IMPACT OF AGRICULTURE AND SOIL TYPE ON INCREASING LEVELS OF NITRATES IN THE WATER OF THE LOWER VALLEY OF THE RIVER NIL (JIJEL)

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Abstract:

The groundwater in the groundwater of the lower valley of the river Nile (Jijel) are increasingly exposed to pollution due to improper use of fertilizers in agriculture. Indeed, application of fertilizers in quantities often exceed the needs of plants leads by leaching and infiltration, the surplus of these products to the water which will then have nitrate levels exceeding the accepted standards of consumption. In order to monitor the spatiotemporal evolution of the pollution, the water services of the wilaya of Jijel were conducted during 2006, with monthly sampling of water in the aquifer for chemical analysis and particularly to assay nitrate. The results of these tests have revealed the persistence throughout the year in areas marked by high concentrations of nitrate in groundwater. The levels of NO-3 vary in a range from 20 to 125 mg / l, but these are the agricultural areas are characterized by high concentrations.

Apart from the improper application of fertilizers, other factors contribute to this pollution among them stress the special role:

- Rainfall particularly important in this region, associated with irrigation water in summer period, plays a major role in the leaching of soil nitrate ions and their diffusion to the water ;
- The lithology and thickness of the ventilated area which the permeability, together with the shallow water-table, facilitates the migration of nitrates into the groundwater. However, the existence of clay intercalations in the aerated zone (and / or roof of the water), slows the flow of pollutants and promotes reducing conditions, transforming nitrate to amonium ions;
- The type of crops grown is also important: each type of plant has its own need nitrogen and its absorption capacity and excess of this element in soil is leached and then leach into the water.

Thus, developing a conservation plane for the hydro-chemical quality of water is imperative and, in this prespective, it is urgent to begin to folow some basic rules of protection, such as :

- Renouncing the use of fertilizer (or similar products) in some stores more vulnerable ;
- Limiting surfaces of crops at risk and avoidance of certain crop rotations ;
- Detailed study of soils to enhance their structural stability with fertilizers recalcifier (especially decalcified soils), with a regular calcium intake by adding sodium carbonate.

Keywords: Agricultural pollution, nitrates, soil, ventilated area, water table, oxidation-reduction.

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