

Irrigated Agriculture and Industries: Conflict in the Niayes Coastal Aquifer

Ndiaye Babacar*

*Ecole Supérieure Polytechnique Civil Engineering Department

BP A10 THIES (Senegal, West Africa)

The fragile agro-ecological Niayes area is located on a strip of territory (10 to 30 km wide) along the Senegal Northern littoral. It takes part for 80 to 85 % in the national production of vegetables. The unique water resource available is the Quaternary Sand aquifer. The demand for water to support irrigated agriculture (2.65 liters/s per km²) and Phosphate Industries (1 000 m³/day) has led to seawater intrusion.

The aquifer modeling were achieved with MODFLOW taking into account these contradictory water needs. Piezometric measurements monitored in february 2000 have been used for the calibration phase. The actual seawater position has been estimated for 5 representative profiles using the Ghyben-Herzberg principle.

The results showed that from the center to the northern part, seawater intrusion has reached 500 m to 5.3 km. We simulated several pumping rate for irrigation agriculture and industries in order to propose a maximum pumping capacity that protect this valuable freshwater resource.

Keys Words: Senegal, Water Conflict, Phosphate Industries, Irrigated Agriculture, Seawater Intrusion