

## **SUMMARY OF THE WATER QUALITY STUDY**

Temporary pools are being characterized by small hydroperiod and limited size. They are therefore very sensitive ecosystems in hydrological pressures as well as in pollution. The main conclusions from the analysis of hydrochemical data are:

### *Hydrochemistry*

- pH in the ponds seems to be controlled from photosynthesis actions, as well as from oxidation activities of organic material. These activities may in short time periods follow each other.
- The concentrations of the main elements (and consequently of the conductivity) in the ponds are a relation, primarily, of the hydrological/hydrogeological state and secondly of the petrological composition of their catchment area. At last, the waste water may have also effect in the accumulation of chlorine ions and sodium, as in the case of the pond of Kourna.
- Due to the mainly rain water fed nature of the ponds of Elaфонisi and Omalos, these ponds present low accumulations of salts. On the contrary, the pond of Kourna presents high geological accumulations of dissolved elements. At last, the ponds of Falasarna present maximum salinity as a result of their ground water supply with subsaline water. This phenomenon in the pond 2 decreases, due to the inflow of surface fresh water.
- Due to the significant variation of the hydrology of the ponds during the year, the ponds present dramatic temporal hydrochemical fluctuations.

### *Water quality (regarding nutrients)*

- The ponds present greater problem regarding ammonia as towards this parameter, their water is characterized, on average, of medium quality. The high accumulations of ammonia are obliged to the mineralization the organic matter (i.e. excrement of sheep in Omalos and in Elaфонisi) or in waste water and in use of fertilizers (i.e. pond of Kourna and Falasarna 1).
- The water quality regarding the nitrates fluctuates from high (Kourna pond), to vary high (Falasarna 2), while at the rest of the ponds the water quality is in good levels.

- The water regarding the nitrates is characterized in good (Kournas, Falasarna 1, Omalos), medium (Elafonisi) and bad state (Falasarna 2).
- At last, regarding the total phosphorus, the ponds are characterized in good state, except of the Kourna pond, which is sorted in medium state.
- Summarizing, except of the Falasarna 2 pond, which is sorted totally in the medium state, all the rest are in good state. The Kourna pond shows the best state, Omalos and Falasarna 1 and the Elafonisi ponds follow, while the Falasarna 2 pond comes next.
- All the ponds present dramatic temporal fluctuations in nutrient concentration. Especially, during the first flooding phenomena, follows the dry period, increased concentrations of ammonia are imputed to the mineralization of the organic matter, as being seen in the case of Omalos. Obviously, rather low disturbances like watering of free grazed livestock (mainly in Omalos and Elafonisi and secondly in lake Kourna) may cause dramatic increase of ammonia and of organic phosphorous, particularly during the time that the ponds dry out. Finally, during the periods of fertilizing the farms, significant increase of nitrates is happening (i.e. Falasarna 2).

Therefore, methods of restoration the water pollution problems in ponds could be:

1. In Falasarna, the input of water from the drainage canal must end in the pond nearby the sea, while in cooperation with the Agricultural Association of Platanos new techniques of decontamination of soils in greenhouses must be promoted (i.e. solar decontamination), as well as the use of new technology fertilizers, that don't create such negative effects in water quality. In actions of promotion the environmental friendly agricultural practices, the LIFE-program will participate (after the necessary license from EU) by the publication of brochures, the organization of meetings/lectures with the direct concerned and the pilot application of decontamination practices in certain green-houses.
2. In Elafonisi, the watering-constructions will reduce the stress from grazing and water supply of sheep and goats from the ponds, while in cooperation with the Municipality of Inachorio, an area will be found for the sediment drawing, in order to stop the uncontrolled excavation of the area around the ponds. The spread of green-houses also should be constrained and for that reason the

above Municipality will propose the creation of a geoenviromental park, which will be protected and will include the important habitats of the site.

3. In Kourna site there is no important problem in the water quality, except of some temporary increased rates of nutrients, which probable come from the waste water of the stores around the lake. Thus, the possibility of manufacturing a sewage system will be discussed with the Municipality of Georgioupoli in order to definitely solve the issue of urban pollution, in the program's frameworks, biodegradation of pollutants solutions will be practiced, as long as the ammonia level remain high.
4. In Omalos, the principal stressing comes from the grazing and particularly from the watering of sheep and goats from the pond. This problem will be minimized by watering constructions and drilling network which will supply with fresh water the network, while as shown above the Omalos pond is not connected to the underground water and therefore the drilling will not cause any negative effect.
5. Furthermore, in Gavdos also there are no important problems in the water quality, except of the watering of sheep and goats which performs great stressing in some sites. Thus, in the specific site, the construction of a watering network and the relevant information of the local population will minimize the problem of the water quality degradation.