



# Contribution of GLOBE students' research to the issue of water and agriculture in Ferlo, Senegal



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## Introduction

Ferlo is an almost semi-arid area receiving annually small amounts of poorly controlled precipitation. To provide a solution to this situation, the State of Senegal has been pursuing a water control policy for several decades aimed at making sufficient water available to populations. The evolution of this Senegalese hydraulic policy was achieved in part with the construction of rainwater retention basins including that of Piterki. Lake Guiers is a body of fresh water located in the north of Senegal, in the upper delta of the Senegal River. The lake occupies an area of almost 300 km<sup>2</sup> and contains some 600 million cubic meters of water. Lake Guiers is the largest fresh water reserve in Senegal. In this research we studied rainfall, pH and water temperature and assured breeders and farmers about water quality.

## Research questions

- Are there artificial retention basins with water that can be used permanently during the long dry season ?
- Does the fluctuation of the water level during the dry season and the rainy season affect the pH and temperature of the water in Lake Guiers and the Piterki retention basin ?
- Are the pH and temperature measurement values compatible with the life of herds and crops ?
- Does the investigation of GLOBE/SERVIR-AO clubs have a measurable impact on school life and community life ?

## MATERIALS METHODS

### Materials

- Two study areas: The PITREKI water retention basin and the Lake GUIERS
- The materials used in this research are: pH paper, beachers, gloves, bots, water thermometer, pluviometer, sheet and pencil

### Methods

#### Hydrology protocols

- pH of the water :
- Water temperature
- Precipitations: rainfall
- Market gardening
- Local visits

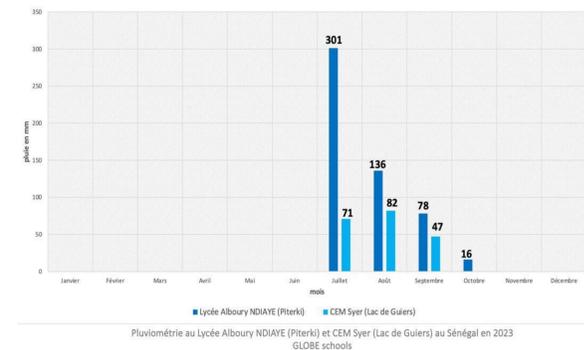


## Results

Document 1 : annual distribution of rainfall at Albouroy Ndiaye (basin Piterki), Linguère and CEM de Syer (lake Guiers), Louga 2023

month	January	February	March	April	May	June	July	August	September	October	November	December
<b>Rainfall (mm) PITERKI 531</b>	0	0	0	0	0	0	301	136	78	16	0	0
<b>Rainfall (mm) GUIERS 200</b>	0	0	0	0	0	0	71	82	47	0	0	0

Document 2 : comparative rainfall histograms of Albouroy Ndiaye (Piterki) and CEM Syer (lac de Guiers), 2023



Document 3 : table of variation of pH and water temperature on the two hydrology sites :

Sites	Average water pH					Average water temperature (°C)				
	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
No relevé										
Date	April 2021	May 2021	June 2021	Nov. 2023	Feb. 2024	April 2021	May 2021	June 2021	Nov. 2023	Feb. 2024
Piterki	7	7	7	6	7	33,3	27,75	28,9	28,5	23,7
Lac de Guiers	6	6	7	7	7	33	30	31,5	31	31

Document 5 : introducing students of Clubs GLOBE/SERVIR-AO to agriculture



## Discussions

The operation of the WENDOU Platform <https://wendou.csesn.dev>, with the support of the SERVIR-AO program and the CSE, allowed learners to know the location of retention basins and ponds at the Ferlo level. The research results showed that the rainy season is short (3 to 4 months) and that the total annual rainfall is low (531 mm in Piterki and 200 mm in Syer). The GLOBE surveys carried out by the establishments showed that pH (6-7) as well as the water temperature (27-33°C) have normal physiological values compatible with the life of farm animals and that of market gardens developed throughout these 2 water points. To verify these hypotheses, the CEM Syer garden located at lake Guiers is watered from an irrigation canal dug by the students themselves. This also allowed us to have introductory experiences in entrepreneurship. We have also started local visits to populations to discuss our GLOBE data and the issues of livestock farming and agriculture with them. In addition, the practical activities of GLOBE as well as the analysis of data in class allowed us to strengthen our level and STEM skills both for boys and girls, accordance with the orientations of the SERVIR-AO program.

## Conclusions

In conclusion, we can highlight the importance of the two sites of this study in resolving the water problem in Ferlo. The values of the physicochemical constants of the water, namely pH and temperature, are compatible with livestock breeding and agriculture throughout the year. The work has a very positive impact in schools and in the community. In perspective, subsequent studies will focus on water transparency and soil protocols including fertilization to better support scientists and the Ferlo landscape community.