and maintaining vital ecosystem services, the project will improve the livelihoods in an area subject to high poverty and social hardship indices, particularly among smallholder farmers in agrarian reform settlements. This will lay the basis for scaling up to an intermediate geographical scope including the rest of the ASD in Sergipe.

72. Strategic action at the national level through the Ministry of Environment, Secretary of Extraction and Sustainable Rural Development, Department to Combat Desertification and Land Degradation (MMA/SEDR/DCD) and the National Commission for Combating Desertification (NCCD) will enable this state's SLM governance model to be disseminated to other states of the NE, thereby facilitating replication across the entire Brazilian semi-arid region and evoking further Global Environmental Benefits (GEB) in the long term. While uptake of SLM practices under the project (Outcome 2) is local, many of the governance issues dealt with under Outcome 1 will generate change in government policy at the regional and national scales, such as criteria for licensing and oversight.

73. A number of decisions were made in the design including amongst others:

(i) Focus on Sergipe

74. Sergipe has high levels of land degradation, pockets of poverty and different types of LD, so that different kinds of solutions can be demonstrated, thus facilitating replication to other states. The state, which has been a pioneer in several environmental initiatives, such as its forest inventory (the first in the country) and the on-line authorization for transport of wild or domestic animals. The smallest state in Brazil, it is fifth in total expenditures on environment in absolute terms. Most importantly, it has completed its PAE-SE and has identified priority actions to reduce levels of LD. Various state baseline programs exist, which the project can influence over its lifetime to ensure that SLM considerations are taken into account. Sergipe also has significant political will and buy-in from SEMARH to move forward to implement the PAE-SE plan and to take action on LD and on poverty reduction. In order to achieve this, the state government has good relations with rural social movements, especially of landless workers.

75. Because of its small size, Sergipe has the advantage of close proximity of target groups to markets, government agencies, banks, civil society organizations and academic institutions. The focus on one state will enable the project to have substantive on-the-ground impact and will provide a model for replication throughout the ASDs. Replication of the most successful and sustainable practices to other states will be encouraged through information dissemination, knowledge management and national-level project elements. While some states will be influenced by horizontal interstate dissemination, the national level, including various ministries, national commissions and civil society organizations, will draw in the states that may be less inclined to embrace social and environmental causes. Regional mechanisms such as SUDENE (connected to the Ministry of National Integration), BNB and ASA are relevant for the NE Brazil, while international exchange contributes to wider dissemination within the country and abroad.

(ii) Selection of sites for on-the-ground activities

76. The sites for on-the-ground activities will be in the municipalities with the largest new agrarian reform settlements that are suffering from the greatest pressures from drivers that degrade land but on the other hand also provide the best possibilities for engagement of municipal governments. This is because one of the great challenges Brazil faces is to reconcile agrarian reform with environmental sustainability.

Also both Canindé do São Francisco and Poço Redondo, the largest of the seven municipalities in the SAS, which are home to dozens of settlements, are developing their Municipal Action Plans to Combat Desertification and Mitigation of the Effects of Drought (PAMs) using the model established by the PAE for the state's ASDs. Within these municipalities, priority will be given to on the ground work within at least one large older settlement and one newer settlement selected according to criteria regarding: 1) pressure on land use and water resources, 2) type of LD problems such as erosion, salinization and deforestation, 2) variability of potential SLM practices (to ensure a wide range) , 3) risk of environmental degradation (wood harvesting, overgrazing, inappropriate management), 4) existing forest cover, 5) proximity to forest cover (see Annex V.2). Also by working with families in the entire settlement/community piloting combinations of different SLM practices in a specific geographical area the project will be able to go beyond impact in individual lots and farms and determine the overall effect in landscapes. This can then be replicated through co-funding and baseline programmes to areas with similar characteristics further up-scaling SLM to larger landscapes.

77. Two municipalities, three agrarian settlements and one community outside settlements have been pre-selected for local level and filed implementation. These municipalities and settlements, were proposed by the state government, rural extensionists and local social movements, and were visited by the team preparation working. In addition, all rural areas of the 07 SAS municipalities will be the target of project activities as regards the PAM's the strengthening of credit schemes land reform settlements communities.

78. Field studies undertaken during the PPG phase pre-selected the following sites as the most appropriate for on-the-ground activities: 1) Jacaré-Curitiba I-VIII, established between 1997 and 1999 in Poço Redondo and Candindé de São Francisco, with nearly 800 well-organized families practicing irrigation, livestock raising and dryland farming in 20,940 ha. 2) Florestan Fernandes, also in Canindé do São Francisco, with 31 families in 824 ha needing assistance to avoid grazing in protected areas. 3) Valmir Mota Kenio, with 33 families in 429 ha, near one of the largest remaining forest patches in the state. (4) A community under strong pressure from clearing: Poço Preto, in Poço Redondo, outside land reform settlements, which can be a model for more general replication, . Within these sites a final selection of families will be completed in the first three months of the project and will take into account factors such as level of farmer interest, local organization, co-funding opportunities and partnerships. More details on field sites can be seen in the Annex V.2 of this project document.

79. Direct extension and promotion of SLM under Outcome 2 will be focused primarily on small-scale producers, primarily in land reform settlements, a source of new pressures for LD, while the practices of large-scale farmers and ranchers will be influenced by the governance measures of Outcome 1.

(iii) Social inclusion

80. The issue of gender is addressed in the project design by stressing and strengthening the role of women in family farming, especially in the social context of female-headed households, as well as the environmental context of water shortage and the use of firewood for cooking. Women also play key roles in sustainable livelihoods that offer alternatives to unsustainable production practices, such as use of native fruits and nuts and commercial handicrafts like basketry and bio-jewelry. Such new roles promote empowerment. Cisterns that provide availability of water near the house and reduced need for firewood relieve women and girls of heavy burdens of fetching water, washing laundry in streams and gathering wood. Cisterns also improve hygiene. Men should also assume some of the responsibilities that are traditionally feminine. The participation of women will be encouraged through insistence about their presence and voice and will be monitored in lists of participants in training and meetings. In addition to gender, issues regarding youth and the elderly will be addressed in order to facilitate sustainable family arrangements needed for the survival of small-scale farming systems. In addition to education, youth have knowledge of modern technology like computer spreadsheets and access to means of communication like

mobile telephones and internet, while the elderly have traditional knowledge and wisdom, as well as determination to persist in the face of adversity.

2.2. Project Objective, Outcomes And Outputs/Activities

Project objective

81. The project objective is to strengthen SLM governance frameworks to combat LD processes in the semi-arid region of the state of Sergipe in the NE of Brazil. The project strategy includes two main outcomes to directly address the barriers that undermine widespread adoption of SLM practices in the state. Outcome 1 will lead to the establishment of an improved governance framework through the revision of state-level plans and sector programs, effective cross-sectoral and inter-institutional coordination mechanisms in Sergipe, improved licensing and oversight processes, a supportive national-level governance framework and information dissemination. Outcome 2 will promote increased uptake of SLM through the implementation of best practices, strengthened state-level extension services and increased access to funding. The spatial scope of each output is in Table 10.

Table 10. Levels of direct and indirect impact (replication) of project outputs.

Outcomes and Outputs	Levels of Direct Impact	Level of Indirect Impact
OUTCOME 1: Governance framework strengthened to avoid, reduce and revert land degradation in Sergipe state		
Output 1.1. Sergipe's state policy and planning framework supports integration of SLM in ASD	<ul style="list-style-type: none"> • Alto Sertao 7 municipalities 361,451 ha – rural area) (PAMs) • Sergipe State ASD (strengthened PAP) covering 75% of State and 1,480,413 ha 	<ul style="list-style-type: none"> • End/post project ASD in semi-arid NE Brazil 111,079,903 ha)
Output 1.2. State land use licensing processes stimulate appropriate measures to reduce LD	<ul style="list-style-type: none"> • 03 Agrarian Settlement and 01 Community in Alto Sertao (22,943 ha) • Improved licensing and CAR implementation in Alto Sertao 7 municipalities 	<ul style="list-style-type: none"> • Sergipe State ASD 1,480,413 ha (rural area) • ASD (111,079,903 ha, including Sergipe ASD – rural areas)
Output 1.3. Monitoring land use optimized for SLM implementation	<ul style="list-style-type: none"> • Early warning system in Alto Sertao 7 municipalities 361,451ha) • Drivers of LD in 03 Agrarian Settlements and 01 community (field sites) in the Alto Sertao (22,943 ha) • LD state measured in 03 Agrarian Settlements and in the Alto Sertao and lands of at least 1 community (22,943 ha) • Integrated management areas (SLM/SFM) with management plans elaborated and approved by environmental authority (8,000ha). 	<ul style="list-style-type: none"> • Sergipe State ASD (1,480,413 ha) • ASD (111,079,903 ha, including Sergipe ASD – rural areas)
Output 1.4. Supportive knowledge management and national-level governance framework increases adoption of SLM in Sergipe and	<ul style="list-style-type: none"> • Sergipe State ASD (1,480,413 ha) • ASD (111,079,903 ha, including Sergipe ASD – rural areas) 	<ul style="list-style-type: none"> • Brazil (329,941,393ha – rural areas) • Global

facilitates replication in NE		
OUTCOME 2: Uptake of SLM increased in Sergipe ASDs		
Output 2.1. SLM best practices implemented in the Alto Sertão provide guidance for licensing process to revert LD processes	<ul style="list-style-type: none"> • Field implementation 3 agrarian settlements and one community 8,000 ha (~35%) • 13,566 Rural Establishments <100ha in the Alto Sertão (201,491ha), agrarian settlements in particular. 	<ul style="list-style-type: none"> • Alto Sertão ASD (361,451ha) • Sergipe State ASD (1,480,413 ha) • ASD
Output 2.2. State extension services incorporate SLM guidelines for ASDs and provide targeted support to the Alto Sertão	<ul style="list-style-type: none"> • 13,566 Rural Establishments <100ha in the Alto Sertão (201,491ha), agrarian settlements in particular. • Sergipe Alto Sertão (361,451ha) 	<ul style="list-style-type: none"> • Sergipe State ASD (1,480,413 ha)
Output 2.3. State and national access to diverse funds improved for uptake of SLM in ASDs	<ul style="list-style-type: none"> • Sergipe Alto Sertão (361,451ha) 	<ul style="list-style-type: none"> • Sergipe State ASD 1,480,413 ha (rural area) • ASD (111,079,903 ha, including Sergipe ASD – rural areas)

Outcome 1: Strengthened governance framework contributes to avoiding, reducing and reverting land degradation in Sergipe ASD

82. In order to improve the policy and planning framework in Sergipe, the project will support the collection of detailed information lacking in the PAE-SE to strengthen the planning framework to support implementation of the PAE-SE. In addition, the state-level land use planning and sector programs will incorporate key elements from the PAE-SE and identify appropriate SLM practices for different types of Caatinga vegetation and different degrees of land degradation.

83. Collaboration with the state-level Ecological and Economic Zoning (EEZ) process will seek to include appropriate consideration of land degradation in the Caatinga, which has not been dealt with in previous EEZ efforts carried out in other regions of Brazil. Cross-sectoral and inter-institutional mechanisms will be strengthened to facilitate integrated land use planning by helping the Standing Group to Combat Desertification (GPCD) to facilitate integrated decision-making processes among different sectors and programs. This will be achieved through interagency dialog with high-level support from the state and federal governments. The objective is to include PAE-SE priorities in state pluri-annual budget allocations (PPA).

84. A significant entry point for the project to impact LD will be the land use licensing process, so that SEMARH and municipal agencies, where appropriate, take LD issues into account. This will involve staff training, the definition of procedures and processes for SLM practices and clarification of roles and responsibilities for officers involved in licensing procedures. For the issuance of licenses for agricultural and livestock initiatives, the project will promote SLM practices, adherence to the new Forestry Code requirements regarding Legal Reserves (LRs) and Areas of Permanent Preservation (APPs) and the identification of degraded areas that require restoration. The licensing process will be linked to the EEZ so as to define where SFM may be appropriate and the Rural Environmental Registry (CAR) that shows where recovery is needed from past lack of compliance with legal requirements. In order for SLM to become operational in environmental regulation, with all the legal implications, it will be necessary to define clearly exactly what qualifies or not in concrete terms. The project will support the development of guidelines for SLM in these areas and for restoration actions in degraded areas or compensation. As part of the licensing process, EIAs for larger public works such as dams and roads will include specific

guidance for LD in ASD, outlining measures for prevention of degradation and, where necessary, recovery of degraded areas.

85. To complement the strengthened licensing system, the project will enhance land use oversight. A training program will be carried out for officers involved in oversight processes at the state and federal levels (SEMARH and IBAMA, respectively). Selected municipal governments will also be strengthened to oversee environmental licensing for activities within their boundaries through the provision of training in licensing, SLM and EEZ and through support for existing or new municipal environmental agencies. For licenses under the responsibility of IBAMA, such as those covering areas over 50,000 ha, the procedures for the issuance of licenses will be revised to promote incorporation of SLM criteria. Additional norms and directives to reduce LD will be developed for different Caatinga ecosystems and degrees of degradation. This federal-level advocacy can be achieved with support of the National Commission to Combat Desertification (NCCD), which is coordinated by MMA.

86. In all cases, in addition to specific training courses organized by the project, greater impact will be achieved through outreach initiatives by including classes and contents in existing training programs in university degree programs, university extension, federal technical institutes. The project will also prepare and disseminate training materials such as manuals, folders, data-show presentations and inputs for pages for websites of government and international agencies and non-governmental organizations generating capacity development results reaching far beyond the areas of direct project action. Co-funders will be encouraged to provide support for graduate students to do field work for theses and dissertations on new experiences with SLM. Finally, in order to support the creation of an enabling environment for replication, the project will develop a communications strategy and promote knowledge management and information dissemination to various target groups on best practices in SLM based on experiences in Sergipe.

87. Outcome 1 will be delivered through the four outputs, described in greater detail in following paragraphs: a) Sergipe's state policy and planning framework supports integration of SLM in ASD; b) State land use licensing processes stimulate appropriate measures to reduce LD; c) Monitoring land use optimized for the implementation of SLM in ASD; d) Supportive national-level governance framework increases adoption of SLM in Sergipe and facilitates replication in NE.

Output 1.1. Sergipe's state policy and planning framework supports integration of SLM in ASD

88. This output aims at consolidating policies that integrate SLM into state-level planning in Sergipe with a focus on semiarid areas. Although there are already several public initiatives, programs and projects related to SLM, such as the PAE-SE and the Forestry Program (FAP), these tools are not always sufficient or are not being implemented as required. In other cases, there are gaps to be filled, especially with regard to municipal policies, and at other times there is a lack of integration and interaction among different policies, programs and projects.

89. With a focus on integration among public initiatives, the PAE-SE and PAF will be updated in connection with state-wide land use planning. Information gaps to be filled include the following: 1) updated information on LD within priority semiarid areas of the state (the Alto Sertão) and the remainder ASD in the state; 2) completed baseline LD measurements with indices and monitoring procedures to guide decision-making; 3) final prioritization of actions identified in the PAE-SE; 4) detailed procedures to optimize relevant sector intervention for these priority areas; 5) clarification of institutional roles and responsibilities in the implementation of the PAE-SE; 6) detailed funding needs for PAE-SE actions and funding sources for those that are not presently covered by existing programs; 7) assess expected climate change impacts on LD and develop related adaptation strategies. With the support of the Standing Committee to Combat Desertification, this information will be used in the Pluriannual Budget (PPA) to

include programs and actions for sustainable management, conservation and land use and reclamation for the implementation of PAE-SE and PAF, targeting food, energy and water security and conservation of biodiversity, with a clear definition of procedures and institutional and sectoral roles for implementation as well as the necessary amounts of budget funds.

90. In the seven municipalities of ASDs subject to severe degrees of desertification, Municipal Action Plans (PAMs) will be developed. These plans will contribute not only to the promotion and implementation of SLM, but also the strengthening of municipalities with the definition of appropriate technical frameworks that can contribute to and guide the implementation of these plans. Through the development of municipal policies and programs for strengthening and qualification, fostering partnerships with federal and state government and private enterprise, it will be possible to achieve the consolidation of sustainable local economic development.

91. Territorial planning constitutes an important tool for managing urban and rural areas. Within this planning, the use and occupation of land must be carefully organized so as to promote sustainable use of resources and avoid future problems. In this context, Ecological Economic Zoning (EEZ) is an indispensable tool to support government decisions, guiding development processes, land use, biodiversity conservation and monitoring in ASDs. Thus, all instruments for strengthening and implementation of SLM undertaken by the project should serve as inputs and be aligned and integrated with the Ecological Economic Zoning and the forest inventory of Sergipe, also considering the state water resources plan, watershed plans (in preparation) and SEMARH's Waters of Sergipe project, among others.

92. The project will promote consolidation and strengthening of the Standing Commission for Combating Desertification (GPCD) created by state decree. To be more workable, this commission has a maximum of twenty members. The selection of members considers institutions in two situations: the first is related to the specific content of PAE-SE, with the institutions that are responsible for carrying out actions in the program, and the second takes into account the institutions that were given priority in the development of participatory workshops in the ASD for preparing PAE-SE. This commission has the mandate to ensure, encourage and induce compliance with the actions and strategies defined in the PAE-SE, optimizing actions to favor their integration. It will entail technical chambers and working groups with specific functions for articulation of institutional actors and implementation of programs foreseen in the four-year pluriannual budget (PPA) to be defined in 2015. The project will promote strengthening their on SLM and on the advances of this and other related projects and share information on SLM best practices, providing technical information for decision making.

Output 1.2. State land use licensing processes stimulate appropriate measures to reduce LD

93. The strengthening of state and municipal environmental agencies to enable them to promote prevention, adaptation, mitigation and rehabilitation of degraded land through licensing of land use requires specialization and extension of technical staff so that there are qualified human resources to implement SLM.

94. To strengthen the state in procurement processes related to land use, a set of actions is required. The first is to further analyze procurement procedures and formalities that the state follows for this purpose, identifying gaps and good practices. Based on this the project would support discussions about the licensing bottlenecks among different local, state and federal authorities (ADEMA/SEMARH, IBAMA/MMA, the Public Attorneys, INCRA). This discussion will contribute to an analysis of state environmental legislation in the light of the new Forest Code and the state of public initiatives mentioned in Output 1.1. For this purpose, an interagency advisory group will be created to guide the analysis as well as promoting new instruments for more appropriate state environmental laws.

95. In order to support environmental regularization of rural properties through CAR and PRA, technical assistance will be provided to develop a program for institutional strengthening of the state for the use of planning tools. There will also be support to SEMARH in the implementation of the Environmental Regularization Program (PRA). Since farmers need to be registered in the CAR in order to access finance, training of SEMARH about CAR will include links to LD and SLM monitoring and oversight, using satellite imagery and equipment provided via the MMA. Considering the environmental liabilities of rural properties in ASDs and specifically with regard to registration of Legal Reserves (LR) and maintenance of Areas of Permanent Preservation (APPs), inter-institutional coordination of actions will be developed regarding the organization of technical procedures for regularization of properties identified as strategic for the enhancement of environmental recovery actions. In this context, an in-depth analysis will be undertaken to identify best approaches for implementation of the CAR in the municipalities of Alto Sertão and an action plan developed for this implementation. Technical training of government and NGO staff will be provided to improve implementation of CAR.

96. As deforestation for livestock expansion is a serious problem in the ASDs in Sergipe and a key driver of land degradation, the project will focus on promoting integrated management of natural resources which will link livestock activities with forest management. A training program will be designed for public managers from various relevant federal, state and local agencies to strengthen their knowledge on SLM processes and procedures for licensing. Emphasis will be placed on sustainable use of forests and will include specific topics, for example, sustainable management, reclamation plans; conservation of the species that have repercussions on individual and collective actions for the recovery of areas of native vegetation .

Output 1.3. Monitoring land use optimized for SLM implementation in ASD

97. The monitoring of drivers of LD, along with integrated national, state and municipal surveillance that is effectively implemented, is essential to combat the processes of land degradation and desertification. For this purpose, the project will support the timely implementation of the desertification Early Warning System (SAP) in Sergipe so as to link this regional database to the needs of local planning. This system, developed by MMA and INPE, is designed to predict drought in Brazil's semiarid regions, characterizing current scenarios of vulnerability resulting from land use as well identifying possible future scenarios as a result of climate change. With the release of SAP tools, in addition to having a consolidated database to support the system, search engine can be used and cross-reference information on drought and desertification at the municipal level. This will enable more accurate analysis of vulnerability to desertification in Brazil's semiarid region. The warning system will also integrate remote sensing and weather data to enable a continuous assessment of the most susceptible areas by improving the understanding of the combined effects of drought and desertification, aiming to provide tools to support sustainable planning by decision-makers.

98. In this context, a plan to control fires will also be defined and implemented in the ASDs. Uncontrolled fires are common in the backlands of Sergipe, resulting in the impoverishment of the soil leading to further processes of LD and desertification. This plan, to be prepared jointly with IBAMA, will define guidelines to foresee risks and avoid large scale burning by establishing guidance for farmers and ranchers and providing management methods for soil and forest protection.

99. The Early Warning System and the burning control plan will be key inputs for developing an integrated system of monitoring and evaluation of drivers and processes of LD in ASDs in Sergipe prepared together with SEMARH, ADEMA and IBAMA. Data on actual levels and types of soil loss, water deficiency and salinization should be included at scales that can be used at the local level. Once this

system is designed, a training program will be developed and implemented for employees of SEMARH, ADEMA, IBAMA, ATER, EMDAGRO, COHIDRO, municipalities and farmers on monitoring processes of land use. This monitoring system should also be contemplated in municipal plans to combat desertification.

100. To complete this system, plans for improving and integrating research will encourage monitoring of LD and foster interaction and integration of best practices and lessons learned, as well as in loco application and validation in the semiarid region. This action will create the basis for an integrated system of research, involving different public and private research institutions in studies about development of actions for combating desertification in the semiarid region.

101. In addition to monitoring the LD processes, the actions of federal, state and local enforcement of norms and standards with regard to forest management will be strengthened and integrated. For this purpose, technical training will be carried out on consumption and transportation of firewood, oriented to promoting integrated surveillance between ADEMA and IBAMA firewood consumption and transport of forest products, thus creating a context of greater efficiency and effectiveness of the actions of the government regarding illegal use of forest resources of the Caatinga and hence greater control of illegal deforestation.

Output 1.4. Knowledge management and national-level governance framework strengthened to increase adoption of SLM in Sergipe and facilitate replication in NE

102. Output 1.4 aims to improve regulation, communication and knowledge management processes to support adoption of SLM practices regarding crops, livestock, forest resources and energy in the semiarid in Sergipe and facilitate their replication in the NE. It will (i) develop standards and technical policies to prevent, reduce and mitigate LD in Caatinga ecosystems and levels of degradation in the NE region; (ii) Incorporate the lessons from Sergipe on SLM in semiarid knowledge management and dissemination systems; and (iii) support a working group to promote appropriateness of norms regarding sustainable use of natural resources with more emphasis on guidance for appropriate technology and less on control and punishment. A number of different lines of actions will be supported as described below. This Output is in line with the National Action Program to Combat Desertification and Mitigate the Effects of Drought (PAN-Brazil) focuses on the Areas Susceptible to Desertification (ASD) and targets these for relevant government programs that offer production alternatives to combat desertification while promoting social inclusion, local development and environmental sustainability. Optimizing the contribution of these programs to SLM requires actions grounded on extensive liaison among federal, state and local governmental institutions implementing these policies as well as civil society organizations. The key institutional partners at the federal level include the Ministry of Social Development and Fight against Hunger (MDS), the Ministry of National Integration (MI), the Ministry of Agrarian Development (MDA) and the Ministry of Mines and Energy (MME).

103. The first line of action will be to support the development of norms and technical directives for reducing working through the National Commission for Combating Desertification (NCCD) & National Environment Council (CONAMA). To this end, the project will support the review and influence the drafting of regulations to promote SLM practices, simplify licensing procedures and strengthen decentralization of environmental management. In this way experiences from Sergipe will be replicated to other NE States LD.

104. The second line of action will be through developing a communication programme with the following characteristics: a) communication actions to public institutions regarding the advantages of systems as a tool for environmental management; b) scientific publications, manuals, folders, magazine

and newspaper articles, films, videos, CDs and radio and television programs generated directly or indirectly by the project.

105. The third is knowledge management (closely linked to communication and to the monitoring system). This will include:

- Policy papers developed based on project results, for example regarding SLM practices and licensing and oversight procedures. These will be used to influence the executive and legislative branches and commissions that include civil society participation;
- Outreach initiatives including classes and contents in existing training programs in university degree programs, university extension, federal technical institutes (for example in Piranhas, Alagoas, adjacent to Canindé), rural extension services and seminars, workshops and congresses. These inputs will contribute to the work of institutions such as the Xingó Center, the National Semiarid Institute (INSA), the Federal Institute of Alagoas (IFAL) and the Federal Institute of Education, Science and Technology (IFPB) in Campina Grande, Paraíba;
- Dissemination of training materials such as manuals, folders, data-show presentations and inputs for pages for websites of government and international agencies and non-governmental organizations such as ASA (www.asabrasil.org.br), MST (www.mst.org.br), IABS (www.iabs.org.br) and ISPN (www.ispn.org.br, www.cerratinga.org.br).
- Strengthening of the inter-ministerial (MMA and MCTI) Desertification Network. The Network's mission is to seek solutions to contribute to sustainable development in ASD, through the generation, dissemination and appropriation of knowledge and technologies in environmental planning and management, as well as contributing to the formulation of public policies for prevention and mitigation of desertification processes and the negative effects of climate impacts, aimed at conserving natural resources and improving quality of life. Also the project will strengthen the efforts of the National Institute for the Semiarid (INSA), which is Brazil's scientific focal point for the UNCCD, in its efforts regarding knowledge management on SLM in the semiarid region.

OUTCOME 2: Uptake of SLM/SFM practices increased in Alto Sertão of Sergipe (SAS), with replication in rest of the State's ASD

106. Outcome 2 will focus on increased uptake of SLM by determining best practices for specific land degradation types and by increasing financial and human resources channeled toward the promotion of SLM and where appropriate, SFM. SLM best practices will be implemented to address land degradation in specific locations and to showcase best practices for the Alto Sertão, also serving as a tool for rural extensionists and providing guidance for the licensing process under Outcome 1. These practices will be tailored to local levels of land degradation. Soil erosion control techniques will be demonstrated in areas with moderate LD. Water management practices to reduce soil salinization and alkinization from irrigation for areas with accentuated LD and restoration of Legal Reserves, Areas of Permanent Preservation and alternative production practices will be promoted in areas subject to severe LD, among other possible practices to be established. In general these practices will enable adaptation to climate change by promoting resilience of agro-ecological systems in the Caatinga. Annex V.2 of Section IV include more information on best practices.

107. SLM practices will be showcased in four demonstration landscapes selected in Sergipe's Alto Sertão municipalities (see details below in output 2.1). These will be disseminated and replicated through work on extension, knowledge management and finance described in Annex V.1

108. In order to address the limited incorporation of SLM content in extension services and to further replication over the medium term, new directives and policies will be incorporated in the state-level extension services coordinated by EMDAGRO so as to promote adoption of appropriate practices. Training material on appropriate SLM practices will be developed for areas with desertification risk. In addition, targeted capacity building of rural extensionists and family farmers will be achieved through the implementation of training programs in the Alto Sertão on SLM practices for sustainable subsistence and commercial agriculture, irrigation projects, livestock rearing and recovery/protection of Legal Reserves and Areas of Permanent Preservation identified through the CAR and PRA.

109. A critical element of Outcome 2 will be the provision of adequate financial incentives to promote greater uptake of SLM practices. This will require action both at the national and state levels and will entail ensuring that funds and financial instruments specifically target SLM actions and that capacities to access funds are strengthened. At the state level, a funding advisory facility will be established to coordinate deal flows and provide guidance for lenders and borrowers, donors and grantees, so as to enable timely access to available funds for farmers and other stakeholders interesting in carrying out SLM activities in Sergipe. The project will strengthen local capacities to access funds in order to increase the financial resource base for SLM in Alto Sertão by providing training in project proposal formulation skills for civil society and smallholder farmers and training for public officers to strengthen their project review skills. The project will also work with regional and state-level banks to revise credit-based financial products to include funding for SLM activities. National-level financing for Sergipe ASDs will be increased by strengthening coordination between the MMA-SEDR-DCD and GPCD and by promoting budgetary integration with the Ministry of Social Development (MDS) and other relevant agencies, to channel resources for SLM activities and PAE-SE priorities. These actions are expected to address the current bottlenecks that prevent full utilization of approved budgetary and other resources and to provide the needed financial resources for greater adoption of best practices in Sergipe.

110. Three outputs are envisaged to achieve Outcome 2 and are detailed in following paragraphs and annexes V.2 and V.3 of Section VII. The outputs are:

- SLM best practices implemented in the Alto Sertão municipalities provide guidance for licensing processes so as to revert LD processes
- State extension services incorporate SLM guidelines for ADS and provide targeted support to the Alto Sertão
- State and national access to diverse funds improved for uptake of SLM in ASDs

Output 2.1. SLM best practices implemented in SAS provide guidance for licensing process so as to revert LD processes

111. SLM practices will be implemented in various landscapes in the SAS. These were selected during the PPG phase through field visits and local consultations. Together they address the range of drivers of land degradation in the seven SAS municipalities and the challenges faced from implementation of SLM practices. Thus not only will they deliver direct impact in the selected landscapes and significant socio economic benefits but will also serve for replication through outputs 2.2 and 2.3. The details of these landscapes and the proposed SLM practices and their implementation in field sites can be found in Annex V.2, Part IV of this document. Table 11 summarizes the field sites characteristics.

Table 11. Areas pre-selected for project field activities.

Field Site	Area (ha)	Families	Area per family (ha)	RL (ha)	APP (ha)	Municipality	Year Created
Jacaré-Curituba Settlement	20,940	700 to 800	22.2 (rain-fed) 3.6 (irrigated)	1200-1600	622.1	Canindé de São Francisco and Poço Redondo	1997-1999
Poço Preto Community	750	50	~15	No data	No data	Poço Redondo	Not applicable
Florestan Fernandes Settlement	824	31	26.6	176.0	No data	Canindé de São Francisco	2002
Valmir Mota Settlement	429	33	13.0	178.2	225.2	Canindé de São Francisco	2009
Total	22,943	914	~19.0	>1900	>850		

RL: Legal Forest Reserve; APP: Permanent Preservation Area (Forest).

No data: to be confirmed during 1st. year project

112. The PPG consultations and analysis resulted in the pre-selection of these landscapes and the proposal of specific SLM practices for each. Within the pre-selected field sites different LD scenarios are encountered. Therefore, the project will support appropriate SLM practices as per characteristics of specific farms within the landscape. This will require a combination of technical analyses and consultations with local leaders, extension agents and individual family farmers during the inception phase. Thus at project outset, the specific location of each of these practices across the landscapes will be undertaken through further consultation with families and confirmation of on-site conditions including the degree of land degradation and the mix of SLM practices to be implemented in each specific site. Other criteria to be used to make this final selection in the landscape include type of vegetation, scale, farmer interests, local organization, co-funding availability and partnerships.

113. The SLM practices to be showcased have been piloted in other states and regions, but will be adapted to local conditions, especially as regards types of vegetation and fauna and socioeconomic conditions of agrarian reform settlements with different types and levels of land degradation and at scale across larger landscapes.

114. This project will support the implementation of SLM practices in the selected lots to demonstrate best practices for recovery of degraded land and sustainable management of natural resources in areas of moderate, accentuated and severe LD and in areas that are more conserved. In areas of moderate LD the SLM practices will aim at the technical control of soil erosion, such as rain-fed agriculture, cover crops, tillage, crop diversification, improved livestock and range control, including pest control for livestock and handling pastures. In areas of accentuated LD, measures oriented to the reduction of soil salinization by irrigation water management practices (collecting rainwater, drip irrigation) will be implemented. Finally, in areas of severe LD, the restoration/ recuperation of Legal Reserves and alternative production (e.g. honey production) will be implemented. The following paragraphs summarize the types of SLM to be implemented, while further details on this and on costs are also presented in Annex V.2, Part IV.

115. Emphasis will be placed on the implementation at scale of practices that have shown positive results in smaller more dispersed pilots. Amongst these are livestock agroforestry systems, forestry management for forage, soil and water conservation, recovery of degraded areas and beekeeping.

116. Livestock agroforestry systems tested by EMBRAPA, the Dom Helder project and the second National Meeting on Confronting Desertification (ENED II) indicate that livestock agroforestry systems, also known as silvopastoral systems, offer valuable beneficial effects in terms of maintaining soil fertility restoration and diverse forage support (leguminous trees, alley cropping) for cattle, sheep and goats, firewood production and reduction of environmental stress, while also obtaining higher production levels than monocultures and lower stress for livestock. However, traditions are being lost, especially in new agrarian reform settlements and among younger generations.

117. The use of Caatinga forest management for goat, cattle and sheep will also be implemented. This will build work in EMBRAPA and the Federal University of Campina Grande to improving livestock productivity, increase income and the availability of protein in livestock diet through silvopastoral management of the Caatinga. Sustainable livestock management will be implemented as part of an integrated SLM in the landscapes to reduce erosion processes linked to cattle trampling, adjust livestock stocks to carrying capacity, reduce livestock mortality in severe droughts and promote food security.

118. Irrigation can be an important agricultural technique to supply water to crops and produce high yields. Irrigation deficiencies will be addressed to promote the correct management of water in irrigation perimeters, thus avoiding unnecessary energy expenditures, reducing the cost of manual labor and soil salinization. Irrigation systems in settlements in the irrigation perimeters will be assessed to verify the design is appropriate for crop-needs without wasting water or causing erosion or salinization.

119. In addition, soil conservation practices will also be implemented to address the damage caused by excessive plowing and disking and the subsequent reduction of water infiltration into the soil. Practices to be implemented include zero tillage, crop systematization, liming, fertilization, soil decompaction, crop rotation systems, management of crop residues, contour plowing and soil preparation. These SLM techniques will entail both sustainable water and agriculture management, in line with agro-ecology. Again, these will be implemented in an integrated fashion, in order to promote higher productivity on land already cleared, lower use of water and soil, therefore improving water security.

120. A third set of practices to be implemented relates to recovery of areas degraded by overgrazing. This includes the introduction of native and/or exotic forage species adapted to local ecological conditions and introduction of sustainable ranching alternatives.

121. Initiatives for implementation and development of practices to increase production in forests as a subcomponent of the agro-ecosystems within settlements ensuring careful planning and technical assistance to complement characteristic products of the family farm, which must be conducted with. Caatinga vegetation is known for its richness and diversity of NTFP, including honey, oils, waxes, fibers, food, fodder and wood that is not timber. In the Alto Sertão, forest resources are currently underutilized. The absence of some of these products has been attributed to lack of knowledge and lack of consumer markets. Other Caatinga products common in the region are important for its sustainability, but have been extracted without due care. On the one hand, there are negative impacts as in the case of native honey extraction performed by some farmers that destroy hives, killing or expelling the bees. On the other hand, there are economic issues, as in the case of the *umbu* fruit characteristic of the region, which has good market acceptance, but has been harvested without minimal planning. Given this situation, the project aims to identify the potential for sustainable use of Caatinga forest fragments in settlements and, together with the communities, discuss and implement sustainable techniques of extraction, processing and marketing. The project will liaise with the EMBRAPA UNDP GEF project that will work on markets and finance for NTFP including *umbu*.

122. The project will address shortages of native seed that currently impede more widespread conservation and use of agro-biodiversity. It will support the collection and characterization of existing landraces and traditional varieties and select those that are most productive and adapted so that they can be multiplied and made available to settlers and farmers in appropriate combinations. This will build on and coordinate with work proposed under the GEF FAO project

123. One of the best sustainable uses of the Caatinga forest is beekeeping of both exotic (*Apis mellifera*) and native (stingless) species of bees. The former have higher productivity and the latter produce honey used for medicinal purposes. The Caatinga is one of the biomes most suitable for honey production, but beekeeping is still spotty because of fear of the bees, lack of familiarity with native beekeeping and regulatory barriers. Brazilian beekeeping is undergoing expansion, including international recognition of methodology for management of Africanized European bees (*Apis mellifera scutellata*), which are now omnipresent (not being introduced by the project), and significant growth of the beekeeping industry and world markets given recent die-off of bees in other countries. The project will promote rational beekeeping based on improvement of bee pasture (vegetation cover) for the production of honey, pollen and propolis with exotic and native species, contributing to food security and household income.

124. The project will compile the best practices in each field landscape, monitoring soil quality and water management. Economic analysis of production practices (ability to pay, need for private and public investment), as well as socioeconomic and environmental analyses about the effects of management practices and their effects on the landscape will be undertaken to develop specific plans for replication. The results will be integrated into the state's Environmental Recovery Plan by EMDAGRO and CFAC. The SLM practices experiences will be replicated to other settlements in the Sergipe ASDs through co-financing from a number of stakeholders, including public financing. The results also will be compiled and disseminated and will serve as useful tools for guiding licensing process in ASDs at the state and national level. This will include an outreach program or both extension workers and farmers with teaching-learning materials to support this dissemination. For this purpose, the project will establish partnerships with IABS, EMDAGRO, ATER and Federal Institutes (IFs) that provide technical training, among others.

Output 2.2. State extension services incorporate SLM guidelines for ASDs and provide targeted support to SAS

125. Strengthening rural extension for addressing land degradation through suitable mixes of SLM and SFM practices at farm and landscape level is one of the key initiatives of the project. The structures for technical assistance are already in place in Sergipe, but the challenge is to integrate the various organizations and institutions that implement technical assistance and rural extension (ATER) and ensure they have updated knowledge and capacities regarding land degradation. New conceptions of natural resource use and strategies for SLM as well as new patterns of social organization need to be better communicated by the extension agent to farmers. The project will support integrated interagency technical assistance in the region. This will include promoting dialogue and integration between extension and licensing processes, the design of a strategy to incorporate SLM principles in extension services in Sergipe and the development of a rural extension plan for Sergipe to promote joint action on SLM by MDS and MDA with the IFAD Dom Távora project.

126. This approach should be reflected in public procurement processes for companies hired to provide ATER services. Performance targets in these contracts should include SLM practices, both for direct government action (EMDAGRO, INCRA and SFB) and partnerships with local non-governmental agencies such as CFAC. The project will develop proposals for this purpose to be submitted to the NCCD and MDA.

127. In addition to the above, and to ensure specific technical training for deployment and dissemination of SLM practices, the project will support a program of technical training for extension agents and the development of specific guidelines on SLM practices for sustainable family farming, irrigation projects, livestock raising and integrated biodiversity management. The landscapes and specific sites selected under Output 2.1 will be used for field work in this training program, serving as a reference points for ATER and credit at a larger scale in ASD, influencing the procurement processes of the MDA as well as funding for entrepreneurial actions in initiatives such as the Dom Távora project, which operates in many parts of Sergipe. Specific technical materials (manuals, brochures, videos) of good SLM practices (conservation and soil management, use of contour plowing, "Zero-Base" dry stone dams, integrated forest management, nurseries and seeds, recovery of degraded areas, household energy security, environmental licensing etc.) will be prepared and used in training and dissemination activities.

128. The training program for technical staff and farmers who can act as agents of multiplication and dissemination of SLM technologies for reducing land degradation in the semiarid will include 20 technicians from each of the seven municipalities of Alto Sertão and 10 in the other ASDs in Sergipe. There will be specific technical training in practices for SLM for 250 farmer multipliers in Sergipe, in order to consolidate and disseminate actions in the areas of reference, involving technical staff of EMDRAGRO, other ATER agencies and technical agricultural schools. Another technical training program for best SLM practices for sustainable coexistence with the semiarid will involve 20 technical multipliers in each of the 11 states of the ASD, for a minimum structure of 220 multipliers. Field days will also be held on best practices of SLM for sustainable coexistence with the semiarid for leaders of public agencies engaged in credit and licensing such as BNB, BANESE and ADEMA.

129. An integral part of the extension effort will be communication and dissemination on WOCAT, the Desertification Network and NCCD, aimed at strengthening the process of institutionalization and raising awareness about the importance and potential of SLM best practices for sustainable coexistence with the semiarid.

130. ATER actions regarding SLM will be implemented through partnerships between funding agencies such as the Climate Fund of the MMA, the Forest Fund of the SFB, the FUNDECI of the BNB and the Environmental Fund of the CEF and technical assistance and rural extension and communication implementing agencies and public institutions such as EMDAGRO and INCRA.

Output 2.3 State and national access to diverse funds improved for uptake of SLM in ASDs

131. This Output will support actions to overcome barriers that currently hinder finance (credit and grants) for the uptake of SLM at scale. It will do so through four parallel actions regarding: 1) government social programs, 2) grants, 3) bank credit, 4) fiscal and market-based incentives.

132. The first action will focus on improving the access of poor small farmers and settlers to resources in existing government social programs and ensuring these support SLM best practices to avoid, reduce and revert LD. The project will first develop guidelines on how SLM concepts should be included into the various social programs associated with the *Brasil Sem Miséria* plan. Once the municipal plans combating land degradation are complete (Output 1.1), they will also be integrated to relevant government social programs to optimize the channeling for resources to priority LD hotspots to combat desertification. An environmental safety net will be discussed and proposed.

133. A second line of work will be to facilitate the access to these and other financial instruments that could be used for SLM activities. This will include reviewing and simplifying procedures and ensuring that project proposal quality reaches required standards. One approach for this will be through support to

set up a funding advisory facility to coordinate deal flows and provide guidance for lenders and borrowers, donors and grantees, so as to enable timely access to available funds for farmers and other stakeholders interesting in carrying out SLM activities in Sergipe. This will draw from existing government institutions that will select staff for specific training; create procedures manuals and determine long-term funding and operational structures so as to continue post project. Another approach will be to strengthen local capacities to access funds in order to increase the financial resource base for SLM in Alto Sertão by providing training in project proposal formulation skills for civil society and smallholder farmers and training for public officers to strengthen their project review skills. For instance, PRONAF is one of the main financiers for family agriculture in Brazil, however, no parameters for SLM practices are in place under their application guidelines.

134. A third line of action in this Output will be to work with key banks and restructuring of credit and financial services at the local level to increase the chances of success of credit policies and stimulate business investment in less urbanized regions. Despite the fact that Brazil has a very sophisticated banking system, with service networks, correspondent banks and post offices offering banking services throughout the country, there are large gaps in provision of many financial services to millions of Brazilians, primarily in rural areas. In addition the project will support strengthening the institutional capacity of the different banks and lines of credit by training for bank credit analysts agents, develop communication materials and promote a broad process of diffusion of SLM among finance agencies and farmers through various representations and ATER organization. The project will prepare specific guidelines for assessing SLM practices in projects and training bank credit analysts agents on their analysis with proper training and publications. The main targets will be the BNB, CEF, BB, BANESE and BNDES banks and funds (Climate Fund, FUNERH, FUNDEMA/SE). The project also will seek to promote liaison among BNDES, BNB and BANESE to develop appropriate instruments of credit and funding. Further details are included in Annex V.1, Part IV. The Governor of Sergipe will be encouraged to take a proposal for a credit bonus to the Council of Superintendency of Development of the Northeast (SUDENE).

135. The project will promote a process of training in best SLM practices for agents that provide credit and funding to improve state instruments regarding access to BANESE credit. The training process will include civil society and leaders of small farmers to formulate project proposals for SLM as well as civil servants to strengthen their capacity to analyze projects.

136. The project will propose institutional arrangements to extend to the municipalities the financial services that are needed to meet the demand for implementation of best practices in SLM. This involves public and private banks, ATER agencies, training in innovative SLM practices, environmental licensing, social movements, farmers and labor unions in a network with all government policies and programs of different origins. Its focus will be on socio-productive inclusion, sustainable land management and poverty reduction.

137. A fourth line of action will be to develop proposals for both fiscal and market based incentives. As regards fiscal incentives, the project will propose inclusion of LD criteria in the distribution of state ICMS tax revenues to municipalities that combat LD, as is done in some states to compensate municipalities that have large protected areas. As regards market mechanisms, review will be undertaken of existing approaches to link payment for environmental services (PES) schemes to combating land degradation. The immediate possibility is for CHESF royalties from the Xingó dam to be channeled to pay farmers for restoring and maintaining riparian vegetation.

138. An institutional link among MDS, MDA and MMA will also be established to propose creation and implementation of a safety net of protection to support environmental best practices (i.e. a sustainable

socio-environmental stipend). The process of institutional coordination will also be geared to the preparation of calls for proposals for ATER to implement good practices of sustainable coexistence with the semiarid in the SAS and other ASD.

139. The project initiatives will create synergy with demands of programs that are under way or planned in the region, such as the initiatives of the State Prosecutor for PES related to water (the first in the Brazil's semiarid region), the ANA program for Water Producers, the Waters of Sergipe Project, the Dom Távora Project (sustainable value chains) and Local Productive Arrangements (APLs) for milk and ceramics.

2.3. Expected Global, National and Local Benefits

140. Without the project, action to address LD in the Semiarid region of Brazil will probably continue as good intentions in official documents without significant change in policy, practice and funding. There are many diagnostics and recommendations, but much remains to be done. The national organization is in place, although there are few concrete results. Compared to other states, Sergipe has a head start, but implementation is lagging in the NE and Brazil as a whole because of lack of knowledge, qualification of human resources and specific national and international commitments through projects. The municipalities of the SAS are involved in meetings of various kinds, but with few concrete results on the ground. At all levels, consciousness needs to be translated into effective action.

141. The baseline in environmental and socioeconomic terms in the project area can be summed up as threats of increased land degradation due to economic pressures, new agrarian reform settlements and climate change, on the one hand, and rural poverty undergoing remediation, on the other. This is similar to the situation in Brazil's ASDs as a whole. The baseline in institutional or governance terms at the project level can be summed up as a state government and civil society that are willing and able to work together to revert the process of land degradation. The national and regional governance structures are generally favorable to achieving the solutions, although there are many competing priorities and limits on government spending. There needs to be specific stimulus to adopt new approaches to reverting land degradation that are economically and politically feasible.

142. The project is an important step in a process that will generate far-reaching benefits. First of all, the project will provide specific formal commitments about SLM with which authorities and stakeholders will be obliged to comply. There will be staff from local, national and international organizations dedicated specifically to achieving and disseminating the results foreseen. State-level training will benefit the entire state and information dissemination has no spatial limit. As results appear in terms of specific know-how, flows of funding and concrete SLM practices, visibility will create momentum to reach the rest of the ASD in Sergipe, the rest of the state, other NE states and the national level.

143. The project will contribute to global environmental benefits (GEB) primarily through reduced soil erosion, reduced risk of degradation and desertification and increased conservation of biodiversity. It is expected to lead to 2,000 rural properties over about 70,000 hectares (see Table 14 and TT) under SLM practices and reduce the rate of loss of Caatinga vegetation in 7 municipalities; within these ~1,000 families covering 8,000 ha in the four pre-selected sites and (2 municipalities) will receive direct support. It will provide models that can be used in other countries, especially in Africa.

144. The project will trigger SLM through strengthened licensing and oversight, enhanced extension services, facilitation of access to existing sources of funding and institutional capacity building. The project strategy will lead to greater implementation of various alternative production systems, which are

outlined in Table 12, along with their associated expected benefits. Table 13 indicates the current practices; alternatives to be put in place by the project and global benefits.

145. The project will promote landscape-level integrated ecosystem management of native Caatinga vegetation by implementing a combination of best practices that, on the one hand, ensure sustainable environments for crop and livestock production while, on the other hand, reducing land degradation, enabling biodiversity conservation and maintenance of ecosystem functions, reducing threats to natural resources and promoting reclamation of degraded land. The actions of extension, training and strengthening of multi-sectoral approaches will promote replication in all of Brazil's areas susceptible to desertification, creating opportunities for expansion of sustainable landscapes. These efforts increase the environmental sustainability of economic development and poverty reduction programs and generate multiple global environmental benefits. Significant benefits in terms of combating desertification will be achieved, since the project presents a strategy based on best practices as alternatives to major drivers of desertification including deforestation, overgrazing and soil salinization. The project will result in reduced carbon emissions and increased carbon sequestration through the reduction of deforestation. It will also promote integrated management of natural resources that allows for grazing and collection of biomass following sustainability criteria, ensuring conservation of biodiversity and maintaining sustainable landscapes.

146. Best practices implemented in the field sites in areas susceptible to desertification will be multiplied through a multi-sectoral extension approach. This will contribute to water and soil conservation, reduced soil degradation and salinization and establishment of sustainable production environments in semiarid areas. These in turn promote food, water and energy security as well as biodiversity conservation. They contribute to improved quality of life and reduction of poverty by promoting sustainable coexistence with semiaridity, while effectively combating land degradation and desertification.

147. The project will demonstrate that it is possible to promote development and poverty alleviation in areas susceptible to desertification together with conservation of biodiversity, capture of carbon from the atmosphere, reduction in greenhouse gas emissions, prevention of soil degradation, reclamation, i.e. integrated natural resource management. The best training institutions for the integrated management of natural resources and the dissemination of good practices in the demonstration areas will provide other long-term global benefits, in particular the management of watersheds and landscapes related to hydrological cycles, which are vital in areas susceptible to desertification.

148. Additional global benefits such as reducing carbon emissions will be generated to promote a change in land use and vegetation, good management practices of natural resources for preparing soil for crops, sustainable forestry techniques and other sustainable practices that maintain forest cover in the Caatinga, the conservation of soil and water, presented as alternatives to the degradation process that generate, promote net benefits of climate change, biodiversity conservation and combating desertification. The overall benefits are also enhanced by the increase in carbon capture in degraded lands that are restored through afforestation and the implementation of appropriate land use practices.

149. Table 12 provides a specific breakdown of the global environmental benefits of each good practice that will be promoted by the project.

Table 12. Best Practices and global environmental benefits (GEB) to be applied to field sites.

BP Items	SLM Best Practice	Global Environmental Benefits (GEB)	Direct Benefit
Sustainable soil management (Category/Item I)	Palisades	Soil conservation and recovery of degraded areas that reduces soil erosion (furrows and gullies), combined with re-vegetation, restoration of biodiversity, carbon sequestration and improved water flow.	The Palisades decrease soil loss by 75%, preventing soil loss in micro-basin runoff.
	Contour curves/stone contour	Soil conservation and recovery of degraded areas (moderated level of degradation) when combined with re-vegetation; restoration of biodiversity; carbon sequestration; improved water flow	1m of contour curves have potential to impact 0.01ha, improving superficial layer (20 cm) of productive plateaus and resulting in 20m ³ of total soil retained after 2 years of implementation (~54 tons of total soil per linear metre implemented; 18C tons/m; ~7,000L of water).
	Dry stone dams/successive dams/Zero-Base dams – BBZ	Recovery of accentuated and severe degraded areas; reverse high erosion process (gullies and rills); improved water flow, no soil salinization, sustainable production in semi-arid environments, elimination of poverty, water and food security, conservation of natural resources.	1m ³ of dry stone dam has the potential to form 100m ² of new productive plateaus in 2-4 years (variation depending on rainy season), retaining about 270 tons of total soil (including water – 94.500L; and organic matter – 90C tons).
	Planting of <i>Atriplex sp.</i>	Recovery of salinized areas, production of fodder for livestock in hostile environments, food security possibility to plant crops	After 5 years, total recover of salinized areas, if planting were applied to agroecosystems/crop rotation.
Sustainable Water Management (Category/Item II)	Trench tanks	Water conservation, preventing sheet soil erosion and providing fresh water supply for livestock, water security of production, sustainable production systems and access to water for livestock; Should be implemented associated with water diversion techniques.	Storage 500m ³ of water (500,000L) for livestock maintenance along 8 months (~40 heads of milk cattle or 250 heads of goat/pig/lamb/sheep), within a maximum area of 125m ² to avoid water losses by evaporation.
	Drip and micro-aspersion irrigation (Xique-Xique system)	Reduced soil alkalization, salinity and erosion; improved soil quality; increased productivity; improved water availability; no runoff; reduced siltation of river courses.	Reduce the use of water in 60%-70%. Total soil recover after 4 years of integrated system implementation (crop rotation/ <i>Atriplex</i> planting)
	Runoff cisterns	Less degradation of soil and improved water conservation in sustainable production systems adapted to areas susceptible to desertification should be implemented associated with water diversion techniques to avoid erosion processes in vulnerable areas.	Storage of 52,000L of water for production maintenance of 0.25ha (a productive backyard for example) during 8 months.
Sustainable agriculture management (Category/Item III)	Integrated System Management Plan	Focused on cultivation of crops in properties <100ha, presents a high linearity with agroecology systems, less need for clearing, lower use of chemicals, less pollution of soil and water, less production costs, more income, better health;	Tree density > 1500 tree/ha after 5 years, forming steeping stones between forest fragments; To improve productivity (about 30% production improvement by integrated system implementation after 2 years).
	Peridomestic agroforestry Productive Backyards	Productive environments in semiarid areas promoting food and energy security, about 85 different vegetal sps, including medicinal plants; enhancing the role of women in production systems and strengthening family autonomy.	Improve the familiar income (U\$50/month in areas of 0.25 ha) and/or reduce familiar expenses with food; provides food security.

BP Items	SLM Best Practice	Global Environmental Benefits (GEB)	Direct Benefit
Sustainable livestock management (Item IV)	Integrated System	Conservation of biodiversity through the appropriate use of native vegetation, use of adapted breeds, elimination of poverty, food security and biodiversity conservation, landscape maintenance, ecosystem services, improved water flow, reduced soil loss, reduced siltation of reservoirs. Can take place in community areas and private areas.	
	Management Plan		
Sustainable forest management (Category/Item V)	Agroforestry with management of native vegetation	Productive environments in semiarid areas promoting food security, revegetation, densification, food and energy production, carbon capture and maintenance of ecosystem services; mulching improvement, incorporating organic matter;	Tree density 2000-4000 tree/ha; 150st/ha of fuelwood production (60m ³) in 12 year; No carbon emission (zero balance – growth rate 5m ³ / ha/year); fallow period of 10-12years enabling RL use in properties <100ha and/or communitarian RL.
	Integrated Systems Management Plan	Conservation of biodiversity through appropriate use of native vegetation, sustainable biomass for energy, non-timber forest products, use of adapted breeds, elimination of poverty, food security, biodiversity conservation, landscape maintenance, ecosystem services, improved water flow, reduced soil loss, reduced siltation of reservoirs.	
Sustainable use of biodiversity (Category/Item VI)	<p>Beekeeping</p> <p>Native sps – Meliponiculture</p> <p>Exotic sp - Apiculture</p>	Proper management of native vegetation, guarantee pollination ecosystem functions, conservation of plant biodiversity, food security, income generation, reduction of poverty; The production depends on the maintenance floral resources of vegetation. The activity should be implemented with to productive Backyards and agroforestry systems.	<p>The Native sps can be handled by all family (stingless bee), produce less honey (3-6 kg/hive/year) but with higher nutrient quality and more expensive (~US\$30.0/kg). The exotic sp (<i>Apis mellifera</i> - sting bee) need a special preparation by famers for management, including protective individual equipment for safety handle, but honey production is higher than native sps (50-70kg/hive/year); the medium price is ~US\$ 5.0/kg.</p> <p>Potential of pollination to support ecosystems functions is still unknown/not evaluated.</p>
Others (VII)	Eco-efficient stoves	Peridomiciliar management of fuel wood; Energy efficient technology, mitigation of carbon emissions, reduced deforestation, respiratory health through reduction of indoor smoke and the weight of fuel wood collected by women.	Reduce to 3h/week the time of firewood collection by women (~80% reduction rate); Reduce 83% radius of collection area (6km to 500m), when associated to peridomiciliar agroforestry; Reduce the fuel wood consumption to 14st/year (family of 5 individuals) (~60%), representing 10.35t CO ₂ e/year of avoided emissions per technology implemented. There is no data report concerning health improvement in the family environment. This will be assessed during the project monitoring surveys.

Table 13: Benefits associated with integrated and sustainable production systems proposed by project to SAS.

Current practices	Alternative production systems	Expected benefits
Area under intense agriculture use and limited adoption of sustainable soil management and conservation practices; Accentuated level of land degradation and soil erosion (misused mechanization and	Soil erosion control techniques such as dry farming, zero-tillage, crop diversification, mulching systems, contour curves and stone curves (<i>renque de pedra</i>), dry stone dams, use of cover	Reduced soil losses; higher soil moisture and increased water availability; improved soil biological and chemical quality and productivity

Current practices	Alternative production systems	Expected benefits
<p>irrigation, failure to use contour lines, increased monocultures and total clearing, etc.)</p> <p>For Caatinga biome under intense agriculture uses with no soil conservation practices there is a loss of approx. 10 tons of soil per hectare (3 carbon tons/ha) every year.</p>	<p>crops in agroecology systems/integrated management systems with no-tillage</p>	<p>The integrated implementation of soil conservation practices (proposed by the project) have potential to reduce about 50% of soil loss in 3 years after intervention (variation related to rainy season, land degradation levels and main area use – crop/consortium/livestock) – should be confirmed for each field site.</p>
<p>Excessive and inappropriate use of chemical inputs (herbicides, pesticides and fertilizers)</p>	<p>Biological control; adherence to requirements for chemical inputs; mulching systems; crop rotation/agro ecologic systems to reduce pests; management of fallow to restore nutrients.</p> <p>The fallow period for agriculture uses in SAS is <3 years (rural establishment <100ha).</p>	<p>Reduced groundwater contamination; improved soil quality; improved worker health.</p> <p>The recommended fallow period for soil nutrient recover is >5 years, to be implemented and optimized by management plans adoption.</p>
<p>Misuse of irrigation techniques (flooding and aspersion are not adequate for areas with potential for salinization)</p> <p>It is estimated that 25% of irrigated areas in ASD are under salinization process; SAS has high density water (Brackish water) due to soil characteristics and high evaporation rate (2.000 mm/year), which speeds up the salinization process and water loss where flooding or aspersion systems are applied.</p>	<p>Micro-aspersion and drip irrigation (<i>Xique-xique system</i>); efficient use of water runoff; crop rotation; <i>Atriplex</i> sp. cultivation to recover soil properties.</p>	<p>Reduced soil alkinization, salinity and erosion; improved soil quality; increased productivity; improved water availability; reduced siltation of river courses</p> <p>Total soil recover after 5 years of integrated system implementation (crop rotation/<i>Atriplex</i> planting)</p>
<p>Introduction of less drought resistant species for animal husbandry</p>	<p>Support reintroduction of native breeds;</p>	<p>Increased net primary production in pastures</p>
<p>Degradation of forest due to encroachment on LR and APP for fuelwood extraction and subsequent agricultural use</p> <p>Tree density in areas with accentuated or severe level of degradation or areas is under intense use <800 tree/hectare</p>	<p>Maintenance/protection of existing LR and APP and appropriate fencing; environmental recovery program for restoration of forests including where appropriate alternative production, such as agro-forestry systems and beekeeping for honey; appropriated fallow periods in usable areas (RL)</p>	<p>Reduced deforestation (0.14% per year); improved connectivity; reduced soil erosion; reduced pressure on threatened species</p> <p>Tree density >1500 tree/hectare; Natural recover in Caatinga biome areas with a preserved soil seed bank take up 5 to 10 years, just by fencing; Areas with soil loss, it is recommended to mix SFM and soil conservation practices to start up the recovery process, which can take up 8 to 13 years (total recover).</p>
<p>Uncontrolled burning to clear land</p>	<p>Prescribed burning; rehabilitation of lands subjected to excessive burning</p>	<p>Improved soil structure; increased vegetation cover; biodiversity benefits</p>

150. This project will provide significant direct socio-economic benefits in the project lifetime to 1,000 smallholders in Sergipe's ASD, which comprises 74.2% of the state, with the establishment of a strengthened state-level and national governance framework to promote SLM. In addition, the project will

work more directly to benefit the rural population of the Sergipe ASDs as a result of the demonstration of best practices in SLM, strengthened extension services and increased capacity to access funding opportunities. The increased adoption of SLM practices will increase well-being through:

- Greater food security resulting from increased agricultural productivity, crop diversification and adoption of more sustainable agricultural practices;
- Increased water security from improved ecosystems services in river basins through land restoration/recovery;
- Reduced vulnerability to climate change and extreme climatic events such as drought with the adoption of more sustainable approaches that are adapted to changing conditions;
- Reduced economic vulnerability and increased incomes through diversified activities (including cover crops, crop diversification, beekeeping, fish farming, sustainable forestry management, silvopastoral activities, etc.), increased productivity, enlargement of markets and increased access to credit for SLM activities, which could also reduce rural-urban outmigration.

2.4. Key Indicators, Risks And Assumptions

Table 14. Project Indicators

Intervention Logic	Objectively Verifiable Indicator	Targets (end of the Project)
Project Objective Strengthening SLM governance frameworks to combat land degradation processes in Sergipe ASD in NE Brazil	Area (ha) of rural properties in which recommended SLM practices are implemented in Sergipe.	70,000 ha on 2,000 rural properties, including replication areas.
	Average tree density in forest patches of less than 50 ha.	>1,500 tree/ha
	Loss of vegetation coverage in SE-ASD (48 municipalities).	Rate of deforestation reduced to 0.14% per year
	Production of small-scale farms for the four field sites	30% increase of productivity of crops by end of project.
	Increase in the general score of LD Tracking Tool.	General score of LD Tracking Tool: 3
Outcome 1: Strengthened governance framework contributes to avoiding, reducing and reverting land degradation in Sergipe ASD.	Improved norms and directives on SLM at State level.	LD norms and technical directives developed and submitted to NCCD. Revised PAE and 07 MAPs at the SE-ASDs prepared, approved with operational plans and budget for implementation
	Level of capacity of staff at SEMARH, key municipalities in SE-ASD and IBAMA, where appropriate, related to: SLM and LD issues; licensing of agriculture/livestock and forest management activities; and land use oversight/enforcement.	Nuclei of SLM and LD issues established and trained in SEMARH, with participation of key municipalities in SE-ASD, IBAMA and ADEMA.
	Number of state licenses taking into account SLM criteria and practices for Alto Sertão Sergipano (SAS)	10% increase in licenses with SLM criteria per year, post year 3. By end year 2: revised licensing criteria for multiple uses designed and proposed to ADEMA, GPCD and NCCD. By end year 4: revised licensing criteria for forest use designed and proposed to IBAMA,

		ADEMA, GPCD and NCCD.
	% of compliance with rural licensing processes in 2 SAS municipalities.	10% increase per year post year 3.
Outcome 2: Uptake of SLM/SFM practices increased in Alto Sertão of Sergipe (SAS), with replication in rest of SEASD	Number of farming households implementing sustainable subsistence and commercial agricultural practices, improved grazing systems and integrated SLM practices in SAS	At least 2,000 farming households in SAS adopt sustainable agricultural practices, improved grazing systems and integrated SLM practices by end of project. By the end of year 3: 500 families in 4 field sites with SLM strategies developed and implemented.
	Reduction in land degradation over 8,000 ha in 04 field sites.	Reduce 25% of land degradation in 04 field sites (2,000 ha), measured by reduced soil loss by water erosion < 5 t/ha; and reduced loss of soil carbon < 2 t/ha (to be confirmed during year 1). Carbon sequestration by means of carbon retention in soil = 8 t/CO ₂ e/ha (to be confirmed during year 1).
	Percentage of agricultural extensionists active in SAS delivering targeted support that includes recommended SLM directives	100% of extensionists active in SAS deliver targeted support that includes recommended SLM directives, with replication in SEASD
	Investments in SLM practices in Sergipe	20 % increase in investment in SLM practices in Sergipe. By year 2: SLM technical guidelines to support decision making by credit agents.

Risks and assumptions

Table 15. Risks, ratings and mitigation.

Risk	Rating	Mitigation
SLM practices take time to provide tangible and targeted beneficiaries may be reluctant to change non-suitable land use activities and practices	Low	The direct intervention sites were pre-selected through meetings with all stakeholders to guarantee the commitment of all beneficiaries of rural settlements and local communities. The project will also work in cooperation with community leaderships (including youngers and women), associations, cooperatives and extension workers promoting the empowerment and schooling of entire community/settlement. The achievement of project outputs especially 1.3, 2.1 and 2.2, depends on a strong training and communication and this has been built into the implementation strategy. The SLM to be promoted is based on practices in similar semiarid spaces in Brazilian ASD that proved economic feasibility. These will be adapted to the environmental conditions of Sergipe ASD at scale. The sensitivity assessment that will be undertaken during the project will elucidate the SLM socioeconomic and environment benefits, encouraging the communities to support the project implementation and the maintenance of activities in long-term (after the end of the project).
With Sergipe's growing economy and severity of LD, increased pressures on land will overwhelm state-level licensing and	Medium	The development of Ecological and Economic Zoning (EEZ) including LD considerations will establish the framework for permissible and recommended activities in ASD, in line with the differing levels of land degradation. Together with the strengthening of inter-sectoral mechanisms to promote coordination action, this will allow the adoption of an integrated approach to reduce land use conflicts and manage pressures. The project will also focus on strengthening state-level licensing and oversight capacities and environmental and social safeguards defined for land use

Risk	Rating	Mitigation
oversight capacity		so as to reduce LD in ASD.
Insufficient buy-in from relevant agencies undermines the ability to mainstream SLM in baseline programs and to channel resources to Sergipe	Low	The Brazilian government is strongly committed to poverty reduction and has recognized the link between poverty and LD. Furthermore, the state of Sergipe is fully supportive of all proposed project elements. The specific manner in which funds will be allocated to Sergipe from large baseline programs has not yet been determined and Sergipe therefore has the opportunity to influence this process to ensure that SLM considerations are taken into account and that LD is targeted.
Impacts of climate change exacerbate land degradation and increase pressures on remaining soil and forest resources	Low/ Medium	Climate change is expected to lead to serious consequences in the region that are already beginning to be felt, such as longer, drier and hotter dry seasons and more frequent and less predictable drought events. IPCC predicts increased temperature and evaporation, more extreme events and loss in nutritional value of food crops. The project will identify and promote the implementation of SLM practices and species that are adapted to a changing climate and will therefore help to reduce the vulnerability of farmers to climate change, increasing productivity, diversity and resilience. In addition, an important part of the project involves increasing learning and information exchange on semiarid production systems, including the expected impacts of climate change (higher temperature, lower precipitation, more evaporation) on such systems and existing practices that have produced positive results in this context and could be replicated.
State and Presidential Elections resulting in political changes at the different levels may compromise project implementation schedules and arrangements	Low/ Medium	The project will work at four different levels: national, state, regional and local levels. The project will work to mobilize continued collaboration between all government instances through NCCD and GPCD as the institutional instruments to support the decision making concerning LD. Furthermore, the project has included training/capacity activities to increase the governmental understanding and awareness of the goods of SLM on sustainable rural development, and on rural population security. A member of NCCD and GPCD will have a chair in Project Advisory Committee, in order to align the project with NAP, ensure it is aligned with relevant government programs act as a vehicle for communication between project, stakeholders and decision-makers, minimizing the impacts of government transition. Moreover, the project are built based on cooperation agreements between stakeholders, formalized in the co-financial letters, and anchored in the umbrella of public consolidated structures (NCCD and GPCD).

2.5. Country Ownership, Eligibility and Policy Conformity

151. Brazil is a state party to the United Nations Convention to Combat Desertification (UNCCD), which it ratified in 1997. The project will help the country meet its commitments under this Convention as well as advancing the strategic objectives of the UNCCD 10-year strategic plan, namely: 1) To improve the living conditions of affected populations; 2) To improve the condition of affected ecosystems; 3) To generate global benefits through effective implementation of the UNCCD. It addresses all five operational objectives of the 10-year UNCCD Strategic Plan: 1) Advocacy, awareness-raising and education; 2) Policy framework; 3) Science, technology and knowledge; 4) Capacity-building; 5) Financing and technology transfer.

152. Brazil has also developed a number of policies, plans and programs that signal its commitment to tackling the issues of land degradation and poverty. The National Action Plan to Combat Desertification and Mitigate the Effects of Drought (2004), known as PAN-Brasil, has four objectives: i) Fighting poverty and social inequalities; ii) Enhancing sustainable production capacities; iii) Preservation,

conservation and sustainable management of natural resources; iv) Institutional strengthening and democratic governance. The project will help to achieve these objectives through its focus on promoting sustainable production in areas of high poverty, reducing LD and contributing to the conservation of the remaining forest in Sergipe and significant institutional strengthening in licensing, oversight and extension. Furthermore it will facilitate the implementation of Sergipe's 2011 State Action Plan to Combat Desertification (PAE-SE), contributing directly to four of this plan's five objectives: i) reducing poverty and decreasing the rural exodus; ii) ensuring food security and nutrition by promoting sustainable production; iii) guaranteeing conservation, preservation and sustainable use of biodiversity; iv) developing mechanisms to ensure that policies, programs and projects to combat desertification are being implemented effectively. The Plan establishes priority actions, some of which are covered by existing sectoral programs, but these require tailoring and coordination to optimize their role in SLM. Other key actions such as capacity development, testing and disseminating appropriate technologies not yet widely adopted, improving licensing and oversight procedures and facilitating access to credit, which are not covered by ongoing or planned programs, together with developing the coordination mechanisms and procedures for guiding sector programs to combat desertification, represent the entry point for the GEF project. The PAE-SE identifies the SAS as its priority, an area which is also defined for priority action through Brazil's national social programs and the focus of many of this project's components.

153. The project also advances a number of broader national and state-level strategies and plans. Amongst these is *Brasil sem Miséria* (Brazil without Misery), an ongoing national policy to eradicate extreme poverty, which has a substantial focus on the semiarid region of the Brazilian NE, where 85% of the country's poor live. The GEF project will mainstream SLM considerations in the programs funded by this plan and channel resources to Sergipe for actions to reduce LD. The project is also in line with National Policy on Climate Change (NPCC) established in 2008, which highlights the need to reduce LD and deforestation from agriculture and other forms of land use to mitigate climate change. The project will help implement the NPCC's action plans for arresting and controlling deforestation in the Caatinga and Cerrado biomes by promoting the conservation of Sergipe's remaining forest through strengthened enforcement of Legal Reserves and Permanent Protection Areas and promotion of forest restoration, where feasible. These actions will also contribute to advancing Sergipe's Forest Program, which was elaborated through the MMA UNDP GEF Caatinga project. This outlines a program to recover and conserve the vegetation of Sergipe over the next 25 years and sets out the theoretical base for the State Forest Policy.

154. This project will address land degradation (LD) in the state of the Sergipe in the Brazilian Northeast (NE) and will contribute to GEF objectives LD1 Maintain or improve flow of agro-ecosystem services sustaining the livelihoods of local communities and LD3 Reduce pressures on natural resources from competing land uses in the wider landscape, as well as UNCCD's 10-year strategic action plan. It is designed to optimize and coordinate baseline programs to engender a shift to more sustainable land management, reverting land degradation in a state where half of the land is susceptible to desertification and only 13% of the original Caatinga vegetation remains in large patches. While total deforestation cannot be reduced in the short run in absolute terms, the rate of increase can be cut significantly, contributing to LD3. This will be achieved through promotion of sustainable livelihoods (LD1), which generate and benefit from agro-ecosystem services.

UNDP Comparative Advantage

155. This project will contribute to Outcome 2 of Brazil's CPD (Country Program Document) for 2012-2015: "Capacities for integrating sustainable development and productive inclusion for poverty reduction", as well as to the UNDAF Outcome (2012-2016): "Incorporating sustainable development, green economy and decent labor paradigms into national public policies" (outcome pending approval) and to the related strategic plan focus areas: environment and sustainable development. Under this UNDAF

outcome, UNDP will contribute its knowledge on sustainable development and biodiversity conservation and will facilitate the articulation of the overarching goals of poverty eradication, productive inclusion and reduction of inequalities.

156. UNDP has an extensive portfolio of SLM projects in Latin America and globally, many of which focus on establishing SLM governance at local levels in arid lands and is therefore poised to maximize inter-project learning. UNDP Brazil has implemented a number of projects related to SLM and to supporting small and medium rural producers and communities in alternative production systems as part of its poverty alleviation and environmental goals. These include the recently completed MMA-UNDP-GEF project “Demonstrations of Integrated Ecosystem and Watershed Management in the Caatinga” (2004-2010), which promoted integrated land management in the Brazilian NE, and the project “Promoting biodiversity conservation and sustainable use of the frontier forests of the Northwestern Mato Grosso”, which promoted agro-forestry systems and NTFP to increase connectivity across the landscape.

157. The GEF-UNDP Small Grants Program (SGP), known in Brazil as the *Programa de Pequenos Projetos Ecosociais* (PPP-ECOS), has tested and disseminated many sustainable livelihood strategies in the Cerrado, Amazon and Caatinga. In many cases, it has provided the first outside support, through which communities learn how to prepare proposals, organize collective efforts, manage funds and report to donors. The worldwide SGP network, managed by UNDP, includes all the developing countries subject to land degradation.

158. UNDP-Brazil also has significant experience in capacity development and has consolidated strong relationships with a diverse array of stakeholders critical for the successful implementation of this project. Furthermore, a total of eight staff members will contribute to the overall management and supervision of the project, including the Environment Unit Coordinator, who will be responsible for project supervision.

2.6. Coordination with other related initiatives

159. At the global level, the project will contribute directly to implementation of goals set in the items on desertification, land degradation and drought (205 to 208) of the Rio+20 final document "The Future We Want", which provides guidance for implementation of sustainable development. The project exemplifies concrete solutions. It will also contribute to implementation of items 42, 43, 56, 57 and 77, which in turn are relevant to post-2015 development agenda of the United Nations.

160. There are various other projects in Brazil with which this project will collaborate. It will build on and incorporate achievements and findings from previous GEF-funded projects in the Caatinga. The main starting point is the MMA/UNDP/GEF project on the Caatinga (2004-2010) which validated Integrated Ecosystem Management (IEM) approaches at demonstration sites in other states in Brazil's NE and could be up-scaled through Outcome 2 of this project once the governance framework is in place. Findings from the GEF World Bank "Caatinga Conservation and Management - Mata Branca" project in Ceará and Bahia (2007-2013) will be used to include best approaches for successful mainstreaming of integrated ecosystem management practices in public policies. Of particular relevance will be their approaches to creation of environmental councils at the municipal level in Bahia, state policies to combat desertification in Ceará and strategic EIAs undertaken for intensive agro-forestry systems, alternative energy sources and recuperation of degraded land. Close coordination will be sought with the Waters of Sergipe program in part funded by a loan from the World Bank. SEMARH is the executing agency of both projects and has indicated its commitment to ensure that they are complementary, particularly in the land use planning and institutional strengthening components and in efforts to modernize irrigation and improve water management in the ASD municipalities in the Sergipe River Basin. The EEZ will be carried out in the Waters of Sergipe program. Coordination will focus primarily on the delivery of the programs to

extension workers and farmer leaders in the dry sub-humid municipalities of moderate LD to prevent the advancement of desertification processes and on credit-based financial mechanisms to include funding for SLM activities. An Inter-American Development Bank (IADB) project will focus on consolidation of the National System of Conservation Units (SNUC), which includes the two Natural Monuments (MONAs), one of which is federal and the other state, but without overlap with this project.

161. The Climate Fund, established in 2010 with funds provided by the Brazilian government, has nine subprograms, one of which is specifically for Combating Desertification. It supports projects, studies and enterprises which contribute to climate change mitigation and adaptation. The lending is carried out by the National Economic and Social Development Bank (BNDES), while grants are managed by the Ministry of Environment (MMA). The Climate Fund project approved for Sergipe constitutes co-financing for the GEF project.

162. The Fresh Water project (PAD) of the Secretariat of Water Resources and Urban Environment (SRHU) of the MMA, begun in 2004, is being redesigned to deal with salinization in the Semiarid region through social participation, environmental protection, institutional involvement and local community management.

163. The Dom Helder Câmara project (PDHC) is carried out by the Secretariat of Territorial Development of the Ministry of Agrarian Development (MDA) in the Northeast since 2001 with support from IFAD and GEF in eight rural territories and 77 municipalities of the Semiarid region, benefitting 15,021 families. It supports rural sustainable development through activities involving agro-ecology, participatory certification and bio-water, among others, which complement but do not duplicate the present project.

164. The Dom Távora project, carried out by the Sergipe state government, also with support from IFAD, combats rural poverty by supporting initiatives that promote food security, including beekeeping, free-range poultry, fish farming, fruit production and irrigated agriculture, among others, in 15 municipalities involving 40,000 people. The sites do not overlap with the present project.

165. In addition to these governmental initiatives, the project will establish close coordination with a proposal submitted by FAO for GEF funding on "Reversing Desertification Process in Susceptible Areas of Brazil: Sustainable Agro-forestry Practices and Biodiversity Conservation." The two proposals represent complementary interventions within Brazil's plans for sustainable rural development. FAO will focus on the complexity of addressing SFM and INRM in semiarid and dry sub-humid areas with Caatinga and Cerrado forest, defining methods, processes, species and seeds to promote restoration of areas already degraded. Where forest cover is high, it will promote sustainable fuelwood harvesting practices. The FAO project will not work directly in Sergipe, but rather at sites selected in other states. It will not work with governance. In this project, UNDP will focus on the governance mechanisms to avoid, reduce and revert land degradation in the state of Sergipe and promote the uptake of SLM in the SAS and other ASDs of Sergipe where forest removal has already reached critical levels and where SFM for fuelwood is not a primary option. It seeks the promotion of a wide array of SLM practices, such as soil conservation techniques and water management, by facilitating inter-sectoral coordination, enhancing implementation of the policy framework, institutional strengthening and increased access to financial resources. Wherever relevant, practices developed through FAO will be incorporated if they contribute to the uptake of SLM in the SAS. The fact that both steering committees have DCD participation will provide coordination so as to avoid duplication.

166. The UNDP/GEF Small Grants Program (SGP) includes the Caatinga and actions to support sustainable agriculture and forest management at the community level to avoid conversion to pasture and

monocultures and maintain ecosystem services. The project will work in synergy with the SGP program so that small grants awarded in this area support this project's objectives and lessons learned are shared. UNDP, ASA, MMA and the Brazilian Cooperation Agency (ABC) of the Ministry of External Relations (MRE) have seats on the SGP National Steering Committee (NSC). The project will also share information with 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", particularly related to the work under that project on trade-off scenarios and reliable information on NTFP and agro-forestry system contributions to biodiversity conservation and ecosystem services (e.g., productive capacity and production costs; contribution to rural family income; and economic feasibility) and sustainable harvesting limits for at least 12 species, some of which are from the Caatinga. Results will be taken into account in the licensing and oversight processes and extension services.

167. Specific coordination mechanisms among the various GEF projects include yearly meetings among staff of the different projects to ensure information sharing and discussion on relevant topics, the formation of an inter-project working group and dissemination of the results of each project's monitoring and evaluation reports. The project team will also work closely with a number of other key programs outlined in the baseline section to maximize project outreach and impact.

168. There are many ways in which lessons learned in other places in the Caatinga, Cerrado and the Amazon can be applied and replicated in this project. The Semiarid Association (ASA) has various closely related projects with regional scope in the NE. With the support primarily of Spanish international cooperation, the Brazilian Institute for Development and Sustainability (IABS) has various projects in the NE regarding social technology, coexistence with drought (i.e. adaptation), aquaculture, tourism and innovative use of mobile phones to support small-scale production. One of the most relevant IABS projects is the Xingó Center for Coexistence with the Semiarid, right across the São Francisco River from Canindé, which carries out research and training and extension on socio-productive inclusion. Another is the Mandacaru Awards, which so-far has provided financial awards totaling R\$2 million for innovative projects and practices for access to water and coexistence with the Semiarid. The NGO called Advice and Management in Studies of Nature, Human Development and Agro-ecology (AGENDHA), based across the river in Paulo Afonso, Bahia, provides technical support for sustainable use of native biodiversity and water catchment and storage in the whole region. These civil society initiatives and many of their sources of support are involved in the design of the project through contacts in the field in Sergipe, meetings and courses in the NE, participation in various committees and personal exchanges that took place in Brasília.

2.7. Cost-Effectiveness

169. In the past, the general approach to desertification in Brazil's NE region has tended to be combatting drought by building dams and canals, distributing water in tank trucks and undertaking public works to generate temporary employment. The direct costs were high and even higher indirect costs resulted from losses of production, debt and out-migration, among others. Short-term results were cost-ineffective. Recently, the approach has changed to "coexistence with drought". This alternative approach to climate fits well with the new national approach to poverty reduction through "socio-productive inclusion", which is essential based on self-reliance through one's own work, as a complement to cash transfers. The project is designed to complement this new approach and develop the governance; policies; finance and know how to upscale SLM practices of small-scale and family farmers in drought stricken area where current land use practices are causing land degradation aggravated by climatic characteristics. The project is also designed to mainstream SLM practices into social programmes such as *Brasil sem Miséria*, and others that support cash transfers making co-existence with drought not only feasible but also halting and reverting land degradation processes that are exacerbating the impacts of drought and

increasing vulnerability to desertification. Cost-effectiveness is thus achieved mainly by means of optimizing and coordinating a substantial set of baseline programs to engender a shift from unsustainable to sustainable land use and by mobilization of co-financing from various federal and state government agencies and non-governmental organizations for this initiative (US\$ 17.33million). In addition the following design elements have been incorporated to increase cost effectiveness:

- The focus on one state is more cost-effective and will have greater on-the-ground impact than spreading resources too thinly over multiple states. With an area of 21,918 km², Sergipe is Brazil's smallest state, although it is comparable in size to Israel and larger than El Salvador. It will provide a model for replication and is coupled with strategic national-level action to ensure that the GEF resources have broad impact. The neighboring states, which share similar ecological and socioeconomic characteristics, are Alagoas to the north, Pernambuco to the west and Bahia to the west and south.
- Sergipe already has a substantial amount of baseline information as well as a State Plan to Combat Desertification, making it much more cost-effective to work here than in other states, where it would be necessary to start from scratch with data collection, interagency coordination and stakeholder engagement.
- Selection of field sites has been carefully undertaken to ensure that different degrees of degradation are covered will provide models for replication for different LD and socioeconomic scenarios.
- Adoption of a multi-stakeholder and multi-sector approach will reduce duplication of efforts and investments and minimize contradictory initiatives.
- SLM practices contribute to decreased public expenditures and increased tax revenues, generating net benefits without creating dependence of local and state governments neither on federal government, nor of poor people on government.

2.8. Sustainability

170. Environmental, economic-financial, social and institutional sustainability, all of which are interrelated and interdependent, will be achieved through a multi-faceted exit strategy. The means to attain each kind of sustainability are summarized below.

171. Environmental sustainability will be sought, first of all, through promotion of uptake of more sustainable agricultural and animal husbandry practices, especially in the areas most susceptible to desertification. They will include practices that are adapted to expected climate change impacts and promote resilience, so as to minimize future losses and damages. Lasting environmental benefits on a large scale depend on strengthened land use planning, taking due account of LD. They depend on better integration of environment into the governance framework, coupled with increased capacity and availability and accessibility of funding.

172. Economic and financial sustainability requires higher levels of agricultural productivity, lower costs of inputs, improved access to markets, family farm incomes that are higher and subject to less seasonal and inter-annual variation, including more severe climate impacts in the future, and affordable investments in new technologies. SLM 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. 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 SLM criteria into large existing baseline

programs and through support for increased access to funding for such activities, as well a state-level funding committee.

173. Social sustainability will be sought through training at the state and national level, rural extension with farmers, capacity building, information dissemination, civil society participation and policy advocacy. Social movements that defend social sustainability such as the Semiarid Association (ASA) and the Landless Workers Movement (MST) are already involved in government efforts to combat desertification and in this project through civil society participation and large projects to perform services regarding cisterns and extension. In addition to large networks, there are also various NGOs. These groups provide for regional and national alliances, outreach and continuity. They form constituencies to influence elected officials and formulate demands on government agencies regarding public policy. Incorporation of gender and generation issues contributes to social sustainability in and of itself as well as being essential for sustainable and resilient family farm production systems. Part III of Section VII, on stakeholder analysis, provides more details on how the project will ensure social inclusion.

174. Institutional sustainability will be promoted through the project emphasis on clarification of institutional roles and procedures, training on licensing, oversight and extension, strengthening of state-level land use planning and consolidation of inter-institutional mechanisms to facilitate integrated planning. The main institutions engaged directly in environmental management are SEMARH, ADEMA, EMDAGRO, INCRA and IBAMA and other members of the GPCD and NCCD. Many of their staff will receive training. Other institutions that will become more involved are SEPLAN, SEAGRI, SEIDES, SEINFRA, SEIDETEC, other MMA secretariats and other ministries, particularly MDS, MDA and MAPA. The project will build on existing institutions and mandates, particularly the State Commission for Combating Desertification and the NCCD, which are permanent structures, to make progress from intentions to concrete and specific forms of action. Institutional capacity building through formal and informal training and suggestions about relevant criteria for recruitment of new staff with appropriate qualifications is an essential element of institutional sustainability.

175. The implementation arrangements are designed to foster the cooperation and coordination through discussion and consultation forums, study commission, and participatory committees, increasing sustainability of the project over the long run. This multi-sectoral implementation arrangement will result in the empowerment, cooperation and proactivity of the stakeholders that deal with SLM, LD and combat desertification topics in all project levels, strengthening the committees that are responsible for the issue (NCCD and GPCD). This will facilitate the cooperation and coordination among stakeholders and overcome the current lack of articulation and clarity about their mandate and their role in promoting SLM in ASDs.

176. Additionally, low access to SLM knowledge and the lack of systematization were raised as significant barriers to SLM uptake during project preparation meetings. The project design has placed emphasis on capacity and training activities for government and non-government teams, community leaders, youth and other stakeholders / beneficiaries of the project to minimize these barriers. Moreover, the creation of a SLM study commission under the NCCD to promote discussion and systematization of knowledge will optimize the institutionalization of project achievements, and stimulate the activity of other networks of knowledge, such as the Desertification Network. To this end the project will pursue strengthening a knowledge network, which will include the schooling and qualification of multipliers, extension workers, environmental managers, bank workers and decision makers, thereby encouraging the adoption of SLM as to combat desertification and land degradation strategy.

177. In parallel, the project will carry out a communication strategy with decision makers and other stakeholders to improve the knowledge and raise awareness about the benefits of SLM to combat desertification and land degradation and the importance of integrating SLM in national and sectoral public

policies. Moreover, the project will elucidate the social-economic and environmental benefits of SLM adoption by carrying out a sensitivity assessment, evaluating costs and benefits of SLM practices, information demanded to qualify the decision-making process.

2.9. Replicability

178. The focus on one state will enable the project to have substantive on-the-ground impact and will provide a model for replication throughout the ASDs. Such replication to other states will be encouraged through information dissemination and knowledge management; through the strengthened governance framework and through increased access to funding.

179. **Information exchange and dissemination:** In order to promote replication, the project will document best practices and disseminate written material to other areas. The national-level semiarid SLM knowledge management and information dissemination system will be strengthened by this project through the inclusion of information on best practices developed or tested in Sergipe, which will facilitate learning about the achievements of Sergipe in other parts of the country. The National Commission has representatives from various federal government agencies, 11 states and civil society and serves as an important venue for information exchange, dissemination and uptake beyond the borders of Sergipe. There are also practical networks of rural extension, technical assistance and credit as well as scientific networks such as the Climate Network (*Rede Clima*) coordinated by the National Institute of Space Research (INPE), which includes a sub-network on regional development that focuses on the Semiarid. The institutions involved in combating desertification in Brazil also have numerous contacts in other countries, such as Chile. Brazil has signed an agreement with Portuguese-speaking countries to promote information exchange on land degradation, which could facilitate replication in other countries, especially in Africa, where Brazil avidly promotes South-South cooperation

180. **Governance** Through Output 1.4, the development of a supportive national-level governance framework will facilitate replication in the NE and Brazil as a whole through the revision of procedures for the issuance of licenses and oversight under federal domain (IBAMA) to incorporate SLM criteria and practices. For example, it will be shown that wood harvesting and rotation of small cleared plots with sufficient fallow (*roça de toco*) and wild collection for sustainable use of biodiversity, although they may be considered detrimental to the environment, do not necessarily generate negative impacts and can be beneficial, especially as compared to monocultures and pastures that replace small-scale family farming. The DCD will be strengthened within the MMA and in relations with other ministries. Replication will be promoted through the development of norms and technical directives regarding licensing, oversight, rural extension and credit to prevent, reduce and mitigate LD for Caatinga ecosystems and degradation levels in NE region working through the NCCD and CONAMA, as well as changes to similar norms and/or procedures at the state level. All this work within Brazil will create many opportunities for interaction with other countries with areas subject to desertification, as has already begun with Chile and African countries.

181. The incorporation in public policies of technical guidelines for SLM, renewed licensing framework and other outputs of the Project depends on a good flow of information and strength of decision-making and communication channels in which the participation of stakeholders is guaranteed. The Project will enhance and strength the participatory forums to qualify the decision-making by the government stakeholders with this mandate (under the umbrellas of the NCCD and CONAMA). This will enable building public policies that include SLM practices and are aligned with the national strategy of sustainable rural development and with the PAN.

182. **Funding changes:** The project will work on strengthening existing funding programs to incorporate SLM criteria, which can have a significant impact on replication, such as the Climate Fund, the program for Low-Carbon Agriculture (ABC), the National Environment Fund (FNMA), the Bank of Brazil Foundation (FBB), the Small Grants Program (SGP), the Brazilian Biodiversity Fund (FUNBIO), the environmental program of the state oil company (Petrobrás Ambiental) and the Critical Ecosystem Partnership Fund (CEPF). If opportunities arise, it may also be possible to influence policies regarding Green Grants (*Bolsa Verde*) and other forms of payment for environmental services (PES) or Reduction of Emissions from Deforestation and Degradation (REDD+), which are new developments in the policy arena, but are still to be defined. To the extent possible, the project and its wide range of partners will also seek to influence North-South technical and financial cooperation, private international donors and the policies of official and private banks regarding various forms of funding.

PART III: MANAGEMENT ARRANGEMENTS

183. The project will be implemented over a five-year period. The Government of Brazil has requested UNDP's assistance for the design and implementation of this Project based on UNDP's comparative advantages, which includes vast experience in supporting the Government in project implementation in Brazil, but also considering its role as the GEF Implementing Agency (IA).

184. As the GEF Implementing Agency, UNDP is ultimately accountable and responsible for the delivery of results, subject also to their certification by MMA, as Implementing Partner. UNDP shall provide project cycle management services defined by the GEF Council including the following:

- Providing financial and audit services to the project;
- Overseeing financial expenditures against project budgets;
- Ensuring that activities including procurement and financial services are carried out in strict compliance with UNDP/GEF procedures;
- Ensuring that the reporting to GEF is undertaken in line with GEF requirements and procedures;
- Facilitating project learning, exchange and outreach within GEF;
- Contracting the project mid-term and final evaluations and triggering additional reviews and/or evaluations as necessary and in consultation with the project counterparts.

Implementation Modality

185. The project will be implemented under UNDP's Direct Execution modality (DEX). In line with UNDP Internal Control Framework (ICF) there will be a clear division between UNDP oversight function as GEF IA and its role as executing agency. The management arrangements, described below and summarized in Figure 1, constitute the Project Board; Project Management Unit, a Project Advisory Committee and a regional Technical Commission. The MMA is the National Focal Point of the United Nations Convention to Combat Desertification and Drought (UNCCD) with responsibility for coordinating the National Action Program to Combat Desertification (PAN). In this capacity, the MMA will be the lead government partner and will have responsibility in technical oversight and management through its role in the Project Board; in the Project Management Unit; in the chairing of the Advisory Committee; in coordination with the Sergipe State Secretariat of Environment and Water Resources (SEMARH) and the Regional Technical Commission. It will also in designate staff for the delivery of different project activities who will work in close cooperation with the UNDP to deliver the Project.

Project Board (PB)

186. The Project Board (PB) will provide the overall managerial guidance for project execution. It will: (i) Analyze and discuss the development of the Project activities and recommend changes as required based on project monitoring and evaluation processes and products and in line with GEF and UNDP policies; (ii) Discuss and approve the Annual Work Plan ensuring that required resources are committed; (iii) Discuss and approve the Progress Reports and Final Report of the Project; (iv) Analyze Project achievements and assure these used for performance improvement, accountability and learning; and (v) Settle controversies arbitrating on any conflicts within the project or negotiating a solution to any problems with external bodies. In order to ensure UNDP's ultimate accountability for the project results, PB decisions will be made in accordance to standards that shall ensure management for development results, fairness and integrity.

187. The PB will be composed by the UNDP, the Brazilian Agency for Cooperation (ABC) and MMA and their respective alternate members. The Board can be expanded upon mutual agreement between the Parties. UNDP as the Executive will represent the project ownership, chairing the PB and organizing its meetings at least once a year or upon request of either of the Parties. The ABC as the Senior Beneficiary will represent the interests of those who will ultimately benefit from the project; and the MMA as the Senior Supplier will represent the parties that will provide funding for cost-sharing and will lead the technical expertise and guidance to the project. For this MMA will appoint a National Project Technical Director (NPTD) who will be a senior staff member and will be responsible at the highest level for providing guidance on technical feasibility of the project ensuring its implementation leads to the achievement of project's results. He/she will represent the MMA on the PB; will chair the Project Advisory Committee (PAC); will keep the MMA updated on Project advances and challenges as needed and will represent the Project at high-level national and international meetings. This is a part-time position continuing for the duration of the Project.

188. The Project Board's role in project management will be complemented by inputs and recommendations from a Project Advisory Committee (PAC) - see below. In addition the PB will approve the appointment and responsibilities of a Project Manager who will be responsible for the daily project execution. UNDP also will provide Project Assurance support to the Project Board Executive by carrying out objective and independent project oversight and monitoring functions related to UNDP project cycle management services as GEF IA. UNDP will appoint a representative for the Project Board; another for Project Assurance support and another for the approval of transactions. None of these 3 UNDP staff will be the Project Manager.

Project Management Unit (PMU)

189. A Project Management Unit (PMU) will be responsible for overseeing the day-to-day execution of Project activities. The PMU will have responsibility for, among others: (i) operational planning, managing and executing the project including the direct supervision of project activities sub-contracted to specialists and other institutions, as well as those that are to be implemented through the MMA, if applicable; (ii) coordinating the management of financial resources and procurement; (iii) reporting on the application of resources and results achieved; (iv) preparing management reports for the MMA, PAC, the GEF, and UNDP including annual reports (PIR) and any proposals for the adaptive management of the Project if required and based on inputs from the Project M&E plan; (v) promoting inter-institutional linkages; and (vi) disseminating project results.

190. The PMU will consist of a full-time Project Manager, two Technical and Monitoring Consultant and one Administrative Assistant hired with GEF resources and a National Project Technical Coordinator (NPTC) assigned by the Project National Technical Director. The NPTC will be a MMA staff member and will collaborate with the PMU in project implementation channeling MMA's technical inputs and

guidance into the planning and execution of project activities. This is a part-time position continuing for the duration of the Project, reporting directly to the NPTD.

191. The PMU will be led by the Project Manager and who will be responsible for the overall management and implementation of the project's activities and requesting disbursement of Projects resources for their execution. Upon request of the GoB (see Annex V.6) implementation will be through the DEX modality with UNDP providing direct project services such as procurement and hiring of consultants following best value for money, transparency and effective competition. These will follow current UNDP policies and procedures including those for cost recovery (see para 229). Under the PM's lead and guidance the PMU team will prepare Annual Operational Plans (AOP) for the effective and efficient implementation of the project activities to achieve stated objectives; will be responsible for all substantive reports from the Project; will prepare and/or oversee the development of Terms of Reference for consultants, subcontractors and partnerships hired for specific technical assignments and their close monitoring, ensure consistency between the various project elements and activities provided or funded by other donors; and develop reports on project progress on the project for PAC and technical meetings, and other appropriate forums. This is a full-time position continuing for the duration of the Project, reporting directly to the Executive of the PB.

192. Considering the transversal nature of desertification and in agreement with the principles of the UNCCD and the PAN Brazil Desertification recommendations, project implementation should occur in an integrated and coordinated with the various social actors involved in the question. The project will strengthen and expand partnerships with the Parties under the UNCCD, with federal, state and municipal institutions, international cooperation agencies and civil society to jointly build effective and sustainable solutions within the proposed prevention, control, mitigation and rehabilitation activities. For implementation of relevant Outputs, in particular those related to implementation of field activities, agreements will be established with local, state, regional or national organizations, research and/or academic institutions or civil society organizations, according to the specific needs.

193. In addition, decentralized implementation is envisaged in order to promote greater interaction and institutional dialog among government, academia and civil society, as well as the exchange of the knowledge generated and the need to achieve results spread throughout the national territory. It is expected that the selected partners, given their accumulated experience in the areas of operations, will achieve results more effectively with the target beneficiaries at the intervention sites. The actions to be undertaken by the Implementing Agencies will be described in detail in specific Terms of Reference, prepared by the PMU, in cooperation with MMA, including the definition of the project element/activity to be executed at intervention areas. The transfer of project funds to the Implementing Agencies to cover the costs of the activities under their responsibility will be formalized by specific agreements defined by UNDP.

194. The project will promote a pre-selection of the Implementing Agencies with the support of MMA to identify organizations that are in a position to participate in the initiative as institutional partners. The criteria for selection and registration as partners will be defined during the Inception Phase of the project (first six months of implementation). The main criteria to be observed in the selection of partner institutions include, among others: experience with projects of this kind; ability to innovate and add value to the project; accumulated knowledge about the subject of the action; technical and specialized capacity to achieve results; and expectation or existence of partnerships with other institutions in the area. The hiring of 'implementing agencies' would be carried out through a competitive process.

195. After the selection process, the Implementing Agencies will participate in a workshop when the common vision of the goals of the project will be explained and guidelines to standardize the methods of monitoring and evaluation will be defined for all those partners. Furthermore, in order to replicate good

practices for SLM in ASDs, the project will also explore the possibility of calls for grants to support small projects in the ASD of Sergipe, based on experiences implemented in priority areas of the Alto Sertão. If possible, these calls will be supported with resources from development instruments of federal and state governments and through the institutional coordination process.

Project Advisory Committee (PAC)

196. The MMA through its NPTD in the PB; and the NPTC in the PMU will lead technical responsibilities during the executing of the project and ensure alignment with relevant national policies and programmes. In this role the MMA will closely coordinate with the SEMARH, ADEMA, IBAMA, Ministry of Agrarian Development, University of Sergipe (UFS), INCRA, who will represent the interests of those co-funding the Project and also those who will ultimately benefit from the project and ensure the realization of project results. The vehicle for this coordination will be a Project Advisory Committee (PAC) to be constituted at Project inception as the highest level for providing technical coordination for the project. It will consist of MMA as chair and representatives of the National Commission to Combat Desertification (NCCD), which includes representatives of federal, state and local governments, and civil society organizations; also of SEMMARH, ADEMA, IBAMA, MDA, UFS, INCRA and UNDP. The PAC will play a critical role in facilitating inter-ministerial coordination and ensuring complementarity of actions among different stakeholders and co-financiers. The main responsibility of the PAC is to see that the project's activities lead to the required outcomes as defined in the Project Document. The Project Technical Coordinator will attend PAC meetings, but is not a formal voting member of the committee

197. The PAC will meet twice per year to review progress and obstacles and to advice on strategic and critical Project issues. Matters of institutional concern (i.e. going beyond the Project's scope and contents) will be addressed at the appropriate levels of dialogue between UNDP and the Government of Brazil. It will provide recommendations to the PB on progress and on any changes that may be required for improving efficiency and effectiveness. The NTDC will instruct the NTC to provide detailed project information to the PAC as needed, to convene meetings and to prepare PAC minutes. He/ she will assisted by the Project Manager in these. Extraordinary PAC meetings can be held if deemed necessary by one of the PAC members. If appropriate, the PAC can invite external consultants to assist in the monitoring process.

Regional Technical Commission (RTC)

198. The Regional Technical Commission (RTC), to be designated during the project inception phase, will be constituted by technical focal points that will be the primary contact for the coordination of state and local activities with the national level. It will be composed by specific technical civil servants, as well as professionals hired specifically to work on the project. The RTC will be responsible for supervision and monitoring of activities to be performed on project's site interventions, ensuring good SLM implementation in situ. The RTC will ensure identification and participation of key relevant stakeholders from local and state organizations, such as family farming, agriculture and livestock, water resources and forestry institutions, as well as representatives of relevant co-funding contributions.

Acknowledgement of UNDP and GEF property rights and security

199. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation of publications regarding projects funded by GEF should also accord proper acknowledgement to the GEF. Any material for promotional and/or dissemination purposes must be submitted to UNDP CO for revision and approval prior to publication. Since UN visibility is

important for security purposes, the UNDP logo should possibly appear more prominently - and separated - from the GEF logo on hardware items (in particular on vehicles).

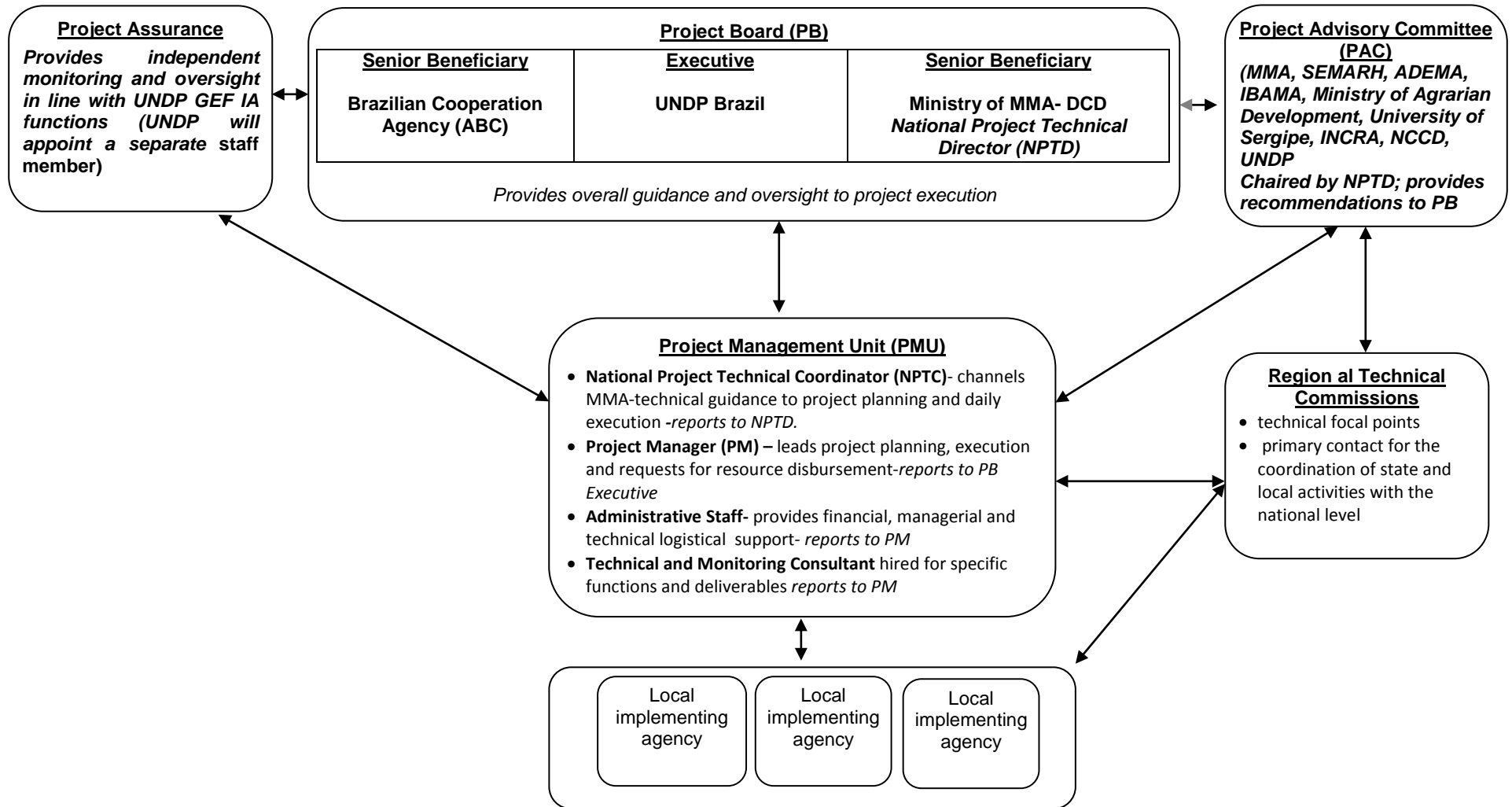
Audit arrangements

200. It will be performed an auditing by independent audit firm or individuals, hired by the project or by the UNDP Evaluation, Auditing and Investigation Office, as provided for in the UNDP rules applicable to the projects executed by the direct execution modality. When the regional Bureau authorizes the execution of the projects by this modality, UNDP Office in Brazil becomes in charge of fully enforcing the UNDP rules and procedures during the project implementation, monitoring and evaluation, as well as must guarantee that the costs will be recovery within the scope of this project. The office will also provide and keep records about the project on the corporate databases.

Compilation of learning experiences

201. During implementation, the Project team is expected to identify processes, sub-processes, outputs and approaches that may be useful for monitoring purposes and for sharing of knowledge with stakeholders in Brazil and the region.

Figure 1 Project Organization Structure



PART IV. MONITORING FRAMEWORK AND EVALUATION

202. Project M&E will be conducted in accordance with the established UNDP and GEF procedures and will be provided by the project team and the UNDP-CO with support from the UNDP/GEF RSC in Panama City. The Project Strategic Results Framework provides performance and impact indicators for project implementation along with their corresponding means of verification. The M&E plan includes an inception report, project implementation reviews, quarterly and annual review reports, mid-term and final evaluations, and audits. The following sections outline the principle components of the M&E plan and indicative cost estimates related to M&E activities. The M&E budget is provided in the table below. The project's M&E plan will be presented and finalized in the Project Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

Project Inception Phase

203. A Project Inception Workshop (PIW) will be held within the first three (3) months of project start-up with the full project team, relevant GoB counterparts, co-financing partners, the UNDP-CO, and representation from the UNDP-GEF RSC, as well as UNDP-GEF headquarters as appropriate. A fundamental objective of this PIW will be to help the project team to understand and take ownership of the project's goal and objectives, as well as finalize preparation of the project's first annual work plan on the basis of the Project Results Framework and the LD GEF Tracking Tool. This will include reviewing the results framework (indicators, means of verification, and assumptions), imparting additional detail as needed, and on the basis of this exercise, finalizing the Annual Workplan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

204. Additionally, the purpose and objective of the PIW will be to: a) introduce project staff to the UNDP-GEF team that will support the project during its implementation, namely the CO and responsible RSC staff; b) detail the roles, support services, and complementary responsibilities of UNDP-CO and RSC staff in relation to the project team; c) provide a detailed overview of UNDP-GEF reporting and M&E requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR/PIR), as well as Mid-term Review and Final evaluation. Equally, the PIW will provide an opportunity to inform the project team on UNDP project-related budgetary planning, budget reviews including arrangements for annual audit, and mandatory budget re-phrasings.

205. The PIW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines and conflict resolution mechanisms. The Terms of Reference (ToRs) for project staff and decision-making structures will be discussed, as needed, in order to clarify each party's responsibilities during the project's implementation phase. The PIW will also be used to plan and schedule the Tripartite Committee Reviews. A report on the Inception Workshop is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting (see details below).

Monitoring Responsibilities and Events

206. A detailed schedule of project review meetings will be developed by the project management in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: a) tentative timeframes for Tripartite Committee (TPC) Reviews, Steering Committee (or relevant advisory and/or coordination mechanisms); and b) project-related M&E activities.

207. **Day-to-day monitoring** of implementation progress will be the responsibility of the Project Technical Coordinator (PTC) based on the project's AWP and its indicators. The PTC will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion. The PTC will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the PIW with support from UNDP-CO and assisted by the UNDP-GEF RSC. Specific targets for the first-year implementation progress indicators together with their means of verification will be developed at this workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the AWP. Targets and indicators for subsequent years will be defined annually as part of the internal evaluation and planning processes undertaken by the project team. Measurement of impact indicators related to global benefits will occur according to the schedules defined through specific studies that are to form part of the project's activities.

208. **Changes in local Exchange Rates and anticipation of changes in exchange rates.** Possible changes in local exchange rates due to the differences in the rates will be increased or decreased in the corresponding value of U.S. dollars (USD) for each deposit, in accordance with Chapter 5, rule 5.04 of the UNDP Financing Manual. The adjustment will be made through budgetary revision, previously anticipated to the steering committee members.

209. On a quarterly basis, the UNDP, jointly with the Project Director, will perform an analysis of how much the available budget can cover and of the available project funds (as a result of eventual variations in exchange rates) in order to adjust the work plans. Any modifications needed will be made through a project revision, in accordance with SC members

210. **Periodic monitoring** of implementation progress will be undertaken by the UNDP CO through quarterly meetings with the project implementation team, or more frequently as deemed necessary. This will allow parties to take stock of and to troubleshoot any problems pertaining to the project in a timely fashion to ensure the timely implementation of project activities. The UNDP CO and UNDP-GEF RSC, as appropriate, will conduct yearly visits to the project's field sites, or more often based on an agreed upon schedule to be detailed in the project's Inception Report and AWPs to assess first-hand project progress. Any other member of the Steering Committee can also take part in these trips, as decided by the Steering Committee. A Field Visit Report will be prepared by the UNDP CO and circulated no less than one month after the visit to the project team, all Steering Committee members, and UNDP-GEF.

211. **Annual monitoring** will occur through the Steering Committee meetings. This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to Steering Committee review at least once every year. The first such meeting will be held after the inception workshop. The project proponent will prepare an APR/PIR and submit it to UNDP CO and the UNDP-GEF regional office at least two weeks prior to the Steering Committee meeting for review and comments.

212. The APR/PIR will be used as one of the basic documents for discussions in the TPC. The PTC will present the APR/PIR to the Steering Committee, highlighting policy issues and recommendations for the decision of the Steering Committee participants. The PTC will also inform the participants of any agreement reached by stakeholders during the APR/PIR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary. The Steering Committee has the authority to suspend disbursement if project performance benchmarks are not met. Benchmarks will be developed at the PIW, based on delivery rates and qualitative assessments of achievements of outputs.

213. The Terminal Steering Committee Review is held in the last month of project operations. The PTC is responsible for preparing the Terminal Report and submitting it to UNDP-CO and to UNDP-GEF RSC. It shall be prepared in draft at least two months in advance of the Steering Committee meeting in order to allow review, and will serve as the basis for discussions in the Steering Committee meeting. The terminal Steering Committee

review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learned can be captured to feed into other projects being implemented.

Project Monitoring Reporting

214. The PTC, in conjunction with the UNDP-GEF extended team, will be responsible for the preparation and submission of the following reports that form part of the monitoring process and that are mandatory.

215. A **Project Inception Report** (IR) will be prepared immediately following the PIW. It will include a detailed First Year/AWP divided in quarterly timeframes detailing the activities and progress indicators that will guide implementation during the first year of the project. This work plan will include the dates of specific field visits, support missions from the UNDP CO or the RSC or consultants, as well as timeframes for meetings of the project's decision-making structures. The IR will also include the detailed project budget for the first full year of implementation, prepared on the basis of the AWP, and including any M&E requirements to effectively measure project performance during the targeted 12-month timeframe. The IR will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions, and feedback mechanisms of project-related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. When finalized, the IR will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to the IR's circulation, the UNDP CO and UNDP-GEF's RSC will review the document.

216. In light of the similarities of both APR/PIR and PIR, UNDP-GEF has prepared a harmonized format for use in fulfilling the following two requirements:

217. The **Annual Project Report** (APR/PIR) is a UNDP requirement and part of UNDP CO central oversight, monitoring, and project management. It is a self-assessment report by the project management to the CO and provides input to the country office reporting process and the Results-Oriented Annual Report (ROAR), as well as forming a key input to the PB Review. An APR/PIR will be prepared on an annual basis prior to the PB Review, to reflect progress achieved in meeting the project's AWP and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The format of the APR/PIR is flexible but should include the following sections: a) project risks, issues, and adaptive management; b) project progress against pre-defined indicators and targets, c) outcome performance; and d) lessons learned/best practices.

218. The **Project Implementation Review** (PIR) is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from on-going projects. Once the project has been under implementation for one year, a PIR must be completed by the CO together with the project management. The PIR can be prepared any time during the year and ideally prior to the TPC review. The PIR should then be discussed in the Project Advisory Committee meeting so that the result would be a PIR that has been agreed upon by the project, the Implementing Partner, UNDP CO, and the RSC in Panama. The individual PIRs are collected, reviewed, and analyzed by the RSC prior to sending them to the focal area clusters at the UNDP-GEF headquarters.

219. Quarterly Progress Reports outlining main updates in project progress will be provided quarterly to the local UNDP CO and the UNDP-GEF RSC by the project team. Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform and the risk log should be regularly updated in ATLAS based on the initial risk analysis.

220. **Specific Thematic Reports** focusing on specific issues or areas of activity will be prepared by the project team when requested by UNDP, UNDP-GEF, or the Implementing Partner. The request for a Thematic Report

will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learned exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

221. A **Project Terminal Report** will be prepared by the project team during the last three (3) months of the project. This comprehensive report will summarize all activities, achievements, and outputs of the project; lessons learned; objectives met or not achieved; structures and systems implemented, etc.; and will be the definitive statement of the project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities.

222. **Technical Reports** are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List detailing the technical reports that are expected to be prepared on key areas of activity during the course of the project, and tentative due dates. Where necessary, this Reports List will be revised and updated, and included in subsequent APR/PIRs. Technical Reports may also be prepared by external consultants and should be comprehensive and specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national, and international levels.

223. Project Publications will form a key method of crystallizing and disseminating the results and achievements of the project. These publications may be scientific or informational texts on the activities and achievements of the project in the form of journal articles or multimedia publications. These publications can be based on Technical Reports, depending upon the relevance and scientific worth of these reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and (in consultation with UNDP, the GoB, and other relevant stakeholder groups) will also plan and produce these publications in a consistent and recognizable format. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

Independent Evaluations

224. The project will be subjected to at least two independent external evaluations as follows:

- a) An independent **Mid-Term Review** will be undertaken at the mid-point of the project lifetime. The Mid-Term Review will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency, and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation, and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, ToRs, and exact timing of the Mid-Term Review will be decided after consultation between the parties to the project document. The ToRs for this Mid-Term Review will be prepared by the UNDP-CO based on guidance from the UNDP-GEF RSC. The management response of the evaluation will be uploaded to the UNDP corporate systems, in particular the UNDP Evaluation Resource Center (ERC). All GEF Tracking Tools for the project will also be completed during the mid-term review cycle.
- b) An independent **Final Evaluation** will take place three months prior to the terminal Steering Committee meeting, and will focus on the same issues as the Mid-Term Review. The Final Evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations

for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Resource Centre (ERC). The ToRs for this evaluation will be prepared through close collaboration with the UNDP-CO, based on guidance from the UNDP-GEF RSC. All GEF Tracking Tools for the project will also be completed during the final evaluation.

Audit Clause

225. According to UNDP's general corporate audit regulations, internal and external audits will be carried out individually to each responsible party, and these costs will be covered by the project. The audit will be conducted according to UNDP's financial regulations, rules, and audit policies. The GoB will provide the Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance rules and regulations.

Learning and Knowledge Sharing

226. Results from the project will be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums. In addition, the project will participate, as relevant and appropriate, in UNDP-GEF sponsored networks, organized for Senior Personnel working on projects that share common characteristics. UNDP-GEF RSC has established an electronic platform for sharing lessons between the project managers. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identify and analyzing lessons learned is an ongoing process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every twelve (12) months. UNDP-GEF 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 in the area of sustainable land management.

M&E Workplan and Budget

Type of M&E Activity	Responsible Parties	Budget US\$ Excluding project team staff time	Time Frame
Inception Workshop and Report	<ul style="list-style-type: none"> ▪ Project Manager ▪ UNDP CO, UNDP GEF 	Indicative cost: \$15,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> ▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions and delegate responsibilities to relevant team members. 	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> ▪ Oversight by Project Manager ▪ Project team 	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG 	None	Annually
Project Board Meetings	<ul style="list-style-type: none"> ▪ Project Coordinator ▪ UNDP-CO 	\$20,000	Two times per year

Type of M&E Activity	Responsible Parties	Budget US\$ Excluding project team staff time	Time Frame
	<ul style="list-style-type: none"> ▪ GoP representatives 		
Periodic status/ progress reports	<ul style="list-style-type: none"> ▪ Project manager and team 	None	Quarterly
Mid-term Review	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ UNDP RCU ▪ Evaluation team 	Indicative cost: \$20,000	At the mid-point of project implementation.
Final Evaluation	<ul style="list-style-type: none"> ▪ Project manager and team, ▪ UNDP CO ▪ UNDP RCU ▪ Evaluation team 	Indicative cost : \$30,000	At least three months before the end of project implementation
Lessons Learned	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ Local consultant 	None	Yearly
Project Terminal Report	<ul style="list-style-type: none"> ▪ Project manager and team ▪ UNDP CO ▪ Local consultant 	None	At least three months before the end of the project
Audit	<ul style="list-style-type: none"> ▪ UNDP CO ▪ Project manager and team 	Cost per year approx. \$4.000 (total \$ 20.000)	Yearly
Visits to field sites	<ul style="list-style-type: none"> ▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives 	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL		US\$105,000	

PART V. LEGAL CONTEXT

227. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Brazil and the United Nations Development Programme, signed on December 29, 1964. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

228. The UNDP Resident Representative in Brazil is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- (a) Revision of, or addition to, any of the annexes to the Project Document;
- (b) Revisions which do not involve significant changes in the outcomes, outputs or activities of the Project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- (c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- (d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

Cost Recovery Policy

229. As per Determination and Decision of the UNDP's Executive Board on the *Policy on Cost Recovery from Regular and Other Resources*, UNDP shall recover costs for the provision of project related general management services (GMS) and direct project services (DPS). In GEF funded projects, GMS costs are

incurred by UNDP in undertaking its Project Cycle Management Services as a GEF IA and are not included in the project budget as they are covered by GEF fees and provided to the UNDP Country Office through UNDP internal distribution. DPS costs are those incurred by UNDP for the provision of services requested by a host Government and that are execution driven and can be traced in full to the delivery of project inputs. They relate to operational and administrative support activities carried out by UNDP offices on behalf of the Direct Execution Modality (DEX) or Country Office support to National Execution Modality (NEX) and include the provision of the following estimated services:

- Payments, disbursements and other financial transactions.
- Recruitment of staff, project personnel, and consultants.
- Procurement of services and equipment, including disposal.
- Organization of training activities, conferences, and workshops, including fellowships.
- Travel authorization, visa requests, ticketing, and travel arrangements.
- Shipment, custom clearance, vehicle registration, and accreditation.

230. These execution-related costs are separate and distinct from the GMS costs. In accordance with UNDP policy on cost recovery (2010) and the BOM and UNDP GEF guidance on Direct Project Costs (2012) the costs incurred by UNDP for the provision of direct project services needs to be recovered on the basis of estimated actual costs expected to be incurred or on a per-transaction basis using the Universal price list or Local Price List costing template and should be charged directly to project budgets. The estimated costs are included in the project budget and are funded within the total project management Costs (PMC) allocation provided by GEF to the implementation Parties and cannot exceed the total PMC allocation. Once incurred after each of the above services is provided by UNDP, costs shall be charged against budget code line 74599.

SECTION II. STRATEGIC RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: Capacities for integrating sustainable development and productive inclusion for poverty reduction.
Country Programme Outcome Indicators: Capacities for integrating sustainable development and productive inclusion for poverty reduction
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): Environmental considerations are mainstreamed in sector and local-level strategies and plans.
Applicable GEF Strategic Objective and Program: LD 1: Maintain or improve flow of agro-ecosystem services sustaining the livelihoods of local communities; LD 3: Reduce pressures on natural resources from competing land uses in the wider landscape
Applicable GEF Expected Outcomes: Outcome 1.2: Improved rangelands/livestock management; Outcome 1.3: Sustained flow of services in agro-ecosystems Outcome 3.1: Cross-sectoral enabling environment for integrated landscape management (in support of SLM); Outcome 3.2: Integrated landscape management adopted by local communities; Outcome 3.3: Increased investments in integrated landscape management
Applicable GEF Output Indicators: 1.2 Types of innovative SL/WM introduced at the field level; 1.3 Suitable SL/WM interventions to increase vegetative cover in agro-ecosystems; 3.1 Integrated land management plans developed and implemented; 3.2 INRM tools and methodologies developed and tested 3.3 Appropriate actions to diversify financial resource base; 3.4 Information on INRM technologies and good practices disseminated

	Indicator	Baseline	Targets End of Project	Sources of Verification	Risks
Project Objective Strengthening SLM governance frameworks to combat land degradation processes in Sergipe ASD in NE Brazil	<ol style="list-style-type: none"> Area (ha) of rural properties in which recommended SLM practices are implemented in Sergipe. Average tree density in forest patches < 50 ha. Loss of vegetation coverage in SE-ASD (48 municipalities). 	<ol style="list-style-type: none"> No recommended SLM practices disseminated to date. < 800 tree/ha. Projected rate of deforestation without the project 0.29% per year. 	<ol style="list-style-type: none"> 70,000 ha on 2,000 rural properties, including replication areas. >1,500 tree/ha Rate of deforestation reduced to 0.14% per year. 	<ol style="list-style-type: none"> Project reports, LD monitoring and evaluation system, data from ADEMA and ATER services. Data from ATER services. INPE remote sensing deforestation rates; data from Rural Environmental Registry (CAR). 	<p>New federal and state administration taking office in 2015 less supportive of strengthening SLM governance frameworks.</p> <p>Data disaggregated by municipality unavailable on yearly basis</p>

	Indicator	Baseline	Targets End of Project	Sources of Verification	Risks
	4. Production of small-scale farms for the four field sites.	4. Projected rate of productivity 0.7 t/ha of main subsistence crops (manioc, beans, corn).	4. 30% increase of productivity of crops by end of project.	4. Annual IBGE production data by municipality (PAM, PPM, PEVS) and/or data from ATER services.	
	5. Increase in the general score of LD Tracking Tool.	5. General score of LD Tracking Tool: 1	5. General score of LD Tracking Tool: 3	5. GEF LD Tracking Tool	
Outcome 1: Strengthened governance framework contributes to avoiding, reducing and reverting land degradation in Sergipe ASD.	1. Improved norms and directives on SLM at State level. 2. Level of capacity of staff at SEMARH, key municipalities in SE-ASD and IBAMA, where appropriate, related to: SLM and LD issues; licensing of agriculture/livestock and forest management activities; and land use oversight/enforcement. 3. Number of state licenses taking into account SLM criteria and practices for Alto Sertão Sergipano (SAS) 4. % of compliance with rural licensing processes in 2 SAS	1. LD norms and technical directives are not in place at state level. 2. 01 State level Action Plan to Combat Desertification (PAE) and no municipal Action Plans (MAP) at the SE-ASDs. 3. Number of staff who are knowledgeable on SLM practices is nearly null. 4. Existing licenses do not take due account of SLM criteria in SAS.	1. LD norms and technical directives developed and submitted to NCCD. 2. Revised PAE and 07 MAPs at the SE-ASDs prepared, approved with operational plans and budget for implementation. 3. Nuclei of SLM and LD issues established and trained in SEMARH, with participation of key municipalities in SE-ASD, IBAMA and ADEMA. 4. 10% increase in licenses with SLM criteria per year, post year 3.	1. NCCD resolutions, project reports 2. MAPs presented to State Permanent Working Group to Combat Desertification (GPCD) and NCCD. Sergipe PPA. 3. Training program certificates and Administrative Rule with Nuclei Creation. 4. ADEMA and/or IBAMA and/or GPCD and/or NCCD records on	Turnover of staff within SEMARH, key municipalities and IBAMA reduces impact of project capacity-building actions. Political disputes undermine development of MAPs for INRM Political resistance and bureaucratic delays and unforeseen legal issues

	Indicator	Baseline	Targets End of Project	Sources of Verification	Risks
	municipalities.	Baseline for compliance will be determined when final deliberation on CAR is made.	By end year 2: revised licensing criteria for multiple uses designed and proposed to ADEMA, GPCD and NCCD. By end year 4: revised licensing criteria for forest use designed and proposed to IBAMA, ADEMA, GPCD and NCCD.	licensing.	
<p>Output 1.1: Sergipe state-level policy and planning framework supports integrated SLM in its ASD</p> <p>Output 1.2: State land-use licensing processes stimulate appropriate measures to reduce LD</p> <p>Output 1.3: Monitoring land use optimized for SLM implementation in ASD</p> <p>Output 1.4: Knowledge management and national-level governance framework strengthened to increase adoption of SLM in Sergipe and facilitate replication in NE</p>					
<p>Outcome 2: Uptake of SLM/SFM practices increased in Alto Sertão of Sergipe (SAS), with replication in rest of SEASD</p>	<ol style="list-style-type: none"> Number of farming households implementing sustainable subsistence and commercial agricultural practices, improved grazing systems and integrated SLM practices in SAS Reduced land degradation over 8,000 ha in 04 field sites. 	<ol style="list-style-type: none"> Fewer than 50 farms with recommended SLM practices adopted in SAS. Legal requirements for LRs and APPs not enforced. Nearly 50% of the land area in 04 field sites is under accentuated and/or severe land degradation (soil loss by water erosion = 10 t/ha; and loss of soil carbon = 3 t/ha) 	<ol style="list-style-type: none"> At least 2,000 farming households in SAS adopt sustainable agricultural practices, improved grazing systems and integrated SLM practices by end of project. By the end of year 3: 500 families in 4 field sites with SLM strategies developed & implemented. By end of project 25% of land degradation in these 04 field sites (2,000 ha) reduced (soil loss by water erosion < 5 t/ha; and loss of soil carbon < 2 t/ha* ; **) 	<ol style="list-style-type: none"> Project reports, LD monitoring and evaluation system, data from rural extension institutions Soil loss and carbon stock data in 04 field sites. Project Surveys. 	<p>Drought or severe climatic conditions impede uptake of some SLM practices.</p> <p>Staff turnover reduces delivery of SLM guidance to producers; difficulty obtaining data on rest of SEASD</p> <p>Banking rules and regulations or alleged lack of technical</p>

	Indicator	Baseline	Targets End of Project	Sources of Verification	Risks
	3. Percentage of agricultural extensionists active in SAS delivering targeted support that includes recommended SLM directives	3. Practically none (0%)	3. 100% of extensionists active in SAS deliver targeted support that includes recommended SLM directives, with replication in SEASD	3. Reports of training workshops of extensionists, rural extension agency plans.	parameters Ministerial reorganization in new federal administration affects resources or priorities for allocation
	4. Investments in SLM practices in Sergipe	4. Financing through commercial banks without SLM criteria. -US\$18Million in financing through PRONAF to SAS in 2012 (nearly 12 thousand contracts) with limited SLM criteria. -US\$995k through environmental funds to Sergipe (0.2% of total investment).	4. 20 % increase in investment in SLM practices in Sergipe. By year 2: SLM technical guidelines to support decision making by credit agents.	4. Bank credit lines and other funds descriptions and project reports	
<p>Output 2.1: SLM best practices implemented in SAS provide guidance for licensing so as to revert LD processes</p> <p>Output 2.2: State extension services incorporate SLM guidelines for ASDs and provide targeted support to SAS</p> <p>Output 2.3: State-level and national access to diverse funds improved for uptake of SLM in ASDs</p>					

SECTION III. TOTAL BUDGET AND WORKPLAN

Award ID:	00083642	Project ID(s): 00092018
Award Title:	BRA/14/G32-Sustainable Land Use Management in the Semiarid Region of Northeast Brazil (Sergipe)	
Business Unit:	BRA10	
Project Title:	Sustainable Land Use Management in the Semiarid Region of Northeast Brazil (Sergipe)	
PIMS no.:	3066	
Implementing Partner (Executing Agency)	UNDP/MMA	

Donor	Resp. Party	Fund	Source of funds	ERP/ATLAS Budget		AMOUNT YEAR 1	AMOUNT YEAR 2	AMOUNT YEAR 3	AMOUNT YEAR 4	AMOUNT YEAR 5	TOTAL	Note
				Account Code	Budget Description	US\$	US\$	US\$	US\$	US\$	US\$	
OUTCOME 1: Strengthened governance framework contributes to avoiding, reducing and reverting land degradation in Sergipe ASD.	UNDP/ MMA	62000	GEF	71200	Intl Consultants-Sht Term-Tech	0	0	20,000	0	30,000	50,000	1
				71400	Contractual Services - Individual	80,000	80,000	80,000	80,000	80,000	400,000	2
				71600	Travel Expenses	25,000	27,000	27,000	26,000	25,000	130,000	3
				72100	Contractual Services-Companies	50,000	65,000	70,000	65,000	48,000	298,000	4
				72200	Equipment and Furniture	8,000	0	0	0	0	8,000	5
				72300	Materials & Goods	14,600	14,600	14,600	14,600	14,600	73,000	6
				74200	Communic & Audio Visual Costs	20,000	20,000	20,000	20,000	20,000	100,000	7
				74500	Miscellaneous Expenses	10,000	15,000	15,000	15,000	15,000	70,000	8
				75700	Training Workshops and Conferences	10,000	200,000	201,628	75,000	19,000	505,628	9
Subtotal GEF						217,600	421,600	448,228	295,600	251,600	1,634,628	
OUTCOME 2: Uptake of SLM/SFM practices increased in Alto Sertão of Sergipe (SAS), with replication in rest of SEASD	UNDP/ MMA	62000	GEF	71300	Local Consultants	0	50,000	20,000	10,000	0	80,000	10
				71400	Contractual Services - Individ	40,000	40,000	40,000	40,000	40,000	200,000	11
				71600	Travel Expenses	30,000	30,000	30,000	30,000	30,000	150,000	12
				72100	Contractual Services-Companies	60,000	120,000	100,000	90,000	60,000	430,000	13
				72200	Equipment and Furniture	20,000	18,889	10,000	0	0	48,889	14
				72300	Materials & Goods	75,000	150,000	150,000	140,000	50,000	565,000	15
				74200	Communic & Audio Visual Costs	10,000	20,000	30,000	30,000	30,000	120,000	16
				74500	Miscellaneous Expenses	10,000	15,000	15,000	15,000	15,000	70,000	17
				75700	Training Workshops and Conferences	50,000	90,000	90,000	90,000	15,000	335,000	18
Subtotal GEF						295,000	533,889	485,000	445,000	240,000	1,998,889	
Project Management	UNDP/ MMA	62000	GEF	71400	Contractual Services - Individ	21,236	21,236	21,236	21,236	21,237	106,181	19
				71600	Travel Expenses	3,500	5,000	5,000	5,000	3,500	22,000	20
				72200	Equipment and Furniture	3,000					3,000	21

Donor	Resp. Party	Fund	Source of funds	ERP/ATLAS Budget		AMOUNT YEAR 1	AMOUNT YEAR 2	AMOUNT YEAR 3	AMOUNT YEAR 4	AMOUNT YEAR 5	TOTAL	Note
				Account Code	Budget Description	US\$	US\$	US\$	US\$	US\$	US\$	
				74599	UNDP Cost Recovery Charges	9,356	12,131	11,928	10,285	6,794	50,494	22
				Subtotal GEF		37,092	38,367	38,164	36,521	31,531	181,675	
TOTAL GEF GEF						549,692	993,856	971,392	777,121	523,131	3,815,192	
Federal Government (MMA, IBAMA, INCRA, INSA)						1,164,292	2,058,281	1,964,000	1,664,928	1,063,470	7,914,971	
Sergipe State Government (SEMARH, ADEMA, SEDETEC, EMDAGRO)						671,963	1,187,922	1,133,509	960,901	613,774	4,568,068	
NGO (Agendha, F. Araripe, CFAC)						312,695	552,795	527,474	447,152	285,618	2,125,734	
Private Sector (BANESE, BNB, CEPIS)						356,606	630,422	601,545	509,943	325,726	2,424,242	
UNDP						60,000	60,000	60,000	60,000	60,000	300,000	
TOTAL CO-FINANCING						2,549,686	4,507,436	4,300,970	3,646,030	2,328,896	17,333,016	
GRAND TOTAL						3,115,248	5,483,277	5,257,920	4,420,045	2,871,718	21,148,208	

Summary Budget: GEF and CoFin Resources per Year

Project Components	Year 1		Year 2		Year 3		Year 4		Year 5		Total	
	GEF	CoFin	GEF	CoFin	GEF	CoFin	GEF	CoFin	GEF	CoFin	GEF	CoFin
OUTCOME 1: Strengthened governance framework	217,600	617,984	421,600	1,197,344	448,228	1,272,968	295,600	844,930	251,600	714,544	1,634,628	4,647,770
OUTCOME 2: Uptake of SLM/SFM practices	295,000	1,742,150	533,889	3,120,540	485,000	2,838,450	445,000	2,611,547	240,000	1,424,800	1,998,889	11,737,486
Project Management	37,092	189,552	38,367	189,552	38,164	189,552	36,521	189,552	31,531	189,552	181,675	947,760
Total Project Costs	549,692	2,549,686	993,856	4,507,436	971,392	4,300,970	777,121	3,646,029	523,131	2,328,896	3,815,192	17,333,016

Budget Notes for Total Project Budget

Budget Notes	
Outcome 1:	
1	International Consultants: (US\$ 50,000) Experts in SLM for the independent mid-term review and for the final project evaluation to identify lessons and recommendations (short-term consultants).
2	Contractual Services- Individuals: (US\$ 400,000) Technical expertise to provide oversight and management of the Outcome 1 outputs ensuring technical quality and integration of State planning and policy with SLM practices, in coordination with the Project National Technical Coordinator (this is expected to be delivered by a person hired to also provide project management functions for approximately 40% the time for managerial tasks ensuring project is executed in an efficient manner- see PMU). One Monitoring specialist to monitor M&E indicators of project implementation so that environmental, sociocultural and productive aspects are integrated in the implementation of SLM by relevant stakeholders. Specific consultants to deliver the following products: (i) Implementation of the LADA evaluation in the Field Sites and ASDs in Sergipe; (ii) Technical support to preparation of 07 Municipal Action Plans (PAM); (iii) Technical support to CAR implementation in the 07 municipalities; (iv) Technical support to strengthening the state planning instruments; and (v) Design of the communication and advocacy strategy for the project.
3	Travel: (US\$ 130,000): The long distances and the far location of the field sites in which the SLM activities will be implemented require resources to co-finance the technical team in the field, for monitoring and advisory visits of project personnel and consultants from the field, as well as occasional trips of the field personnel to Brasilia or to other ASDs for planning meetings and forums.
4	Contractual Services (Companies): (US\$ 298,000) Consolidated working groups will be hired to provide the following products: (i) develop the SLM guides and protocols to be applied in the ASDs; (ii) Provide training to field sites technicians and national technicians (ATER) on the application of the guides/protocols and on the use of the LADA methodology to evaluate land degradation; (iii) Surveys of stakeholders related to livelihoods and SLM implementation as well as soil conservation indicators per field sites. Project audits are also included here.
5	Equipment and Furniture: (US\$ 8,000) Information technology equipment for project technical management and monitoring activities (laptops, printer, and software).
6	Materials and goods: (US\$ 73,000) Procurement of materials and/or tools (goods) needed for efficient operations of the Project, including that used in technical consultations and by support personnel, including tools for the monitoring systems.
7	Communication & Audio Visual Costs: (US\$ 100,000) The funds will be used to editing and design of SLM guides/ protocols for the ASDs, including their distribution, as well as for implementing a communication and advocacy strategy under this outcome. Rental of audio visual equipment for capacity building activities and events and for communication costs between the different levels of project implementation (federal, state, municipal, field sites) for the duration of the project. It also includes the costs related to printing materials for capacity building activities under this outcome. Expenses associated with the translation of project documents, including annual reports; mid-term review and final evaluation are also included.
8	Miscellaneous expenses: (US\$ 70,000) Funds for expenses associated with unforeseen circumstances that may arise including in relation to planning framework support, as well as to cover currency fluctuations, insurance, and banking costs needed to enable effective project implementation.
9	Training ~ Workshops: (US\$ 505,628) This entails: (i) Training programs for technicians, small farmers and agency staff on the application of the LADA/WOCAT methodology at the local level to monitor land use in ASDs; (ii) workshops to validate the SLM guides and protocols with the key stakeholders involved, facilitating meetings of the multiple stakeholders to support the coordination work and establishment of agreements ; (iii) Meetings and workshops for interaction and integration of different public policies and NCCD support, public consultations during the preparation of PAMs, licensing processes, and CAR and SAP implementation.
Outcome 2	
10	Local consultants: (US\$ 80,000) Specific consultants to deliver the following products: (i) Guidelines to improve financing of SLM practices on existing credit lines/policies; (ii) Re-structuring financing mechanisms for SLM at public administration at all levels; and (iii) Guidelines on licensing processes with SLM/SFM in SAS.
11	Contractual Services- Individuals: (US\$ 200,000) Specific consultant to provide technical support to SLM/SFM practices in field sites, collection of best practices for specific land degradation types and their incorporation in State programs, local regulations, extension services and research organizations in each field site.
12	Travel: (US\$150,000) The long distances and the far location of the field sites in which the SLM activities will be implemented require resources to co-finance the technical team in the field, for monitoring and advisory visits of project personnel and consultants from the field, as well as occasional trips of the field personnel to

	Brasilia or to other ASDs for planning meetings and forums.
13	Contractual services (Companies): (US\$ 430,000) Consolidated working groups will be hired to provide the following products: (i) Technical services for implementation of SLM practices and their replication (such as the establishment of pastures, the construction of fences, the installation of irrigation systems, and maintenance of water conveyance systems for irrigation, among other practices) in field sites; and (ii) Awareness raising program on the benefits of SLM practices and the results obtained from their adoption.
14	Equipment and Furniture: (US\$ 48,889) This includes computer equipment for project technical activities at field sites (laptops, printers, GPS and software), including equipment (cameras, projector, screens) that facilitate the monitoring and evaluation of the state of LD and the implementation of SLM at field sites.
15	Materials and goods: (US\$ 565,000) Procurement of materials and/or tools (goods) for the field capacity building activities and SLM/SFM practices in field sites (ATER) and participatory monitoring and surveillance, including that to be used for the consultation processes.
16	Communication & Audio Visual Costs: (US\$ 120,000) Includes the development, printing and distribution of publications on SLM and SFM experiences in the field sites and the design and broadcasting of communication pieces. Also includes the design and elaboration of materials associated with the communication and advocacy strategy (digital and audiovisual graphics) for this outcome. Rental of audio visual equipment for capacity building activities under this outcome.
17	Miscellaneous expenses: (US\$ 70,000) Funds for expenses associated with unforeseen circumstances that may arise including in relation to planning framework support, as well as to cover currency fluctuations, insurance, and banking costs needed to enable field activities.
18	Training ~ Workshops: (US\$ 335,000) This entails: (i) Training to small farmers, extension workers and technicians on credit funds, microcredit, revolving funds and other financial incentives that are available to support the implementation of SLM activities; (ii) The promotion of information exchange and knowledge management on the best SLM practices demonstrated in field sites; and (iii) Training and sharing of experiences from and among producers and other stakeholders (i.e. organizations, associations, rural communities) on the implementation of SLM practices, for transfer of knowledge and replication.
Project Management	
19	Contractual Services- Individuals: (US\$106,181) Project Manager responsible for the managerial and planning requirements of the project, including those related to project management and funding. (this is expected to be provided a person hired to also provide of technical expertise for overseeing Outcome 1). Project management functions would correspond to approximately 40% of the managers time) Administrative assistance support for project implementation on accounting and administrative issues related to the PMU and to activities carried out in the project (part time).
20	Travel: (US\$ 22,000). Corresponds to the travel made by the PMU to the project's field sites to facilitate agreements and to coordinate with stakeholders and/or trips for stakeholders to participate in national meetings.
21	Equipment and Furniture: (US\$3,000) This will include the acquisition of computer equipment (laptops, printer, and software) for the PMU.
22	Miscellaneous: (US\$50,494) Funds for expenses associated with unforeseen circumstances that may arise including in relation to planning framework support, as well as to cover currency fluctuations, insurance, and banking costs needed to enable effective project management. It includes the DPC costs based on transaction costs that are agreed between the Government of Brazil and UNDP for project execution services, above and beyond those covered by the implementing agency fee.

Budget per Output

GEF Result/ Atlas Activity	GEF US\$	CoFinancing	
		US\$	DONOR
Outcome 1	1,634,628	271,370	ADEMA
		54,274	CEPIS
		10,152	F. ARARIPE
		1,673,451	IBAMA
		117,639	INCRA
		452,284	INSA
		898,552	MMA
		546,120	MMA/DCD
		623,928	SEMARH
Total Outcome 1	1,634,628	4,647,770	
OUTPUT 1.1	248,000	706,146	
OUTPUT 1.2	595,000	1,163,852	
OUTPUT 1.3	360,000	1,287,779	
OUTPUT 1.4	431,628	1,489,993	
Outcome 2	1,998,889	90,457	AGENDHA
		452,284	BANESE
		1,809,136	BNB
		108,548	CEPIS
		1,944,821	CFAC
		904,569	EMDAGRO
		80,304	F. ARARIPE
		1,917,639	INCRA
		226,142	INSA
		998,914	MMA
		584,590	MMA/DCD
		1,356,852	SEDETEC
		1,063,230	SEMARH
		200,000	UNDP
Total Outcome 2	1,998,889	11,737,486	
OUTPUT 2.1	728,889	1,447,669	
OUTPUT 2.2	620,000	6,459,012	
OUTPUT 2.3	650,000	3,830,805	
Project Management	181,675	499,640	MMA
		348,120	SEMARH
		100,000	UNDP
Total PM	181,675	947,760	
Total	3,815,192	17,333,016	

SECTION IV. ADDITIONAL INFORMATION

PART I. Other Agreements (Co-funding letters)

PART II. Terms of Reference for Key Project Staff (Project Management Unit)

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V.1. Sources of Credit and Funding

V.2. SLM Best Practices in the ASDs, Benefits, Field Sites, Activities, Costs and Replication

V.3. GEF Land Degradation Tracking Tool (separate file)

V.4. UNDP Environmental and Social Screening Tool

V.5. Risk Log Matrix

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V.7. References

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PART II. TERMS OF REFERENCE FOR KEY PROJECT STAFF (PROJECT MANAGEMENT UNIT)

- i. Project Manager
- ii. Project Administrative/Financial Assistant

i. Project Manager

1. The Project Manager will act as the head of the PMU and will be responsible for overall project implementation and supervision of the PMU staff. The Project Manager will work under the supervision of UNDP, and will coordinate with other concerned stakeholders to ensure adequate project implementation.

2. The Project manager shall run the Project on a day-to-day basis on and his/her prime responsibility shall be to ensure that the project produces the result specified in the project document, to the required standards of quality and within the specified constraints of time and cost. The PM will be a person with significant experience related to the scope of the project in addition to strong management skills. S(he) will provide overall managerial direction and leadership for the project, working closely with Institutions represented in the PB, the Technical Committee and key stakeholders. In addition on a part time the incumbent will be chief technical advisor providing technical oversight and direction to key outcomes particularly Outcome 1 outputs ensuring technical quality and integration of State planning and policy with SLM practices. The technical functions are expected to occupy some 60% of the incumbent's time. Managerial functions are expected to occupy approximately 40%

3. This post will be funded by the GEF.

4. Main duties and responsibilities corresponding to managerial functions are listed below. Technical duties will be detailed with the National Technical Director and Coordinators once appointed.

- To provide overall project coordination and M&E for the achievement of the Project outcomes and objectives, based on RBM.
- To manage day-to-day implementation of the project, coordinating project activities in accordance with the rules and procedures of UNDP and based on the general guidance provided by the PB;
- To establish the PMU's internal working procedures and coordination mechanisms with UNDP, Project Board, the Technical Committee and other key stakeholders.
- To ensure adequate inter-institutional coordination and stakeholder participation mechanisms during project implementation.
- To prepare the annual workplans and budgets and submit them for approval of the PB.
- To supervise the activities of the PMU staff, including analysis and approval of workplans and activity reports.
- Ensure adequate compliance of project implementation with UNDP-GEF procedures.
- Supervise drafting of TORs for project activities, analyze and approve technical reports.
- Carry out visits to the project stakeholders as part of the overall supervision of project implementation and prepare visit reports.
- To work closely with the UNDP offices in the region in organizing and providing technical and logistic support and coordination to all missions and assignments by international and national consultants; and,
- To prepare overall reporting.

5. Profile: At least 8 years of experience in project management and implementation, as well as significant direct experience related to the scope of the project; experience in environmental governance and capacity

building issues is highly desirable; leadership as well as strong management and interpersonal skills; computer skills; high flexibility and capacity to work under pressure.

ii. Project Administrative/Finance Assistant

6. The administrative/finance assistant will be stationed in the PMU and will provide support to the PM in management and administration of the project. This post will be funded by the GEF. The administrative/financial assistant (AFA) will be stationed in the PMU and will be responsible for project administrative and financial management. In addition on a part time basis the incumbent will provide logical support to delivery of technical components of the project. The AFA will work under the supervision of the Project Manager and will coordinate with UNDP and Lead National Institution to ensure adequate project management.

7. Main duties and responsibilities:

- Ensure adequate administrative and financial management in accordance with UNDP procedures.
- Hold regular meetings with the Project Coordinator regarding management issues and maintain regular contact with the Component Managers and Executing Agency on administrative and financial issues.
- Draft correspondence related to administrative and financial issues.
- Provide assistance in preparing annual workplans and budgets.
- Monthly accounts and financial reports, and bookkeeping.
- Prepare disbursement requests and keep track of project disbursements.
- Procurement of goods and services, including preparation of bidding documents, specifications and contracts.
- Management of administrative, accounting and financial files
- Provide support to project audits and external evaluations.

8. Profile: At least 5 years of experience in accounting and financial matters; experience in project administrative and financial management; acquaintance with UNDP procedures is highly desirable; computer skills; initiative and responsibility; teamwork ability, high flexibility and capacity to work under pressure.

PART III. STAKEHOLDER ANALYSIS AND PARTICIPATION

1. Throughout the preparation of the project, dialogue was carried out with stakeholders that are active at the federal, state and local levels in areas relevant to the project and that work with SLM and the four pillars of the PAN-Brazil. This process identified the key stakeholders essential for proper development of the project. They were mobilized through the National Commission to Combat Desertification (NCCD) in partnership with the Government of the State of Sergipe, through its environmental secretariat (SEMARH). The mandates and responsibilities of each stakeholder and their interest in the project were mapped, as well as potential problems and means of mitigation. Many formal and informal consultations were held with various stakeholder groups, with interviews and field visits in the seven municipalities of the SAS and at the headquarters of the State Government in Aracaju together with the representatives of the Federal Government involved in combating desertification and promoting development in areas relevant to the project.

2. These preparatory consultations involved, in addition to government agencies, many stakeholders in civil society, the seven municipalities, organizations engaged in technical assistance and rural extension, sustainable rural development, combating desertification, SLM in semiarid and dry sub-humid areas, rural cooperative associations, farmer settlers, educational, research and development institutions, public prosecutors and federal and state public banking institutions operating in the project area and other ASDs in Brazil.

3. The consultations throughout the preparatory phase made clear the strong interest in the project on the part of these stakeholders. Commitments were made explicit in the final workshop to validate the logical framework and the outputs of the project held in the state capital. This interest, which was also apparent among local populations in the field sites in pre-selected areas, indicates high potential for full participation and absorption of innovations, which are essential for project implementation. Approaches and specific activities were defined and schedules and contributions of stakeholders were negotiated for the implementation of such approaches and activities. The consultations were participatory dialogues that helped lead to the negotiation of the forms of collaboration between the project team and the stakeholders. They also resulted in substantial inputs involved in identifying and discussing new and pre-existing concerns of the stakeholders in relation to training, extension, ownership of processes and support in certain areas. The continuity of these participatory forums was incorporated into the project, being foreseen throughout its implementation.

4. For this process, an Executive Committee was established for preparation of the project involving the Ministry of Environment (MMA), through the Department to Combat Desertification (DCD) of the Secretariat of Extractivism and Sustainable Rural Development (SEDR), the Government of the State of Sergipe, through the Department of Environment and Water Resources of SEMARH, and UNDP, through its country office. Thus, it was possible to establish the logical construction of the project, incorporate the inputs received from various stakeholders and identify baselines and synergies for cooperation for the duration of the planned implementation of the project, as well as associated co-financing.

5. The state agency responsible for the licensing process (ADEMA) expressed interest in participating in the activities of the project as a key participant. The commitment was formalized via the State Government. The Project was also discussed with the managers of a protected area adjacent to one of the field sites, the Grotta do Angico Natural Monument, who stressed the importance of sustainable rural development and conservation strategies in buffer zones. The field sites were pre-selected based on different scenarios for multiple uses, environmental degradation and sector pressure, diversity of stakeholders and challenges of management and licensing. Thus, it is expected that the pilot interventions will contribute to the implementation of the project through the participation of local communities and other decision makers in the process of monitoring, implementation and management. Additional partnerships will be pursued and formalized during the first year of project implementation

6. Once the project has been started, a Steering Committee (SC) will be established. The SC will include representatives of the MMA, SFB, NCCD, GPCD, SEMARH, ADEMA and stakeholders from each of the field sites of the project, such as municipal environmental agencies, ATER companies, universities, local communities, NGOs and the private sector. It will meet to evaluate the implementation of the project. Although the overall coordination of all project activities is the responsibility of the Project Management Unit (PMU), communication channels will be established between the PMU and various stakeholders, such as IBAMA, ICMBio, universities and other educational and research institutions, NGOs and community-based organizations involved in implementation of activities. Therefore, throughout the project, there will be full participation of the main stakeholders. Partnerships with implementing agencies will be established using the appropriate types of contracts and agreements, depending on their nature. This decentralized mechanism for the implementation of the project was selected to ensure that it enables stakeholders to be empowered and participate in the process as the basis of future multiplication. Where the stakeholders possess proven expertise, this strategy will allow broader participation in the implementation of the project and its technical collaboration, thereby increasing the cost-efficiency of the design strategy.

7. In general, the essential points of this Involvement Plan include: links among different stakeholders to promote integrated policies for SLM, participatory management and monitoring by the local government, civil society organizations and extension agents; developing partnerships with the private sector for financial sustainability and the promotion of new financial arrangements that encourage the adoption of SLM Plans. The following information describes the participation of different stakeholders in relation to project Outcomes and Outputs.

Outcome 1. Structure strengthened to prevent, reduce and reverse land degradation in the state of Sergipe governance.

Output 1.1. The state policy and planning framework of Sergipe support SLM integrated into Sergipe ASD

8. Structuring and consolidating a state policy that supports the SLM depend on the architecture of a governance system which strongly involves the state stakeholders, as these are the key actors in formulating and implementing such policies. Thus, at the local level, each of the seven municipal governments SAS respond directly by building their Municipal Action Programs to Combat Desertification through the structure of the respective Municipal Environment Systems (being created with support from MP/SE) and the Territorial Board, with the support and partnership of GPCD, SEMARH, NCCD and DCD/SEDR/MMA. At the state level, the activities related to Output 1.1 (including the incorporation of these policies in the pluri-annual budget plan) include on involvement of SEMARH as the coordinator of GPCD , SEAGRI (Project Dom Távora) and EMDAGRO. Therefore, by providing technical studies and best practices on SLM, the project will create an enabling environment for SLM practices adoption in the state and nationwide. The co-sponsors of this output will be SEMARH, EMDAGRO, and MMA.

Output 1.2. State licensing of land use processes incorporate adequate protection for LD hotspots.

9. This will be accomplished through institutional strengthening and ADEMA, SEMARH state and municipal initiatives relevant to livestock and agriculture; for forest management activities; and alternative use.

10. Output 1.2 will contribute to the formulation of the proposed strengthening the licensing process in the state instruments and technical-scientific studies, mapping and analysis of bottlenecks in the process and training to overcome these bottlenecks relating to the theme activities besides re-structuring and refinement of all stages of the licensing process itself. Thus, the actions regarding this strengthening will be performed by the MMA, and ADEMA SEMARH with technical and scientific support of the MMA, SFB, IBAMA,

INCRA, State Prosecutor, EMDAGRO, and Institutions of Research and Development as UFS, Sergipe Federal Institute, INSA, UNILAB, EMBRAPA Semi-Arid and EMBRAPA Coastal Tablelands (research and development capabilities). Projects and actions in progress in the area of intervention should delimit the actions of refinement of the licensing process, as well as activities related to PRA, regionally, should incorporate the usage guidelines specific soil in areas susceptible to desertification through methodological guides and studies promoted by this Output.

Output 1.3. Monitoring the use of land perfect for implementing SLM in LD hotspots.

11. The implementation of the Early Warning System Drought and Desertification at the state/local level and the development of a plan to control the fires will be key inputs for the construction of a system of monitoring and evaluation of integrated LD for ASD in the state. These instruments should be developed/implemented in partnership between MMA, SEMARH, ADEMA and IBAMA. Once defined this integrated system should recital at the local level and the methodology selected from the LADA methodology/FAO defined as feasible scenario for the Sergipe indicators, as well as data and indicators set out in the diagnosis of the state forest and national forest inventory (in progress) that reflect the local reality. The training program on monitoring processes of land use and incorporation into state and municipal plans will be the responsibility of the MMA, SEMARH, EMDAGRO ADEMA and provided with support and partnership of Education and Research Institutions involved in the project (INSA, IF UP, UFS, UNILAB and EMBRAPA), thus structuring a Core Research for ASD Sergipe, linked to GPCD.

Output 1.4. National governance structure supports and extends the adoption of SLM in Sergipe & facilitates replication in NE.

12. This Output aims to equip, strengthen and delimit the Brazilian action focusing on supporting and expanding the adoption of SLM as a strategy to combat desertification, in an action that must be grounded in extensive liaison with institutions holding public office in relation to policies (federal, state and local) related to SLM. The responsibility for carrying this Output is the MMA as Executive Secretariat of NCCD, forum where national governance structure should be discussed and absorbed by governmental and non-governmental stakeholders of the three spheres. The NCCD will also have the responsibility to lead the technical support for the processes of construction of resolutions related to the SLM via the National Council for the Environment, CONAMA, the main instrument for implementing the National Environmental Policy (NEP), and the implementation of these policies by IBAMA and OEMAs. GPCD is the responsibility of maintaining the flow of information and encouraging the construction of the national structure, subsidizing and supporting MMA and NCCD for better ownership by members of NCCD the Outcomes obtained with the Project in the State of Sergipe. Among the key institutional partners at the federal level we have the National Water Agency, the Ministry of Social Development and Fight Against Hunger (MDS), the Ministry of National Integration (MI), the Ministry of Agrarian Development (MDA), the Ministry of Agriculture, Livestock and Supply (MAPA) and the Ministry of Mines and Energy (MME), all with permanent seats in NCCD.

Outcome 2. Adoption of SLM practices increased in Areas Susceptible to Desertification (ASD) priority of Sergipe.

Output 2.1. SLM best practices implemented in Alto Sertão (7 municipalities) serve as guides to the licensing process and control processes LD.

13. The Output is composed of a series of actions that involve since the implementation of demonstration units of 4 SLM based on best practices identified during the preparatory and partnerships in the project, to exchange knowledge, guidelines for processes licensing in the state, processes to be incorporated by means of knowledge sharing and absorption of these experiments at the state and regional level, as mentioned in the Output 1.2., 1.4., and 2.2. this Project. Interventions will be performed by the MMA, in partnership with

SEMARH, ADEMA, and support of projects and programs under development in the state (e.g. Dom Helder Project, Dom Távora Project, Producers of Water), companies operating in the region ATER (CFAC and EMDAGRO), educational institutions and research (UFS, UNILAB, EMBRAPA, IF Sergipe, State Agricultural School), and civil society organizations active in the region and/or expertise in the subject (e.g. ASA, IABS, SASAC). Once implemented the Field sites will be integrated into the State Plan for Environmental Recovery EMDAGRO and CFAC, and contribute to a program of outreach program and dissemination of technologies in the medium and long run, allowing the replicability of these actions, both for extension and for farmers elaboration of didactic-pedagogic material. Another important Outcome is that the studies will be developed in parallel, in monitoring of interventions that will enable an analysis of socioeconomic and environmental sensitivity of sustainable production practices linked to SLM (including ability to pay, aggregated environmental benefits, ability to preserve ecosystem functions to identify potential environmental services, the management effects on ecology and conservation of landscapes, mapping demands for public and private investments).

Output 2.2. Extension services incorporate state policies SLM for areas at risk of desertification and provide targeted support to the Hinterland Alto.

14. The technical assistance and rural extension (ATER) should be seen as one of the key initiatives of the Project. Changing paradigms of action and incorporate practices that promote SLM require a specific strategy that addresses the challenges are the integration between the various bodies and institutions, incorporating new concepts of natural resource use, and new patterns of social organizations and forms transmission of knowledge. The establishment of an integrated interagency technical assistance in the region will be a priority to respond to these challenges. For this Output, the responsibility for implementing the MMA and SEMARH, the key stakeholders involved are ATER companies operating in the region in case the EMDAGRO and CFAC, and educational institutions and extension (IF Sergipe, Agricultural Schools), in addition to the collective of contextual education associated with civil society (RESAB) organizations within the NCCD and GPCD. Parallel areas of local intervention design will be incorporated in this process as specific practices for conducting field work environments, providing a reference for activities ATER, credit scale in ASD and development of local productive arrangements, involving projects that promote SLM and production processes based on natural resources (harvesting, agro-ecology), as is the case of notices of MDA, MDS and actions of the FIDA Project Dom Távora and APLs developed by SEDETEC.

Output 2.3. Access in State and National level in various funds and credit lines improved to increase adoption of SLM in Sergipe and the ASD.

15. The structuring mechanisms of credit and development are fundamental to sustainable action in the structuring and implementation of good SLM practices aiming at coexistence with semiaridity in ASD. Thus, this Output will promote the design of inter-institutional cooperation arrangements aiming to equip the municipalities of financial services and structured to meet the demand for SLM, from the combined use of public, private, bodies ATER agents, training in innovative practices SLM, environmental licensing, official development banks, social movements, farmers, unions. The main stakeholders in this context are banks (BNB, CEF, BB, and BANESE BNDES) and environment-related funds (Fund on Climate Change, State Water Resources Fund (FUNERH), Resources Defense Fund Environment of Sergipe (FUNDEMA). The project will work in the promotion of proposed budget and tax incentives for combating desertification processes, aimed at creating legislation to Ecological ICMS and processes of Payment for Environmental Services in the latter case using the expertise developed by ANA in Producers of Water program. parallel design this Output will stimulate the training of staff in bank credit analysis projects that involve good SLM practices aimed at combating desertification /degradation the training process had extended to civil society and leaders small farmers to formulate project proposals, and public officials to strengthen the capacities of project review.

Table 1. Institutional Capacity/Stakeholders Engagement Plan

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
Ministry of Environment (MMA)			
<p>Responsible for promotion of environmentally sustainable policies at the federal level</p> <p>Department to Combat Desertification (DCD)</p> <p>Linked projects: Desertification Project BRA/IICA/14/001 GEF-FAO project</p>	<p>Formulation, development and integration of environmentally sustainable federal policies on combating desertification, mitigating the effects of drought and sustainable rural development in semi-arid and dry sub-humid areas and surroundings (UNCCD scope)</p> <p>Technical Focal Point of UNCCD in Brazil</p> <p>Responsible for coordination of PAN-Brazil and the Ten-Year Strategy and for their implementation</p> <p>Executive Secretary of NCCD</p>	<p>Chair of the Executive Committee</p> <p>Coordination of the Project Technical Committee in partnership with SEMARH</p> <p>Project Coordination</p>	<p>Potential problems</p> <ul style="list-style-type: none"> • Formulation and implementation of public policies require coordination among various institutions at the federal, state and municipal levels in order to implement the project, without which it is not possible to ensure coordination/leveraging of actions taken in the field and their incorporation in public policy • National legislation does not provide clear definition of the roles and mandates of federal, state and municipal institutions, which leads to weak coordination and law enforcement <p>Mitigation strategy</p> <ul style="list-style-type: none"> • Establishment of a Steering Committee and a National Project Coordination Team • Establishment of a Project Technical Committee coordinated by DCD and SEMARH • Participatory management and consultation with forums, on which the decisions of the steering committee will be based, in order to reach consensus on institutional mandates that govern licensing procedures, training of extension services and other project activities • Representative of NCCD as a member of the Executive Committee, in order to guide and coordinate the actions of its 44 members and enhance replication of the project outcomes • Capacity-building for local institutions in the municipalities and the state
<p>Secretariat of Biodiversity and Forests (SBF), Department of Biodiversity Conservation (DCBio)</p>	<p>Design of environmental policies for conservation and sustainable use of ecosystems and biodiversity and forests in the project area</p>	<p>Support the preparation of technical information related to SLM, including technical field studies, sensitivity analysis, teaching-learning materials and landscape ecology,</p>	<p>Potential problems</p> <ul style="list-style-type: none"> • Lack of agreement on criteria for the conservation and sustainable use of resources in areas with high potential for ecotourism or for zoning and land use planning <p>Mitigation strategy</p> <ul style="list-style-type: none"> • Dissemination of knowledge, methodologies and processes regarding combating desertification in the context of conservation and sustainable

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
Caatinga Center Cerrado Center		among others	rural development <ul style="list-style-type: none"> Establishing internal communication channels (study commissions under the NCCD) that enable the exchange of information and experiences among biomes, to serve as a basis for management decisions
Brazilian Forest Service (SFB)	Sustainable use of forests	Encourage and support the adoption of SLM as a strategy to combat desertification in ASD Provide technical support for the implementation of the National Forest Inventory in Sergipe Support training for best practices in SLM	<p>Potential problems</p> <ul style="list-style-type: none"> National legislation does not clearly define the roles and mandates of federal, state and municipal institutions, which leads to weak coordination and law enforcement Lack of consensus on best practices and implementation strategies for SLM Lack of consensus on guidelines for sustainable rural development linked to environmental conservation Lack of knowledge about SLM and challenges of combating desertification in ASD <p>Mitigation Strategy</p> <ul style="list-style-type: none"> Participation in the Project Technical Committee Participation in the NCCD (Study Commission on SLM) Capacity-building and training
National Commission to Combat Desertification (NCCD)	Consultative and deliberative collegiate body Decide on the implementation of the national policy to combat desertification and mitigate the effects of drought, in conjunction with other sectoral policies, programs, projects and government activities to combat desertification and mitigate the effects of drought, promoting national policy and planning at national, regional, state and municipal levels Guide, monitor and evaluate the implementation of	Member of the Project Advisory Committee Articulator for promoting the adoption of SLM in ASD in the country, increasing the scale range of the project outcomes Consultative forum/deliberative space for creating consensus on the subject, empowering social stakeholders involved, including minority groups Design of new	<p>Potential problems</p> <ul style="list-style-type: none"> No involvement of NCCD stakeholders in processes involving ownership of project Outcomes, compromising the medium and long-term impact of the project Lack of participation in procedures for strengthening the national framework to support the implementation of SLM Lack of support for articulation of stakeholders at the national level for creation of consensus regarding decision-making on the subject Disagreements among CONAMA, SFB and IBAMA Lack of participation to the design of SLM methodological guides and regulations Norms and resolutions not incorporated in decision-making of the groups of stakeholders involved in combating desertification <p>Mitigation strategy</p> <ul style="list-style-type: none"> Member of the NCCD participates in the Project Advisory Committee, being responsible for the flow of information and consultations on the

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>commitments made by Brazil to UNCCD</p> <p>Establish strategies for government actions to combat desertification and mitigate the effects of drought, with a view to sustainable development in ASD, promoting agreements nationally, as well as monitoring international cooperation for combating desertification.</p>	<p>guidelines, methodological guides and related regulations regarding licensing procedures and adoption of SLM (in partnership with DCD, CONAMA, SFB and IBAMA)</p>	<p>theme of the project within the NCCD</p> <ul style="list-style-type: none"> • NCCD establishing, under its Technical Board of Science, Technology and Traditional Knowledge, a committee to study SLM and its processes, in its role of promoting debates, studies and analyses that support the NCCD in identifying, supporting and promoting technologies and activities necessary for the development of innovative actions to combat desertification and promote sustainable use of natural resources • Strengthening of councils and commissions
National Environment Council (CONAMA)	<p>Collegiate consultative and deliberative body for implementation of the National Environmental Policy (PNMA), establishing norms and criteria for the licensing of polluting or potentially polluting activities, to be granted by the various levels of government (federal, state, municipal).</p> <p>Decide at the final administrative level on fines and other penalties imposed by IBAMA</p> <p>Determine, through representation of IBAMA, the loss or restriction of tax relief granted by the Government, in general or conditional character, and the loss or suspension of participation in credit lines in official credit</p>	<p>Support for the creation of methodological guidelines on combating desertification</p> <p>Formulation of resolutions, regulations and/or recommendations on best SLM practices, licensing procedures and changes in land use related to rural development on an environmentally sustainable basis</p> <p>Support the development of related studies about SLM and PES in partnership with NCCD</p>	<p>Potential problems</p> <ul style="list-style-type: none"> • Lack of involvement in the establishment of methodological guides on the subject of SLM in combating desertification • Lack of appropriation of project outcomes in the design of resolutions and regulations related to SLM • Lack of support for the development of studies on SLM and PES in partnership with NCCD <p>Mitigation strategy</p> <ul style="list-style-type: none"> • Involvement of CONAMA representatives in project consultative/informative forums, ensuring knowledge about and ownership of project activities • Formal invitation from NCCD to indicate a participant in the study committee to be formed within the technical panel on science, technology and traditional knowledge • Articulation via DCD, NCCD and IBAMA for CONAMA involvement in the processes of creation of methodological guides, related to SLM and PES studies and subsequent construction of resolutions and standards (to be published via NCCD and/or CONAMA) • Strengthening of councils and commissions

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>establishments</p> <p>Establish standards, criteria and standards relating to the control and maintenance of the quality of the environment, with a view to the rational use of environmental resources, especially water, as well as establishing the technical criteria for the declaration of areas that critical, saturated or being overrun</p> <p>Establish systematic monitoring, evaluation and enforcement of environmental standards</p> <p>Encourage the creation, structuring and institutional strengthening of state and municipal environment councils for management of environmental resources and watershed committees</p> <p>Regularly evaluate the implementation and enforcement of environmental policy and standards, establishing systems of indicators</p> <p>Develop, approve and monitor the implementation of the National Agenda for the Environment, to be proposed to the agencies and organizations involved in</p>		

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	SISNAMA, in the form of recommendations		
Environmental Funds			
National Climate Change Fund (FNMC)	Instrument of National Policy on Climate Change Finance projects, studies and projects for climate change mitigation and adaptation Negotiate concession of grant funds from BNDES via the FNMC Council Operate non-reimbursable funds (via Climate Fund Management/DLAA/SMCQ/MMA)	Support the implementation of the project interventions Encourage the adoption of SLM in Brazil's ASD Support the development of studies and projects related to the theme of combating desertification as a tool for adaptation and mitigation of the effects of climate change Support the development of strategies that promote increased resilience of populations to climate change, encouraging empowerment and social inclusion of minority groups and the maintenance of the youth in the countryside	<p>Potential problems</p> <ul style="list-style-type: none"> • Low levels of implementation of environmental funds in the territories in the project area • Lines for grant funds do not reflect the environmental challenge of combating desertification and mitigating the effects of drought in Brazil's ASD • Lines of credit (loans), where applicable, are not appropriate for the profile of the target groups of the project in ASD • Farmers do not become aware of funding opportunities for grants and credit refundable and non-refundable via environmental funds, do not know how to get access to them and do not realize the advantages of obtaining financial resources for SLM practices • Banks operators of recoverable resources, when appropriate, prefer to make loans on traditional credit lines, with less bureaucracy and effort, since bank staff do not have the necessary expertise to evaluate SLM proposals <p>Mitigation strategies</p> <ul style="list-style-type: none"> • Liaise with banks that provide credit through the management committees of the respective funds to find, when appropriate, alternative ways of increasing and decentralizing credit and funding for SLM activities in the SAS and other ASD through transfers of tranches for regional/state banks operating in the interior • Better dissemination of opportunities for loans and grants • Technical-scientific studies on the needs and feasibility of financing accompanied by a sensitivity analysis for the adoption of SLM, supporting the decision-making of the management committees about the channeling of resources for ASD
National Environment Fund (FNMA)	Instrument of National Environment Policy Support projects in different modalities, aimed at the rational and sustainable use of natural resources, in	Support the implementation of the project interventions Encourage the adoption of SLM in the ASD of the country as a strategy	<ul style="list-style-type: none"> • Linking NCCD with management committees to promote uptake of project outcomes • Capacity building for bank staff (see item on banks in this table)

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>accordance with the priorities of the National Environment Policy, including the maintenance, improvement and recovery of environmental quality</p>	<p>for recovery of environmental quality of degraded areas and sustainable management of landscapes Support the development of studies about sensitivity analysis for the development of APLs, Supply Chains, PES and other instruments that promote sustainable use of environmental resources and sustainable rural development in ASD</p>	
Brazilian Institute of Environment and Renewable Natural Resources (IBAMA)			
<p>Linked action Federal Technical Register</p>	<p>Authority responsible for implementing the National Environmental Policy (NEP) Exercise the power of environmental police Perform actions of national environmental policies, relating to federal responsibilities relating to environmental licensing, environmental quality control, authorization for use of natural resources and environmental inspection, monitoring and control, subject to the guidelines issued by the MMA Perform the complementary actions of federal responsibility, according to</p>	<p>Support the development of methodological guidelines, regulations and/or resolutions with NCCD, CONAMA and ADEMA Assist in monitoring and supervision of project activities Support and monitor the implementation of the CAR and the PRA in the area of project intervention Provide technical inputs relating to supervision and monitoring to promote the adoption of</p>	<p>Potential problems</p> <ul style="list-style-type: none"> • Lack of agreement between IBAMA and resource users on the level of use that is sustainable and appropriate measures of conservation, monitoring and enforcement • Lack of agreement on the methodology and implementation of SLM among stakeholders (government institutions, universities and local users) • Role of the agency does not reflect its potential and the importance of its involvement in project implementation • Lack of support for and participation in the redesign/refinement of procedures for the licensing of SLM <p>Mitigation strategy</p> <ul style="list-style-type: none"> • Establishment of participatory forums for technical issues and administrative measures • Regular meetings and technical assistance for the design of project activities during the implementation phase of field activities to guide the design of procedures for licensing, monitoring and enforcement of SLM

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	existing environmental regulations	<p>SLM in ASD Support the training process and capacity building in SLM in the state and other ASD</p> <p>Support the implementation of field operations in the SAS Support and provide inputs for the refinement of procedures for licensing in order to encourage adoption of best SLM practices as technological alternatives for sustainable use of natural resources</p>	<ul style="list-style-type: none"> • NCCD formal invitation to participate in the new study commission • Strengthening the role of the body in relation to desertification by training analysts and technical staff in Sergipe on the issue of SLM
Government of the State of Sergipe			
<p>State Secretariat for Environment and Water Resources (SEMARH)</p> <p>Linked projects: Waters of Sergipe Climate Fund</p>	<p>Formulation and management of state government policies relating to the environment, water resources and environmental education</p> <p>Conservation, preservation and restoration of ecological processes</p> <p>Preservation, conservation and sustainable use of ecosystems, biodiversity and forests</p> <p>Ecological-Economic Zoning (EEZ)</p> <p>Promotion of rational use and integrated management of sustainable multiple use of</p>	<p>Support the implementation of the project actions</p> <p>Coordination of the Project Technical Committee in partnership with DCD/MMA</p> <p>Support the coordination among stakeholders at the State level</p> <p>Promote statewide uptake and replication of project outcomes</p> <p>Support the adoption of SLM as a strategy to</p>	<p>Potential problems</p> <ul style="list-style-type: none"> • Support for the activities of the project does not reach the level of participation and contribution required because of low technical and institutional capacity for the theme • Lack of support for articulation with state entities • Conflicts over definition and uses of SLM adoption as strategies to combat desertification <p>Mitigation strategy</p> <ul style="list-style-type: none"> • Strengthening through training and consolidation of permanent crew of the organ <p>Forums and meetings for consensus, agreements and coordination</p> <p>Establishment of continuous communication channels among the main stakeholders of the Project Technical Committee</p>

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>water resources Revitalization of watersheds Formulation and management policies for the integration of environment, production and consumption Proposition of strategies, mechanisms and economic and social instruments to improve environmental quality and the sustainable use of natural resources Management of Sergipe's socio-environmental funds (FUNERH and FUNDEMA)</p>	<p>combat desertification and promote sustainable rural development in the State Absorb the project outcomes in decision-making on environment</p>	
<p>State Environment Agency (ADEMA)</p>	<p>State Authority linked to SEMARH Responsible for environmental licensing activity potentially causing environmental impacts and potentially polluting Responsible for the implementation of CAR and related activities in Sergipe</p>	<p>Participate and assist in the design of procedures for licensing of SLM (alternative use and forestry management) Support the implementation of field activities Member of the Project Technical Committee Provide guidance for, optimize and strengthen procedures for licensing and monitoring Incorporate the project outcomes in the processes of licensing, monitoring and oversight of projects applying SLM</p>	<p>Potential problems</p> <ul style="list-style-type: none"> • Unclear information on guidelines for approval coupled with the difficulty of obtaining licenses may cause pressure and conflicts on the part of producers in the use of land for their survival and their families • Cumbersome licensing procedures, low effectiveness and marginalization of activity for lack of knowledge hampering adoption of SLM in the state • Lack of technical capacity to review proposals for more complex licensing involving integrated SLM • Increased demand and complexity of the proposals makes the licensing process more time consuming • More restrictive rules prevent the practice of integrated SLM with sustainability, including economic sustainability <p>Mitigation strategies</p> <p>Strengthening the body responsible for issuing environmental licenses and continuous training strategy Empower procedurally human resources of the municipal agencies of the SAS to take on responsibilities and decentralize environmental management Models of territorial governance with coordination among the various federal,</p>

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
			state and municipal government policies and programs to support the efficacy of the process, a network of stakeholders in the SAS region, overcoming political differences and power relations Methodological guidelines supporting the analysis of management plans, facilitating decision-making and improving the process of licensing, monitoring and oversight of SLM activities
State Secretariat of Economic Development and Science and Technology (SEDETEC)	Fostering sustainable economic development of all regions of the state, in a participatory form integrated with government policy, promoting increased competitiveness of the productive sector through access to technology and innovation	Encourage the development of sustainable local production arrangements (APLS) in the ASD incorporating SLM guidelines resulting from the project Support scientific-technical development related to project actions	Potential problems Lack of consensus on guidelines for sustainable rural development to be absorbed in planning and economic, scientific and technological development strategy in the ASD Support for project actions jeopardized by the lack of knowledge about SLM Mitigation strategy Strengthening actions of the institution through capacity building of its permanent staff regarding SLM principles Forums and meetings for alignment and consensus among stakeholders
State Secretariat of Agriculture and Rural Development (SEAGRI) Linked projects: Dom Távora	Responsibility for definition and management of state-level agricultural policy Induce rural development Define the policies of incentives for agriculture, livestock, aquaculture and fisheries Encourage the use of renewable natural resources Provide technical assistance and rural extension services Conduct research and plant and animal experimentation Initiatives to promote water supply and sanitation in rural communities Efforts to promote the	Support the development of project activities Absorb the project outcomes in decisions on incentive policies for rural development Support the training of stakeholders, including producers and extension agents Absorb and promote best practices in SLM related to the proper use of irrigation	Potential problems Lack of consensus on guidelines for sustainable rural development to be absorbed in Sergipe's agricultural strategies and policies Training processes do not include best SLM practices Support for project actions jeopardized by the lack of knowledge about SLM Mitigation strategies Strengthening the actions of the institution through capacity building of its permanent assets in the framework guidelines SLM Forums and meetings for alignment and consensus among stakeholders Staff responsible for training participate in the actions and activities of the project in order to absorb and diffuse SLM content

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>realization of works to make water supply permanent in watercourses, ponds, dams, cisterns and wells</p> <p>Develop procedures for irrigation and drainage</p> <p>Support the process of Agrarian Reform, in conjunction with the Federal Government</p>		
<p>Standing Interagency Task Force to Combat Desertification (GPCD)</p>	<p>Coordinate and implement actions to combat the causes and effects of desertification in the state as foreseen in the PAE/SE</p> <p>Contribute to incentives for proposal, development and implementation of projects to provide financial and technical support to increase the capacity for coexistence with drought in a sustainable manner</p> <p>Encourage municipalities of ASD to create their municipal plans</p>	<p>Promote networking among state stakeholders</p> <p>Forum for consensus building and strengthening of SLM adoption in Sergipe</p> <p>Support for the formulation of 7 municipal plans to combat desertification in SAS</p> <p>Promote the flow of information and lessons learned in the project to the NCCD</p>	<p>Potential problems</p> <p>Lack of participation and involvement of members of GPCD in project activities</p> <p>Disjointed and non-participatory support for the formulation of municipal plans</p> <p>Mitigation strategies</p> <p>Developing capacity of GPCD members with training on SLM</p> <p>Communication strategy and GPCD meetings planned and ongoing</p>
<p>Municipal Environmental Agencies (in 7 SAS municipalities)</p>	<p>Environmental management at the local level</p> <p>Encouraging the adoption of practices that promote sustainable economic, social and environmental development</p> <p>Track, monitor and verify activities with potential for</p>	<p>Facilitate and support the implementation of project activities</p> <p>Develop local action plans to combat desertification</p> <p>Consolidate/strengthen their Environmental Systems (councils,</p>	<p>Potential problems</p> <p>Lack of institutional structure to absorb lessons learned and project outcomes</p> <p>Weak institutional structure for training (no permanent staff)</p> <p>Lack of consensus and integration about guidelines for sustainable development related to combating desertification in the SAS</p> <p>Financial arrangements and funding strategy for implementation of environmental actions are not sufficient to the challenges of implementing municipal plans</p>

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	pollution and environmental impact	legislation and environmental funds) Encourage the participation of members of the GPCD as a state-level consultative forum on desertification Support the development of technical capacity on desertification and LD	Mitigation strategies Training and capacity building Development of local programs that take into consideration the specificities of the territory Participation in consultative forums (e.g. GPCD) and the Project Technical Committee, for ownership and empowerment on the subject and a better basis for decision-making State supports the institutionalization of the theme (hiring of technical staff)
Agrarian Reform Institutions			
National Institute of Colonization and Agrarian Reform (INCRA)	Implement the National Policy on Land Reform and carry out national land use planning, contributing to sustainable rural development	Absorption of actions undertaken in the project in the planning of new settlement projects Support for project activities in agrarian reform settlements Support for coordination with the technical assistance and rural extension services	Potential problems Individualistic work culture of farmers makes collective action difficult Lack of information and assistance to settlers on sustainable land use Difficulties in enabling access to public policies to eradicate poverty in new settlements Mitigation Strategy: Meetings for raising of awareness and building forms of relationships based on solidary economy Training of agents and analysts about sustainable rural development based on integrated SLM Partnerships to work seamlessly with other project stakeholders via GPCD and NCCD
Sergipe Sustainable Development Agency (PRONESE)	Implement programs and activities for promotion of sustainable territorial development with inclusion via income and rights Manage and implement credit for agrarian reform in the state		
National Water Agency (ANA)			
National Water Agency (ANA)	Responsible for the implementation of federal policies for the management of water resources Participates in the National	Promotion of guidance to state agencies on water resources about use of instruments of water resource	Potential problems Lack of agreement about management of water resources in ASD Lack of agreement about the benefits of SLM for watersheds in ASD

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	System for Water Resource Management, in coordination with the MMA and the National Water Council, at the federal level, and with state agencies of environment and water resources and local watershed councils and agencies	management Support for project activities Integrate SLM strategies for sustainable use in river basin management, so that the environmental gains from the implementation of SLM are assessed from the perspective of environmental programs such as the Water Producer program	Mitigation strategies Meetings of alignment and implementation of SLM in ASD Formal invitation to be part of the study committee under the NCCD Training and technical assistance
Banking Institutions			
National Savings Bank (CEF)	Promote citizenship and sustainable development as a financial institution, agent of public policies and strategic partner of the Brazilian state Main agent of public policy of the federal government Strong capillarity in its operations Now engaged in the promotion of rural credit	Support the development of a financial arrangements to increase the supply of resources for adoption of SLM in ASD in the state Support capacity-building of bank staff for dissemination in rural communities, the advantages and allocation of mitigation and adaptation of sustainable land use programs Qualify the channels of supply of agricultural products, and the funding arrangements to meet the current needs for stimulating adoption	Potential problems Lack of clarity about opportunities and requirements of numerous lines of credit, jeopardizing the ability to choose the most favorable lines to stimulate the adoption of SLM Insufficient guidance and monitoring of the producers Increased rates of default, increasing the risk Delay in the review and release of funds due to the lack of documentation of producers and the difficulty of obtaining the environmental licenses Lack of stimulation of bank staff for the promotion of programs/products benefiting sustainable rural development and SLM Lack of knowledge about the benefits of adopting SLM for better economic sustainability of rural properties Insufficient coordination with ATER agencies responsible for drafting proposals limits access to government incentive programs operated by banks, such as PRONAF Mitigation strategies Establish credit lines targeted to family farms, so as to increase in the specific provision of credit that encourages the adoption of SLM Communication material about the main lines of credit focused on agro-industry, family farming and SLM projects in accessible language
Bank of Brazil (BB)	Be a competitive and profitable bank, promoting sustainable development in Brazil and fulfilling its public function with efficiency Agencies in all states of Brazil, in the municipalities of the state of Sergipe and 7 municipalities in the SAS region		

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	Bank of mixed economy, with shares traded on the stock exchange	of SLM Prepare bank staff to evaluate proposals for SLM for rural credit programs	Capacity building/training for bank credit agents Facilitate the process of making credit with the development of methodological guidelines for SLM, as well as lists of necessary documents, reducing the transaction cost to access the funding Devise new ways of channeling refundable and non-refundable government resources for environmental projects with better rates of interest, promotion in rural communities and dissemination of information about benefits to producers
Bank of Northeast Brazil (BNB)	Promotion of sustainable development, as a competitive and profitable public bank Effectiveness in promoting sustainable development Implement a selective and agile development policy that can contribute in a decisive way to overcome the challenges and establish a standard of living compatible with the region's resources, capabilities and opportunities Bank with the most representative/capillarity in the Brazilian Northeast	Stimulate the capillarity of the credit system in all municipalities to operate SLM programs Support capacity-building of agency staff on the fundamental concepts and analysis of projects focused on SLM practices Support the training of technicians and ATER agencies in designing projects involving SLM	Provide training for bank credit agents Leverage partnerships through forums and meetings Promote environmental sustainability in the operation of Poverty Reduction Programs Refine strategy of monitoring borrowers credit Create instruments to collect data to evaluate socioeconomic and environmental impacts of credit to producers
Bank of the State of Sergipe (BANESE)	Financial agent to promote socioeconomic development of Sergipe 61 branches in the state, 200 correspondent agents in all municipalities in the state of Sergipe and SAS Partnership with SEMARH for funding of conversion of brick and tile factories and bakeries for use of gas instead of firewood	Supporting the dissemination and communication of project actions	
National Economic and Social Development Bank (BNDES)	The main instrument for implementing the investment policy of the Federal Government, with the primary objective of supporting	Primary and secondary operator of the Climate Fund Primary source of funds passed on to banks	Potential problems Low application directly on the resources of the Climate Fund and also in lending to financial institutions qualified as operators Lack of agencies and lack of capillarity to meet demand in the interior Operates with large projects, excluding access possibilities for family farmers

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>programs, projects, works and services that contribute to economic and social development</p> <p>Encourage free enterprise, including public sector support for projects that are in the national interest</p> <p>Main instrument of long-term financing for investments in all sectors of the economy, including social, regional and environmental dimensions</p>	<p>operating subprograms</p> <p>Provide a specific credit line to Combat Desertification, among the credit lines focused on Environment</p>	<p>and settlers</p> <p>Interest rates of the program to Combat Desertification are not attractive to the lending banks</p> <p>Mitigation strategies</p> <p>Negotiations among MMA, BNDES and official banks for decentralization of resources and transfers to banks with greater capillarity and agility, automatically, in tranches, so as to encourage the dissemination and adoption of SLM as a strategy to combat desertification</p> <p>Negotiations regarding interest rates charged</p>
Technical Assistance and Rural Extension			
<p>Agricultural Development Company of Sergipe (EMDAGRO)</p>	<p>Contributes to strengthening family farming and agribusiness expansion of the State of Sergipe, through Technical Assistance and Rural Extension, Research, Agricultural Security and agrarian reform</p> <p>Responsible for ATER in the state, serving 40,000 farmers in preparation of proposals and monitoring of projects</p>	<p>Diagnosis of training needs and credit for rural farmers</p> <p>Support and facilitate dialogue with the grassroots stakeholders (settlers and other rural communities)</p> <p>Develop a new strategy for monitoring of ATER projects</p> <p>Support for the actions of training and qualification of ATER services</p> <p>Collaborate in the project actions and activities, in particular at field sites</p> <p>Promote synergy among ATER actions in the</p>	<p>Potential problems</p> <p>Lack of technical and institutional capacity to meet all the demand for ATER in the state</p> <p>Conflict of roles between EMDAGRO and the CFAC in the provision of ATER services</p> <p>Lack of agreement on training content</p> <p>Lack of consensus on the strategy to introduce the theme of SLM and combating desertification in the activities and proposals of projects receiving ATER services</p> <p>Mitigation Strategies</p> <p>Discussion of the content of the institutional relations among those involved so as to avoid overlapping of roles and omissions</p> <p>Participatory forums and meetings for discussion and consensus building regarding project activities</p> <p>Training of technical staff</p> <p>ATER represented on the project technical committee</p>
<p>Dom José Brandão de Castro Agricultural Training Center (CFAC)</p>	<p>Responsible for ATER in INCRA agrarian reform settlements by (through MDA call for proposals)</p> <p>Work in more than 210 settlements in the state (about 10,000 settlers), with 12 regional teams (technical assistance, project design,</p>		

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	monitoring and training) -Work with the tripod: Cooperatives, Agribusiness and Agro-ecology	state Support the adoption of the SLM strategy to promote sustainable rural development and combat desertification	
Civil Society Organizations			
Semiarid Network (ASA) Linked programs: Training and Social Mobilization for Coexistence with the Semi-Arid, including One Million Cisterns (P1MC) and One Land Two Waters (P1 +2) programs	Network comprised of one thousand civil society organizations working on management and development of policies for coexistence with the semiarid region First network of NGOs represented in the UNCCD focal point of civil society Strengthening civil society for building participatory processes for sustainable development and coexistence with the semiarid based on cultural values and social justice The entities members of ASA are organized in forums and networks in 9 states in the Brazilian semiarid region (AL, BA, CE, PE, PB, PI, SE, RN and MG)	Support the implementation of the project at field sites Support coordination among key social stakeholders for project implementation Support and promote the training of its members in the theme of the Project Disseminate good practices and lessons learned generated by the project, promoting the adoption of SLM by network members Present new alternatives for sustainable coexistence with the semiarid region	Potential problems Conflict among institutional roles in the provision of ATER services Inappropriate legal framework Difficulty to introduce SLM and combating desertification in ATER activities and programs Mitigation Strategy: Discussion of the content of the institutional relations among those involved so as to avoid overlapping of roles and omissions Training of technical staff Forums and meetings to discuss and create calls to action for ATER to promote SLM practices
Research, education, development and extension institutions			
Federal University of Sergipe (UFS)	Generate, organize and disseminate knowledge, contributing to the training of citizens and sustainable human development Provide a university that is	Support the development of studies on SLM and Combating Desertification in ASD and in particular in Sergipe	Potential problems Institutions do not consider themselves to be key stakeholders in the project implementation process Lack of consensus on how to translate scientific findings into extension projects Numerous methods of disseminating knowledge that do not consider

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	public, free, high-quality and socially committed for teaching, research and extension	Support the creation of methodological guidelines for SLM Promote the flow of technical and scientific information and traditional knowledge	appropriate forms of communication to target groups of the project Procedures for extension within weak institutions Institutions ignore the main challenges of combating desertification and the benefits of adopting SLM for sustainable rural development
Federal Institute of Sergipe (IFS)	Public institution that offers free professional education, through and initial and ongoing courses and training programs for workers (FIC), career technical middle-level education and professional technological education at the undergraduate and graduate levels, in connection with research projects and extension	Participate in project forums Support training activities of social stakeholders in the project Promote the uptake of project outcomes and best practices by academic community in its research, education and extension	Mitigation strategies Encouragement of extension activities Promotion of innovation Capacity-building and on-the-job training of educators Curriculum and methods of teaching, research and extension appropriate for the reality of combating desertification and good practices for adaptation and mitigation, focused on the project's target groups
Agricultural Family School (EFA)	Facilitate the means and training tools, suitable for the growth of the students, who are the main protagonists of promotion of integral development (vocational, intellectual, human, social, economic, ecological, spiritual) and the whole process of training Association responsible for ensuring philosophical and managerial autonomy with effective presence of families Promote sustainable local development through training of young people, their families and other stakeholders, with	Seek socio-environmental inclusion of project stakeholders through extension activities of the institutions Support coordination with the ATER agencies in Sergipe, improving education and training on the subjects of the project	

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	the primary focus on strengthening family agriculture and professional employment and entrepreneurship of young people in rural areas		
International University of African-Brazilian Lusophone Integration (UNILAB)	Provide higher education, conducting research in various areas of knowledge Promote regional development and cultural, scientific and educational exchange Promote university extension, with the specific institutional mission of training human resources to contribute to the integration between Brazil and the other member states of the Community of Portuguese Speaking Countries (CPLP), particularly in Africa		
Brazilian Agricultural Research Corporation (EMBRAPA) Decentralized Units (Coastal Tablelands, Semiarid - CPATSA)	Corporation under the Ministry of Agriculture, Livestock and Food Supply (MAPA) Develop, together with other members of the National Agricultural Research System (SNPA), a genuinely Brazilian model of tropical agriculture and livestock Facilitate solutions to research, development and innovation for sustainable agriculture for the benefit of Brazilian society		

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
National Semi-Arid Institute (INSA)	<p>Research Center under the Ministry of Science, Technology and Innovation (MCTI)</p> <p>Its role is to coordinate, undertake, promote and disseminate Science, Technology and Innovation as universal heritage for the good of society, and particularly Brazil's semiarid region</p> <p>Scientific Correspondent of Brazil to the United Nations Convention to Combat Desertification (UNCCD)</p> <p>Focal Point in South America in the Arab-South American Summit (ASPA) of the Cooperation Framework in the technical, scientific and technological areas</p>	<p>Coordinate among stakeholders involved in development, research, education and extension, through the Desertification Network</p> <p>Promoting forums and meetings on the subject of SLM as a strategy for combating desertification</p> <p>Be part of the team of Project Technical Committee</p> <p>Collaborate in capacity development and training of stakeholders</p>	<p>Potential problems</p> <p>Desertification Network disjointed</p> <p>National legislation does not clearly define the roles and mandates of federal, state and municipal institutions, which leads to a lack of coordination and enforcement</p> <p>Weak dialogue with other instances of project participants and stakeholders</p> <p>Mitigation strategies</p> <p>Strengthening of participatory institutional forums as communication and knowledge exchange channels</p> <p>Participatory management for clarification of institutional mandates that govern licensing procedures, training for extension services and other project activities</p> <p>Coordination among stakeholders, empowered by NCCD and its role as scientific correspondent of the UNCCD, supporting training activities for stakeholders and project target groups</p>
Public prosecutors			
Public Prosecutors of the State of Sergipe (MP-SE)	<p>Public prosecution, as foreseen in law</p> <p>Ensure effective respect of public authorities and important public services for the rights guaranteed in the Constitution, taking the necessary measures to guarantee them</p> <p>Promote investigations and civil action for the protection of the public and social property, the environment and other diffuse and collective</p>	<p>Support project activities</p> <p>Strengthen the implementation of Environmental Systems in 7 SAS municipalities</p> <p>Support the organization of forums for exchanging knowledge, in particular on the experiences of SLM, PES and community empowerment</p> <p>Support for training and capacity development</p>	<p>Potential problems</p> <p>Level of knowledge about the benefits of adopting SLM for sustainable rural development, combating desertification and environmental conservation strategy</p> <p>Mitigation strategies</p> <p>Training and participation in technical and scientific forums</p>

Key Stakeholder	Responsibilities/Institutional Mandate	Role/Interest in Project	Potential Problems and Mitigation
	<p>interests</p> <p>Promote lawsuits of unconstitutionality or representation for the purpose of intervention of the Union and the States in the cases specified in the Constitution</p> <p>Defend in court the rights and interests of indigenous peoples</p> <p>Issue notices in administrative procedures within its competence, requiring information and documentation</p> <p>Perform other functions conferred upon it, provided they are compatible with its purpose, it being forbidden to provide legal representation and legal advice to public authorities</p>	<p>activities and preparation of methodological guides</p>	

PART IV. OTHER ANNEXES

ANNEX V.1 SOURCES OF CREDIT AND FUNDING

1. During the PPG phase a study was commissioned to identify the main stakeholders, their mandates and responsibilities in the project, potential problems and forms of mitigation regarding supply and access to financial resources of various kinds for rural producers in the Alto Sertão of Sergipe. The report listed the various credit lines that are in theory available. The sources of information were various departments at the Ministry of Environment in Brasília and federal and state agencies and institutions in Sergipe, including SEMARH, FUNERH, FUNDEMA, Waters of Sergipe Program, Bank of Brazil, SEDETEC, EMDAGRO, BNB, MST, CFAC, INCRA, BANESE and FIDA.
2. In Sergipe, there are 100.606 rural establishments; 95% of them are properties less than 100ha, featuring Family Agriculture/Family Farmers. This is the credit borrower profile of Sergipe ASD. In general, 64% of the family farmers have annual gross family income up to R\$ 10,000.00 (~US\$ 4,800.00) (IBGE, 2006), fitting in B line of PRONAF credit.
3. Generally, Family Farmers have low technical level in sustainable procedures in Brazil. Performance and viability of rural sustainable development with innovation depend on a number of factors and agents needed to form a balanced scenario through the agro-industrial chain, demanding a systemic approach. Moreover, the rural exodus of youth should be mentioned as a challenge to guarantee the innovation and continuity of development processes.
4. The main source of credit for small farmers in Brazil is the National Program to Strengthen Family Farming (PRONAF), created in 1996. The program is coordinated by the Ministry of Agrarian Development (MDA) and executed by the Bank of Brazil (BB), the Bank of the Northeast (BNB), the Amazon Bank (BASA) and the Federal Savings Bank (CEF). The interest rates are the lowest in Brazil, ranging from 0.5% for PRONAF Women to a maximum of 4.0%.
5. There is also support from PRONAF for non-agricultural rural activities such as rural tourism, handicrafts, agroecology and forestry. Loans from the Constitutional Fund for Financing of the Northeast (FNE) for low-income groups (A, A/C and B) of PRONAF Youth, PRONAF Semiarid and PRONAF Forest only require personal and/or collective group guarantees, without collateral
6. In 2012, Sergipe State received about R\$ 120M (~US\$ 55M) on 41153 contracts of PRONAF credit lines (table 1). The 07 SAS municipalities are responsible for US\$ 18M of this amount (table 2). Despite SAS represent about 1/3 of Sergipe incomes of PRONAF, there are limited/none contracts that consider SLM approach and best practices.

Table 1. PRONAF contracts and values in reais for 3 main credit lines in Sergipe – 2012.

Source	Agriculture				Pastoral				Total	
	Services/Products		Investment		Services/Products		Investment			
	n° of contracts	value (R\$)	n° of contracts	value (R\$)	n° of contracts	value (R\$)	n° of contracts	value (R\$)	n° of contracts	value (R\$)
FNE	1312	10,304,872	10599	31,901,942	402	1,424,574	22777	44,300,356	35090	87,931,743
IHC	0	0	72	922,167	0	0	734	4,799,390	806	5,721,557
P.Rural	3019	16,706,847	68	580,315	915	5,109,313	604	3,753,098	4606	26,149,572
RTN	3	12,408	211	157,958	5	15,899	432	851,823	651	1,038,088
Total Sergipe	4334	27,024,127	10950	33,562,381	1322	6,549,786	24547	53,704,666	41153	120,840,960
Total Brazil	469472	5,349,317,025	408852	4,017,370,532	188875	2,092,068,651	756011	4,900,221,943	1823210	16,358,978,153
%Sergipe/Brazil	0.9	0,5	2,7	0,8	0,7	0,3	3,2	1,1	6,6	0,7
FNE Total NE	5526	39,464,085	251690	799,687,890	30,261	111,377,860	526798	1,109,844,371	784044,261	2,060,374,209
% FNE Sergipe	23,7	26,1	4,2	4,0	1,3	1,3	4,3	4,0	33,5	15,8

Table 2. PRONAF contracts and values in reais for the 07 Alto Sertão municipalities (SAS) – 2012.

Municipality	Services/Products		Investment		Comercialization		Total	
	n° of contract	Value (R\$)	n° of contract	Value (R\$)	n° of contract	Value (R\$)	n° of contract	Value (R\$)
Gararu	556	2.437.348	2455	7.228.383	0	0	3011	9.665.731
Porto Folha	475	2.352.957	1947	7.069.292	0	0	2422	9.422.249
N.Sra.Glória	166	1.312.698	1915	5.338.796	0	0	2081	6.651.494
Monte Alegre de Sergipe	157	1.299.627	1747	5.669.496	0	0	1904	6.969.123
Poço Redondo	40	352.751	1781	4.714.318	0	0	1821	5.067.069
N.Sra.Lourdes	76	366.953	628	1.654.751	0	0	704	2.021.704
Canindé de São Fco.	64	445.667	428	1.252.345	0	0	492	1.698.012
Total SAS	1534	8.568.001	10901	32.927.381	0	0	12435	41.495.382
Total Sergipe							41153	120.840.960
SAS/Sergipe							30,2	34,3

7. In parallel, there are other financial instruments that could be used by rural borrower focused on rural activities. For 2013-14, the Harvest Plan allocated US\$3 billion for the semi-arid region. The main rural credit operating agents are the Bank of Brazil, BNB, CEF for all Northeast Brazil, and BANESE only for Sergipe state.

8. The sources of funding available in the region also provide various forms of agricultural and non-agricultural credit such as savings accounts and insurance which can be important for rural producers. Moreover, some environment funds have established specific lines in last 2 years to combat desertification and sustainable management in order to promote climate change adaptation and biodiversity conservation.

9. In 2011-2014 period, environment government Funds (FNMC, FNMA) have provided about US\$ 40M in grants for environment projects in ASD, promoting SFM, environmental recovery, seeds houses, energetic efficiency and security, among other combat desertification activities. Sergipe State has only access 0,2% of this amount.

10. The main finding of the PPG study was that various potential sources of credit and other funding exist on paper, but that it is difficult for family farmers, cooperatives, NGOs and State to access financing for sustainable land management (SLM) activities in formal financial institutions and government funds in ways that are appropriate for this target group. Traditional public banks are not familiar with the specificities of this demand and are not always convinced that it provides sufficient payback in the

appropriate time frames. Norms are inflexible. Since it is not their priority, they have little interest in the complex projects, which are not part of their performance goals. There are serious problems with default on previous loans and a culture of non-payment. Collective undertakings come up against individualistic attitudes. It is difficult for family farmers to provide all the documents that are required. Cooperation among banks and government agencies does not always function as it should.

11. A major difficulty in access to PRONAF is the need for Declarations of Eligibility for PRONAF (DAP), which lag far behind the levels of coverage in the South and Southeast of Brazil. The existence of branch offices in the interior is also limited. The Bank of the Northeast (BNB), for example, only has branches in two small municipalities in the Alto Sertão (Gararu and Nossa Senhora da Glória), not in the largest municipalities with the most family farmers.

Table 3. Institutions involved in credit and funding, problems and mitigation.

Institution	Problems	Mitigation
MMA, National Climate Fund (FNMC)	Producers unfamiliar and banks prefer traditional credit lines.	Coordination with BNDES to transfer funds to BNB and BANESE, rural development agents, funds for grants, training for staff, better extension, dissemination material.
SEMARH, ADEMA	Need to prove land ownership, need for approved plans, ambiguity of norms, need for licenses.	Institutional strengthening, technology, capacity-building at the municipal level, territorial governance.
BNDES	Low level of investment, few branch offices, preference for large loans, low interest rates unattractive for banks.	Decentralization, decision-making at higher levels, review of current interest rates.
BNB	Rigid norms, delay due to lack of documentation, lack of promotion, lack of demand, problems in relations with EMDAGRO.	Reduce bureaucracy, promotion of SLM, combine credit with grants, rewards for banks and clients who practice SLM, promotion of productive clusters (APLs), anti-poverty partnerships, transfers in tranches, more field visits without onus to producers, more data on impacts.
Bank of Brazil (BB)	Need for profit for shareholders, complexity of credit lines, low awareness regarding SLM, barriers regarding licensing, non-payment, limited field monitoring.	Stronger governmental posture, more appropriate dissemination material, consideration of capacity of entire family farm unit, reduce transaction costs, better data collection, better use of Climate Fund.
CEF	Limited experience with environment and rural development, lack of experience with SLM.	Capacity-building on SLM, use of funds from the Climate Fund, collection of socioeconomic and environmental data to evaluate impact of loans.
BANESE	Staff lacks familiarity with SLM.	Capacity-building on SLM together with technical assistance personnel, transfer of funds from BNDES, collection of socioeconomic and environmental data to evaluate impact of loans.
OCESE	Producers are being foreclosed and losing their property, cooperatives do not pay members, interest charged grew more than income.	Strategic planning with professional management, inclusion of women and inclusion of youth, renegotiation of debts, rural environmental registry (CAR), diversification of monocultures with forestry.
EMDAGRO	Lack of capacity to meet demand, loss of staff through retirement, disagreements with BNB.	Rediscussion of respective institutional roles, new hiring, increased technical assistance and monitoring for entire project lifetime.

Institution	Problems	Mitigation
CFAC	Banks not interested in agroecology, high default rates, lack of credit.	More involvement of women, including community banks, capacity-building on SLM in the Caatinga, improved understanding of how to make continued use of credit.
INCRA	Individualism instead of collective cooperation, lack of information on SLM, difficulties of access in new settlements.	Solidarity economy, appropriate capacity-building with exchanges of experience, partnerships with various government agencies and MST.
Rural producers	Stagnation due to years of drought, low educational level, 75.3% have less than 10 ha., low technological level, high indebtedness and default, little knowledge of SLM, limited access to knowledge and markets.	Capacity-building and technical assistance, public policies integrated with local people for inclusive socioeconomic development, community banks and collective savings and differentiated access to credit.

ANNEX V.2 SLM BEST PRACTICES IN THE ASD, BENEFITS, FIELD SITES, ACTIVITIES, COSTS AND REPLICATION.

SLM Best Practices in the ASD

1. There is a wide range of possible best practices of sustainable land management (SLM) by small and large-scale farmers with potential for reduction of land degradation (LD) in the ASD. The practices are a subset of what is known in Brazil as "social technologies". Sustainability is understood to mean maintenance of interdependent ecosystem functions related to aquatic resources, biodiversity and carbon (ABC), in this case to avoid or reduce desertification and land degradation. When appropriate, traditional knowledge and lessons learned in other states or countries have been incorporated in the following list.

2. The SLM practices listed here are directly related to land conservation/restoration and sustainable use of natural resources (production and consumption of smallholder farmers), and represent few of all possibilities that exist in the country for dry and sub-humid regions. The items listed below represent the best practices (BPs) already recognized in Brazil, with up scaling potential. Other activities than can contribute to reduced desertification and land degradation but are beyond the scope of the project include processing and marketing in value chains, off-farm employment and social programs, among other. Viable small farms are an alternative to large properties with extensive monocultures and pastures, major causes of LD.

3. The SLM best practices in this list are grouped in items that address soil erosion control, improved water management, improved cultivation of crops and livestock management, sustainable forest management, use of native biodiversity, and general practices to promote efficiency and social inclusion. Many of the practices can be grouped under headings such as integrated multiple-use sustainable management, peri-domiciliary agroforestry and backyard production (*quintais produtivos*). In this way, the best practice categories or items are presented above:

I) Sustainable soil management: *the BPs presented here are focused on control of erosion processes and improvement of soil quality/structure. It is recommended the integrated implementation (soil intervention strategy) to guarantee reduction of soil loss reduction, water retention and infiltration and soil seed bank maintenance, regenerating productive capacity of the intervention area and enabling rain feed agriculture (dry farming, etc). Most of these practices are related to sustainable water management due their application in water basin context (water production).*

- Palisades (for moderated erosion/land degradation processes – f. ex. gullies)
- Dry Stone dams/Successive dams/Zero-base dams (for accentuated and severe erosion processes – rill erosion, and to ensure water flow and conservation, making new agro-productive plateaus in a water sheet management strategy);
- Contour curves and stone contour (renque de pedra) (avoid laminar erosion and improve water infiltration process, improving agro-productive plateaus in a water sheet management strategy);
- Water diversion device (avoid soil erosion that could affect rural roads, comprising community access);
- Cultivation of Atriplex sp. (to revert soil salinization process in areas under misuse of irrigation techniques, livestock fodder).

II) Sustainable water management: *some of these BPs are already under implementation in government programs, generating benefits, inter alia, improved water security, better quality of consumption water, less work for family nuclei, particularly women and children.*

- Cisterns for consumption (from roof runoff);

- Cisterns for production (from roof or ground runoff);
- Rain-fed waterholes (*barreiros*);
- Trench tanks (*barreiros trincheira*) (improve water conservation – maximum deepness and minimum area of superficial layer to avoid water losses by evaporation; water for production, livestock maintenance and water security, associated to water diversion techniques to avoid advanced erosion);
- Stone tanks or caldrons;
- Drip and micro-aspersion irrigation (*Xique-Xique* system) (water management technique which improves water infiltration, preventing water losses due to evaporation and avoiding soil salinization process).

III) Sustainable agriculture management: *focused on cultivation of crops in properties <100ha, the best practices presented here have a high linearity with agroecology systems. These BPs should be implemented under an integrated management system crop-livestock-forest, in order to promote higher productivity on land already cleared, less need for clearing, lower use of chemicals, less pollution of soil and water, less production costs, more income, better health.*

- Zero tillage (plantio direto) (reduce production costs, decrease the machinery needs for soil preparation, avoiding degradation processes);
- Fallow system (improve soil organic matter, promote nitrogen fixation);
- Mulching (improve soil organic matter, promote nitrogen fixation);
- Organic fertilizers;
- Biological control of pests;
- Intercropping;
- Productive Backyards/Peridomiciliary agroforestry (quintais produtivos) (improve food and energetic security of family farmers, women empowerment, improve family health);
- Agrobiodiversity seed banks.

IV) Sustainable livestock management: *as in item III and other management practices listed here, these interventions should be implemented under an integrated strategy. The BPs presented have general impacts on reduction of erosion processes linked to cattle trample, enhancing the livestock scaling according to the carrying capacity, lower livestock mortality in severe droughts, promoting food security.*

- Electric fences, 9 lines fences (in IRNM systems the use of electric fences or 9 line fences avoids grazing activities in unsuitable areas, etc.);
- Voisin (pasture management with rotation of fields, enabling long fallow periods);
- Ecological thinning and lowering (an SFM technique that can be employed to optimized the pasture areas under integrated sustainable system for multiple uses);
- Improvement of native livestock (adapted to dry conditions);
- Silage for dry periods and severe droughts;
- Cactus management (palma) for dry periods and droughts (management applied all year long in consortium with native forest and crops to guarantee livestock food security).

V) Sustainable forest management: *strategies that ensure less clearing, conservation practices, more biodiversity, connectivity among fragments, gene flows, more carbon stored, more income, community organization and empowerment.*

- Forest recovery intervention (can be applied in order to recover the forest potential use of a specific area and to recover ecosystem function of Legal Reserves and Areas of Permanent Preservation – associated to seedling strategies as bird perches for seed dispersion, protective fences implementation, etc.);
- Tree crops for food products;
- Collection of native seed for reforestation, including communitarian native seed banks;
- Ecological lowering and thinning of foliage (rebaixamento e raleamento) (for fodder and native pasture management);

- Enrichment with useful/commercial native species (direct seeding or nursery seedlings)
- Non-timber management (f. ex. extraction/management and processing of native fruits -umbu, licuri, *maracujá boi* etc.)
- Timber (woodland) management for fuelwood, charcoal, thin and thick fence posts (including reforestation activities);
- Ecological corridors and stepping stones for connectivity (maintenance of biodiversity flows and ecosystems function);
- Agroforestry/Agrosilvicultural-pastoral systems (less clearing and degradation, more biodiversity, more carbon storage, diversification of income).

VI) Sustainable use of biodiversity: *maintenance of native plant cover, pollination, less pressure from crops and livestock, food security, income, community organization.*

- Native fruits and nuts extractivism;
- Medicinal plants (specific regulation);
- Native and Apis beekeeping;
- Vegetable oils and essences;
- Biojewelry.

VII) Others: *various environmental benefits, less work for women and children, greater income and community organization, including empowerment for women and youth.*

- Ecoefficient stoves (associated to peridomiciliary firewood management, promote energetic security and health improvement of family farmer, particularly women and children)
- Handicrafts and Art (including sale on internet);
- Ecotourism, including Rural Tourism.

Current land practices in SAS

4. The SLM best practices presented here have a direct link with ASD demands on sustainable land uses. In this way, the current land practices at SAS were assessed during the PPG process, enabling the establishment of general demands on sustainable land practices for SAS according to Best Practices. Table 01 indicates the current practices, the alternative systems based on best practices presented before and the expected benefits of their adoption in general meanings.

- Table 12 of prodoc summarises the Best Practices (BP) and global environmental benefits (GEB) to be applied on field sites due to the land degradation characterization.
- Table 13 of Prodoc summarises the Benefits associated with integrated and sustainable production systems proposed by project to SAS.

5. From that general scenario, 7 best practices or integrated systems listed in BP items were selected as key to promote and integrate sustainable rural development, considering current field activities and land degradation levels in SAS, costs/benefits, and best practices recognized by UNCCD (dryland champion prize – 2014). These technologies and their benefits are listed above in table 02.

6. Any intervention or recommendation about the adoption of sustainable technology or practices should be followed by training, workshops and exchanges, so that the innovations will be adopted by all those directly or indirectly involved.

Selecting field sites in SAS

7. During the PPG process, the sites for project activities in the field were pre-selected according to four categories representing different combinations of land use, types and degrees of degradation¹, and potential for improvement. These combinations include most of the challenges that are faced and the opportunities for upscaling to other ASDs.

- i) Areas with intense land degradation (accentuated and severe level of land degradation) and extensive natural resource use;
- ii) Areas with medium level of clearing (moderated level of land degradation), in which Legal Reserves (RL) are maintained, with high potential for SLM;
- iii) Areas with medium level of clearing and low-to-moderated level of land degradation in which RL are maintained, low mechanization and high potential for SFM/SLM;
- iv) Areas that maintain extensive vegetation cover (RL and APP preserved), to demonstrate potential use under SFM/SLM (low land degradation level).

8. This section contains the baseline data on land use and land degradation at pre-selected field sites and outlines the proposed activities and estimated costs for each as well as strategies of replication in other Areas Susceptible to Desertification (ASD). The recommended activities will help improve food, water and energy security and conserve biodiversity. They should also be taken into account in licensing processes and funding.

Field Sites Characterization and Recommended Activities

Description of project areas in SAS

9. Through field observations and local consultation regarding stakeholder interest, the four field sites listed in Table 3 (below) and shown on the map in Annex V.3 were pre-selected and classified in categories. They include three agrarian reform settlements, namely Valmir Mota, Florestan Fernandes and Jacaré-Curituba, and one community, called Poço Preto. The total area of the settlements and the community is approximately 22,000 ha. The larger sites, especially the Jacaré-Curituba Settlement, include combinations of the categories listed above. Other areas in the SAS or even in other ASDs in Sergipe could be added as more detailed data become available or due to opportunities and requests for project implementation.

Table 3. Areas pre-selected for project field activities.

Categ ory	Field Site	Area (ha)	Families	Area per family (ha)	RL (ha)	APP (ha)	Municipality	Year Created
1	Jacaré-Curituba Settlement	20,940	700 to 800	22.2 (rain-fed) 3.6 (irrigated)	1200- 1600	622.1	Canindé de São Francisco and Poço Redondo	1997- 1999
2	Poço Preto Community	750	50	~15	No data	No data	Poço Redondo	N/A
3	Florestan Fernandes Settlement	824	31	26.6	176.0	No data	Canindé de São Francisco	2002
4	Valmir Mota Settlement	429	33	13.0	178.2	225.2	Canindé de São Francisco	2009
Total		22,943	914	~19.0	>1900	>850		

RL: Legal Reserve; APP: Permanent Preservation Area. No data: to be confirmed during 1st. year project

¹ Land degradation levels classified according to Diagnóstico Florestal de Sergipe (SERGIPE, 2011).

Jacaré-Curituba Settlement

10. The Jacaré-Curituba settlement, located mostly in the municipality of Poço Redondo, is the largest and most complex due to its size and composition, including eight settlement projects, called Jacaré-Curituba I to VIII, combining various categories of land use, degradation and potential for improvement. Implementation of the Jacaré-Curituba Settlement Project, which includes eight areas, resulted in a complex mosaic of uses and potentialities. It has approximately 1,600 ha. of Legal Reserves and approximately 820 lots for settler families. According to the settlers, 60% of the lots are cultivable and their main crops are bananas, acerola, corn, beans, manioc (*macaxeira*), sorghum, pineapple, cactus and passion fruit. All these crops are consumed by the settlers and sold at local markets. The settlement has irrigation channels reaching most lots, but there are also rain-fed areas. Beans comprise 70% of the production of the settlement. Animal husbandry is practiced throughout the settlement, where there are about 3,000 head of cattle, 1,000 goats and 2,000 sheep. In addition to crops and livestock, 10 families work with beekeeping with *Apis mellifera* and wish to increase their profits from this source, which are now around 8% of monthly household income.

11. All scenarios of land degradation levels and multiple uses can be found there. Desertification and salinization are already under way within some of the settlement areas. The most serious problem is salinity, because the settlers make incorrect use of irrigation techniques. Salinity is due to irrigation by flooding, without irrigation kits. According to the rural extension service, the Federal University of Sergipe (UFS) and Petrobrás are preparing guidance on how best to recover these areas through reforestation with native species of the Caatinga. There is also degradation due to gully erosion in much of the settlement. The settlement would welcome any project that could recover these areas. There is some organic fruit and vegetable production in the settlement, but on a small scale. The settlement is served by an irrigation system that benefits the settlers, but also involves some restrictions due to problems along the canals. Water is wasted due to structural problems of the irrigation system, so that some settlers suffer losses of their crops. The settlement also has an electric power substation to support the irrigation system and the homes of the settlers.

12. The various settlements share some characteristics but also have differences:

I) Jacaré-Curituba I was previously ranches called Santa Luzia, Santo Antônio, Petrolinda, Eldorado and São Francisco. Since 85% of its area has flat to undulated topography, the potential for land use is favorable for planting temporary and short-cycle crops such as corn and beans. However, these annual crops need to be well managed in order to be maintained safely and permanently. Part of the area has planted pastures.

II) The area that makes up Jacaré-Curituba II, formerly the ranches called Alto Bonito, Mandassaia, Nova Fortaleza, Santa Maria, San José I and Sao José II, includes various small dams. The 70% of land that is flat to gently rolling can be used, as in Jacaré-Curituba I, for annual crops. Ten percent (10%) of the area is unfit for agriculture use because of its fragility and topography and should remain under native vegetation. Part of the area has already been cleared to plant pastures.

III) Jacaré-Curituba III, formerly Alto Bonito da Formosa, Santa Teresa and Lagoa do Tirri ranches, also has good potential for agriculture, although farming should be associated with soil conservation practices. The entire area has undergone modifications with planting of buffelgrass and regeneration of areas of Caatinga. The main problem in the three areas already mentioned is the degradation of pastures and subsequent soil compaction.

IV) The area of Jacaré-Curituba IV, for the most part, is planted with annual crops such as corn and beans as well as forage cactus. Pastures with dominance of buffel grass and cactus are degraded and need to be renewed. Crop and soil treatments need to be adopted for soil conservation. Areas of Permanent

Preservation (APP) are adjacent to the Grota do Angico Natural Monument, which was registered by the Institute of Cultural Heritage of the Sergipe State Secretariat of Culture.

V) Jacaré Curituba V, formerly the Boa Esperança Ranch, has three dams, one of which receives water from the irrigation system of the California Project. The whole area is fit for cultivation, but is now predominantly used for grazing. Some crops are also planted, but they may be too intensive and lack appropriate land management. When the area was expropriated, there was no record of cropland.

VI) In Jacaré-Curituba VI, formerly the California and Dallas ranches, there were no records of crops or livestock on the properties when they were expropriated, but current land use includes crops and livestock as well as pastures with buffelgrass and cactus. Some lots are part of the irrigation district and others have livestock.

VII) Jacaré-Curituba VII is also part of the irrigated perimeter, since 70% of its area is flat or only slightly hilly. It has areas planted with buffelgrass and elephant grass, as well as cactus.

VIII) Jacaré-Curituba VIII, formerly the Camara Ranch, has six small reservoirs that do not store much water or last through the dry season. There are however two springs that are used for water supply, mainly for livestock during the dry season. The area is suited for crops and livestock, but needs adoption of sustainable land management techniques, especially to improve carrying capacity.

13. For these reasons, the project will implement and diffuse selected sustainable technologies for land use, as described below:

- Integrated Multiple Use Sustainable Forest Management (SFM) on 600 ha. of land suitable for use under management.
- Planting of *Atriplex nummularia* in plots on 2 ha. to assess the impacts in desalinization areas as well as change in the regime of water management in irrigated areas.
- Meliponiculture can be practiced in the areas of Legal Reserve and remaining vegetation near the houses and ponds, including the productive backyards. Residents of the Caatinga collect honey from native bees and use it for medicinal purposes. It would be possible for settlers to start using honey as food and medicine and sell it in local markets. The area has the potential for up to 200 hives. Beekeeping, as already practiced in a few places offers high potential for food, income, avoidance of clearing, burning and use of pesticides and appreciation of environment and benefits of cooperation.
- Productive backyards with the families that are most interested, to be start-up family projects that can be replicated all over the settlement. Agroecological systems, which should be replicated in the settlement itself, strengthening agro-ecological actions practiced in the settlement, ranging from production itself to marketing of the products.
- Eco-efficient stoves in residences that show interest, along with awareness workshops about neighborhood management of firewood collection.
- Soil conservation practices and management linked to the practice of agriculture and the prevention and reversal of erosion.
- Dry stone dams to retain soils subject to being eroded by water, to create areas that can be planted and water reservoirs, as well as favoring infiltration and groundwater replenishment. Some dams will be built as a way to demonstrate how to plan watersheds.
- The Xique-Xique irrigation system, which reduces water use and waste at specific points and is less dependent on equipment and materials that are difficult to acquire. It is more practical and farmers can carry out their own cleaning and maintenance of their irrigation systems.

Poço Preto Community

14. The Poço Preto community consists of three main properties that were subsequently subdivided. The stream (Riacho da Cachorra) that bisects the community is intermittent. A large part of the vegetation was removed and pastures were planted, as well as corn and cactus for animal feed and corn and beans for consumption. The community produces charcoal with the Caatinga vegetation and water is supplied by tank trucks. There is need for intervention with techniques for collection and storage of water and use of forest resources. There are also reports of brick kilns in the community, which further affect the remaining forest and clay deposits. During the PPG the community was classified under category 2 due to its demands on water conservation techniques to combat desertification processes related to overgrazing, and agricultural machinery misuses on crops areas.

15. Properties have an average size of 15 ha. and primarily use family labor. It used to be customary for the community to organize collective work projects (bees) and land use technology was rustic. Now there has been change in agricultural and livestock practices, as well as the instruments used in these activities, allowing for greater autonomy, but weakening collective action regarding land use. Land use in the community is mainly for livestock, either by direct grazing, or by planting forage. Nowadays corn is planted for making silage and forage cactus is planted for feeding livestock. Corn and beans are planted to meet family needs. The pressure exerted by the cultivation of corn has led to the use of agricultural machinery, both for soil preparation and crop harvesting, which consequently involved greater use of pesticides and chemical fertilizers. Today the main activity is raising dairy cattle, with daily production between 15 and 50 liters per cow. The milk is sold directly on the property and is taken on motorcycles to Monte Alegre. Milk processing is not done on properties because of water shortage in quantity and quality, although there are two artisanal cheese factories that sell their products in Monte Alegre. Other activities include raising pigs, sheep and chickens in enclosed areas.

16. In this scenario, the project will introduce technologies for collection and storage of water such as runoff cisterns, dry stone dams, forest-grazing and agroforestry systems, in addition to recovery of degraded areas and improved domestic stoves in households that depend on local collection of firewood along, as well as productive backyards. These areas pre-selected for field activities are justified by the occurrence of impacts cited in PAE-SE. In the case of Canindé de San Francisco, degradation is a result of intense and disproportionate mechanization, which along with the mishandling of water has caused salinization of arable land. In the Jacaré-Curituba settlement, the system of flood irrigation and neglect of water management has caused salinization in some areas.

Florestan Fernandes Settlement

17. The settlement is located in the municipality of San Francisco de Canindé in an area formerly known as Orocó Ranch. The Legal Reserve of 176 ha. is preserved by the settlers, but exploited by outsiders who do not respect environmental regulations.. The settlers want to manage the Caatinga themselves. The property has intermittent streams, 13 small reservoirs and a canal built by the Sanitation Company of Sergipe (DESO).

18. Virtually all of the 31 lots can be cultivated, except for some areas that are susceptible to erosion when cultivated with annual crops and poorly managed. The strongest pressure in this area is from cattle ranching, which has involved planting of pastures, that continue to be used by settlers. The main crops grown are beans and corn for food as well as cactus (for fodder) and grass. Beans and corn are sold to middlemen after harvesting and part of the production is for family meals. On average, when the rains are favorable, each settler harvests 50 sacks of beans and 80 sacks of corn. As for cactus and grass for feeding livestock, in a recent survey there were 640 head of cattle, 200 goats and 600 sheep in the settlement, as well as many chickens, turkeys and guinea hens, which are consumed by settler families. Overgrazing in

the settlement requires adjustments in the carrying capacity and/or changes in forage production. In the settlement there is some incipient organic food production (vegetables) and peridomiciliary agroforestry (*quintais produtivos*) of 10 women of the settlement. Production is for their own consumption and for roadside sale to faculty and staff of schools near the settlement. Water is supplied by tank trucks in the dry season and when it rains by storage tanks constructed by the ASA (for human consumption) and by waterholes for livestock.

19. So far there is no area subject to environmental or other degradation in the settlement and all lots can be cultivated, fitting in category 3. The suggested activities are:

- Integrated Multiple Use SFM for grazing purposes with intervention in native vegetation, with 160 ha. for pasture management.
- Meliponiculture (up to 93 hives) in the areas of Legal Reserve and remaining vegetation near the houses and water reservoirs.
- Peridomiciliary agroforestry with all interested families in the settlement.
- Ecoefficient stoves in residences that show interest; the awareness workshops about management of firewood collection in the neighborhood.
- Strengthening of agro-ecological actions practiced in the settlement to strengthen capabilities for production and marketing.
- Conservation practices linked to agriculture and the prevention and reversal of erosion.
- Dry stone dams, which retain soils eroded by water, forming usable areas and water reservoirs, besides favoring infiltration and groundwater replenishment. Several such dams will be built to demonstrate ways to plan watersheds.

Valmir Mota

20. The land in the Valmir Mota Settlement is one of the youngest agrarian reform area established in SAS. In this way, it is not yet being used extensively for agriculture because settlers do not have licenses for alternative land use, but only for some crops like okra. The APP, which includes part of the large remaining forest fragments in Sergipe, has not been damaged. The area of the settlement's Legal Reserve of approximately 178 ha. was divided into three parts. All together, the shrubs and trees classified as hyperxerophilous vegetation cover 427 ha. Within the Legal Reserve there is an apiary, which provides indications that it is possible to undertake beekeeping in the Legal Reserve.

21. In the Valmir Mota Settlement, there are three sub-areas, formerly the ranches called: 1) Texas, 2) Santa Helena and 3) São Francisco.

1) The part that was formerly the Texas Ranch is crossed by a temporary stream. Land use on part of this property changed to native and planted pastures, including buffelgrass (*Cenchrus ciliaris* L.) of the *Aridus* variety. According to the classification of soils and topography, most of the area is considered improper for annual crops. Clearing for traditional agriculture is limited and if practiced needs to adopt conservation measures to maintain soil structure and conditions for crops. Thus this area, in category 4, is proposed for landscape management primarily for Multiple Use Sustainable Forest Management (SFM) for forestry and grazing purposes and Multiple Use SFM for apiculture, including the Legal Reserve.

2) In the sub-area that was the Santa Helena Ranch, about 50% of the soils are classified as fit for annual crops, principally in the less steep areas, although soil conservation practices should be adopted. The rest of the area has limitations for annual crops and should be used for agroforestry, other perennial crops or provision of fodder. Therefore, this area, in category 4, could be used to implement landscape management including:

- Multiple Use SFM for forestry and grazing purposes;
- Multiple Use SFM for apiculture, including Legal Reserves;

- Traditional rain-fed agriculture or new agroforestry systems.
- 3) In the sub area that was the São Francisco Ranch, the type of land use is the same as on the former Texas Ranch, with possibilities to practice traditional agriculture, provided that soil conservation practices are adopted. Thus, in addition to the recommendations already made, the suggestions are:
- Integrated Multiple Use SLM/SFM over 330 ha integrated with the activities of grazing of native vegetation, and fallow for two years before unrestricted access to grazing.
 - Beekeeping (apiculture) in the areas of Legal Reserve, totaling approximately 180 ha. with about 100 hives.
 - Meliponiculture (native bees) in the areas of Legal Reserve and remaining vegetation near settler houses and water reservoirs (up to 100 hives).
 - Peridomiciliary agroforestry with all the families in the settlement that are interested and available.
 - Ecoefficient stoves in the residences that show interest, along with workshops to raise awareness about management of firewood collection in the neighborhood.
 - Soil conservation practices linked to the practice of agriculture and the prevention and reversal of erosion, associated with dry stone dams.

Strategic approaches for SLM practices

22. All interventions will be accompanied by processes of social mobilization and training. This process should consider the environmental and social heterogeneity in target areas, respecting regional and local differences. For this, methods will be used to mediate among these realities at the same time ensuring the achievement of intended results, inspired by participatory approaches. Participatory processes will also reduce risks of conflict and ensure engagement of women. The strategy of field activities allows them to be installed with the participation of the people that live and work in each area and consequently become involved in diffusion of each process. These people appropriate the strategies that are best adapted to their particular needs. Each field activity will be deployed in pre-selected areas with participation of the community and extension agents responsible for the monitoring and guidance of actions developed on the ground. These units will have informative material such as signs, maps and booklets for reception and orientation of the field activities.

23. The proposed activities, quantities, units and values for each area are shown in Table 4 on the next page.

Table 4. Practices, values and number of interventions in each focus area of expertise.

Valmir Mota	Activity	Qty.	Unit	US\$
	Sustainable Agriculture Management (Integrated Multiple-Use SLM/SFM)	330	ha.	9,701
	Apiculture	100	Hives	18,091
	Meliponiculture	100	Hives	22,614
	Peridomiciliary agroforestry	10	Systems	18,091
	Ecoefficient stoves	33	Stoves	11,191
	Contour curves/stone contour	300	m	11,307
	Dry stone dams	10	m ³	18,245
Subtotal				109,244
Florestan Fernandes	Activity	Qty.	Unit	US\$
	Sustainable Livestock Management (Integrated Multiple-Use SLM/SFM)	4 (160)	ha.	16,282
	Meliponiculture	100	Hives	21,031
	Peridomiciliary agroecosystem/ Productive Backyards	10	Systems	18,091
	Ecoefficient stoves	31	Stoves	10,109
	Contour curves/stone contour	300	m	11,307
	Dry stone dams	10	m ³	18,245
Subtotal				95,472
Jacaré-Curitiba	Activity	Qty.	Unit	US\$
	Integrated Multiple-Use (livestock/crop/forestry) SLM/SFM	600	ha.	17,639
	Planting <i>Atriplex</i> (salinized areas)	2	ha.	9,046
	Meliponiculture	200	Hives	45,228
	Apiculture	300	Hives	54,274
	Trench tanks	4	Units	13,199
	Runoff cisterns	8	Units	7,237
	Peridomiciliary agroecosystem/ Productive Backyards	30	Systems	54,274
	Agroforestry systems	4	ha.	33,180
	Ecoefficient stoves	100	Stoves	33,921
	Contour curves/stone contour	900	m	33,921
	Dry stone dams	20	m ³	36,489
	Xique-xique Irrigation System	4	ha.	4,342
Subtotal				342,751
Comunidade Poço Preto	Activity	Qty.	Unit	US\$
	Integrated Multiple-Use SLM/SFM (grazing)	2-50	ha.	8,141
	Meliponiculture	50	Hives	11,307
	Trench tanks	4	Units	13,199
	Runoff cisterns	12	Units	10,855
	Peridomiciliary agroecosystem/ Productive Backyards	20	Systems	36,183
	Agroforestry systems	2	ha.	16,590
	Ecoefficient stoves	50	Stoves	16,961
	Contour curves/stone contour	300	m	11,307
	Dry stone dams	10	m ³	18,245
Subtotal				142,787
Total				690,254

SLM Monitoring and Replication Strategy

24. Monitoring strategy consists in 3 fields surveys to assess soil conservation indicators (total soil carbon, soil loss rate, physical and chemical total soil structure), tree density and to assess the rural establishment production focused on monitoring the impact of BP implementation during 5 years. The first survey should take place during the first year project, and will be supported by ATER, SEMARH, MMA and Research Institutions (UFS and IF), in order to confirm general Caatinga data for specific field sites and to support the mobilization and sensitizing actions that should take place before technologies implantation.

25. The strategy adopted for replication of successful SLM best practices to other ASDs in Sergipe and neighboring areas, according to opportunities, will be the training of multipliers including both extension agents and representatives of the communities in each area of field activity, in order to carry out exchange of knowledge, site visitation and workshops during project implementation. These workshops, field days and exchanges among neighboring communities and settlements for purposes of replication will disseminate the practices demonstrated in the field, with guidance and support from the team of project consultants, above and beyond the teams of technical assistance who will be trained during the implementation of field activities and who will gain familiarity with the innovations introduced by the project.

26. In addition to the National Commission to Combat Desertification (NCCD), with its multiple participants, the project implementation strategy involves a wide range of state, federal and private agencies or organizations engaged in ATER actions and in improving access to credit and other sources of funding.

27. The strategy adopted for replication will be the training of multipliers including both extension agents and representatives of the communities in each area of field activity, in order to carry out exchange of knowledge, site visitation and workshops during project implementation. These workshops, field days and exchanges among neighboring communities and settlements for purposes of replication will disseminate the practices demonstrated in the field, with guidance and support from the team of project consultants, above and beyond the teams of technical assistance who will be trained during the implementation of field activities and who will gain familiarity with the innovations introduced by the project.

ANNEX V.3 GEF Land Degradation Tracking Tool (separate file)

ANNEX V.4 Risk Log

OFFLINE RISK LOG

Project Title: Sustainable Land Use Management in the Semiarid Region of Northeast Brazil (Sergipe) - BRA/PNUD/13/G42/2014	Award ID: 00083642 Project ID: 00092018	Date: 19SET2014
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#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	SLM practices take time to provide tangible and targeted beneficiaries may be reluctant to change non-suitable land use activities and practices	April 2014	Operational	Low P = 1 I = 3	The direct intervention sites were pre-selected through meetings with all stakeholders to guarantee the commitment of all beneficiaries of rural settlements and local communities. The project will also work in cooperation with community leaderships (including youngsters and women), associations, cooperatives and extension workers promoting the empowerment and schooling of entire community/settlement. The achievement of project outputs especially 1.3, 2.1 and 2.2, depends on a strong training and communication and this has been built into the implementation strategy. SLM be promoted are based on practices in similar semiarid spaces in Brazilian ASD practices that proved economic feasibility. These will be adapted to the environmental conditions of Sergipe ASD at scale. The sensitivity assessment that will be undertake during the project will elucidate the SLM socioeconomic and environment benefits, encouraging the communities to support the project implementation and the maintenance of activities in long-term (after the end of the project).	UNDP CO	UNDP CO	Sept 2014	No change
2	With Sergipe's growing economy and severity of LD, increased	April 2014	Organizational	Medium P = 3	The development of Ecological and Economic Zoning (EEZ) including LD considerations will establish the framework for permissible and	UNDP CO	UNDP CO	Sept 2014	No change

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
	pressures on land will overwhelm state-level licensing and oversight capacity			I = 3	recommended activities in ASD, in line with the differing levels of land degradation. Together with the strengthening of inter-sectoral mechanisms to promote coordination action, this will allow the adoption of an integrated approach to reduce land use conflicts and manage pressures. The project will also focus on strengthening state-level licensing and oversight capacities and environmental and social safeguards defined for land use so as to reduce LD in ASD.				
3	Insufficient buy-in from relevant agencies undermines the ability to mainstream SLM in baseline programs and to channel resources to Sergipe.	April 2014	Political	Low P = 1 I = 2	The Brazilian government is strongly committed to poverty reduction and has recognized the link between poverty and LD. Furthermore, the state of Sergipe is fully supportive of all proposed project elements. The specific manner in which funds will be allocated to Sergipe from large baseline programs has not yet been determined and Sergipe therefore has the opportunity to influence this process to ensure that SLM considerations are taken into account and that LD is targeted.	UNDP CO	UNDP CO	Sept 2014	No change
4	Impacts of climate change exacerbate land degradation and increase pressures on remaining soil and forest resources.	April 2014	Environmental	Low/ Medium P = 2 I = 3	Climate change is expected to lead to serious consequences in the region that are already beginning to be felt, such as longer, drier and hotter dry seasons and more frequent and less predictable drought events. IPCC predicts increased temperature and evaporation, more extreme events and loss in nutritional value of food crops. The project will identify and promote the implementation of SLM practices and species that are adapted to a changing climate and will therefore help to reduce the vulnerability of farmers to climate change, increasing productivity, diversity and resilience. In addition, an important part of the project involves increasing learning and information exchange on semiarid production systems, including the expected impacts of climate	UNDP CO	UNDP CO	Sept 2014	No change

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
					change (higher temperature, lower precipitation, and more evaporation) on such systems and existing practices that have produced positive results in this context and could be replicated.				
5	State and Presidential Elections resulting in political changes at the different levels may compromise project implementation schedules and arrangements.	April 2014	Political	Low/ Medium P = 1 I = 3	The project will work at four different levels: national, state, regional and local levels. The project will work to mobilize continued collaboration between all government instances through NCCD and GPCD as the institutional instruments to support the decision making concerning LD. Furthermore, the project has included training/capacity activities to increase the governmental understanding and awareness of the goods of SLM on sustainable rural development, and on rural population security. A member of NCCD and GPCD will have a chair in Project Steering Committee, in order to align the project with NAP, ensure it is aligned with relevant government programs act as a vehicle for communication between project, stakeholders and decision-makers, minimizing the impacts of government transition. Moreover, the project are built based on cooperation agreements between stakeholders, formalized in the co-financial letters, and anchored in the umbrella of public consolidated structures (NCCD and GPCD).	UNDP CO	UNDP CO	Sept 2014	No change

ANNEX V.5. MAPS

1. Location of Sergipe in Brazil



2. Location of Sergipe in the Northeast



3. ASDs in Sergipe and Alto Sertão



4. ASDs in Sergipe (separate file)

5. Vegetation Coverage in Sergipe's ASDs (separate file)

ANNEX V.6. DEX Letter - GoB Request (See separate file)

ANNEX V.7 REFERENCES

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