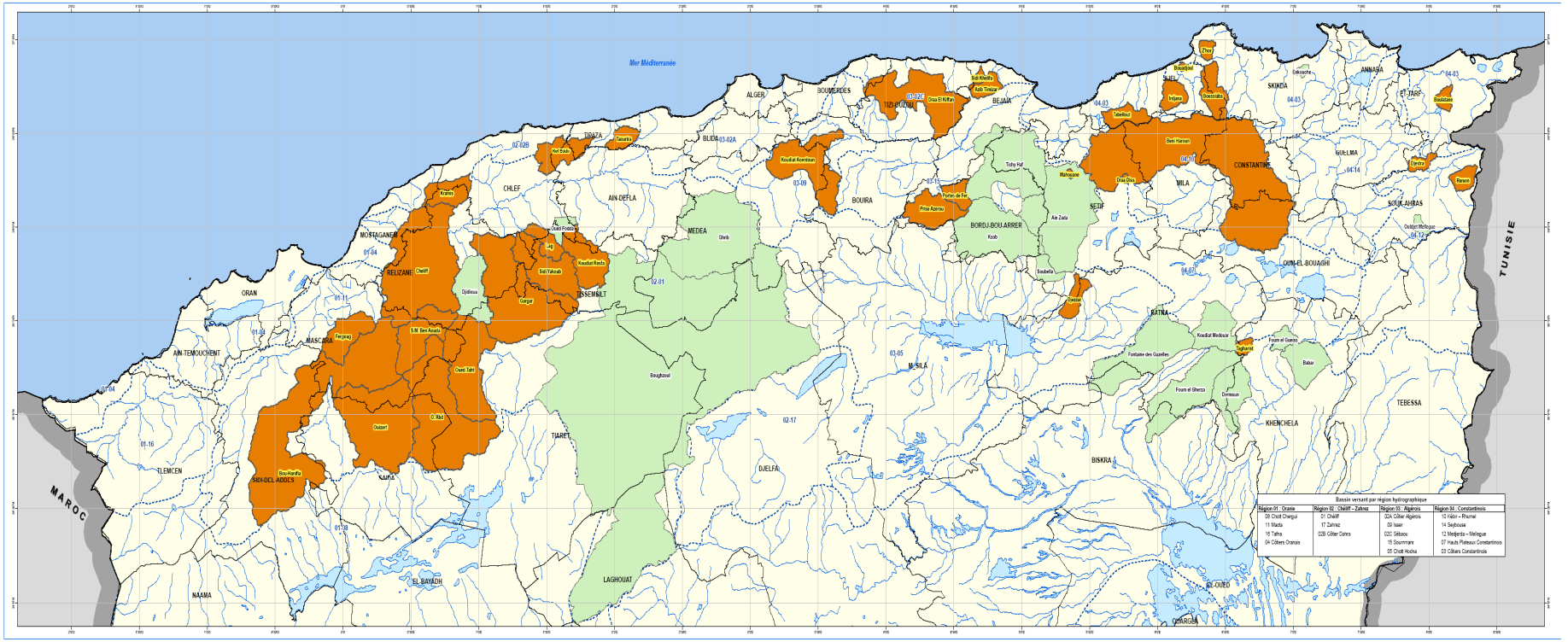
# Effects of the sustainable management of water, biomass and soil fertility (GCES) on agricultural production in mountainous mediterranean Algerian

**By**

**ARABI Mourad**

**Station INRF de recherche Médéa- (Algeria)**
**BP 193 – email :almouraddz@yahoo.fr**

# The Mediterranean region: a fragile environment

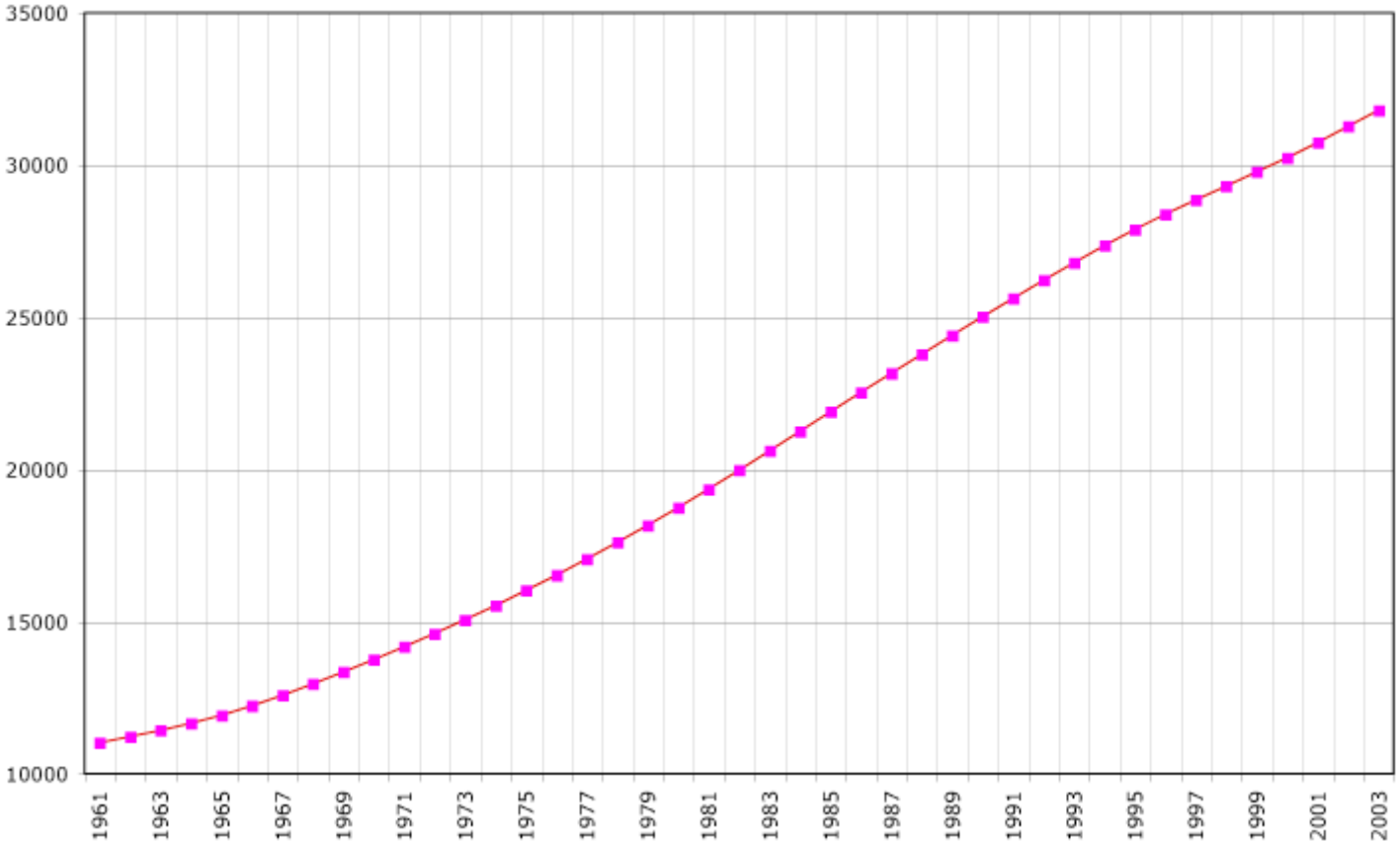



**Légende:**

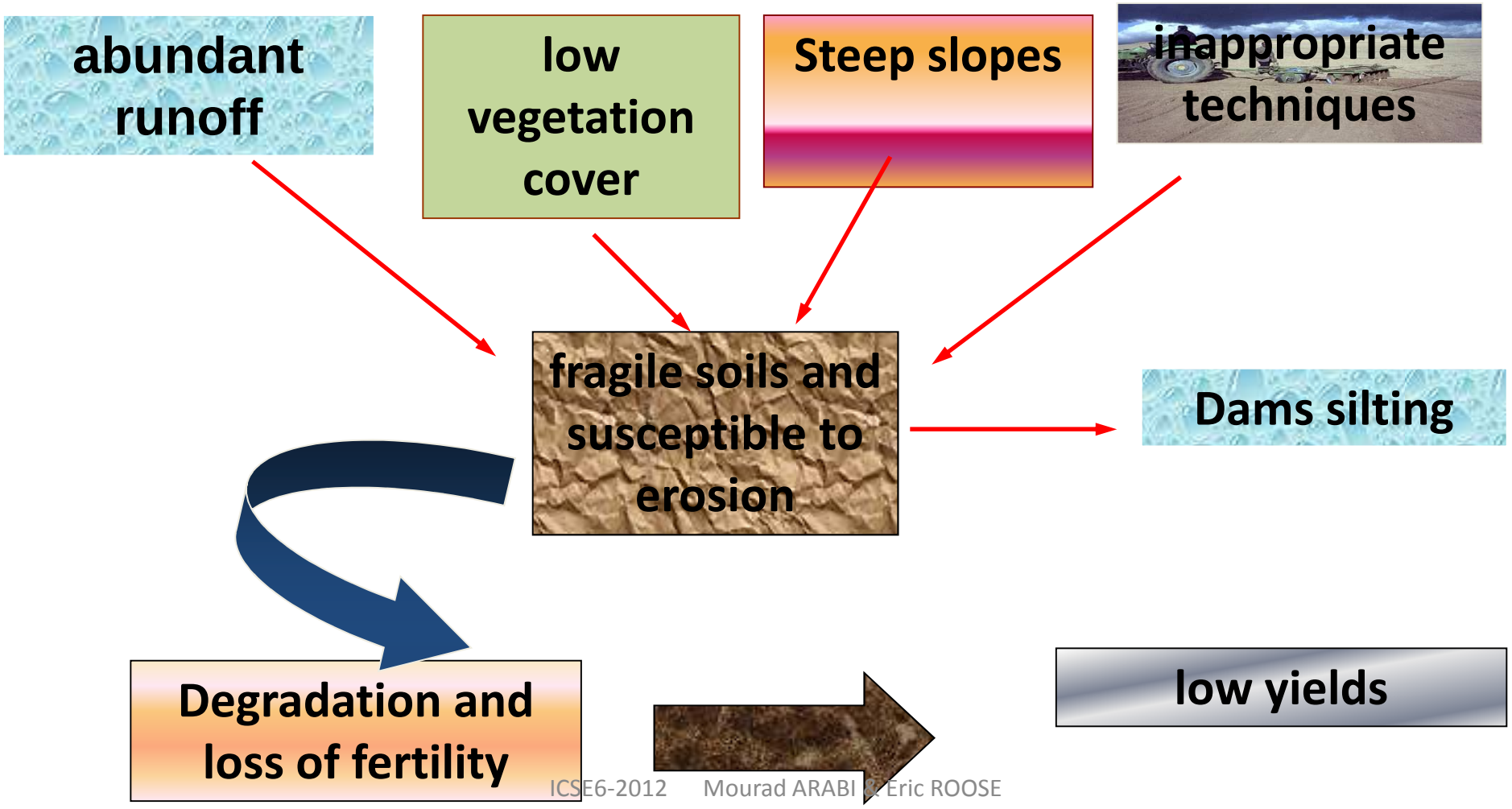
- Ville principale ..... **Alger**
- Limite des bassins versants sous étude par Tecsult
- Région et principaux bassins hydrographiques
  - Numéro de la région hydrographique
  - 01-04 — Numéro des principaux bassins hydrographiques
- Oued
- Chott
- Etudes achevées
- Etudes en cours

**Échelle : 1/1 000 000**

# A population that doubles every 25 years



# AREA


abundant runoff
low vegetation cover
Steep slopes
inappropriate techniques
fragile soils and susceptible to erosion
Dams silting
Degradation and loss of fertility
low yields

# Débordement des CE after 58 mm with Its 35mm/h in 10 mn

# Sol degradation in Chellif river

# Rural hydraulic equipment

**Benches gullied by erosion in the watershed of  Mina River**

# Stands on two different facies

# benches affected by erosion in the basin of the Saf -Saf River .

# Beni Amrane dam: Solid transports very worrying

# The Failure of soil defense and restoration (DRS in french)

## ➔High cost of benches

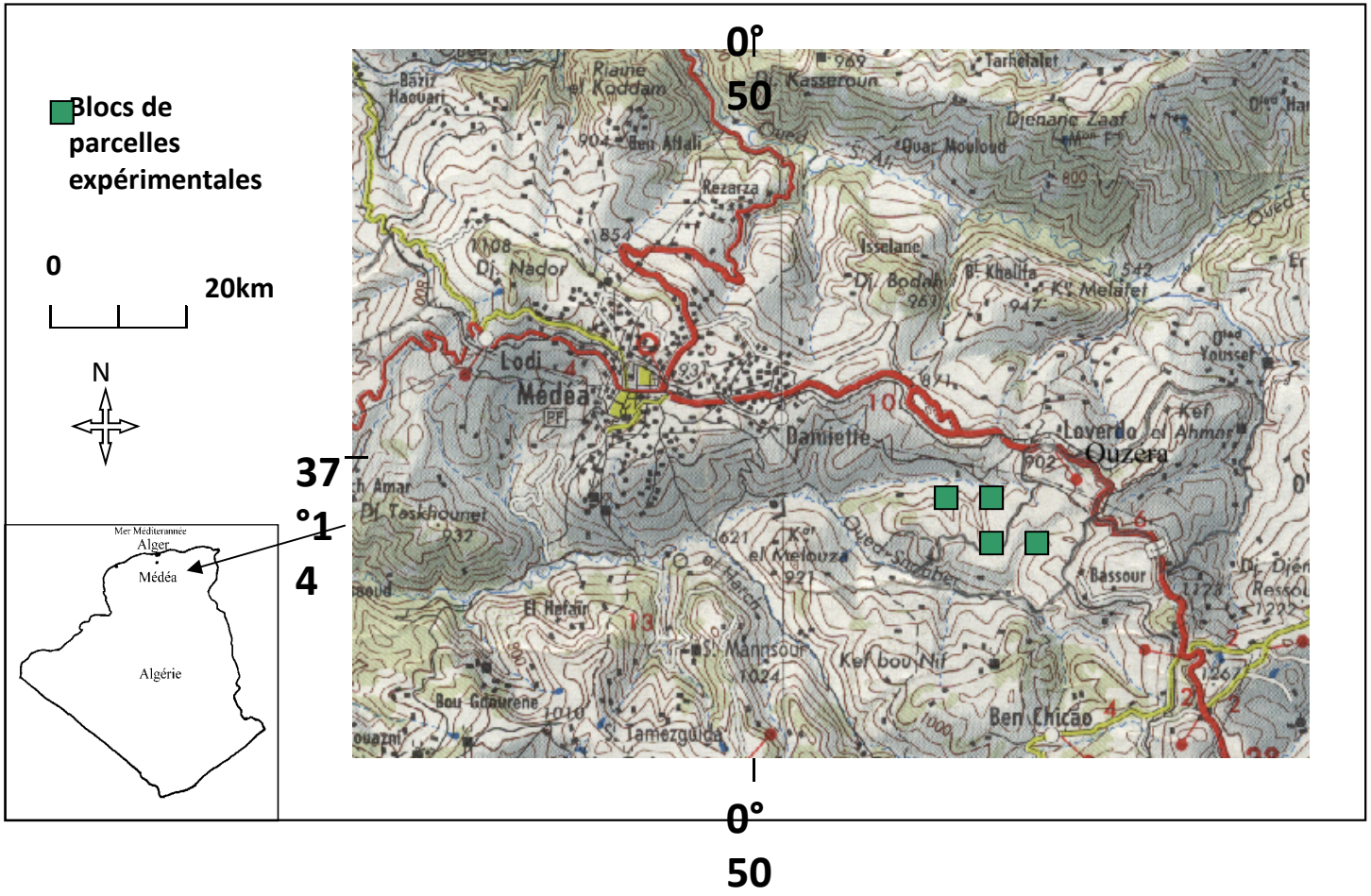
**1 Ha landscaped benches 10000 $ back to 1976**

## ➔Inconclusive results

- **Land continues to deteriorate.**
- **Silt dams increasingly.**
- **And yields hardly improving**

**Hence abandonment of this strategy**

# Study area and experimental plots



# The sustainble management of water, biomass and soil fertility in Médéa (1987-1995)

# standard plot

**Runoff (% of rainfall), erosion (t/ha/yr), yields (t/ha) and net revenue for 15 erosion plots at the INRF station at Ouzera, Algeria.**

| Systems | | Runoff % | | Erosion (t/ha/yr) | Harvest (q/ha/yr) | Net Revenue ($/ha/yr) |
|---|---|---|---|---|---|---|
| | | $K_{aar}$ | $M_{ax}$ kr | | | |
| **Agropastoral** *Vertisol 12%* | **Local** **Improved** | **2,4** **0,9** | **14** **5** | **0,23** **0,05** | **7 w + 2,3 s** **48 w+22 s + 70 b + 27 cr** | **521** **7130** |
| **Sylvopastoral** ***brown calcareous colluvial soil 40%*** | **Degraded** **Reforested** **Diss asture** | **15** **0,6** **1,0** | **25** **2** **4** | **2,0** **0,05** **0,03** | **----** **---** **---** | **80** **package** **package** |
| **Orchard** ***fersiallitic soil 40%*** | **Local** **Improved** | **5,0** **0,7** | **12** **3** | **0,9** **0,1** | **11a** **+ 64 b +33 w+ 19 cr** | **2300** **9830** |
| **Vineyard brown** ***Calcareous soil 40%*** | **Local** **Improved** | **2** **0,2** | **8** **2** | **0,2** **0,01** | **+ 37 b+ /29 w + 4 cr** | **4350** **7842** |

**w = wheat, s = straw, b = bean, cr = other crop residues, a = apricot, g = grape.**

# Conclusions

Improved cover with crop intensification has reduced steadily but moderately runoff and erosion in the field. But what is important is the significant improvement in crop yields and farmers' incomes. If these encouraging results are confirmed, especially in wet years, it should be easy to convince a peasant to adopt new farming practices which are included among the techniques best suited to its environment. These results demonstrate that it is possible to increase crop without damaging the rural environment.


Thank you for your attention