# Socioeconomic' impacts of the water and soil conservation technics in Maradi, Niger

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# Plan

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    1. Conservation methods
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5. Discussion
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    2. Dichotomic key
6. Conclusion

# Context and problematic

- Maradi
- Land degradation:
  - Demographic;
  - Climatic;
  - Market;
  - Agriculture;
  - Livestock.
- Poor fertility and soil capacity

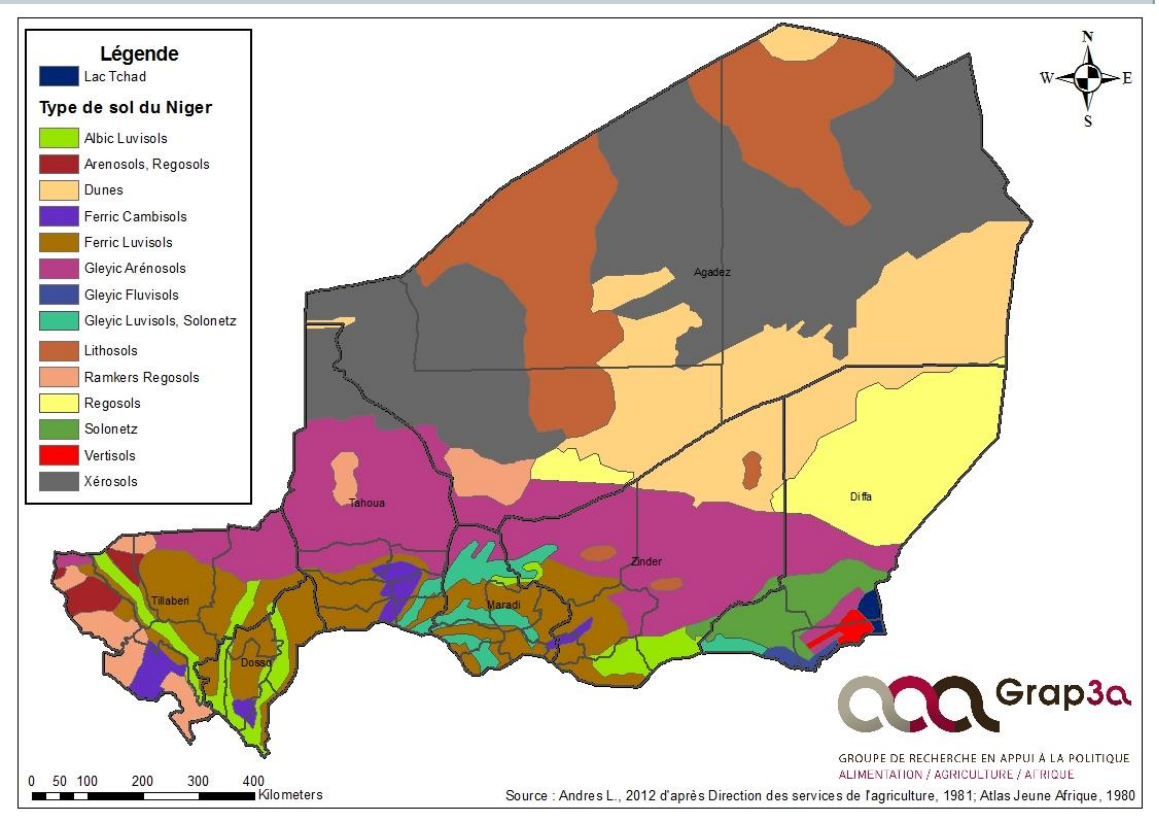


Figure 1: Soil map of Republic of Niger

# Context and problematic

## Land occupation evolution between 1975 and 2006

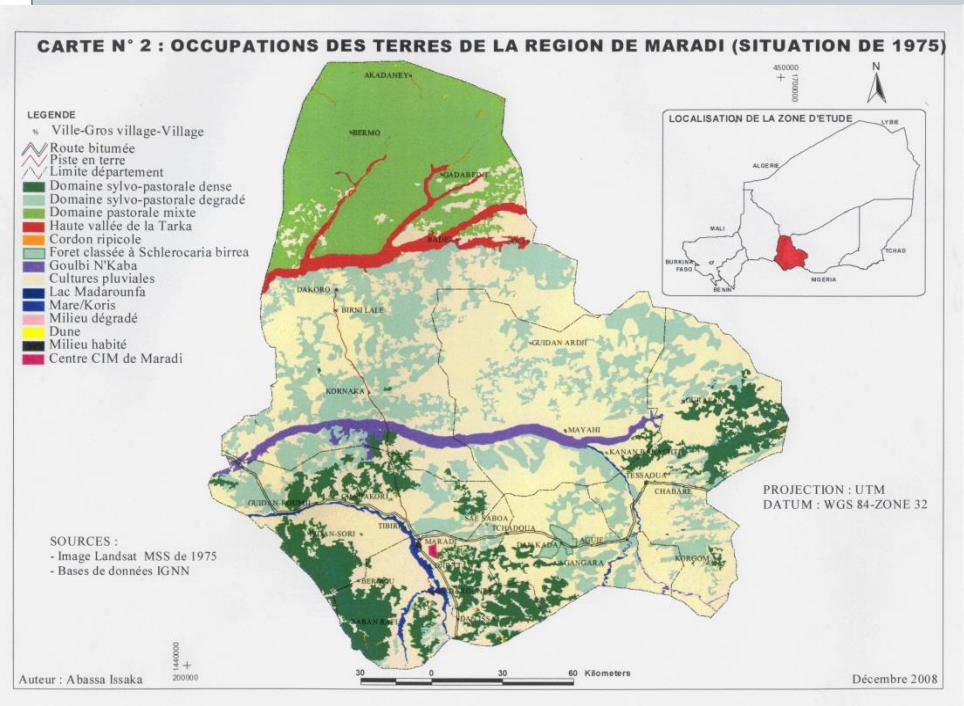


Figure 2: Land occupation of Maradi in 1975

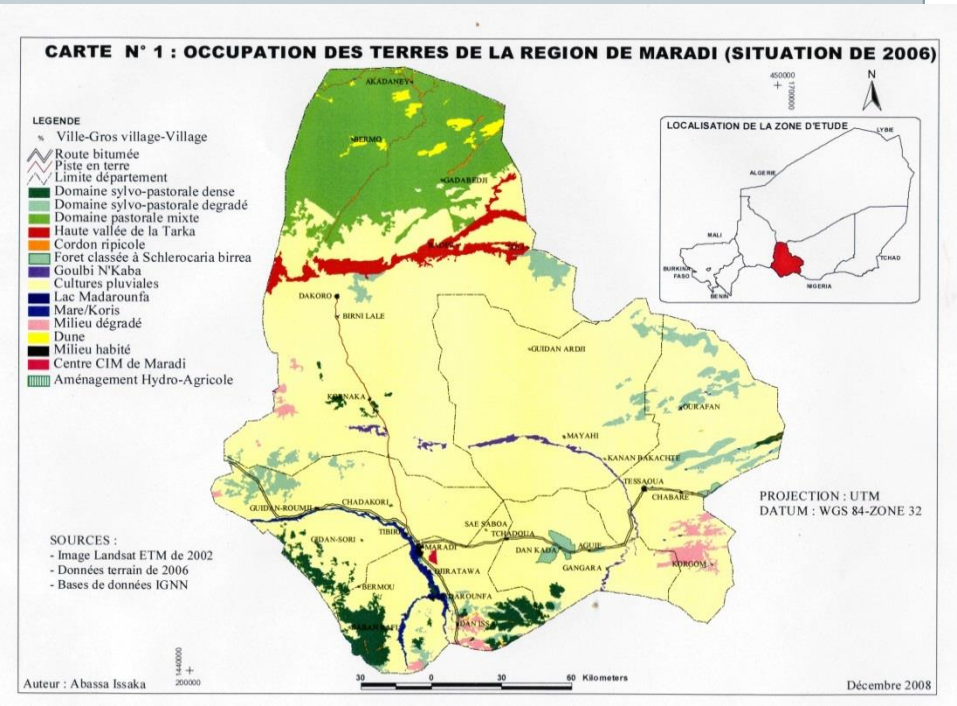


Figure 3: Land occupation of Maradi in 2006

# Research question

What are the indirect and direct socioeconomic impacts of the conservation technics in the Maradi's region ?

- **Objectif:**

Identify the cost and benefit of some conservation technics and create a key method to choose the best practices in function of the context, the socioeconomics factors and the localization

# Material and method

- Socioeconomic tools:
  - Informal and formal interviews;
  - Semi structured questionnary to identify the cost and benefit;
- Observation in South of Maradi:
  - Oumarawa (Gazaoua);
  - Dan Kada (Aguié);
  - Golom  (Gazaoua);
  - Dargué (Guidan Roumdji);
- Large review of litterature

# Material and method

- Operating account: $Oa = R - E$
  - E = Expenditure, depreciated installation fee + maintenance cost;
  - R = Revenu, direct and indirect benefit;
- Profitability rate: $Ri = \text{Oa} / \text{If}$
  - Oa = Operating account;
  - If = depreciated installation fee
- The two factors as been calculated during a current year

# Result and discussion

1. CONSERVATION TECHNICS
2. SOCIOECONOMIC DATA
3. OPERATING ACCOUNT AND PROFITABILITY RATE
4. DICHOTOMIC KEY

# Conservation technics

- Four conservation technics:
  - Half moon;
  - Zai or Tassa;
  - Control the invasive plant;
  - Assisted Natural Regeneration.

Photo 1: Half-moon

Photo 1: Assisted Natural Regeneration

Photo 3: Control the Sida Cordifolia

Photo 2: Zai

# Socioeconomic Data: time and labor force

- Time to renew the conservation technics:
  - Half moon = 1 year
  - Zai = 3 years
  - Control the invasive plant = 5 years
  - Assisted Natural Regeneration = 5 years
- Labor force per hectare:
  - Half moon= 104 man per day per ha (MD/Ha)
  - Zai = 50 MD/ha
  - Control the invasive plant = 70 MD/ha
  - Assisted Natural Regeneration = 2 MD/ha

# Socioeconomics data: Expenditure and structure par hectare

- Expenditure per hectare :
  - Half-moon = 381 euros (installation) + 15 euros (maintenance)
  - Zai = 366 euros (installation) + 0 euro (maintenance)
  - Control the invasive plant = 396 euros (installation) + 15 euros (maintenance)
  - Assisted Natural Regeneration = 11 euros (Installation) + 2 euros (maintenance)
- Technical structure per hectare:
  - Half-moon = 313 per hectare
  - Zai = 10,000 per hectare

# Socioeconomic data: Revenue or benefit

- Half-moon revenue :
  - Biomass = 900 kg/ha*0.66 euro/kg = 595 euros/ha
  - Pastoral seed = 12 kg/ha*0.38 euro/kg = 5 euros/ha (underestimated)
- Zai revenue:
  - Food production = 800 kg/ha* 0.23 euro/kg = 183 euros/ha
  - Agricultural residu = 30 bundles/ha*0.38 euro/bundles = 11 euros/ha (underestimated)
- Control the invasive plant revenue:
  - Biomass = 1,300 kg/ha*0.66 euro/kg = 858 euros/ha
- Assisted Natural Regeneration revenue:
  - Biomass = 81 euros/ha/year
  - Food production = 800 kg/ha*0.23 euro/ha = 183 euros/ha
  - Wood biomass = 63 euros/ha/year

# Operating account and rentability

| Unit per year per hectare (current year) | Revenue | Expenditure | | | Operating account | Profitabiliy rate |
|---|---|---|---|---|---|---|
| | | Installation | Depreciation | Maintenance | | |
| **Half moon** | € 600 | € 381 | € 381 | € 15 | € 204 | 53% |
| **Zai** | € 194 | € 366 | € 122 | € - | € 72 | 20% |
| **Sida Cordifolia** | € 860 | € 396 | € 79 | € 15 | € 766 | 193% |
| **ANR** | € 327 | € 11 | € 2 | € 2 | € 322 | 2820% |

# Dichotomic key

1. Presence of Sida Cordifolia = yes (2) and no (3)
2. ***Control of invasive plant***
3. High available of labor force = yes (5) and no (4)
4. ***Assisted Natural Regeneration (ANR)***
5. Plane area (glacis and plateau) = yes (6) and no (9)
6. Agricultural area = yes (7) and no (8)
7. ***Zai with ANR***
8. ***Zai***
9. Low slope & exposed and crusted soil = yes (10) and no (11)
10. ***Half moon***
11. ***Half moon with « contour » stone bund***

# Conclusion

- Not only one solution
- Revenue didn't integrated all direct and indirect factors:
  - Case of Zai or half moon
  - Fertility and structure of soil
  - Medicinal
- Dichotomic key must be improved with some factors:
  - Soil composition,
  - Geomorhologic area (plateau, slope, glacis, shallows) and
  - Presence of some matter in the aera (organic matter)
- Finally, these methods will be coupled with the other methods: trees plantation, « contour » stone bund, permeable rock dams

# Thanks for your attention

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PROGRAMME NIGER FIDA

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