Interreg
Central Baltic

WATER PACKAGE

Central Baltic 2014-2020 project results related to improving the state of the waters of the Baltic Sea

2021

European Union
European Regional Development Fund

1. Scope of the package

This package contains information about Central Baltic 2014–2020 results of the projects related to improving the state of the waters of the Baltic Sea.

Mostly such projects were implemented under the **Specific Objective (SO):**

'Reduced nutrients, hazardous substances and toxins inflow into the Baltic Sea' (9 projects)

The projects aimed to reduce the inflows of nutrients, hazardous substances and toxins to the Baltic Sea from all types of land-based sources, including the load from agriculture and urban storm waters to the Baltic Sea.

The WATER topic was **directly** addressed also **by other SOs projects**:

Storm water management under SO 'Better urban planning in the Central Baltic region' (1 project)

Improving sewage collection from leisure boats in ports under SO 'Improved services of existing small ports to improve local and regional mobility and contribute to tourism development' (1 project).

The WATER topic was addressed also **indirectly** by even more projects:

- The conflicting needs of coastal areas addressed by preparing marine and coastal zones plans under SO 'Sustainably planned and managed marine and coastal areas' (3 projects)
- Constructed/renovated sewage system/sustainable water solutions for service houses in small ports under SO 'Improved services of existing small ports to improve local and regional mobility and contribute to tourism development' (6 projects).

2. Background

People living around the Baltic Sea experience abundance and importance of the Baltic Sea. The drainage area of the Baltic Sea is inhabited by around 85 million people, and 10,8 million in the Central Baltic area. The Baltic Sea is also the key aspect of our identity. We have common history of fishing, spending time at the beautiful landscapes and beaches. We also gathered a lot of knowledge of the sea over the years: how to use it, enjoy it and take care of it[1].

Despite the knowledge, the Baltic Sea is one of the most polluted seas in the world[2]. We influence the status of the Baltic Sea via our activities on land and sea. The Baltic Sea Action Plan (BSAP) was adopted 2007 by HELCOM contracting parties to achieve good environmental status of the Baltic Sea[3]. The plan has 4 focus areas: eutrophication, hazardous substances, maritime activities and biodiversity.

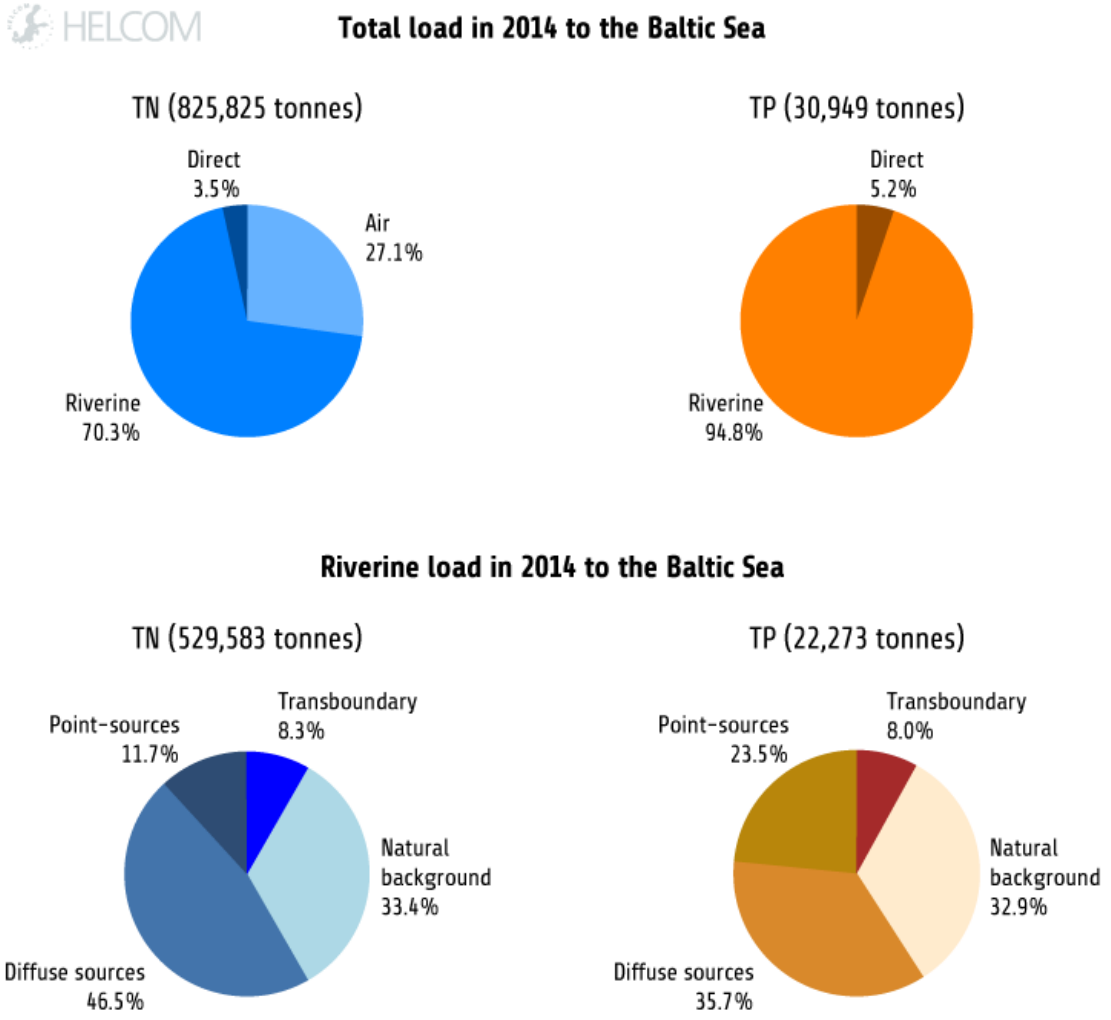
Eutrophication is considered as one of the main threats to the biodiversity of the Baltic Sea. It is caused by a surplus of the nutrients nitrogen and phosphorus in the sea. 97% of the Baltic Sea area is affected by eutrophication. Most of the nutrient input is riverine (ca. 70%.) for both nitrogen and phosphorus. Atmospheric inputs account for about 30% of the total nitrogen inputs[4].

[1] "Portfolio of Baltic Sea Region Images and Identities", https://www.hel.fi/static/kanslia/onebsr/bsr_final.pdf

[2] https://www.wwfbaltic.org/about-the-baltic/

[3] https://helcom.fi/baltic-sea-action-plan/

[4] http://stateofthebalticsea.helcom.fi/pressures-and-their-status/eutrophication/



Source:
http://stateofthebalticsea.helcom.fi/pressures-and-their-status/eutrophication/

Another pressure to the water is related to marine litter. It is estimated that 70% of the litter items in the Baltic Sea are plastic[5].

Managing stormwater is a growing challenge for many municipalities in the Central Baltic region. Stormwater management has been focusing on controlling stormwater quantity, but the emphasis has shifted to more sustainable approaches.

[5] http://stateofthebalticsea.helcom.fi/pressures-and-their-status/marine-litter/

3. Timeline – when the projects were implemented

Projects from all 5 Calls of Central Baltic programme 2014-2020 are included in this package, first projects started in 2015 and some of the 5th Call projects will run until 2022.

Timeline of projects

4. Description of the achieved results and their cross-border effect

The aim of this section is to give a glimpse into project results by grouping them and providing short descriptions.

The main outcome – reduced amounts of nutrients hazardous substances and toxins

The **scope of activities** aiming to improve status of water and reduce amounts of nutrients, hazardous substances was wide.

Some projects tested **measures to reduce the nutrients loads in agriculture:**

- 1,500 hectares of clay fields were treated with gypsum in the catchment area of river Savijoki, in South-Western Finland and monitoring ensured by Finnish Environment Institute (NutriTrade)
- the opportunities to reduce nutrient losses and at the same time possibilities to improve soil fertility, productivity was explored in 22 farms in cooperation with experts in Estonia and Latvia (Green Agri).
- drainage management solutions in Aile and Jodīte streams in Jelgava (Latvia) implemented (NUTRINFLOW), etc.
- phosphorus precipitation devices, phosphorus filters tested in Lieto (Finland), near Ogre in Latvia (Waterchain)

Several projects worked with **stormwater management solutions:**

- integrating stormwater management into urban planning; In result multifunctional stormwater solutions based on Green Infrastructures were elaborated in 7 cities: Rīga, Jelgava, Tartu (Jaamamõisa area), Gävle, Söderhamn and Turku (iWater)
- project CleanStormWater started implementation 2020 with identifying the most common challenges, as well as best practices in implementation of stormwater filtering systems in Estonia, Finland, Latvia, and Sweden[6].

One project worked with sustainable **remediation of contaminated sites:**

- *in situ* methods tested (*bio-stimulation, electro-kinetic pumping, fenton reaction and phytoremediation*) in 8 contaminated sites (Motala in Sweden; two pilot sites in Valmiera, Latvia; Janakkala, Nastola, Virrat, Loppi and Karjaa in Finland), etc. (INSURE)

One project **tested sea-based measures**

- pilots with marl/limestone residue application to phosphorus-rich bottoms were implemented in coastal bays in Sweden and Finland; removing nutrient-rich bottom waters from two eutrophied semi-closed, coastal bays and testing the possibility of recycling nutrients by utilizing the water for irrigation on fields; supporting the spawning of predatory fish-stocks by fishing stickleback in Åland and Östergötland region in Sweden; etc. (SEABASED)

This is not an exhaustive list, but it can be concluded that various measures/methods, including some innovative methods were tested/applied in tenths of locations in agricultural areas and urban environments.

[6] Project started implementation 2020 and prepared report "CURRENT STATUS OF MANAGEMENT OF STORMWATER SYSTEMS AND SOLUTIONS IN PARTICIPATING COUNTRIES" (2020) which will serve as a basis for developing a how-to manual of sustainable stormwater filtering systems.

The projects supported under SO '**Reduced nutrients, hazardous substances and toxins inflow into the Baltic Sea**' were expected to monitor reduction of nutrients, hazardous substances and report it.

Some projects indicated **concrete amounts** (for example, NutriTrade indicated reduce of 6 tons of phosphorus via pilot projects and 28 tons via the *Nutribute* platform during the project duration and 28 tons via the *Nutribute* platform, the project SEABASED currently is about to finish, and the assessment of the applied sea-based measures is being finalised).

Several other projects calculated the **percentage of load reduction**. For example, HEAWATER planned to reduce the concentration of selected indicator substances from pilot rivers' water by at least 10% but according to the preliminary monitoring results they decreased 50% or even more (three pilot streams (Jaaninoja and Kuninkoja, and point data for the Topinoja stream), river Söderhamn in Söderhamn, Mustjõgi river in Tallinn). The project WATERCHAIN foresaw that the targeted pollution loads of nutrients will be reduced by 30% in pilot watersheds and the targeted concentrations of hazardous substances are reduced to one third of the current situation by 2023.

For some projects the quantification of the load reduction was challenging. Nevertheless, some inflows of nutrients were reduced in targeted areas (Green Agri, NUTRINFLOW). Moreover, positive change will continue in some targeted areas also after the project end (for example, improvements in the pilot areas in project HEAWATER and NUTRINFLOW, etc.).

Some of the reviewed projects didn't have the aim to reduce amounts of nutrients inflows to the Baltic Sea directly. It rather came naturally as the effect of their activities. For example, project BATSECO-BOAT worked with sustainable sewage solutions in 20 small ports in Estonia, Finland and Sweden.

4.1 TOOLS

Some projects produced concrete tools which are available together with instructions and can be used in other areas and organisations:

LIST OF TOOLS
Green Factor Tool (excel, iWater)
Excel-based tool for urban planning to ensure sufficient green infrastructure when building new lots in a dense urban environment. **Available** here
Integrated Stormwater Management Toolbox (iWater)
This toolbox introduces the most common approaches and concrete tools for urban stormwater management. The toolbox focuses on approaches that are applicable or developed for northern climate conditions. **Available** here
Checklist for Mapping the Potential Sources of Marine Litter and Prioritisation Tool (excel, BLASTIC)
The aim of this tool is to help to map the sources and pathways of plastic litter in a municipal area. It consists of **2 parts: Mapping Cheklist** (allows mapping of the sources and pathways of marine litter in municipalities and assessing the potential for marine litter generation from the listed sources and pathways) and **Prioritisation** (aiming to help selecting the most critical areas that need to be addressed in the local action plan to reduce marine litter). Available in EN, SWE, FIN, LAT, EST languages here The project published also Guidelines document for municipalities working with the tool. **Available** here
Decision Support Tool (excel, HEAWATER)
The tools helps to select the sustainable stormwater management and stream restoration measures. It follows a **3-step process**: **Step 1**: define the stormwater management goal **Step 2**: choose the type of measure and its placement **Step 3**: a list of stormwater management and stream restoration measures is provided according to the previous inputs **Available** here

4.2 KNOWLEDGE & EXPERIENCE

The measures applied in projects were well documented. In result there is handful number of various guides, manuals and methodologies available for use. Mostly the projects made their knowledge and experience available for all interested via project websites:

WATERCHAIN

- Information about watershed pilots implemented during the project (River Eurajoki, Finland, Åland Water drinking water catchment area, Tallinn drinking water catchment area, river Daugava in Latvia, River Fyris in Sweden)
- Description of the challenges to Baltic Sea related to nutrients and hazardous substances
- Best practices, etc.

BLASTIC

- Knowledge bank consisting of the following chapters: an introduction to the plastic and marine litter, sources and pathways, distribution, impacts and management
- Information about the project pilots
- Reports (for example, BLASTIC overview of monitoring methods, BLASTIC guidelines to riverine litter monitoring, etc.
- Checklist for mapping the potential sources of marine litter and prioritisation tool and guidelines to work with the developed tool, etc.

NutriTrade

- Information about implemented pilots: gypsum, fish, mussel and creation of a Nutribute crowdfunding platform.
- Website section "Materials" has numerous reports about the implemented pilots, preparatory steps for the Nutribute platform, etc.

INSURE

- Section "Results" provides ca 20 reports on how to choose, apply in situ methods, for which sites they are suitable, as well as strategies for handling the contaminated sites, how to apply the supervision method

SEABASED

- Section "Pilots" information about tested **sea-based activities** and related reports (binding phosphorus into sediment, piloting stickleback fishing, irrigation etc.)
- Section "Aquatic compensation" introduces a compensation concept and Water Improvement Fund developed in the SEABASED project in Aland

iWater

- Integrated Storm Water Management: System Guidelines
- Green Factor Tool
- Toolbox
- Information about the pilot sites

BATSECO-BOAT

During BATSECO-BOAT project developed reports about leisure boating and septic pump-out stations are available in the website section “Reports, Materials”. For example:

- Market Investigation: Catalogue of Pump-Out Stations in Sweden, Finland and Estonia
- Practical Guide: Investing in Sewage Pump-out Stations at Leisure Craft Harbours
- Actors and Legislation: Overview of Actors and Legislation Relevant to Sewage Collection Stations in Central Baltic Region and others.

Some projects chose did not have a website. Project outcomes are available in the partner organisations websites (for example, project Green Agri reports available at https://epkk.ee/greenagri/, project HEAWATER reports, measurements in the pilot sites as well as the research analysing attitudes and the willingness of the residents to improve the condition of small water bodies and the sustainable storm water management in the area by paying a small fee available at https://www.tallinn.ee/eng/Project-Heawater-news).

5. Good experience & lessons learned

It is not possible to draw joint conclusions or conclusions fitting the whole Central Baltic area based on the implemented project experience and lessons learned by reading project websites, reports. The scope, geography and scale of project activities varied considerably. Nevertheless, some insights from projects experience are included below:

Considerable attention should be devoted to **awareness raising of the kids, youngsters, local societies, farmers and companies**. Sustainable consumption and effective water management practices, as well as utilization of the best agricultural practices must be ensured as it is much more effective to prevent leakage of nutrients instead of conquering the consequences.

The knowledge, experiences, approaches and legal bases in Central Baltic countries is sometimes quite variable. Therefore, **cooperation in projects brings the added value**, allows spreading of the knowledge, changing practices and learning from each other.

The focus of reducing the eutrophication of the Baltic Sea should be kept in **reducing land-based nutrient load**, but in cases where the internal nutrient load exceeds the external load, and there are no other possibilities for mitigating eutrophication at certain area, use of sea-based applications might become relevant. While some measures, like removing sediment's active, oxygen-consuming surface layer were deemed too costly and ineffective, some, like the awarded innovation of spreading activated limestone to bind phosphorus to the seabed, have potential to be effective but still need further development and research. Comprehensive monitoring of effects and documentation of all steps of the implementation is crucial for future pilots (SEABASED).

Concern is the marine litter in the urban rivers and streams which flow into the sea. Several projects concluded that the most efficient is to try to **avoid littering** e.g. organise awareness raising campaigns. If the litter entered the water body – then it is suggested that removing them close to the source is most efficient (BLASTIC).

It is important to **involve relevant stakeholders** in stormwater management process and find a common understanding, agree on common goals. Integrated stormwater management supports the application of green and ecologically valuable urban planning principles, thus ensuring the possibility of obtaining a wider range of environmental benefits, including ecosystem services, and supporting the transition from the current dominant use of conventional stormwater discharging solutions to sustainable solutions (iWater).

It is much easier if the **development of stormwater management structures starts at an early stage of the planning** of a new development project. That is, it is easier to account for problems related to stormwater management at the beginning than trying to solve them later. When working in already developed areas, the problems are more complex and possible solutions need to be a trade-off between other, possibly contradicting aspects (HEAWATER).

Monitoring and assessment of water quality and littering along streams in different seasons and discharge conditions is essential to identify the environmental problems. Though the main sources of, e.g. nutrients or heavy metals are known, their pathways and local concentration hot spots are usually not known on city scale, which might impede the implementation of effective counter measures and the best use of limited resources (HEAWATER).

6. Developments after the projects' end

A short inquiry by email was made of projects finished several years ago to explore the developments after the project end. It can be summarized that in all cases project experience was used in future projects. Quite often knowledge and tools are being used in everyday work of the partner organisations. In some cases, project experience was disseminated actively also after the project end in various events with other municipalities (also with cooperation partners outside Europe). There are some cases, when practical tools, methodologies were further developed or transferred to other areas/organisations. Some examples of the development afters the project end:

NutriTrade:

Introduced an effective water protection measure – gypsum treatment of agricultural fields to reduce nutrient and suspended solid runoff from agricultural fields. This was tested also in in project SAVE which was implemented in parallel to project NutriTrade from other funding sources, further developed in several new projects.
In a couple of years (2018–2021) the field of area treated by gypsum have increased by 15–20 fold compared to what was treated in NutriTrade and other project where this method was applied.
Gypsum treatment is included in the forthcoming action plan for water and marine management as a water protection measure for agriculture in the coastal regions of Finland (2022–2027).

iWater:

Project iWater is further working with integrated stormwater management solutions in wider area with other partners within BSR platform Water.

Rīga team (lead partner) is consulting the Lithuanian Ministry of Environment who is currently developing the Green Factor based stormwater planning tool for the use in Lithuanian cities as part of the Baltic Smart Water Hub experts' network activities since March 2021. The Green Factor-based tool, currently being developed in Lithuania, closely follows the assumptions, methodology and approach used in Rīga.

Green Factor Tool developed during iWater in City of Turku was included in new detailed plans and in the Building Order of the City on Turku. Now all the building projects apart from one family houses have to use Green Factor Tool.

Jelgava municipality uses the project experience in further work of the municipality when working with local and national planning, tackling climate change, work with students, etc.

Since 2018 the iWater project was presented at over 10 international conferences, seminars by lead partner and webinars. These events were attended by over 1000 participants from over 50 countries of the Europe, South America and Africa.

BLASTIC:

Results (guidelines, tool) were further developed in new projects, translated into Swedish language within a new project and with support of BLASTIC project partner were adapted to be used Västervik and Båstad municipalities in Sweden.

NUTRINFLOW:

The outcomes of the project were planned to be further utilized by the Ministry of Agriculture to prepare suggestions on nutrient retention measures in agricultural drainage to be supported in Latvia during the next planning period of the Common Agricultural Policy (2021–2027). In addition, the Manual on environmentally friendly drainage systems that was elaborated during the project will be used as a reference to specify a list of nutrient retention measures suitable for Latvian conditions.

To summarize, overall projects working with improving status of the Baltic Sea were successful in achieving planned results in cooperation. Some projects methods/developed approaches/documents were transferred and has potential to be **transferable** also in future to other areas/organisations. This capitalisation package might provide some hints for that.

More information about projects, also tools and developed documents, as well as experience and results from implemented pilots can be found on the projects websites' and also the project results database of the Central Baltic Programme http://database.centralbaltic.eu/. Most of the projects can be contacted via contacts details indicated in their websites. Moreover, the list of the documents/tools developed within the projects included in the Water capitalisation package is being prepared and can be available on request from the responsible project manager in the JS.

7. Projects participated

- **INSURE** Innovative Sustainable Remediation
- **WATERCHAIN** Pilot Watersheds as a Practical Tool to Reduce the Harmful Inflows into the Baltic Sea
- **NutriTrade** Piloting a Nutrient Trading Scheme in the Central Baltic
- **Green Agri** Environmentally-friendly Management of Organic Fertilizers in Agriculture
- **BLASTIC** Plastic Waste Pathways into the Baltic Sea
- **NUTRINFLOW** Practical Actions for Holistic Drainage Management for Reduced Nutrient Inflow to Baltic Sea
- **Heawater** Achieving Healthier Water Quality in Urban Small Rivers of the Baltic Sea Catchment by Restoration of Water Bodies and Preventing of Nutrients and Hazardous Substances Inflow from Watershed
- **SEABASED** Seabased Measures in the Baltic Sea Nutrients Management
- **CleanStormWater** Testing new storm water treatment solutions for reduction of hazardous substances and toxins inflows into the Baltic Sea
- **BATSECO-BOAT** Best Available Technologies of Sewage Collecting for Boat Tourism
- **iWater** Integrated Stormwater Management

8. Map of project partner locations in water field

Map of project partner locations in water field