BLACK SEA ECOSYSTEM RESEARCH, ENVIRONMENTAL QUALITY MONITORING, REGIONAL CO-OPERATION: ROMANIAN INVOLVEMENTS AND ACHIEVEMENTS (1990-2005)

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Increasing and more integrated attention has been paid at national, regional and international level to environmental issues of the Black Sea since 1990 (e.g. 18, 20, 26, 27, 34); this has been particularly so in ecosystem research (4, 6, 9, 31), development of integrated quality monitoring (10, 13, 14, 16, 30, 32) and strengthening of regional co-operation (5).

Major reviewed international reference documents stressing the need for long-term sustainability of marine environments and wise use of their resources, including the Black Sea, are the UN Convention on the Law of the Sea (UNCLOS), the UNCLOS Report “The marine environment. Are we destroying the Oceans?” which states that “the state of the world’s ocean continues to deteriorate” with special emphasis on destruction of marine environments, pollution and over-exploitation of non-living and living resources, the Agenda 21 (Rio de Janeiro, 1992) and the Johannesburg Summit Report (2002). Other related references are contained in the Washington Declaration on the Protection of the Marine Environment from Land-based Activities, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) and the International Convention on Biodiversity. For example, the Global Environment Facility (UNEP, UNDP, World Bank) established ecosystem-based priorities for transboundary issues. Concrete achievements consisted in the elaboration of its Strategic Action Plan for the Rehabilitation and Protection of the Black Sea / BS-SAP (33), Transboundary Diagnostic Analysis for the Black Sea / BS-TDA (2) and the concept of Large Marine Ecosystems (LMEs) including the Black Sea as No. 62 on LME’s map of World and Linked Watersheds (17).

Scientific research

The oneness of the Black Sea has been emphasised by various authors, starting with N. M. Knipovich (1862-1939) - “unicum hydrobiologicum” (23), G. Antipa (1867-1944) – “... the Black Sea, because of entirely different conditions from those prevailing in other seas represents a real natural laboratory...” (1), or more recently Jane Lubchenco – “The problems of the Black Sea are not so different as elsewhere, but they are more obvious, in part of isolated, contained nature of the Black Sea” (24).

Scientific research around the Black Sea proved that the state of its ecosystem is dramatically altered and related to the hydrographic basins of its major tributary rivers (Danube, Dnieper, Don, Dniester, Bug). These rivers contribute from a five times larger drainage system than the Black Sea surface itself - and from economic activities of over 165 million people -, to the Black Sea’s present ecological state with about 350 km³ of river water every year (8). Half of the Black Sea catchment area is covered by the Danube River basin! Therefore, the responsibility of the health / disease, or ecological equilibrium / disequilibrium
of the Black Sea has to be shared by all 17 riverine countries, not only by the six coastal states. So, the most important contemporary environmental constraints of the Black Sea, still considered to be "the most seriously degraded sea on our planet" (19), consist of severe ecosystem changes in following respects:

- coastal erosion,
- eutrophication / pollution,
- decline of biodiversity,
- loss of living resources,
- degradation of landscapes.

All of them sustain the necessity of developing national Integrated Coastal Zone Management (ICZM) strategies, preferably in compliance with EU previsions and requirements.

These concerns are also exacerbated by the opening of the Rhine – Main – Danube shipping channel in 1992 (15) and first segment of Danube – Black Sea Chilia – Bystroe shipping channel in 2004 (11).

Nevertheless, a most recent review of the National Institute of Marine Research and Development "Grigore Antipa" (NIMRD), Constanta / Romania, revealed the slight but continuous improvement of the state of the N-W Black Sea ecosystem (Romanian coastal waters) during last two decades (28), compared to its earlier status (7, 12, 29, 35).

Environmental quality monitoring

The environmental quality of the Black Sea has to be assessed through an integrated monitoring, by a macrosystemic understanding (Danube – Danube Delta – Black Sea), continuously developed at national and regional level, up to its recognised EU dimension (Water Framework Directive, Bathing Waters Directive, Habitats Directive, Shellfish Directive, etc.). This approach is consistently supported by UNCLOS + Agenda 21, UN Framework Convention on Climate Change, Convention on Biological Diversity, FAO Code of Conduct for Responsible Fisheries, Straddling Stocks Agreement, GPA for the Protection of Marine Environment from Land-based Activities, Integrated Maritime Enforcement and National Integrated Maritime Enforcement.

Permanently monitored parameters around the Black Sea refer to climate change, global warming and sea level rise, coastal erosion, pollution originating in atmosphere and land-based sources, and biodiversity / living resources; usually, nutrients, heavy metals, radionuclides, petroleum hydrocarbons, persistent organic substances, litter and sewage are monitored basin-wide (e.g. 10).

According to the BS-SAP (1996) "the state of the Black Sea environment continues to be a matter of concern due to the ongoing degradation of its ecosystem and the sustainable use of its natural resources" (33); this consideration referred to levels / loads of chemical, oil, micro- (bacterial) and biological pollution.

Both the GEF / Black Sea and Danube conventions increase the countries capacity of monitoring specific ecosystems and assess effects of pollution, identify and assess main land-based (point and non-point) pollution sources, develop Transboundary Diagnostic Analysis (TDA), develop and approve Strategic Action Plans (for the Black Sea and Danube), and identify and develop investment portfolios.


In above mentioned Bucharest Convention, pollution of the marine environment has been defined as “... introduction by man, directly and indirectly of substances or energy into
the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazard to human health hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities”.

The GEF / Black Sea Environmental Programme related Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (1996) states under Assessment and Monitoring of Pollutants, 54. “A Black Sea Monitoring System based upon biological effect measurements and measurements of key contaminants, will be established in compliance with the Bucharest Convention. It will consist of the integration of obligatory national monitoring programmes, to be included in the National Strategic Action Plans, and an independent quality assurance system. It is advised that the Istanbul Commission develop such a quality assurance system through its Advisory Group on Pollution Monitoring and Assessment, by 1998”.

In Romania "NIMRD is the technical operator of the national network for physical, chemical and biological monitoring of national marine and coastal waters and of surveilance of coastal erosion, entitled to submit the Ministry of Waters and Environment Protection proposals for marine environmental regulations" (HG 686 / 1999). Within the National Integrated Monitoring System (NIMS) dating back in 1975, four categories (physical, chemical, biological & micro- biological and biomarkers) of over 30 parameters are monitored in emerged / submerged sediments, sea water and biota. The objectives of NIMS consist of the:

- assessment of state of health of the Black Sea ecosystem,
- assessment of evolution trends of marine environment quality,
- preparation of policies and measures of protection and rehabilitation,
- estimate of effect and efficiency of protection measures,
- check of respecting and framing in standards, agreements and permits issued by environmental authorities,
- fulfillment of government obligations from international programmes and conventions where Romania is signatory or participating,
- adaptation to EU legislation.

**Regional co-operation**

Various Black Sea conventions / declarations / agreements sustain the progressive strengthening of regional co-operation between Black Sea coastal states, other countries and international organizations:

- Black Sea Fishery Convention (1958)
- Convention on the Protection for the Black Sea Against Pollution (Bucharest Convention) (1992)
- Odessa Declaration (1993)
- Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area – ACCOBAMS (Monaco, 1996)
- Ministerial Declaration / Monaco (1998)
- Declaration of Sofia Ministerial Conference (2002)
- Convention on the Fisheries and Management of Black Sea Living Resources (under preparation)
presently closely relating to the International Commission for the Protection of the Danube River (ICPDR).

Numerous national, regional and international organizations contributed to the present development of capacity building / institutional infrastructure in the Black Sea area, mainly CIESM, IOC, UNEP, UNDP, FAO, NATO, CECAF, IAEA, IMO, ESRB, IUHPS, as well as more recently:

• Commission on the Convention for the Protection of the Black Sea Against Pollution (Black Sea Commission)
• Permanent Secretariat of the Commission (Istanbul, 2000)
• GEF / Black Sea Environmental Programme (BSEP)
• Programe Implementation Unit (of BSEP)
  Advisory Groups (6)
  Ad Hoc Working Group on Water Framework Directive (WFD)
• Activities Centres + National Focal Points
  (1) Development of Common Methodologies for Integrated Coastal Zone Management
  (2) Pollution Monitoring Assessment
  (3) Control of Pollution from Land Based Sources
  (4) Conservation of Biological Diversity
  (5) Environmental Aspects of Fisheries and Other Living Resources Management
  (6) Environmental Safety Aspects of Shipping
• International Centre on Water Research in the BSEC region (Kiev / Ukraine)
• International Centre for Black Sea Studies (Athens / Greece)
• IOI – Black Sea Operational Centres (Constanta/Bucharest / Romania and Sevastopol / Ukraine)
• IOC – Regional Black Sea Centre (Varna / Bulgaria)
• MEDCOAST (Ankara / Turkey)
• Balkan Environmental Association (Thessaloniki / Greece)

Concrete achievements / outputs / references consist of Black Sea Environmental Programme (BSEP), BS-SAP, BS-TDA / based on National Black Sea Action Plans, monographs (1, 3, 25), data bases (22), GEF Strategic Partnership Approach / 2001, Partnership Investment Facility, EC / Declaration on Water and Waterrelated Ecosystems in the Wider Danube and Black Sea (DABLASS Task Force (Black Sea Commission + ICPDR).

Relevant ongoing Black Sea related research (pollution), monitoring and networking projects proved successful basin-wide as to exchange of experience, results and information:

• European sea level system (ESEAS)
• Nutrient management in the Danube basin and its impact on the Black Sea (DANUBS)
• Mediterranean and Black Sea Mussel Watch (MED-WATCH)
• Conservation of dolphins in Romanian waters of the Black Sea (LIFE NATURA)
• A regional capacity building and networking programme to upgrade monitoring and forecasting activity in the Black Sea basin (ARENA)
• A Pan-European network for ocean and marine data and information management (SEA-SEARCH)
• International action for sustainability of the Mediterranean and Black Sea environment IASON)
• European lifestyles and marine ecosystems (ELME)

Examples of new projects under preparations are:
• Coastal state and dynamics (COSTAS)
• A supporting programme for capacity building in the Black Sea region towards operational status of oceanographic services (ASCABOS)
• Black Sea Scientific Network (SCENE)
• Science and policy integration for coastal ecosystem sustainability (SPICES)

Romanian involvements and initiatives, with respect to participation in joint programmes / projects, establishments, responsibilities, consist in recent NIMRD commitments to Black Sea environmental issues such as:

- elaboration of Annual reports on the state of marine and coastal environment (chapter 4 of National “Report on the state of environmental factors in Romania” with reference to EU decisional indicators / state, pressure, impact, response since 2004)
- contribution to Management Plan of the Danube River, Danube Delta, hydrographic basin of Dobrudzha and coastal waters (under co-ordination of National Administration “Romanian Waters”)
- elaboration of ICZM related technical-juridical documents (mainly for Ministry of Waters and Environmental Protection)
- National Action Plan for dolphin conservation in coastal waters
- biological component of National Action Plan to minimize the transfer of harmful marine and pathogene organisms in ballast waters in the Black Sea region
- implementation of EU Directives (WFD, Bathing Waters, Habitats, Shellfish)
- implication in assessment of consequences / effects of Chilia – Bystroe Danube – Black Sea shipping channel
- custodian of Marine Reserve 2 Mai – Vama Veche (southern Romanian littoral)
- Vice-presidency of the Agreement on the Conservation of Cetaceans of the Black Sea, Medieterranean Sea and Contiguous Atlantic Area (ACCOBAMS)
- residence of:
  • Romanian National Committee of Oceanography (National Commission of Romania to UNESCO)
  • Permanent Technical Secretariat of National Coastal Zone Committee
  • GEF / Black Sea Environmental Programme
    - Black Sea Regional Activity Centre of Environmental Aspects of Fisheries and Other Marine Living Resources Management
    - 5 National focal points
  • Balkan Environmental Association
    - International Secretariat of South-East Europe
    - International Training Centre of Environmental Professions
  • IOI – Black Sea Operational Centre (until 2004)
- representation of Romania at UNESCO/IOC, CIESM, FAO, CECAF, ICES, ACCOBAMS, a.o. international bodies.

As to the importance of the concept of ICZM (21), the Government of Romania promulgated the Law of Integrated Coastal Zone Management (No. 280 / 2003), including a National Coastal Zone Committee, whose Technical Permanent Secretariat is located at NIMRD as well.

Conclusions

1. Black Sea ecosystem still in advanced state of ecological disequilibrium,
2. Better knowledge of recent changes in Black Sea ecosystem and appropriate management of living resources,
3. Strong need for adequate policies regarding Black Sea environmental monitoring and protection,
4. Need for harmonization of National Black Sea monitoring programmes (according to presently gained / shared experience),
5. Positive achievements in regional co-operation by successfull joint Black Sea related research, monitoring and management projects / programmes,
6. Need for continuing regional co-operation, including Danube riparian countries and international expertise,
7. Need for exchange of environmental data and development of regional databases and networks for scientific use, decision makers and end users.

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