



Ecological state of the Romanian Black Sea littoral lacustrine ecosystems

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The author uses the results of his own researches as well as data from specialty literature to assess the ecological state of some typical lacustrine ecosystems considered, about 50 years ago, of major importance by their functions, services and researches, for the human populations in the settlements nearby. Based on this assessment the author recommends a few criteria which can be taken into account when programs of integrated management of these coastal ecosystems are initiated.

The paper focuses on the study cases regarding the following major ecosystems: 1. Razelm-Sinoie Lagoon Complex – tightly linked to the Danube River and Delta systems, 2. Taşaul Lake – interfered in the last two decades by a branch of the Danube River - Black Sea Canal and 3. Techirghiol Lake – for a long time under the sea level, a hyperhaline lake with therapeutic, sapropelic mud, disturbed by huge quantities of freshwaters infiltrated from the irrigation system.

At present, the state of the lacustrine ecosystems at the Romanian Black Sea Coast can be characterized, mainly, by the following aspects:

- Increase in the quantities of nutrients and chemical toxicants;
- Rise in the level and frequency of eutrophication and pollution phenomena;
- Drastic reduction of specific diversity;
- Simplification of communities' structure – biocoenosis homogeneity;
- Decrease in numerical abundance and biomass of benthic populations and consequently, low biofilter power by the decrease of the filter-feeder populations;
- Worsening of the qualitative and the quantitative state of the biological benthic resources;
- Thriving opportunistic forms (e.g. the worms causing sediment bioturbation);
- Invasion by some exotic species, with harmful, unexpected consequences;
- All populations undergo quantitative fluctuations;
- Decrease in the fish population and in the use values of lacustrine assets, with strong impact on the welfare of the human society.

Almost all pressure forms associated with the relationship between the socio-economic systems and the other components of the hierarchy of ecological systems also existed, without exception, in the Romanian coastal part of the Black Sea causing manifest ecological effects on various types of para-marine lacustrine ecosystems. Generally, we consider that the following set of effects is typical of the ecological impact resulted from the dynamics of the socio-economic systems at different time and space scales:

- Erosion of diversity as a result of the loss of species or reduction in the species abundance in the local ecosystems and complex of ecosystems or because of the habitat fragmentation, isolation of valuable natural systems, to which other causes may be added such as desertification and salinization or water freshening;
- Erosion of biological diversity caused by: extinction of higher species and taxa, loss of genetic resources, increase in the number of rare species threatened with extinction and significant reduction in the ethno-cultural diversity;
- Depletion or reduction in the stocks of renewable and non-renewable natural resources;
- Changes in the biogeochemical cycles and in the climatic system, caused by the overloading of the surface waters and soils with nutrients, heavy metals, radio-nuclides, greenhouse gases, particulate or dissolved organic matter and by deterioration of other factors. These changes cause, in their turn, a series of processes similar to chain reactions, which lead to an increasing risk of natural disasters;
- Decrease in the productive and supportive capacity of components which form the foundation of the socio-economic system in the reference zone.

- An alarming increase in the „environmental debt” which endangers the chances of short-term and, especially, long-term development.

The author recommends some solutions in solving the conflict of interest, which consist in a set of measures and actions, as follows:

- identifying synergies or contradictions between actions resulting from various policies;
- improving coordination, cooperation and consultation between all concerned as the basis for sustainable development;
- applying locally the principles of subsidiarity and integration, which underlie European environment and regional planning activities;
- approaching the concept of “ecosystem management”, that is 1. input from all levels; 2. decentralized, with feedbacks; 3. risk-taking; 4. willingness to revisit, revise and admit error; 5. shared vision; 6. across administrative boundary, and 7. partnerships).
- Adopting demonstration projects to ensure good cooperation between the various planning authorities, from local to community level.