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**Ecological flow estimation in Latvian – Lithuanian
Transboundary river basins (ECOFLOW), LLI-249**

**RECOMMENDATIONS
FOR AMENDMENTS TO WATER
LEGISLATION**



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Contents

| | |
|--|-----------|
| 1. INTRODUCTION | 4 |
| 2. EU REQUIREMENTS FOR ECOLOGICAL STATUS OF WATERBODIES AND TO E-FLOW | 5 |
| 3. REVIEW OF NATIONAL LEGISLATION IN THE FIELD OF WATER USES | 7 |
| 3.1. LATVIA..... | 7 |
| 3.2 LITHUANIA..... | 9 |
| 4. RECOMMENDATIONS FOR AMENDMENTS TO NATIONAL WATER LEGISLATION | 11 |
| 5. REFERENCES | 14 |

ABBREVIATIONS

| | |
|----------------|---|
| CIS | Common Implementation Strategy |
| CM | Cabinet of Ministries |
| E-Flow | Ecological flow |
| ECOSTAT | WFD CIS working group on Ecological Status |
| EU | European Union |
| HMWB | Heavily Modified Water Body |
| HPP | Hydropower Plant |
| LBN | Latvian Construction Standards (Latvijas Būvnormatīvas) |
| MS | Member States |
| Q min 30d. | Low flow 30-days minimum water discharge |
| Q _E | Environmental water discharge |
| WB | Water body |
| WFD | Water Framework Directive |

1. INTRODUCTION

Recommendations for amendments to Latvian and Lithuanian legislation in the field of water uses are prepared in the frame work of ECOFLOW project (2017-2019).

Investigations provided in 2017 included analysis of different national policy acts regarding use of water resources and comparison of those documents with EU requirements. Results of these researches are presented in the reports “Review of national legislation” [DeliverableT1.2.1 Review national legislation.pdf](#).

Results of river habitat measurements and modelling that have been carried out in 10 rivers in Venta and Lielupe River Basin Districts downstream of 11 HPPs, allow to recommend some amendments to national legislation in the field of water uses, particularly small HPP operation.

2. EU REQUIREMENTS FOR ECOLOGICAL STATUS OF WATERBODIES AND TO E-FLOW

In accordance with WFD [1] requirements MSs have to provide the “good” ecological status of water bodies by 2021 or 2027. The most widespread pressure on ecological status in the EU originates from hydromorphological pressures on water bodies which affect about 40% of the WBs, like dams for hydropower or embankments for flood protection.

The **Blueprint to Safeguard Europe's Water Resources** [2] reminds about known ways to address these pressures. There is a need in many EU river basins to put quantitative water management on a more solid foundation: namely to identify the **ecological flow**, i.e. the amount of water required for aquatic ecosystems to continue to thrive and provide the services people rely upon. Fundamental to this is the recognition that water quality and quantity are inevitably related with the concept of “good status”.

WFD CIS Guidance Document No. 31 “Ecological flows in the implementation of the Water Framework Directive” [3] declares that ecological flow is considered within the context of the WFD as “hydrological regime consistent with the achievement of the environmental objectives”. These environmental objectives refer to:

- non-deterioration of the existing status;
- achievement of good ecological status;
- compliance with standards and objectives for protected areas, including the ones designated for the protection of habitats and species, where status of water is an important factor for their protection.

Ecological status of a river water body includes three components (quality elements):

- hydrological regime;
- river continuity; and
- morphological conditions.

Ecological flow is a necessary component of hydrological regime and hence of the hydromorphological quality that has, according to the WFD, to be consistent with the achievement of good status for the biological quality elements.

If protected areas designated under the Birds and the Habitats Directives are present in a water body, hydrological regime needed for the protection of habitats and species must be achieved.

Guidance Document No. 31 recommends that national legislative frameworks with regard to the definition of E-flow include:

1. a conceptual definition of Ecological flow with a clear reference to both flow quantity and dynamics and to their consistency with the environmental objectives required under the WFD;
2. Ecological flow as a binding requirement where relevant:
 - for all water uses (in particular abstraction, impoundment, flow regulation) in their different characteristics (surface and groundwater, reversible and irreversible, periodic and permanent),
 - in the strategic planning for development of impacting uses,
 - in the delivery of new permits,
 - in the review of existing water rights;
3. clear responsibility for validating the definition of Ecological flow and the inspection of its achievement;
4. penal provisions when regulatory requirements are breached.

WFD CIS Guidance Document No. 34 “Guidance document on the application of water balances for supporting the implementation of the WFD” [6] with regard to the concept of Ecological flow reminds that the percentage of the mean annual river flow or baseflow that needs to be allocated to freshwater-dependent ecosystems to maintain them in good ecological status should consider the temporal variability of the environmental demand and the seasonal natural variations, to account for the functioning of river ecosystems.

ECOSTAT report “On common understanding of using mitigation measures for reaching Good Ecological Potential for heavily modified water bodies impacted by water storage” [7] stresses that, taking into account the provisions of the WFD CIS Guidance Document No. 4 [8] on HMWB designation, physical alterations due to **small scale hydropower** (without relatively large water storage dams) **normally do not fulfil the requirements for HMWB designation.**

3. REVIEW OF NATIONAL LEGISLATION IN THE FIELD OF WATER USES

3.1. LATVIA

Latvian **Water Management Law** [9] includes a requirement transposed from the WFD, to maintain and improve the status of all surface water bodies, with an aim to achieve good ecological and chemical status of natural surface water bodies, and good ecological potential and good chemical status of artificial and heavily modified water bodies.

Regulation No. 736 (23.12.2003) of the CM of Latvia “Regulations on water resources use permits” [10] does not include precise instructions on the estimation of ecological flow. But it states that water use permit for the operation of hydrotechnical constructions must include the values of the minimum guaranteed flow and of the ecological flow, as well as technical prerequisites necessary to ensure these values.

Regulation No. 1014 (27.12.2005) of the CM of Latvia “Procedure for elaboration of water body management regulations” [11] declare the necessity to elaborate water body management regulations that must include, *inter alia*, the values of the minimum guaranteed flow (defined as “Q min 30d. 95%”) and the ecological flow, as well as a description of technical prerequisites necessary to ensure these flow amounts in the water body.

Regulation No. 329 (30.06.2015) of the CM of Latvia “On the construction standard LBN 224-15” [12] requires downstream HPP reservoir during low-flow periods technically ensured:

- minimum guaranteed flow calculated as minimum summer 30-days period low flow with 95% probability;
- in the watercourses especially important for fishery, based on the results of fishery research expertise, Regional Environmental Board may define higher (up to minimum summer 30-days period low flow with 50% probability) ecological flow;
- to ensure protection and preservation of natural biological resources and ecosystems, Regional Environmental Board may, based on the expert

evidence regarding the assumed impact on the state of the environment, define the ecological flow.

Construction standard LBN 224-15 also states that in the watercourses especially important for fishery, HPP and other dams have to be designed with fish passes.

Regulation No. 27 (15.01.2002) [13] of the CM of Latvia defines 214 rivers, where “construction and renovation of hydropower plant dams, and creation of physical obstructions of any kind is forbidden” in order to protect fish resources.

Regulation No. 505 (01.09.2015) of the CM of Latvia “On the construction standard LBN 229-15: Hydrotechnical constructions of class A hydropower plants” [14] states that technical solutions should be chosen to allow the HPP to work, whenever possible, in natural inflow operation mode, so that it is possible to ensure minimum guaranteed flow or ecological flow downstream HPP.

Regulation No. 118 (12.03.2002) of the CM of Latvia “On the quality of surface water and groundwater” [15] defines in total 123 rivers or river stretches and 45 lakes that are considered to be waters of priority importance for freshwater fish. In these waters, it is necessary to perform water quality protection or improvement activities, to ensure favourable environment for fish resources.

Nevertheless, it is not clearly stated that rivers or river stretches listed in the Regulation No. 27 or Regulation No. 118 are those “watercourses especially important for fishery” that are mentioned in the Construction standards LBN 224-15 and LBN 229-15.

Environmental policy guidelines 2014-2020 (Vides politikas pamatnostādnes 2014-2020. gadam) (<http://www.varam.gov.lv/lat/pol/ppd/vide/?doc=17913>) [16] in the field of water resources includes protection of small rivers (F1.8) as an action for achievement of main objectives.

This document also includes as a direction the improvement of the regulatory framework in order to determine environmental protection requirements for the management of water facilities, regardless of the ownership of the facility, as well as to ensure the covering of costs for water use associated with the operation of small HPPs.

3.2 LITHUANIA

Water use and protection in the Republic of Lithuania is regulated by the **Law on Water** (21 October 1997 No VIII-474, last amendment 14 April 2016) [17].

According to the amendment of the Law on Water in 2004, the construction of dams on the Nemunas and other ecologically and culturally important rivers is prohibited. The list of 169 ecologically and culturally valuable rivers or river stretches (where construction of HPPs is prohibited) was approved by the **Regulation No 1144** of the Government (8 September 2004) [18].

According to the Law on Water physical and legal persons, who install and exploit hydrotechnical structures, shall (among others):

- not violate the regime of water level fluctuation that is established by the order of the Minister of Environment;
- ensure that hydrotechnical structures release not less water than **environmental discharge** that is calculated according to the established order of the Minister;
- carry out accounting of water that passes through hydrotechnical structures and provide these data according to the established order of the Minister;
- Install and use effective means for fish protection and ensure possibility for fish to migrate according to the established order of the Minister.

Procedure for Environmental Discharge Calculation [19] that is approved by the Order of the Minister of Environment of July 29, 2005 No D1-382 (last amended 6 August 2014) describes **environmental discharge** as the minimum water discharge required to ensure minimum conditions for ecosystem survival. This document explains that **environmental discharge** (Q_E , m³/s) is the mean of minimum discharges of 30 days in low period (May-October) with 80% or 95% probabilities (depending on a level of river hydrological regime regulation – the river baseflow index φ). For the rivers characterised by irregular flow regime ($\varphi \leq 0.65$),

$$Q_E = Q_{30\min 80\%},$$

whereas for the rivers of regular flow regime ($\varphi > 0.65$),

$$Q_E = Q_{30\min 95\%}.$$

Article 125 of the **Law on Environmental Protection of the Republic of Lithuania** (21 January 1992 No I-2223, last amendment 17 May 2016) [20]

provides sanctions for violation of the **Regulations** (LAND 2-95) highlighting importance of maintaining the defined environmental discharge and water levels. The **National Environmental Protection Strategy** (approved by Seimas of the Republic of Lithuania in 16 April 2015 No XII-1626) [21] declares about significant impact of HPPs on water bodies due to frequent and sudden changes of water level, insufficient number of fish passes, fish injuring turbines, etc. and their damage to water ecosystems. The Strategy identifies hydro power plants as one of the key factors of economic activities affecting the status of surface water bodies.

4. RECOMMENDATIONS FOR AMENDMENTS TO NATIONAL WATER LEGISLATION

Based on the analysis of the requirements specified in LV and LT legislation with regard to E-flow definition, their comparison with the EU legislative framework obligations, as well as project results, following recommendations for changes in legislation are:

- In Latvia, although Ecological flow for the hydropower plants has to be calculated obligatory, in practice there are many examples where ecological flow is defined equal to minimum guaranteed flow, as the definitions of ecological flow and minimum guaranteed flow in different legislation acts are sometimes contradictory. Use of joint definition of Ecological flow as a binding requirement to all water uses, as specified in the WFD Guidance Document No. 31, could be one of the solutions, to improve the water quality, as the limits set by minimum guaranteed flow are many times lower than necessary for sustaining ecosystem survivability.
- The term "minimum guaranteed flow" in following Regulations of the Cabinet of Ministers of Latvia should be abandoned and replaced with correct application of Ecological flow:
 - Regulation No. 736 (23.12.2003) of the Cabinet of Ministers of Latvia "Regulations on water resources use permits";
 - Regulation No. 329 (30.06.2015) of the Cabinet of Ministers of Latvia "On the construction standard LBN 224-15: Amelioration systems and hydrotechnical constructions";
 - Regulation No. 1014 (27.12.2005) of the Cabinet of Ministers of Latvia "Procedure for elaboration of water body management regulations".
- In Lithuania, the term "environmental discharge" ("gamtosauginis debitas" in Lithuanian) that emerged in "Procedure for Environmental Discharge Calculation" in 1997, is not environmentally friendly because it is designed to

ensure only minimum conditions for ecosystem survival. The established environmental discharge is related to probability of multiannual runoff reoccurrence (Q_{30} of 95% or 80% probability), whereas constant low flow cannot fulfil requirements of river ecosystem. This definition of environmental discharge allows high water level fluctuations - artificial repeatable floodings (i.e. hydropeaking) downstream from the HPPs. Environmental discharge is declared as ensuring minimum conditions for ecosystem survival; however, any substantial justification of this - like scientific background - does not exist.

- The term "environmental discharge" in following Lithuanian legislation documents should be abandoned and replaced with correct application of Ecological flow:
 - Law on Protected Areas, Valstybės žinios, 1993-11-24, No 63-1188.
 - Typical Regulations for the Use and Maintenance of Water Reservoirs (LAND 2-95), Valstybės žinios, 1997-07-25, No 70-1790.
 - Procedure for Environmental Discharge Calculation, Valstybės žinios, 2005-08-04, No 94-3508.

- New conceptual definition of ecological flow, with a clear reference to both flow quantity and dynamics and to their consistency with the environmental objectives needs to be developed and consistently used by all involved parties, harmonizing ecological flow calculation methods and necessary data, procedures according to water use and river type, as well as responsible authorities need to be incorporated in the legislation;

- The ecological flow rate has to be calculated for each separate hydropower plant according to the WFD Guidance Document No. 31 : "Ecological flows in the implementation of the Water Framework Directive":
 - based on scientific criteria and monitoring data;
 - encompass and/or repeat a full range/complexity of flow natural regime variability (i.e. no artificial droughts, hydropeaking, etc.);

- comply with biological/habitat requirements of a certain regulated river, especially during spawning and migration seasons;
 - mitigate the negative impacts of climate change;
 - be constantly supervised by environmental authority (State Environmental Service in Latvia, responsible institutions in Lithuania).
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- There should be a clear responsibility for controlling the ecological flow rate, as well as penalties for violating regulatory requirements;

 - The ecological flow rate should be an integral part of the issuing of new water use permits and extending the term for existing permits.

 - It has to be mentioned, that many ecological quality problems both in Latvia and Lithuania are related to quality and status of small rivers, therefore it is also recommended to develop legislative basis for solving both management and legislative issues regarding these waters.

5. REFERENCES

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8. CIS Guidance Document No. 4 “Identification and Designation of Heavily Modified and Artificial Water Bodies”.

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9. Water Management Law, adopted on September 12, 2002.

<https://likumi.lv/doc.php?id=66885>

10. Regulation No. 736 of the Cabinet of Ministers of Latvia “Regulations on water resources use permits”, adopted on December 23, 2003.

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11. Regulation No. 1014 of the Cabinet of Ministers of Latvia “Procedure for elaboration of water body management regulations”, adopted on December 27, 2005.

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12. Regulation No. 329 of the Cabinet of Ministers of Latvia “On the construction standard LBN 224-15: Amelioration systems and hydrotechnical constructions”, adopted on June 30, 2015. *This Regulation replaces the former Regulation No. 631, adopted on August 26, 2005.*

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13. Regulation No. 27 of the Cabinet of Ministers of Latvia “On rivers (river stretches) where, in order to protect fish resources, construction and renovation of hydropower plant dams, and creation of physical obstructions of any kind is forbidden”, adopted on January 15, 2002.

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