

Nitrogen management in Moldova

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Main political papers in Moldova for N-management

Association agreement with EU. Moldova assumed responsibilities for implementation of the provisions of EU Directives (Nitrate Directive, Water Framework Directive, Waste Water Treatment Directive, Habitat Directive etc). Relevant activities are presented in the plans for social and economic development of the country through implementation of national and sectoral programs

General objectives

- to obtain information about the sources, pathways, stocks, losses and sinks of nutrients in the Prut and Nistru river basins
- to increase understanding of the effects of nutrients (nitrogen, phosphorus and silica) on receiving ecosystems, particularly artificial water bodies
- to improve and combine management tools used to measure and assess nutrients in the Moldavian part of the Danube Basin and Nistru
- to develop scenarios and prognoses for nutrient management and the related impacts on water quality and socio-economic development in country.

Main N-related programs

- River basin management plans. According to the EU WFD such documents were prepared for main rivers (Nistru and Danube). Nutrient pollution is a crosscutting issue and relevant scenarios for nutrient reduction for 25 and 50% were developed. Program of measures includes reconstruction/construction of WWTPs in localities with >2000 PE. It is expected that by 2030 around 80% of population will be connected to the centralized drinking water supply and sewer systems. Actually loads of N from populated areas could be estimated as 1,7 mio PE

Waste water treatment

- Main projects:
 1. Development of the treatment facilities in rural communities. Target 70% of rural population by 2030. expected N reduction from this sector is by 20%
 2. Reconstruction of existed facilities in urban areas (Chisinau, Balti, Orhei etc). Permanent activities with expected N reduction by 10-15% by 2030
 3. Construction of artificial wetlands in rural communities. N reduction could be expected rather low, but cost effectiveness is rather high.
 4. Improvement of the solid waste management through composting of organic matters, separate waste collection etc. N reduction could be estimated 5-10%. Removal of unauthorized dumps

Agricultural activities

- This sector is responsible for around 90% of N reaching water ecosystems
- Main projects: Development of organic farming. Expected N reduction 5-10% by 2030
- Soil erosion reduction measures. Permanent activities through extension and reconstruction of green carcasses on agricultural lands. Erosion reduction is expected for 10-20% and superficial runoff also for 10-20%. Thus total N reduction could be estimated for 10-20%.
- Organic farming. Could lead to the reduction of the mineral fertilizers use for 20-25%. Expected n-reduction could be for 20% from this sector

Nitrogen related political issues

- Implementation of the EU directives
- National action program on social and economic development – 2030
- Climate action plan
- Fertilizers use regulation etc)

Tools for implementation of the nutrient reduction measures

- Optimization of the cross sectoral activities (urban/rural development)
- Regional cooperation
- Joint efforts etc

Actions to do:

- Joint actions on river basin management (nutrient reduction)
- Establishing of the integrated nitrogen (P) targets for relevant river basins

Challenges

- Public awareness
- Governmental discussions and development of relevant decisions on implementation of EU Directives (Nitrate directive, Pollution control, habitat etc)

Need for action

- Implementation of the Association Agreement with EU on the base of relevant EU Directives
- National emission standards
- Critical loads in regard to eutrophication
- Nitrogen surplus/deficit in agriculture
- Strengthening of regional cooperation in regard to joint action in nitrogen reduction actions
- Management plans – climate change/erosion/nutrient reduction/hydromorphology are the cross-cutting issues

Main programs related to the management of the point sources of pollution

law on organic farming, stating that application rate of the nitrogen containing fertilizers should not exceed 170 kg N/ha, and Regulation on prevention of water pollution generating by agricultural activities, approved by GD no. 836 of October 29, 2013 stating that identification of polluted waters due to agricultural activities involves the establishment of (1) surface water, including those used or intended for the abstraction of drinking water, containing or likely to contain not more than 50 mg / l nitrates; and (2) natural waters and other bodies of water which are considered to be eutrophic or which may become eutrophic in the near future and which contain or may contain more than 50 mg / l of nitrates

Expected N-reduction from national programs

- National Strategy on Agriculture and Rural Development for the Period 2014-2020 approved by Government Decision No 409 of June 4, 2014. presumes that by 2030 around 70% of rural population will have access to centralised water supply and sewer systems. Implementation of the program could support N-reduction for 10-15% from point sources

Legislation

- Policies, programs, laws and regulations, including standards regulating maximum admissible concentrations of nutrients in agricultural soil and ambient water, and requirements for wastewater discharges that aim to protect surface water and groundwater against contamination by nutrients.

Nutrients point sources pollution

- For total nitrogen from agglomerations >2000 PE is estimated as 5,3 kt/year
- For phosphorus – 0,9 kt/year

One could also estimate additional pollution with nitrogen from agglomerations <2000 PE as 0,4 kt/year for nitrogen and 0,1 kt/year for phosphorus.

Total loads are estimated as 5,7 kt/year for nitrogen and 0,5 for phosphorus

Number of agglomerations, where treatment facilities are going to be constructed/renovated by 2020 – 10

Generated load - 300000 PE

Nutrient point sources pollution from agriculture

Not clear issues and gaps in this domain should be closed in the future to perform comprehensive and detailed analysis. Anyway estimations show that actually the level of pollution originated from the agglomerations with <2000 PE is total for nitrogen as – 0,4 kt/year and 0,1 kt/year for phosphorus

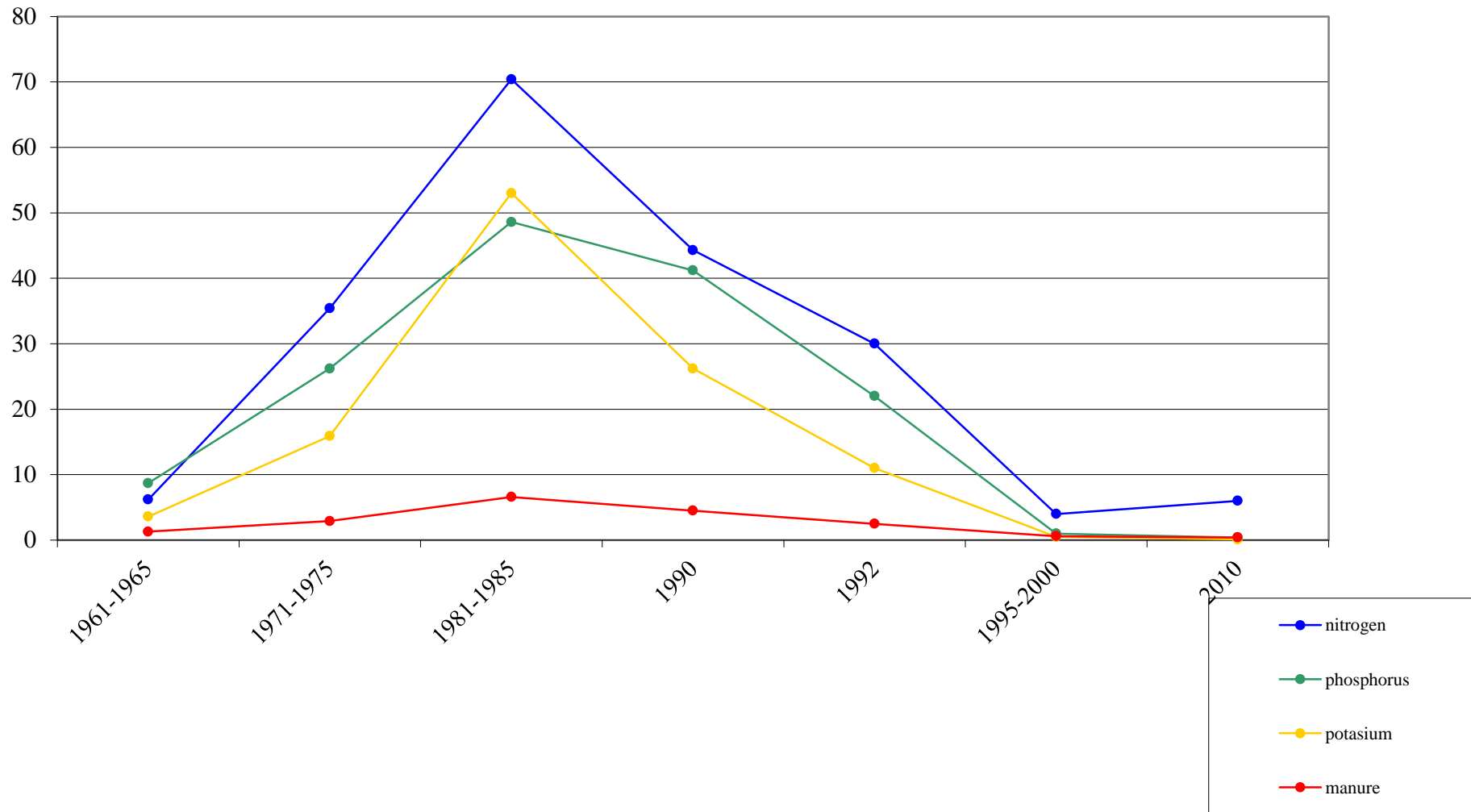
Diffuse nutrient pollution

Diffused source of pollution are presented mainly by widespread of agricultural activities. In addition to it such pollution could be also caused by natural issues such as climate change, flow conditions, soil properties etc. Nutrient input from atmospheric deposition comes mainly outside Moldova and could be estimated as 10-15% for nitrogen and less than 1% for phosphorus from all nutrient loads reaching water ecosystems.

Percentage in changes by 2030 in input parameters of diffuse sources of pollution in comparison with 2015 baseline scenario

- Nitrogen surplus – 18
- Projected livestock – 10
- Fertilizer application – 30
- Area of agricultural land – negative around 2% loss
- NH deposition – negative 10
- Nox deposition - 90

Use of fertilizers in Moldova in kg/ha



Main programs related to agricultural activities

- Recently, Moldova has introduced initiatives to create sustainable agriculture and to enhance the competitiveness of the agro-food sector.
- WB: Agriculture Competitiveness project.
- FAO: Strengthening of sustainable Agriculture in Moldova
- UNDP/GEF: Nutrient Reduction program for the Danube countries

Main conclusion

- The results indicate that the negative impacts of nutrient loads on the status of the water ecosystems in Moldova has significantly changed/reduced since the 1980s. Nutrient levels within the basins of main river basins are relatively low in comparison to other regions/countries of the DRB, but good status of water ecosystems with regard to the requirements of the WFD can only be achieved if future agricultural developments are based on best available practices.