Fishing and climate change in Saloum estuary: Between drought and advancing sea

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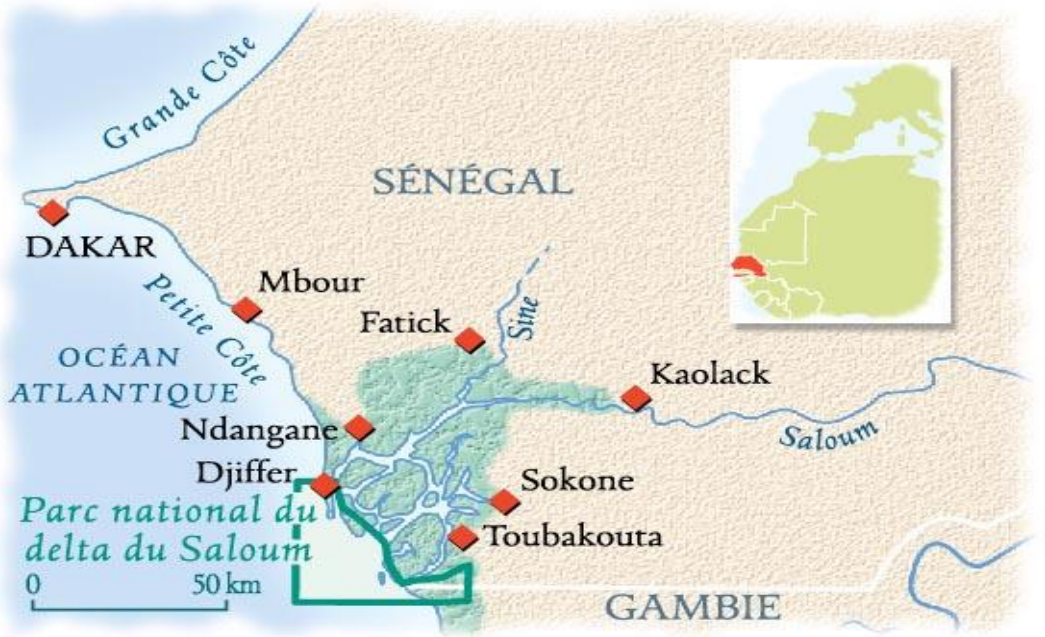
Introduction

- Saloum estuary has experienced major changes for several years;
- Changes caused by a set of complex natural factors which act with variable intensity;
- Main natural factors affecting biodiversity in Saloum are the decreasing rainfall, saltwater intrusion and coastal erosion.



- These factors are also usually influenced by human activities, which are locally affected by changes in the environment and natural resources,
- Through the project PREFACE we tried to:

- analyze the empirical knowledge of local populations on perceived changes on climat factors
- analyze the impacts of these changes on their activities;
- analyze adaptation strategies

Methodology

- Literature review;
- Individual interviews

And

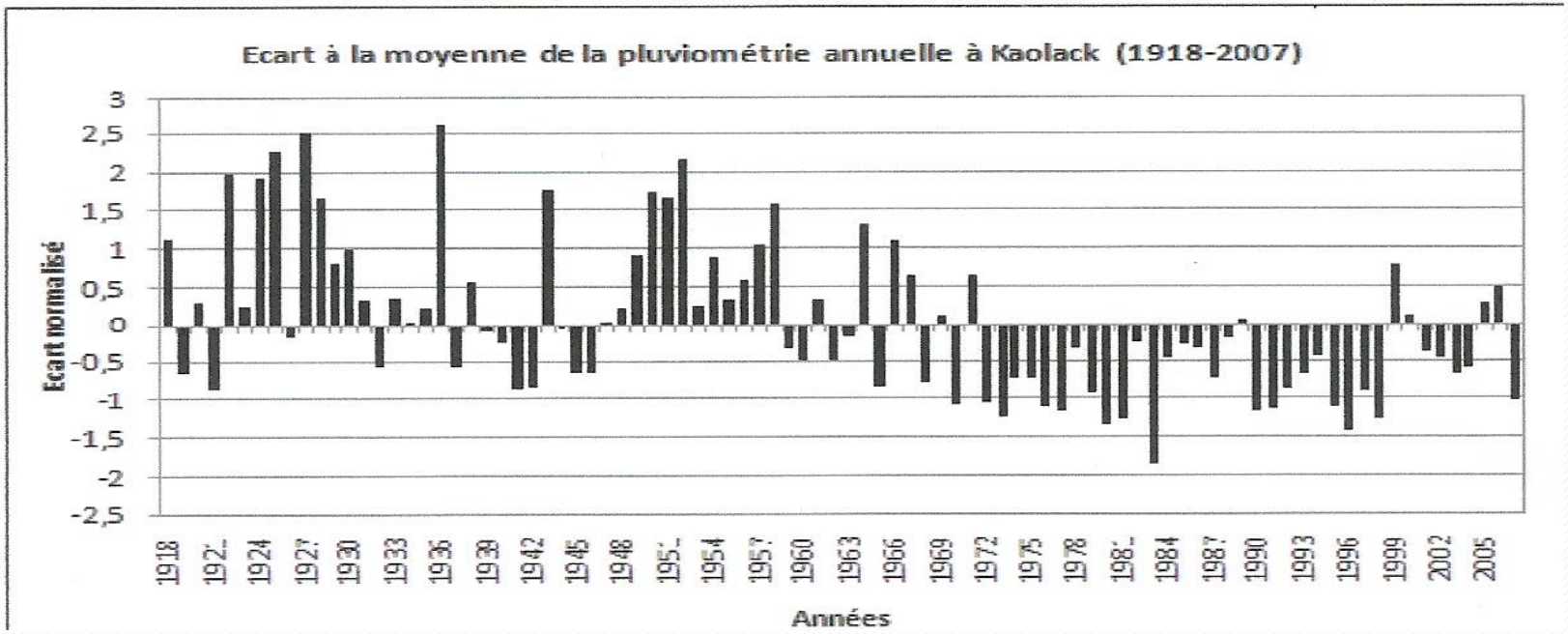
- focus group

with local actor

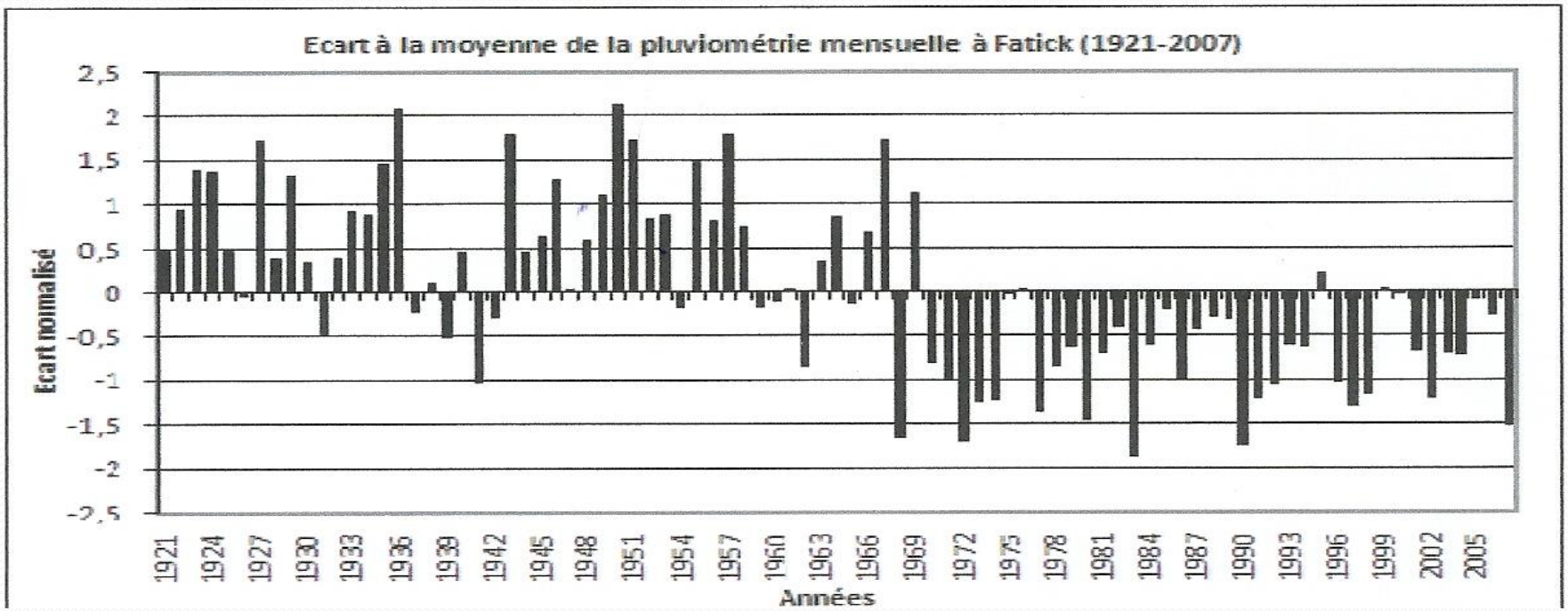
Results

Years of Drought

- Over 60 years in the time series (since 1918) the rainfall are always below average;
- Since 1968 a continuous period of decreased rainfall started with very large deficit phases from 1972 to 1973 and from 1980 to 1983;



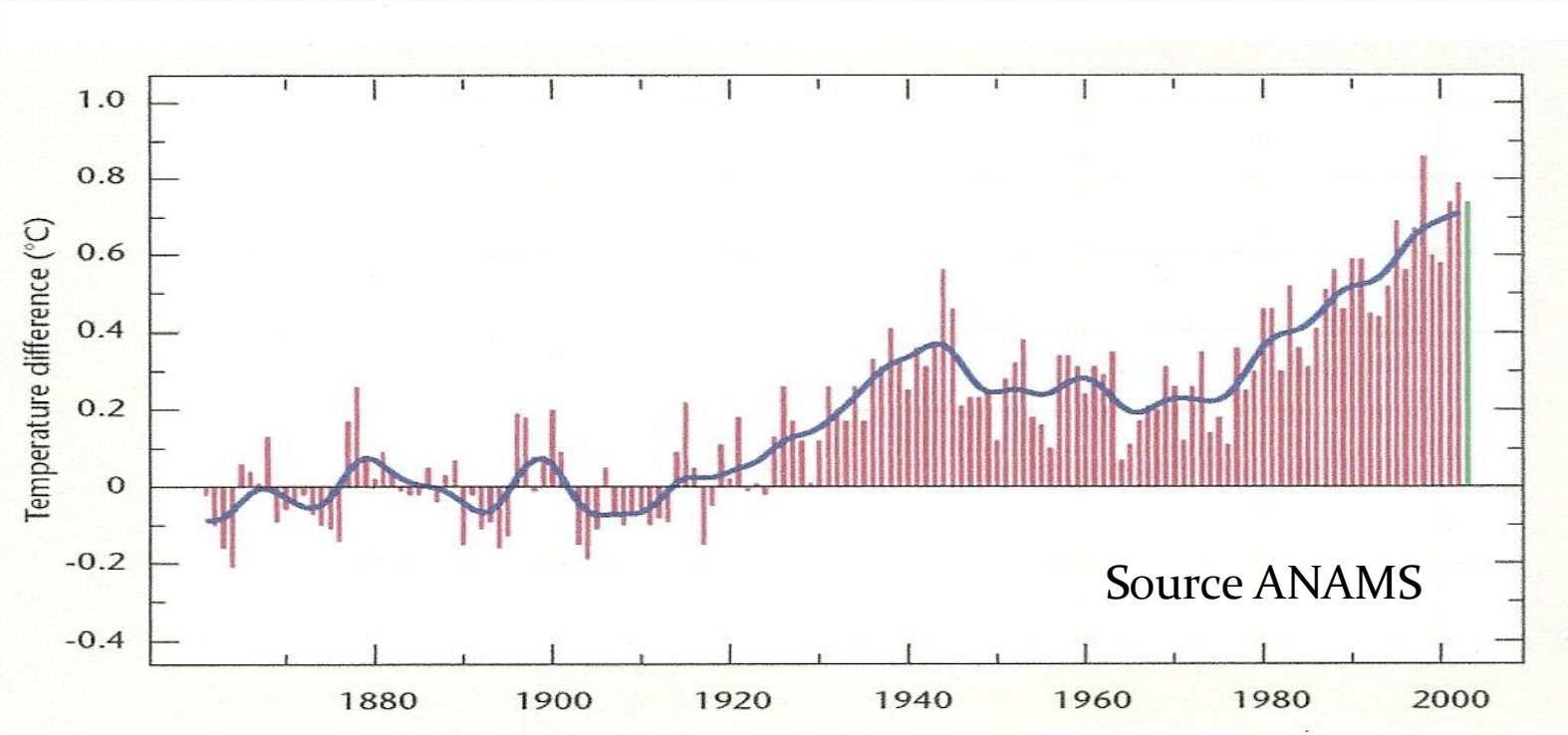
- Comparing the average of the periods 1961-1990 and 1971-2000, confirms the very pronounced deficit in rainfall during the last four decades;
- Relatively normal rainfall conditions are seen between 2000-2010;
- However, there have been large changes in spatial and temporal distribution of rainfall with a marked decrease in duration of the rainy season.



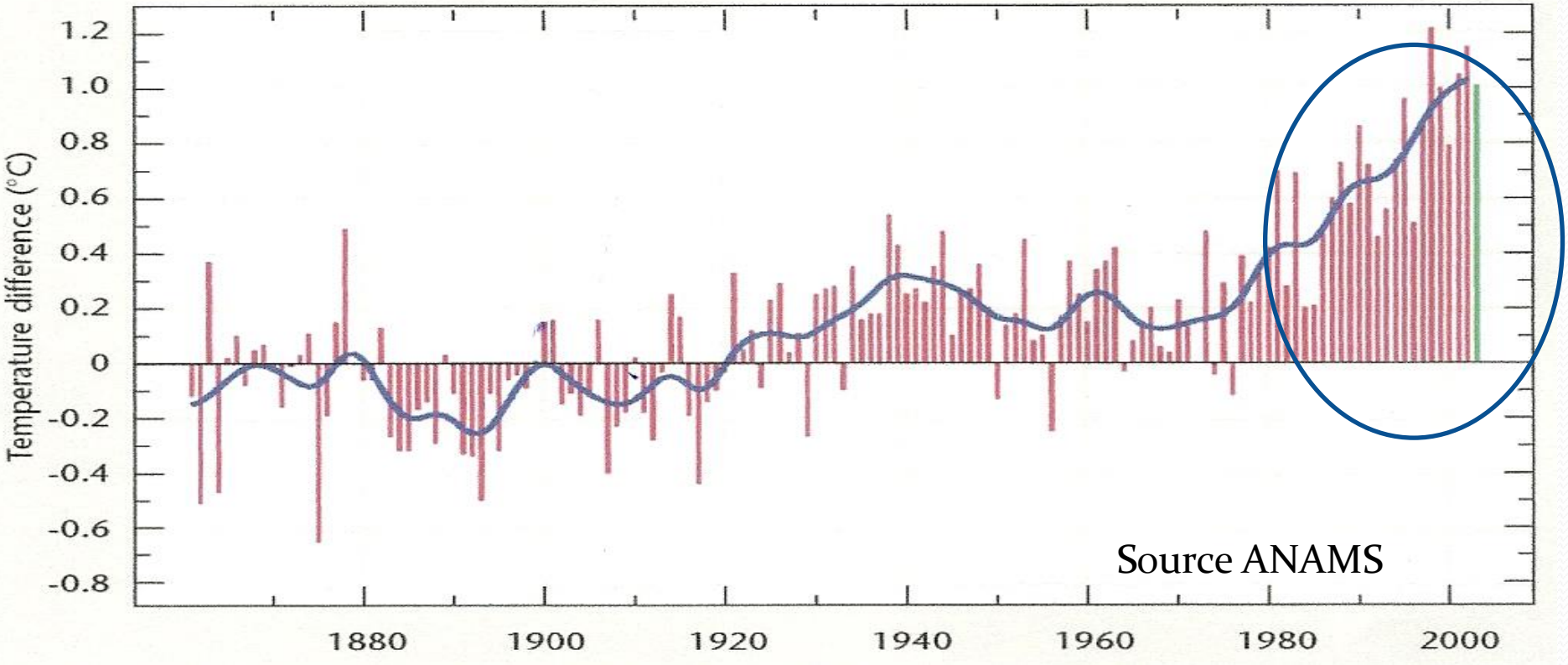
Source ANAMS

Increasing temperatures

- Temperature represents, after rainfall, the most important climate factor;
- Strong increase in global temperatures since the 19th century.

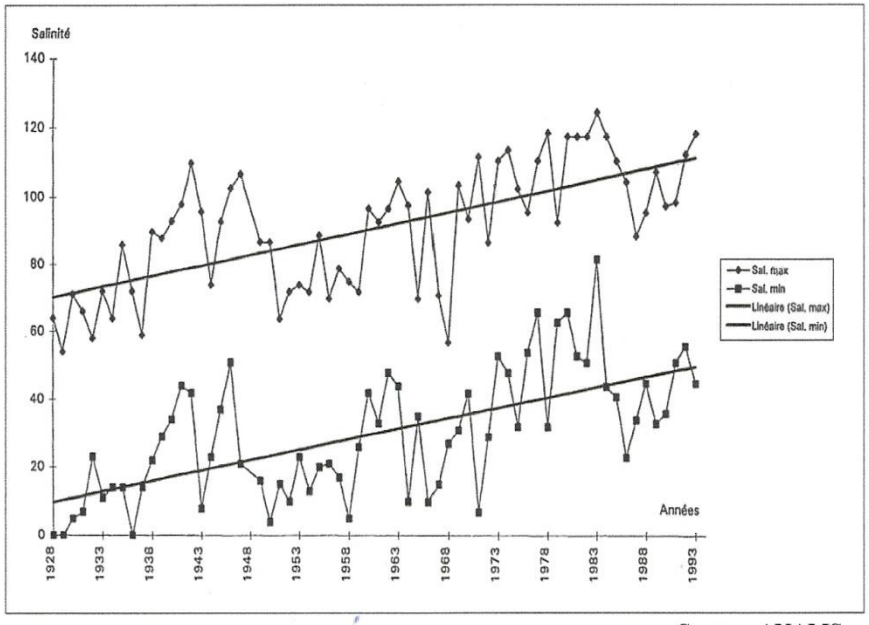


- Temperature data collected in Kaolack show increasingly positive anomalies up to almost 2 ° C, twice the average increase recorded on African continent;
- Rising temperatures recorded from 1980 onwards.



Salinity

- Rivers in the Saloum are heavily influenced by seawater intrusion due to their weak slope;
- The salinization process has greatly increased in recent decades due to long periods of drought and reduced rainfall input.



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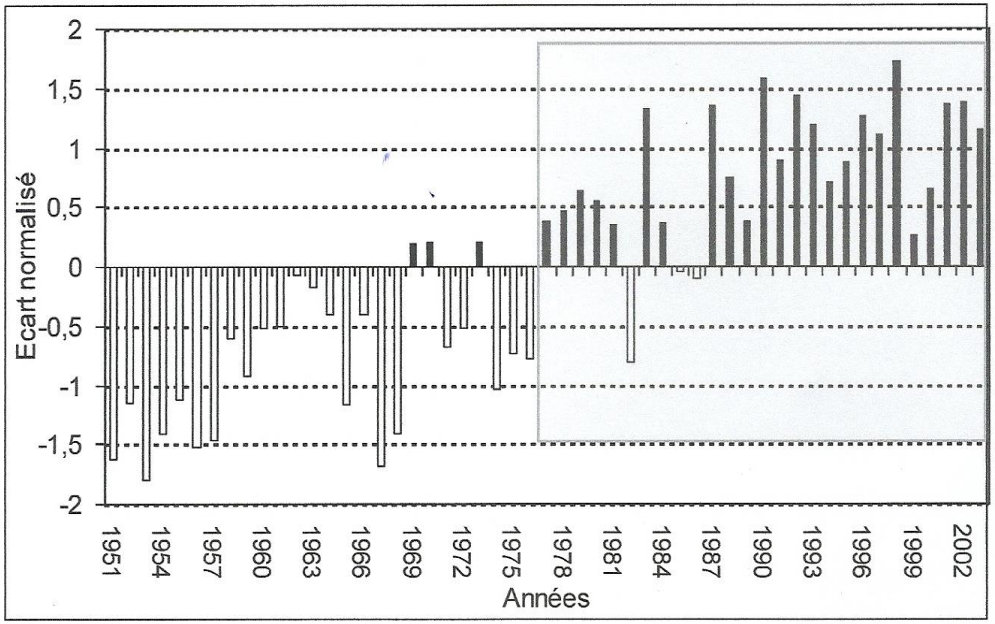


Source: ANAMS

Impacts on human activities

- Deteriorating weather conditions significantly affecting traditional production systems (agriculture and livestock);
- Cultivation of groundnuts and rice are significantly affected by drought and salinization of land;
- Some people have turned exclusively to fishing activity;
- This results in more pressure on the fishery resources in the Saloum;



Impacts on fishing

- Degradation and loss of mangroves affect the breeding, feeding and resting habitat for many marine species;
- Decrease in productivity of estuarine fish species;
- Reduction in size and weight of certain fish species;
- Shrimp fisheries disappear if the salinity increase above 53 ‰ (Rest, 1994), actually this is the case in Saloum nowadays;
- Seasonal variations in total catch and individual shrimp weight is inverse to salinity;
- Sessile species such as shellfish are disappearing in some areas.

The harvest of salt as an adaption strategy of local communities

- Local communities are faced with decrease in fishing opportunities and the loss of arable land;
- Salt harvest could become the main activity of many people;

Feedback of human activities

- However, this activity seems to aggravate the degradation of the ecosystem at the Saloum;
- Salt production aggravates the local salinization on estuary banks;
- Remains of salt on the production area increase the salinity all around the salt production area, after each water renewal.

Aggravated effect on the resource – vicious cycle

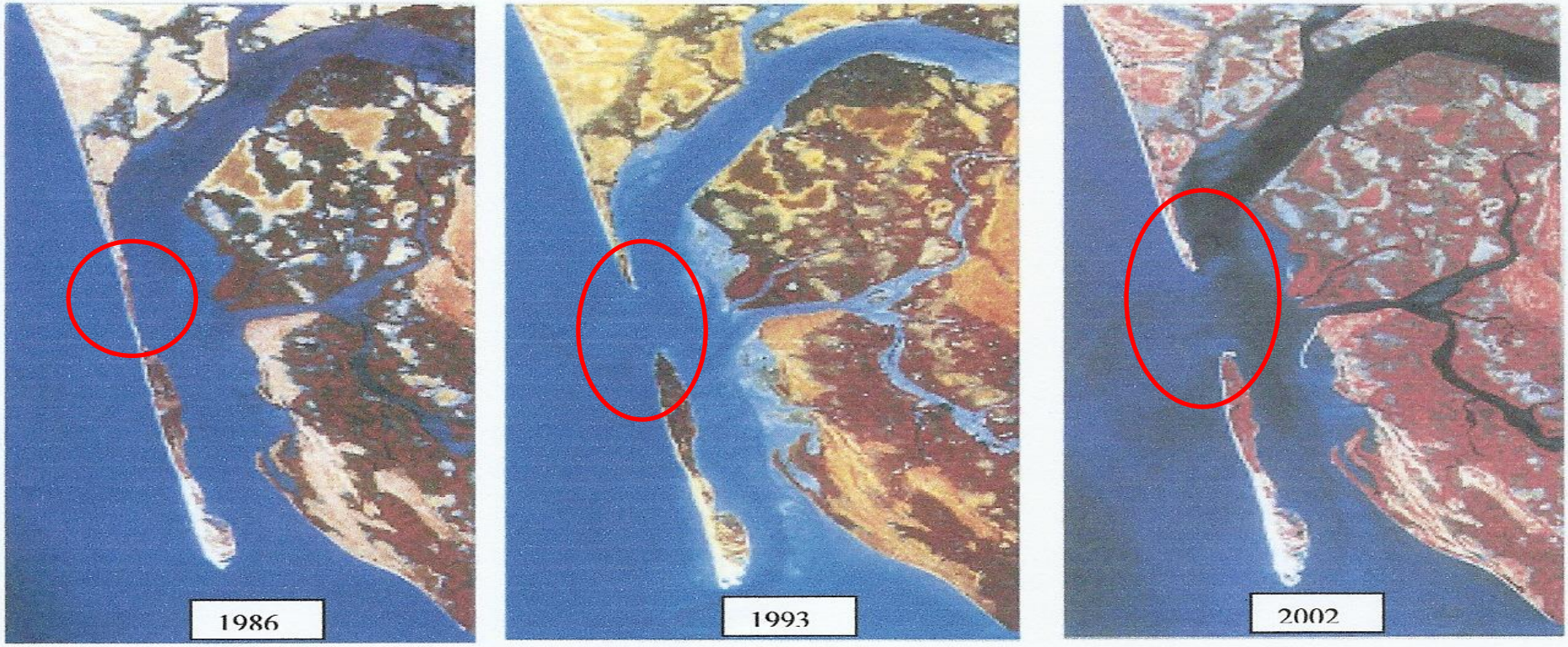
- Increased mortality of fish and other species and degradation of mangroves;
- Mortality of fish increases especially in the dry season;
- Therefore catch decrease during the dry season;
- Only a small period during rainy season with increased fishing leads to increased pressure on the resource.



Effect of change in strength of coastal currents

- Breaking up of the sand spit Sangomar led to increase seawater flows in the Saloum.

Figure 14. Evolution de la pointe de Sangomar de 1986 à 2002



Source : Landsat 1986, 1993, 2002.

- Enlargement has led to erosion, flooding and silting of mud flats;
- But the entry of seawater has reduced the salinity (Saloum is an inverse estuary) in some areas and allowed a recovery of fishing.

Effect on the human activity

- The increase in the coastal currents facilitate the use of drift fishing gears;
- However, it is increasingly difficult to use fixed fishing gears;
- → communities forced to adapt to change fishing technology.

Conclusion

- Impact of climate change is well observed in Saloum;
  - Decreased rainfall;
  - Increase of temperature;
  - Salinization of land and the estuary become inverse;
  - Erosion, seawater inundation and accumulation of mud;
- The main adaptation strategy *i.e*. salt production, aggravates the degradation of coastal habitats;
- Are the current adaptation programs be harmonized with expectations and needs of local communities?;
- This issue is the subject of the second stage of our work in the PREFACE project.


THANK YOU
FOR YOUR
ATTENTION