


ECRAN Regional Workshop, WFD 2000/60/EC Eutrophication Albania

Sarajevo, May 2016

*Technical Secretariat of National Water Council
Ministry of Agriculture, Rural Development and Water
Administration*

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Compliance with the WFD 2000/60/EC

- Law 111/2012 on Integrated Water Resources Management
- Respective by laws currently under preparation
- National strategy on integrated water resources management to be finalized by 2016
- River basin management plans (pilot cases) under preparation, 2 river basins
- Nitrates Directive not yet transposed
- WWT Directive to be transposed, on going
- Two main projects on going:
 - **Water Resources and Irrigation – World Bank**
 - **Conservation and protection of three lakes, Skadar, Ohrid and Prespa - GIZ**

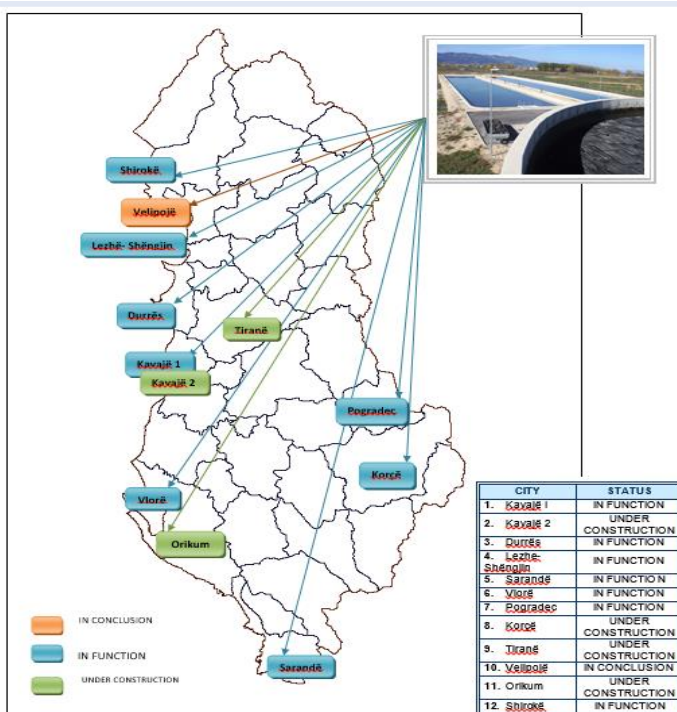
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Monitoring

- Rivers 35 monitoring stations
- Lakes: 3 lakes
- Bathing waters: 71 stations
- Groundwater: 41 stations
- On 2014 adopted the respective DCM for the list of priority substances and quality norms for aquatic environment
- Environmental status report yearly produced by the National Environmental Agency
- Main pollution sources:
 - Waste water untreated and directly discharged
 - Agriculture fertilizers
 - Industrial activity, oil products

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Waste water



CSBL project

GIZ Project on 3 lakes (Albania, Montenegro, Macedonia -> *Data and methodology calibration*)

Lake Skadar: 3 monitoring stations

1. Kalldrun (Sterbeq) station – at coordinates N 42° 11' 44" and E 19° 23' 0.29".

The area here has a considerable agricultural surface which is very adapted for plants such vegetables, tobacco, fodder, viticulture, ether plants, etc.

2. Zogaj station – it is in the southwest part of Albanian part of lake. In Zogaj area the main activities only 2 hotels and 2-3 houses offer accommodation service.

3. Shiroka station – at coordinates N 42° 04' 22.6" and E 19° 24' 13.9". It is in the southern part of Albanian part of lake. There is an urban pressure and discharges.

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CSBL Project

Lake Skadar, monitoring sampling stations

Montenegro

Water body 1: Vuko blato

MNE I Kamenik

- Water body 2: North

MNE III Plavnica

MNE IV Podhum

- Water body 3 South-west

MNE II Virpazar

MNE V Starevo

- Water body 4: Pelagic zone

MNE VI Centre

Albania

Water body 1: Albanian part of Lake Shkodra

AL I Kalldrun

AL II Zogaj

AL III Shiroka

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Sampling Stations



Methodology

Water transparency and **Chlorophyll-a** concentration were used to calculate the Trophic State Index (TSI) (Carlson 1977).

This index is a measure of the state of nutritional enrichment of aquatic ecosystems, reflecting pressures resulting from nutrient (N and P).

Samples for chlorophyll-a analysis were filtered through a 0.45 μm glass fiber filter upon entry to the laboratory, and chlorophyll-a extracted from the filter.

Monitoring was undertaken four times from 2013 – 2014 (April, July, October and February) at three stations.

Phytoplankton samples were taken from a boat in spring (April 2013) and summer (August 2013) to reflect seasonal dynamics of community composition.

Methodology

Variable	Method	Frequency	Equipment
temperature	(APHA-AWA-WPCF, 2010)	every 3 months	Reversing thermometer
transparency	(APHA-AWA-WPCF, 2010)	every 3 months	Secchi disc
pH	ISO 10523:2012	every 3 months	pH-meter WTW pH 197 Glass electrode. No stirring.
Conductivity	ISO 27888:1993	every 3 months	Conductometer
Alkalinity	S-SH 2639-22:1990	every 3 months	Titrimetry
Dissolved Oxygen	(APHA-AWA-WPCF, 2010)	every 3 months	Titrimetry
COD-Mn	S-SH 2639-15	every 3 months	Titrimetry
BOD ₅	(APHA-AWA-WPCF, 2010)	every 3 months	Titrimetry
Chloride	ISO-10304-1:2007	every 3 months	Ion Chromatography
Sulphate	ISO-10304-1:2007	every 3 months	Ion Chromatography
NH ₄ -N	ISO-14911:2003	every 3 months	Ion Chromatography
NO ₂ -N	ISO-10304-1:2007	every 3 months	Ion Chromatography
NO ₃ -N	ISO-10304-1:2007	every 3 months	Ion Chromatography
Phosphate	ISO-10304-1:2007	every 3 months	Ion Chromatography
Total phosphorous	ISO-10304-1:2007	every 3 months	Ion Chromatography
TOC	S SH EN 1484:2000	every 3 months	Analyzer for TC and TN
Pesticides	(APHA-AWA-WPCF, 1998)	every 3 months	Gas Chromatography
Heavv Metals (Cd, Pb)	AAS-Flame	every 3 months	Atomic Absorber

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Eutrophication

Sampling station	Season	TSI	Trophic state
Sterbeq	Spring	31	Oligotrophic
	Summer	42	Mesotrophic
Zogaj	Spring	36	Oligotrophic
	Summer	41	Mesotrophic
Shirokë	Spring	33	Oligotrophic
	Summer	43	Mesotrophic

Total phytoplankton abundance ranged from 4.1×10^4 cells.l⁻¹ at Sterbeq in spring to 3.4×10^5 cells.l⁻¹ at Shirokë in summer.

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Macrophytes

Macrophytes were investigated along belt transects according to methods proposed by the WISER (Water bodies in Europe: Integrative Systems to assess Ecological status and Recovery) project (WISER 2012). The fieldwork was conducted during the period of maximum growth (July–August 2013).

Plants were sampled at different depths from a boat using a double-sided rake with soft rope marked by depth readings (10 samples per one meter depth zone along transects running from the shoreline to the maximum depth of plant growth).

The abundance of each species was estimated on a five-point scale following Melzer (1999), ranging from 1 (very rare) to 5 (abundant or predominant).

All plants sampled were identified to species level using appropriate keys.

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Sampling Protocol

- Sample macrophytes according to the WISER method from the shoreline to the lower vegetation limit, during the period of maximum growth (mid-summer - 20th of July to 15th of August 2013).
- Determine specimens in the field and the laboratory using different floras and keys for vascular macrophytes (Tutin *et al.* 1968-1980, 1993).
- Prepare species lists for all stations (qualitative composition of macrophytes).
- Estimate the abundance of plant species present (quantitative composition of macrophytes)
- Assess the trophic state of the water body based on the macrophyte vegetation.

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Macrophytes

Sampling station	MIS core	Nutrient enrichment	Trophic state
Sterbeq	3,68	High	Eutrophic (level 2)
Zogaj	4,30	Very High	Hypertrophic/Polytrophic (level 3)
Shiroke	3,86	High	Eutrophic (level 2)

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Main Issues

- Untreated wastewater discharge
- Agriculture, livestock and fishing
- Shkodra district is a protected area, IUCN classified;
- The lake is declared Managed Nature reserve area, with 15,719 ha of its surface being are water surface
- The environmental status has changed significantly since 1980.
- The lake is a highly vulnerable ecosystem

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Thank you!!



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