



River restoration projects in the City Lodz - concept, goals, implementation

Kinga Krauze *

European Regional Centre for Ecohydrology
Łódź, Poland

Abstract

The City of Lodz, as many other cities in Europe, suffers due to deterioration of city greens and the urban sprawl. It is driven by economic (decline of textile industry – main driver of the past city development, new investments), societal (place identity, consumption pattern), and demographic (population decrease, migrations) changes on the one hand, and lack of an appropriate planning regulations at different levels of decision making process on the other. That reviled a need for a new strategy of city development. Recent activities have been focused on the remediation of two city river catchments – the Sokolowka and the Ner. They are to provide a backbone and pilot studies for further remediation and revitalization projects. The milestones include: 1) recognizing spatial relationships between factors that influence environmental conditions in study areas, 2) evaluating the inherent capacity of given areas based on their biophysical attributes, 3) assessing current environmental state, 4) defining main trends of changes and associated drivers (policy changes, people's attitudes), 5) identifying social and cultural values and expectations, 6) elaboration of the revitalization plan for demonstration rivers and the recommendations for the city planning in general.

The applied approach is based on two concepts: environmental securability – defined as the potential of an socio-ecological system to provide components of environmental security, and ecohydrology – postulating use of synergies between catchment water cycle and dynamic of its biotic component as management tool, and harmonization of existing and planned hydrotechnical solutions with ecological biotechnologies at all scales.

The aim of a paper is to present our approach to the rehabilitation and revitalization projects in Lodz and their status with special focus on: 1) identification of areas that could catalyze restoration and revitalization processes, 2) defining methods to be applied at those areas at different ecological scales – river bed, valley, catchment 3) incorporating the elaborated

* Corresponding Author: kingak@biol.uni.lodz.pl

measures into development plan of the city toward creation of positive ecological, economic and societal feedbacks. The two cases will be presented in detail – the Sokolowka River remediation plan and the Ner River rehabilitation.

Project 1: the Sokolowka River

The Sokolowka river is one of the Northernmost rivers of Lodz. It is supplied mostly by storm water outlets. The upper and middle channel was regulated by concrete slabs for the purpose of runoff detention, however the middle section is still surrounded by semi-natural vegetation, what makes this section appropriate as a pilot area for analyses best ecohydrological river rehabilitation options. Reservoirs situated in the Sokolowka River receive nutrient-enriched stormwater, which increases their trophic state. Phytoplankton growth and appearance of algae or cyanobacterial blooms may limit ecosystem services (biodiversity, their recreational values) and if toxic, constitute potential hazard to users as possible carcinogens and tumour-promoters. The goal of the project is remediation of the river to support stormwater management, and increase of water retentiveness and biodiversity for better quality of life in the whole catchment.

Concept of renaturation of Sokołówka River –“Sokołówka Valley Park”

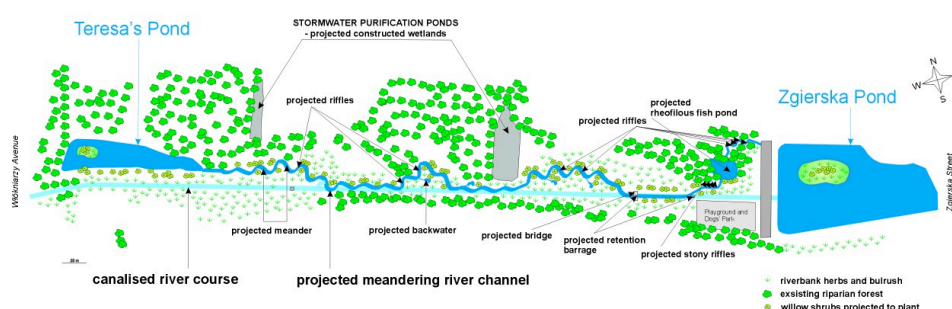


Figure 1. Concept of the remediation of the Sokolowka River and its valley (source: The flyer of the Blue-Green Network by M. Lapinska 2010, www.bluegreen.org.pl)

Project 2: the Ner River

The study area comprises the valley of the Ner River and located in its catchment, the protective zone of the Wastewater Treatment Plant (WWTP). For years the Ner River has (natural flow of about 0,3 m³/s) received municipal and industrial wastewater (average outflow of 2,5 m³/s) from the Lodz agglomeration. It contaminated both the river and its valley with nutrients, heavy metals and organic compounds. The valley is still used for agricultural and recreational purposes and is to maintain city biodiversity, and the river is used by the anglers. That increases a risk of health hazards and lowers environmental security of the area. Series of experiments were conducted in both the valley and WWTP to define the phytotechnological methods that can be implemented to reduce the impact of the past mismanagement. They include conversion of sewage into fertilizer for non-food agricultural use, e.g., in short rotation forestry (energetic willow plantation). Thus the primary goal is development of sewage system management practices that improve quality of environment and create positive socio-economic feedbacks.

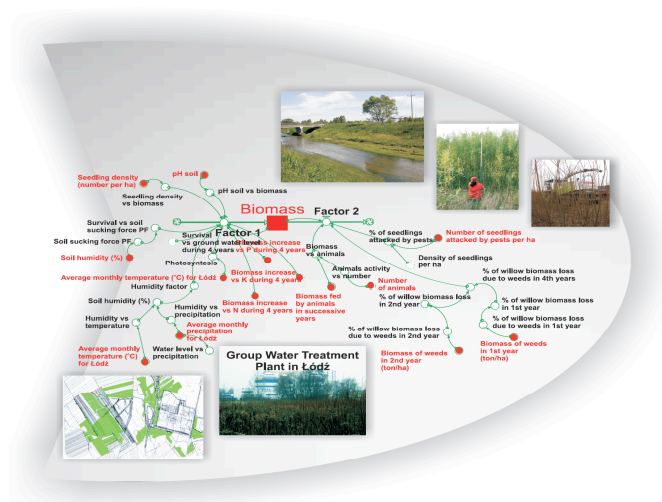


Figure 2. Monitoring and a DSS for sludge management in the Ner River valley (Drobniewska, 2008).