



Federal Ministry  
of Education  
and Research



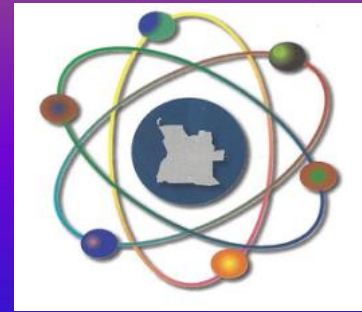
# MITIGATION OF THE EFFECT OF SOIL EROSION (Task ID 173)

## Content:

1. Introduction
2. Thematic background, Key questions and Objectives
3. Methodological Approaches
4. Expecting Results
5. Literature cited in the text

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# 1. Introduction

- **SASSCAL (BMBF) - South African Science Service for Climate Change and Adaptive Land Management**
  - **Climate, Water, Forest, Agriculture and Biodiversity**
  - **Angola, Botswana, Namibia, South Africa and Zambia**

- 1300 Km from Luanda (about 24 hrs driving)
- Latitude 11° 47', Longitude 19° 55'
- 1357 m height above the sea level
- Annual rain fall average: 1200 to 1400 mm
- Maximum average temp: 25.7°C (June) and 30.4°C (September)
- Minimum average temp: 9.2°C (June) and 16.2°C (January and February)

• **ANGOLA: CNIC + CTN (MINCT) -  
National Scientific Research Centres**

➤ **Mitigation of the Effect of Erosion  
in the Luena city**



# Cidade do Luena







# LUENA:

- The **PEACE** city  
in Angola

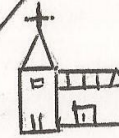




MINISTÉRIO DA AGRICULTURA  
INSTITUTO DE DESENVOLVIMENTO FLORESTAL  
DEPARTAMENTO PROVINCIAL DO MEXICO

# RAVINES SURROUNDING LUENA CITY

I.P.S.M.

B<sup>o</sup> Fe

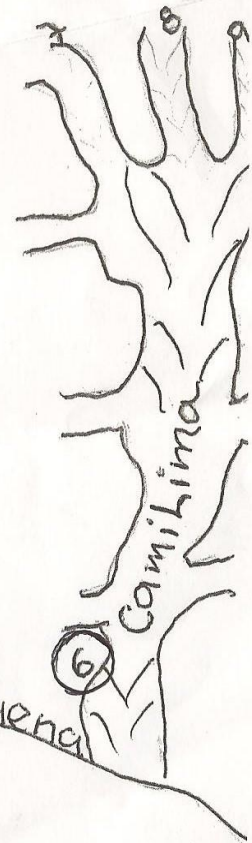
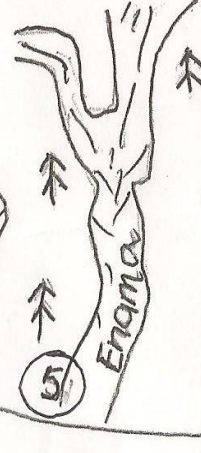
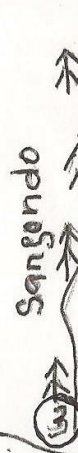
Luena Reja

vala de irrigação

Legenda  
 vala  
 estrada  
 igreja  
 - Casas

Intervenção  
Biológica n.º 1, 4

Intervenção  
mecânica  
n.º 2, 3, 4, 5, 6





# **RAVINES THREATENING SUBURBS OF LUENA CITY**





# RAVINES THREATENING RAILWAYS IN LUENA CITY



# **RAVINES THREATENING THE MUNICIPALITY WATER SUPPLY STATION IN LUENA CITY**

**2014/10/13 13:11**





✓ Integrates Land and Water resources management: covering agricultural crops/agro-forestry species to stabilize degradable Lands.





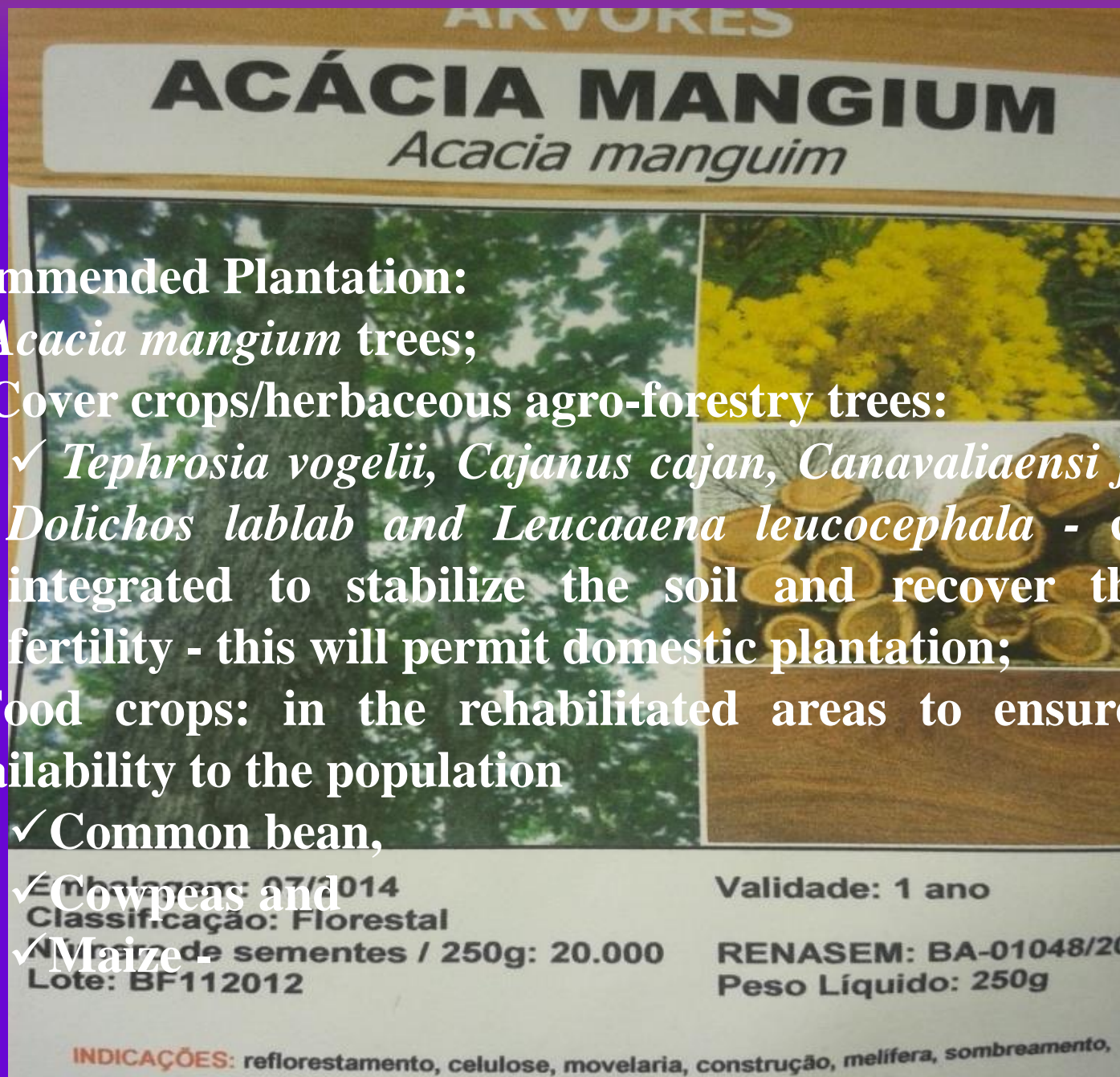
## 2. Thematic background, Key questions and Objectives

- High level of soil degradation is observed in many areas of Angola. Lack of awareness and an unfriendly use of natural resources are amongst the important reasons.
- The city of Luena in Moxico (Angola), has a continual destruction by ravines occasioned by frequent rain falls. To date, little or nothing has been done to slow the phenomenon. However, it is possible to mitigate the impact of rain falls by diversifying agricultural practices.
- Research, answer the following key questions:
  - How to reduce the erosion process using *Acacia mangium* trees
  - How well cover crops/herbaceous agro-forestry species diversity can stabilize the soil and create an artificial forest for domestic and commercial uses.
  - How food security issues (food production), can be integrated in the recuperated areas to increase food availability.



- **Recommended Plantation:**

- *Acacia mangium* trees;
- Cover crops/herbaceous agro-forestry trees:
  - ✓ *Tephrosia vogelii*, *Cajanus cajan*, *Canavalia ensiformis*, *Dolichos lablab* and *Leucaena leucocephala* - can be integrated to stabilize the soil and recover the soil fertility - this will permit domestic plantation;
- Food crops: in the rehabilitated areas to ensure food availability to the population
  - ✓ Common bean,
  - ✓ Cowpeas and
  - ✓ Maize -

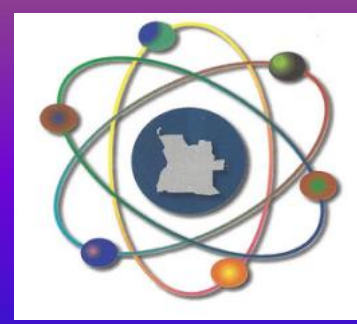






## •Objectives:

- Control of erosion within the SADC;
- Reduce process of water erosion;
- Identify potentials best green manure crops/herbaceous agro-forestry species stabilizing soil;
- Assess agronomic yields of food crops in alley with green manure/herbaceous agro forestry species.
- Supply employment to youth
- Reduce poverty



## 3. Methodological Approaches

- Awareness of the proposed objectives to stakeholders
- Base line survey for benchmarks evaluation
- Purchase/renting of inputs: seeds, materials, machinery and equipment







- Casual labours stipens
- Plantation in the contour of erosion protective trees
- Plantation of cover crops/agro-forestry species







- Plantation of food crops in alley cropping (farmer's participation) Monitoring and evaluation





## Continuing Planting...







## Continuing Planting...







## Planting, Planting...





## Planting, Planting...





**...Planting & Planting...**



## **4. Expecting Results**

- 1. Awareness of the proposed objectives to stakeholders (1/1%)**
- 2. Base line survey for benchmarks evaluation (3/5%)**
- 3. Purchase/renting of inputs: seeds, materials, machinery and equipment (12/25%)**
- 4. Casual laboursstipens (10/12%)**
- 5. Plantation in the contour of erosion protective trees (10/35%)**
- 6. Plantation of cover crops/agro-forestry species (1/5%)**
- 7. Plantation of food crops in alley cropping (farmer's participation) (1/5%)**
- 8. Monitoring and evaluation (2/12%)**

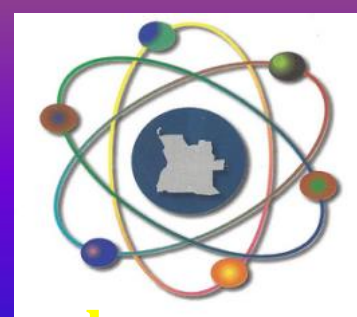
...Planting & Planting...



# Extracted Soil Samples

PARÂMETROS			
	Resultado	Unidade	Metodologia
pH (1:5)	5.00		Potenciometria
C. E.	77.40	µS/cm	Condutimetria
Carbono Orgânico Total	1.54	% C	Volumetria
M.O.	2.65	% MO	Método Walkley Black
% Limo	21.94	% Limo	Dens.Bouyoucos
% Argila	6.00	% Argila	Dens.Bouyoucos
% Areia	72.05	% Areia	Dens.Bouyoucos
Textura	Franco - Arenoso		Dens.Bouyoucos
Azoto Total	865.38	mg/Kg	Kjeldahl
Fósforo	142.00	mg/Kg	Olsen
Magnésio Extraível	1.27	cmolc/Kg	Volumetria
Potássio extraível	0.87	cmolc/Kg	Fotometria de Chama
Sódio Extraível	0.04	cmolc/Kg	Fotometria de Chama
Cálcio Extraível	0.62	cmolc/Kg	Fotometria de Chama
Saturação de bases	72.23	%	Operação
Soma de Bases	2.81	cmolc/Kg	Operação
Acidez trocável	0.00	cmolc/Kg	Volumetria
Acidez potencial	1.08	cmolc/Kg	Volumetria





## ...Planting & Planting...

**Polietilene (plásticos) bags packing and seeding at greenhouse  
for erosion stoppers trees.**

Item	Nome da espécie	Data de sementeira	Data de germinação	Total de espécies germinadas	Total de espécies não germinadas	Total de espécies semeadas
1	.Tephosia Vogelii (Ussungu)	23/09/2014	30/09/2014	3744	234	3978
2.	Guibourtia Coleosperma (Muchivi)	04/09/2014	21/09/2014	7747	2830	10577
3.	Acácia Rubra	13/08/2014	01/09/2014	486	368	854
4.	Acácia Australiana (Acácia Mangium)	04/09/2014	21/09/2014	120	20	140
<b>Total</b>				<b>12.097</b>	<b>3.452</b>	<b>15.549</b>

...Planting & Planting.

## References:

1. **FAO. EROSION Y PERDIDA DE FERTILIDAD DEL SUELO**  
Relación entre erosión y pérdida de fertilidad del suelo
2. **LORENZI, H. 1998. Árvores brasileiras: manual de identificação e cultivo de plantas arbóreas nativas do Brasil. Plantarum, Nova Odessa, vol. 2**
3. **UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.**  
**Soil Screening Guidance: Technical Background Document.**  
**EPA/540/R-95/128. Washington, DC, Office of Solid Waste and Emergency Response, 1996b.**
4. **SOCIEDAD PÚBLICA GESTIÓN AMBIENTAL (IHOBE). Manual práctico para la investigación del Suelo. Gobierno Vasco. 1995.**





...Planting & Planting...



Greenhouse

THANK YOU!...  
(OBRIGADO! ...)

