„STUDY OF THE ENERGY POTENTIAL AND THE POSSIBILITIES FOR ITS ECOLOGICAL USE IN THE MIDDLE AND LOWER COURSE OF MARITSA RIVER AND ITS TRIBUTARIES”

Project - BSF - M01 – 22

HydroPro GROUP Green Solutions for Green Life

Maritza river basin

Background

EC WFD 2000/60/EC – Goal: Achievement of good water status until 2015 (2021, 2027)

EC – FD 2007/60/EC – Goal: Reduce floods and coordinate (trans boundary flood risks management until 2015 (2021, 2027)

Directive 2009/28/EO, Promotion of use of energy from renewable sources - Goal: Part of renewable energy to reach 16 % of all energy consumption for Bulgaria in 2020

Potential conflicts

Flood protection measures

Technical infrastructure, correction and protection of rivers, dikes, walls etc. have negative impacts on hydro-morphological of physical-chemical status, biological quality and groundwater dependent ecosystem.

Organic structures, like wood, trees etc. in the river can cause increasing roughness and higher water levels, reduction of cross section dimensions.

Connectivity weirs are barriers for migrating species (fishes, macro zoobentos), bottom stabilization structures

Introduction

Constructions in river beds due to:

Water supply

Energy supply

Irrigation

Flood prevention

Erosion control

Introduction

Consequences of human activity in river beds

Violation of natural river and sediment runoff

Change of the natural habitat of aquatic species

Violation of biological continuity

Significant damage on aquatic ecosystems

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Project

Purposes:

1. Estimation of energy potential in the middle and lower course of Maritza river, incl. the existing inline structures (weirs, drop structures etc.)

2. Development of variants for ecological use of available structures for energy production, minimizing their impact on the ecosystems

3. Development of methodology for fish passage design

4. Development of proposal for changes in River Basin Management Plan of the river in the studied reaches

Project

General tasks:

1. Collection and analysis of the existing hydrological, climatic, topographic and other information for the lower course of Maritza river

2. Generation of GIS Database

3. Assessment of biodiversity In the studied river reach

4. Identification of the location and technical parameters of existing inline structures (weirs etc.)

5. Assessment of theoretical, technical and cost effective energy potential of the entire river reach and of each inline structure

Project

General tasks:

6. Assessment of technical status of the available structures their fish passages (if available)

7. Study and analysis of the current experience in fish passage design, construction and maintenance

8. Experimental tests of flow kinematics and overall hydraulic performance of fish passages

9. Methodology for design of fish passages

Fish passages

Necesity of:

Establishment of interdisciplinary teams with experts in : ecology, biology, hydraulics, hydrology etc.

Detailed study of rivers:

Condition, existing structures, impact on the existing ecosystems and possibilities for their restoration

Implementation and further development of international experience, taking into account the local conditions

Ratification of unified standards in the country, which serves as a ground for design, construction and maintenance of fish passages

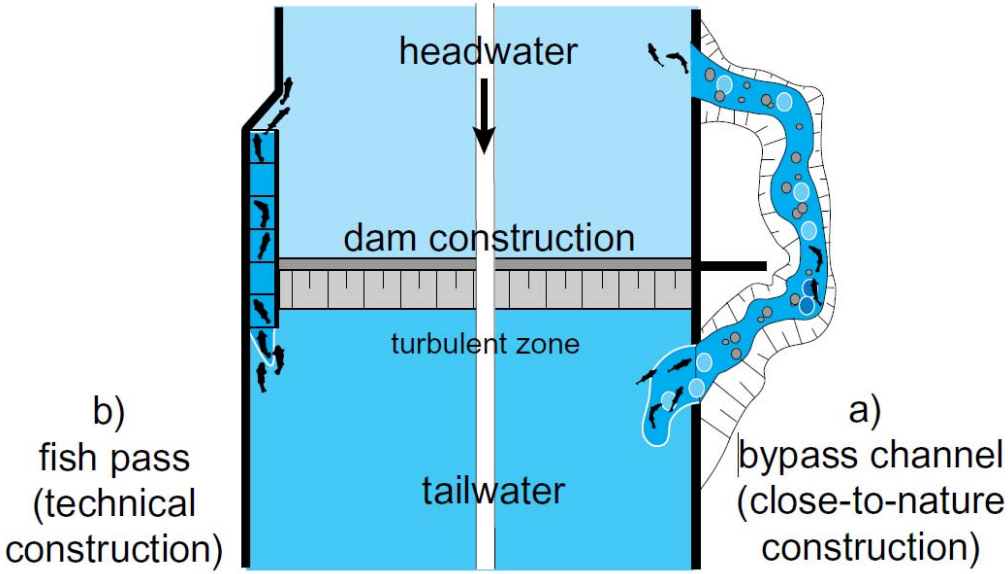
Fish passages

Structures for biological continuity

Bulgarian experience

Foreign experience

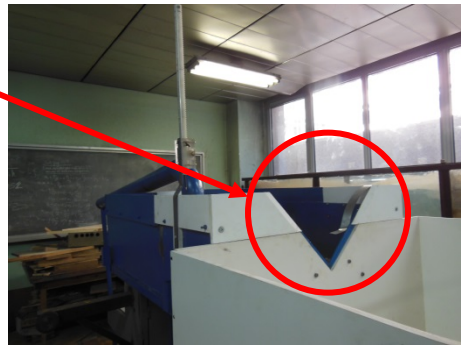
Classification



Hydraulic model tests

Technical construction

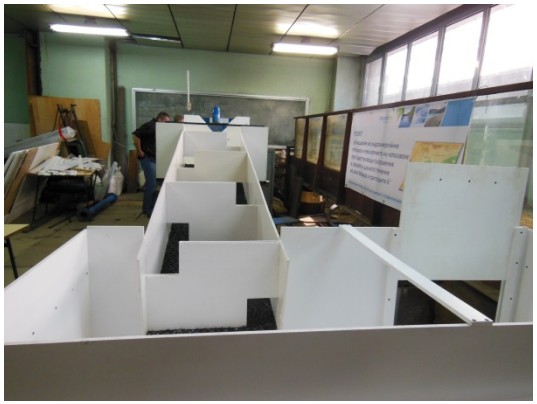
Measuring device



micro ADV – velocity measurements

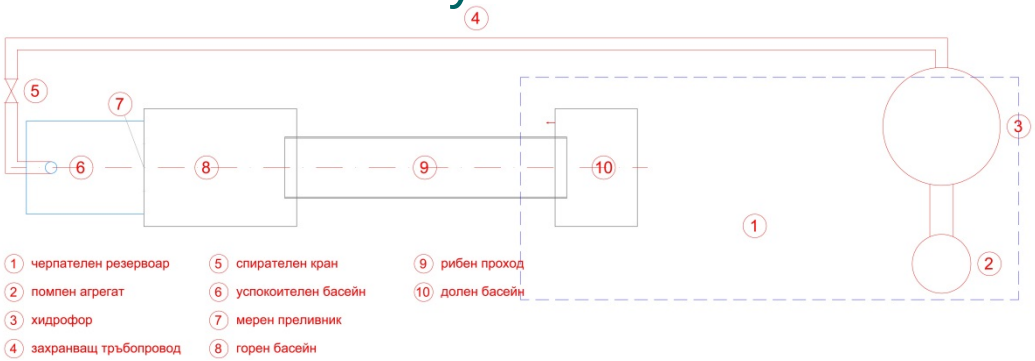
Artificial roughness

Downstream section

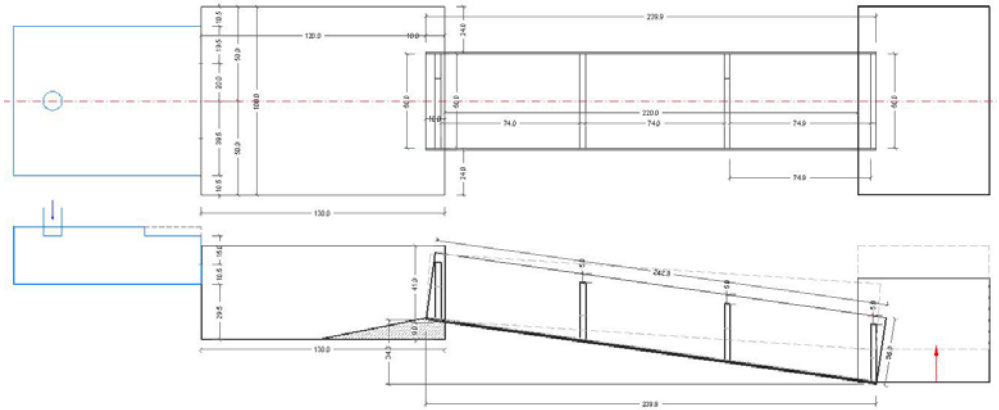


Model study

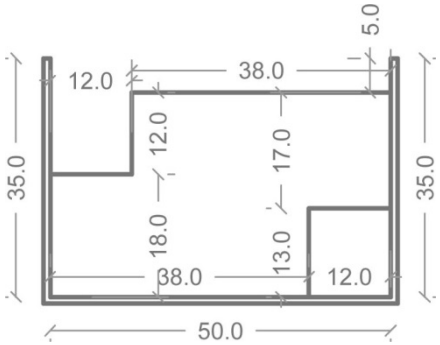
Model layout



model



Notch and bottom orifice



Thank you for your attention!