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COMMISSION STAFF WORKING DOCUMENT

Third River Basin Management Plans
Second Flood Hazard and Risk Maps and Second Flood Risk Management Plans
Member State: Lithuania

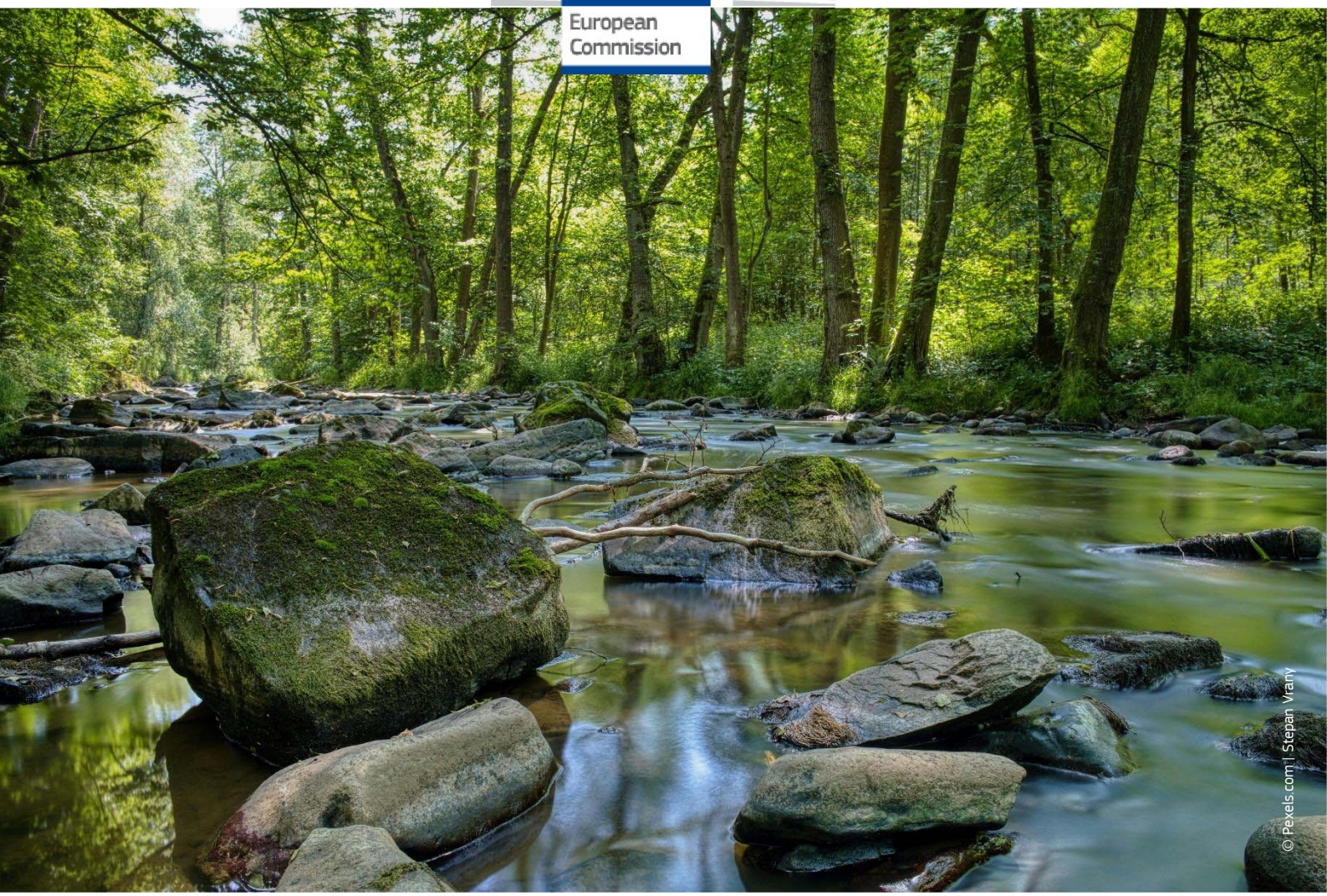
Accompanying the document

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC)
Third River Basin Management Plans
Second Flood Risk Management Plans

{COM(2025) 2 final} - {SWD(2025) 13 final} - {SWD(2025) 14 final} - {SWD(2025) 15 final} - {SWD(2025) 16 final} - {SWD(2025) 17 final} - {SWD(2025) 18 final} - {SWD(2025) 19 final} - {SWD(2025) 20 final} - {SWD(2025) 21 final} - {SWD(2025) 22 final} - {SWD(2025) 23 final} - {SWD(2025) 24 final} - {SWD(2025) 25 final} - {SWD(2025) 26 final} - {SWD(2025) 27 final} - {SWD(2025) 29 final} - {SWD(2025) 30 final} - {SWD(2025) 31 final} - {SWD(2025) 32 final} - {SWD(2025) 33 final} - {SWD(2025) 34 final} - {SWD(2025) 35 final}

European Commission



Country specific staff working document

Lithuania

ENVIRONMENT

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Content

SECTION A:

WATER FRAMEWORK DIRECTIVE

1. General info, member state characterisation

Lithuania is a low-lying Baltic coastal country, with a terrestrial area of close to 62 643 km² and a marine area close to 6,400km². It has borders with Latvia, Belarus, Poland, and the Kaliningrad region of Russia. It is the largest of the three Baltic states. It hosts 2.86 million inhabitants with a density of 45 inhabitants per km2 lower than the EU average. Lithuania has a moderate continental climate with cold winters and rainy summers. Lithuania's 96 km of coast have a unique and vulnerable landscape, rich in natural resources. The share of terrestrial protected areas is 17% of the national territory, well below the EU average. Lithuania's agricultural sector is characterised by relatively favourable production conditions. It is foreseen that the area under organic farming in Lithuania will increase by half and reach almost 13% by 2028. The share of the population living in rural areas (56.2%) is one of the highest in the EU. Approximately 45% of the total area of the country is used for agriculture and largely the rest are forests.

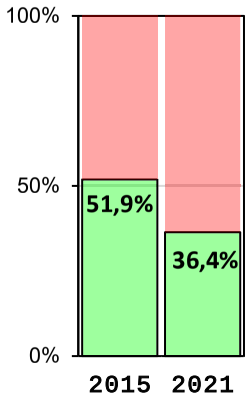
Reporting

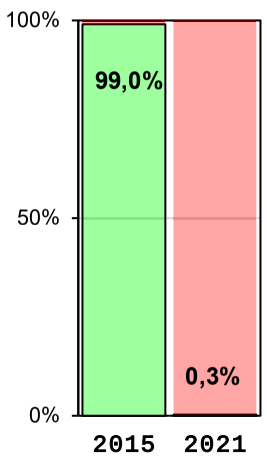
The deadline for reporting the 3rd RBMPs was in March 2022. The Commission and the EEA together with Member States developed an electronic reporting system in WISE (Water Information System for Europe). Its use was voluntary. Some Member States used it to fulfil their obligations, others reported the plans in pdf format. The cut-off date for the WISE e-reporting was September 2023 and the MS were assessed based on the datasets available by this date.

By September 2023 Lithuania submitted full electronic reporting and therefore the assessment is based on this dataset.

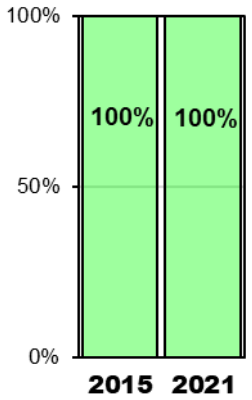
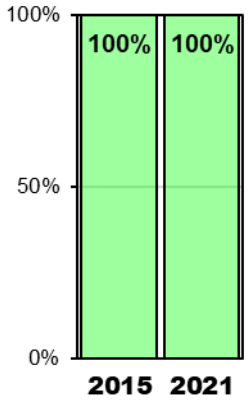
Despite the cut off dates for the production of this report, reporting continued and, for the State of Water report, the EEA aggregated the results available by July 2024 in their products and dashboards available at WISE Freshwater web portal.

Changes in Status, Pressures, Exemptions & Measures

Surface Water Bodies	Trend (% good status/potential)	Main Pressures & Changes & Exemptions
ECOLOGICAL STATUS		Since the 2nd RBMPs, the ecological status of SWBs deteriorated from 51.9% to 36.4% in good (or better) status as more SWBs were downgraded from "good" to "moderate" status. All coastal and transitional water bodies fail the objective of a good ecological status. Lithuania's confidence in classification is reported "low" for most of the water bodies classified to be in good ecological status or potential. Looking forward, Lithuania expects 50.8% of SWBs to reach a good ecological status/potential by 2027.The most significant pressure on surface water is 'diffuse – agricultural' followed by by morphological changes. The most significant impact on the ecological status is nutrient pollution. Nitrates in Lithuania's rivers are unfortunately steeply increasing, contributing also to the euthropication of the Baltic Sea. Lithuania has mapped several measures to reduce pressures on the ecological status of SWBs: KTM1 - Construction or upgrades of wastewater treatment plants; KTM2 - Reduce nutrient pollution from agriculture; and KTM5 - Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams); KTM 6 Improving hydromorphological conditions of water bodies other than longitudinal continuity; KTM7 - Improvements in flow regime and/or establishment of ecological flows. Lithuania has invoked Article 4(4) exemptions for all SWBs failing good ecological status, that is for 62.6% of SWBs based on "technical feasibility" and for 39.6% based on "natural conditions".

CHEMICAL STATUS		94% of SWBs are reported in unknown status, while 5% of water bodies are in poor chemical status and less than 1% are in good chemical status. 5% are in good chemical status if one discounts the uPBTs mercury, PBDEs and PAHs. Lithuania expects that only 0.6% of its SWBs will achieve good chemical status by 2027. There has been a steep reduction of SWBs in good chemical status, with only 0.3% being reported to reach objectives in 2021. This seems mainly due to a steep increase in SWBs reported in "unknown" status. Lithuania did not provide details or a justification on a change of approach that could explain this regrettable development. Data reported under the Nitrates Directive show that Lithuania has the largest proportion of river sites with average nitrate concentrations exceeding 5.6mg (NO3-N/l), namely 25% in 2019-21. Lithuania also has one of the highest proportions of significantly increasing trends of nitrates in surface water bodies (45%) (EEA, 2021). It would appear that the monitoring network did not improve, and also expert judgement is no longer used either to assess the chemical status of surface water. The spatial and temporal scale of monitoring was, it seems, insufficient to characterise the chemical status of SWBs in the 3rd RBMP. This is a regrettable setback compared to Lithuania's 2nd RBMP and suggests non-compliance with basic requirements under the WFD. Lithuania has mapped KTM1 - Construction or upgrades of wastewater treatment plants , KTM 3 – Reduce pesticides in agriculture; but it has not included KTM4 - Remediation of contaminated sites (historical pollution including sediments, groundwater, soil) in the programem of measures. Also, Lithuania has not mapped KTM9 - Water pricing policy measures for the implementation of the recovery of cost of water services from households. Lithuania invoked Article 4(4) exemptions for 5% of all SWBs failing good chemical status, for 1% of all SWBs due to technical feasibility and 5% due to natural conditions.

Ground Water Bodies	Trend (% good status/potential)	Main Pressures & Changes & Exemptions

QUANTITATIVE STATUS		All 20 GWBs are reported to be in a good quantitative status, as in the previous two RBMPs. This assessment is, however, subject to certain doubts as 25% GWBs are affected by saline intrusions and because Lithuania fails to consider groundwater associated surface waters and/or groundwater dependent ecosystems in three of four RBMPs for establishing the quantitative status of its GWBs. 70 % of all classifications are conducted with high confidence whereas there was still 100% high confidence in the previous RBMPs. No justification for this change was provided. Water scarcity is not considered an issue in Lithuania. No GWB is at risk of failing good quantitative status by 2027.
CHEMICAL STATUS		All 20 GWBs are reported to be in good chemical status similarly to the 2nd RBMPs despite 25% GWBs being affected by saline intrusions. Regrettably, the number of surveillance monitoring sites for the 20 GWBs decreased from 278 (2015) to 189 (2021). Only 70% of classifications are still conducted with high confidence, down from 100% (2015). There are also gaps in the assessment methodology and implementation including pharmaceuticals carbamazepine, sulfamethoxazole, and primidone in monitoring. No groundwater body is reported at risk of failing a good chemical status by 2027. This is a pronounced difference to the chemical status of Lithuania's surface water bodies where only 0.6% of SWBs are expected to achieve a good status by 2027. The status of groundwater being influenced by the status of surface waters, one would normally expect that Lithuania's groundwater are also affected by chemical and nutrient pollution in rivers, which interestingly does not seem to be the case. All of Lithuania's drinking water stems from groundwater.

2. Horizontal aspects

2.1 Governance

The main authority competent for implementing the Water Framework Directive (WFD) is the Environmental Protection Agency (part of the Lithuanian Ministry of Environment).

Lithuania also undertakes transboundary surface water body status assessments with Poland and Latvia, which is a good administrative practice. There are no transboundary groundwater bodies reported in Lithuania. Transboundary cooperation with the Russian Federation and the Republic of Belarus has ended after Russia's invasion of Ukraine.

As regards the coordination with the Marine Strategy Framework Directive (MSFD), it is noted very positively that all of Lithuania's RBMPs provide information about the coordination of the implementation of the WFD and the MSFD. The second objective of Lithuania's National Water Development Plan 2022-2027 is to achieve and/or maintain good environmental status in the Baltic Sea. A priority is to reduce pollution reaching the Baltic Sea and the Curonian Lagoon through river runoff. Lithuania is cooperating on the protection of the Baltic marine environment in the HELCOM.

As regards the coordination with the Flood Directive (FD), a joined consultation was organised on the RBMPs and FRMPs and all of Lithuania's RBMPs provide information on the coordination with the Flood Risk Management Plans (FRMP) and equally they integrate WFD and FD objectives in their Programme of Measures.

2.2 Characterization of River Basin District

Lithuania has four River Basin Districts, which are all international, that means shared with other countries namely Latvia, Poland, Belarus, and the Russian Federation. The biggest RBD is Nemunas (LT1100)- covering almost 75% of the country- followed by Lielupe (LT3400), Venta (LT2300), and Dauguva (LT4500). All four RBDs in Lithuania are also international river basin districts (IRBD). The Nemunas RBD covers the part of the Nemunas River Basin in Lithuania, the Lithuanian coastal River Basin, a small part of the Pregolya RB (RU), the Lithuanian part of the Curonian Lagoon (transitional waters), and the Baltic Sea (coastal waters). The Lielupe RBD covers 14%, Venta RBD 10% and Dauguva RBD 2% of the country's territory. The share of Lithuania in the respective international RBDs is 50% (Nemunas), 49.1% (Lielupe), 27.4% (Venta) and 2.2% (Dauguva).

The delineation of waterbodies has remained very stable from the previous cycle to this one. The number of Surface water bodies (SWBs) remained almost unchanged (from 1186 in the 2nd RBMPs to 1194 SWBs in the 3rd RBMPs). One river body was added to each RBD and there was also a 1.1 % increase in the number of lake bodies in the Lielupe and Dauguva RBDs. The numbers of transitional, coastal, and territorial water bodies remained the same. The number of groundwater bodies remained the same in all RBDs. Compared to the 2nd RBMPs, there has been no change in the number of artificial water bodies and heavily modified lakes. Only the number of heavily modified river water bodies has decreased by one, from 244 to 243.

Table 1. Number of surface water bodies and groundwater bodies per RBD in Lithuania

RBD (index)	Rivers	Lakes	Transitional waters	Coastal waters	Territorial waters	Groundwater bodies
Nemunas LT1100	583	285	4	2	1	12
Venta LT2300	96	20	0	0	0	1
Lielupe LT3400	129	20	0	0	0	5
Dauguva LT4500	18	36	0	0	0	2
TOTAL	826	361	4	2	1	20

Source: WISE e-reporting

Lithuania has established reference conditions for rivers and for lakes. Moreover, it has established the ecological status indicator values for biological quality elements in all water categories, except for benthic fauna and fish in transitional waters. Furthermore, type-specific reference conditions have been established for some hydromorphological quality elements in all rivers and lakes and in 67% of transitional waters. Type-specific reference conditions have also been established for some physico-chemical quality elements in all rivers, lakes, transitional and coastal waters.

Pressures on surface waters

It is noted with concern that in this cycle, Lithuania reported significantly more SWBs under pressure than before, for both ecological and chemical pressures. Regrettably, in the 2nd RBMPs less than half of the SWBs were under pressure (48%), while in the 3rd RBMPs all SWBs are under pressure. This is coupled with the finding that Lithuania cannot identify the anthropogenic pressure for almost half of the SWBs (42%), compared to only 3% in the 2nd RBMPs. The problem seems to be caused largely by pressures from diffuse sources which increased from 3% in the 2nd RBMPs to 42% of the SWBs in the 3rd RMBPs.

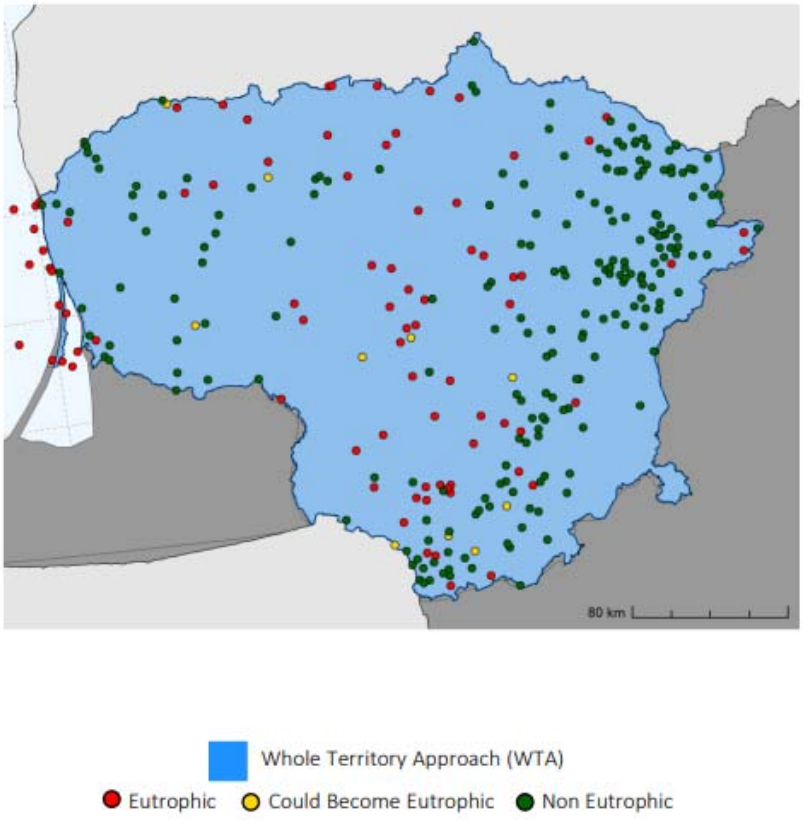
The most significant impact on SWBs is nutrient pollution, affecting 38% SWBs (up from 26% in the 2nd RBMPs), followed by morphological changes (from 11% up to 27%) and organic pollutants (from 9% to 14%). Regrettably, for as much as 36 % of all SWBs the impacts remain still 'unknown'.

The agricultural sector bears the major share of nitrate and nitrogen pollution in water bodies and is also causal to phosphates pollution.

Nitrates pollution of Lithuania's surface water bodies, as reported under the Nitrates Directive, is moderate. 18% of monitoring stations reported nitrates concentrations below 10 mg/l and 9% reported above 10 mg/l. Both population and cattle density are relatively low. Nitrates concentration is, however, high along Lithuania's coast of the Baltic Sea. That said, there is an upward trend of nitrates in Lithuania's rivers. The EEA reports that in 2021 Lithuania had the largest proportion of river sites with average nitrate concentrations exceeding 5.6mgNO3-N/l (25%) as well as the highest proportion of significantly increasing trends (45%).1

1 EEA, Ntrients in Freshwater in Europe, 2021.

Figure 1. Trophic status in Lithuania as per the Nitrates Directive



Source: Joint Research Center of European Commission (n.d.). JRC NITRATES DIRECTIVE - Reporting Period 7 (2016-2019) Trophic Status. [online] water.jrc.ec.europa.eu. Available at: https://water.jrc.ec.europa.eu/portal/apps/dashboards/cb6034c2a75e4df282f8a62f90c16caa

Note : 0% of the monitoring stations are above the threshold of 50mg/l

Based on data from 2014-2018 displayed by the Lithuanian Environmental Protection Agency, a gap analysis2 exists for nitrogen, phosphorus, nitrate, and phosphates pollution. The data also break down required reduction loads per sector, a good practice of transparency. The agricultural sector causes by far the largest pollution with nitrates (92%) and nitrogen (94%) while significantly lower loads fall on agriculture for phosphorus (56%) and phosphates (42.6%) and more efforts will be needed from wastewater treatment plants (31% phosphorus and 41% phosphates).

Waste water treatment: 99% of Lithuania's sewage is treated in line with EU legislation24 in particular with the Urban Waste Water Treatment Directive. Yet Lithuania's gap analysis suggests that 490.27 kilometres of water bodies in two of three RBDs are affected by diffuse urban run-off that is preventing the achievement of objectives. Point source pollution from urban waste water treatment plants prevents 110 water bodies from achieving objectives across all RBDs.27

As regards hydroelectricity, there are over 90 small hydropower plants, together with the Kauno Algirdo Brazausko hydropower plant (100 MW) and the Kruonis pumped storage plant (800 MW). Depending on the water levels, these hydropower plants can generate over 100 GWh of electricity per year to a large extent coming from the river Nemunas.

[2] Detail data can be found in infographics, tables and maps: https://vanduo.old.gamta.lt/files/ataskaita.html#rezultatu-santrauka.

Like in other countries, the establishment of invasive alien species is also hampering the achievement of a good ecological status. In Lithuania, there are four species of crayfish, some of which are considered alien and invasive.[3] These can cause significant harm to the riverbanks and other species.

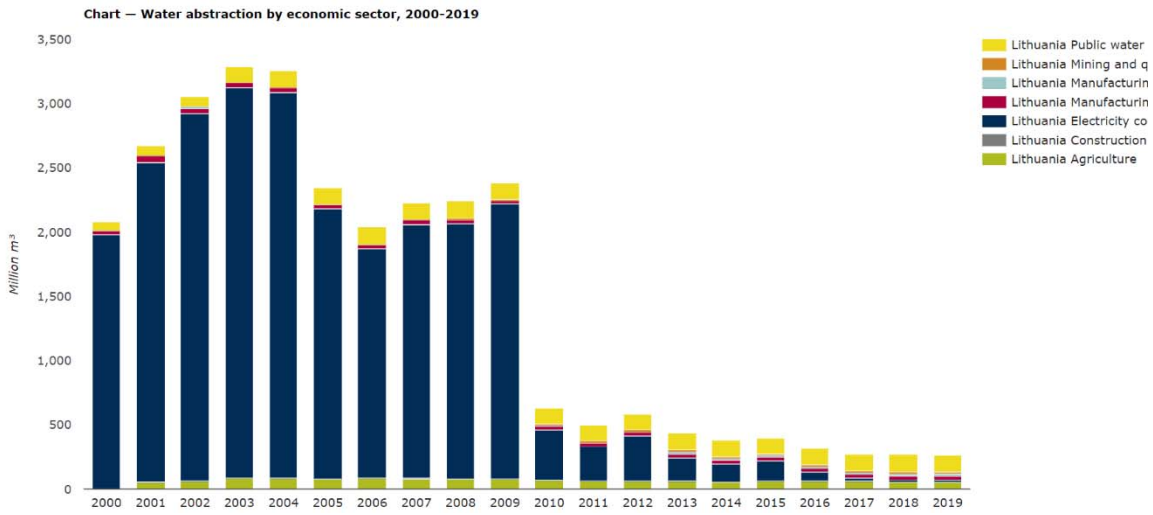
Pressures on groundwaters

In the 2nd RBMPs, 'no significant impacts' were reported for 100% GWBs. Yet, just as for surface waters, Lithuania identifies many more pressures on groundwater bodies compared to the 2nd RBMPs. In this cycle, pressures are reported from public water supply (25%), diffuse pressures from discharges not connected to a sewerage network (20%), pressures from urban run-off (20%) and diffuse pressures from transport (15% GWBs). Furthermore, Lithuania reports for the first time that 25% of GWBs are affected by saline or other intrusions.

As regards abstractions, water abstractions dropped significantly after Lithuania phased out nuclear power generation in 2009. Since then, most water is being abstracted for cooling thermal power plants to produce electricity (90.9%), households and services (5.4 %), aquaculture (1.9 %), industry (1.8%) and agriculture (0.1 %).

Water abstractions seem to be increasing in agriculture, households, and services and in industry. The abstraction of water is generally not identified as a significant pressure on water bodies in Lithuania, similarly to the 2nd RBMPs.

Figure 2. Evolution of water abstractions in Lithuania 2000-2019 (EEA)



Source: EEA Water Abstractions by economic sector 2000- 20194

[3] "A Comparative Study of Physiological and Biochemical Indices of Native European and Alien Species of Crayfish in Lithuania: https://www.astacology.org/article.asp?uid=Guest&a=568&t=1&type=1.

[4] Conventional statistic abstraction data of Eurostat, EEA and OECD exclude water disappearing after abstraction via leakages or evaporation from the surfaces of reservoirs and canals. Leakage and evapotranspiration losses can however be significant in MSs with many reservoirs and/or older distribution systems, as is illustrated by French data. Page 14, French analytical note on total water consumption (incl. evapotranspiration and losses) adding up to 54.000 million m³ abstracted, instead of 30.000 million m³ used: https://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/fs-2024-na_136_enjeux_et_usages_de_leau_avril.pdf

3. Policy elements contributing to biodiversity and climate change adaptation

3.1 Surface Water: what is their ecological status or potential

Monitoring

The entire monitoring network of water bodies consists of 1073 sites. In rivers, fewer monitoring sites are included in the surveillance monitoring program (192) than in the operational monitoring program (489)[5]. The opposite applies to lakes with 224 and 131 sites, respectively. For transitional and coastal waters, 16 and 15 operational monitoring sites are reported, but no surveillance monitoring sites. In coastal and transitional water bodies within the Nemunas RBD, morphological changes, hydrological or tidal regimes are monitored.

There is a nuanced picture on the progress on monitoring. Compared to the 2nd RBMPs, the monitoring increased for some quality elements, especially biological quality elements. It is noted positively that in the 3rd RBMPs, monitoring includes new biological quality elements such as phytobenthos for lakes, phytoplankton for rivers, macrophytes, phytobenthos, and benthic invertebrates for transitional waters, and macrophytes and phytobenthos for coastal waters. Equally welcome is the fact that monitoring of transparency conditions and nitrogen conditions for lakes and oxygenation conditions for rivers have increased. However, on the contrary there has been less monitoring for some quality elements in rivers and lakes for physico-chemical quality [6]. Similarly, monitoring of phosphorus conditions in lakes and rivers has decreased slightly, from 99% to 92% and 100% to 99.8%, respectively. While the nutrients conditions are monitored very well, many physico-chemical quality elements, in particular for transitional and coastal water bodies, are still not monitored at all or not sufficiently. Salinity conditions, thermal conditions and acidification status are not monitored at all for all types of surface water bodies (SWBs). Oxygenation conditions are only monitored in rivers. Transparency conditions are only monitored in lakes and coastal water bodies.

Lithuania's electronic reporting under the 3rd RBMPs also suggests that in practice Lithuania only monitors RBSPs in 5% of its rivers and not at all in lakes. It is also noted that since the 2nd RBMPs (2016), Lithuania no longer uses expert judgment to close data gaps for RBSPs, or data gaps regarding the hydrological regime or the morphological conditions of rivers. Most of the time, RBSP were monitored at a frequency equal to or above the minimum frequency (four times per year).[7]

Status Assessment

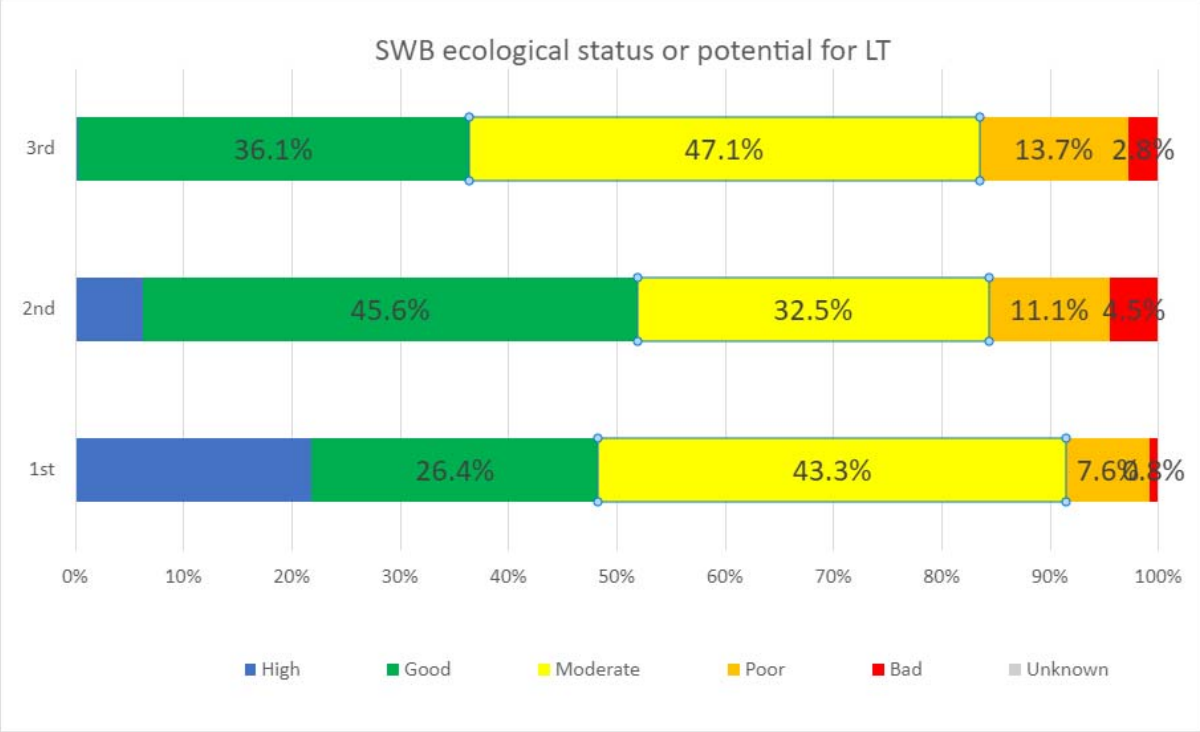
[5] There are two types of monitoring: i) operational monitoring to determine the status and which covers all water bodies at risk and ii) surveillance monitoring aimed rather at identifying impacts and long-term changes. Lithuania has reported [4] types of monitoring: intensive and extensive surveillance monitoring, operational monitoring, and investigative monitoring.
[6] The Republic of Lithuania subsequently explained that oxygenation conditions are monitored in lakes, fish are not monitored in coastal waters, and that hydrological regime and morphological conditions are monitored in 100% of coastal waters. Moreover, fish, hydrological regime, and morphological conditions are monitored in 75%, 100%, and 100% of all transitional water bodies respectively. Additionally, all general physico-chemical quality elements are monitored in all coastal and transitional water bodies. Finally, further concerns were raised about the accuracy of the data on the salinity conditions and the acidification status for lakes and rivers, but no further details were provided.
[7] RBSP were monitored at 38 river water bodies with 48 sites, 1 lake was monitored with 1 site, 2 coastal waters were monitored with 5 sites, 4 transitional waters were monitored with 16 sites.

The 3rd RBMPs explain how the river basin specific pollutants (RBSPs) have been identified and how they are used for classifying surface water bodies according to ecological status. Grouping is only applied for the ecological assessment of rivers if they are not deemed at risk of failing good status.

Lithuania's confidence in its classification of ecological status is overall stronger than in the 2nd RBMPs. However, for most water bodies classified in a good ecological status or potential, Lithuania's confidence remains low. Confidence is to the contrary overall high for most water bodies classified in moderate or poor ecological status or potential. It is thus improved confidence in the classification of moderate or poor status rather than those in good status that caused an improvement of Lithuania's overall confidence in status assessments.

TThere has been a significant deterioration of the ecological status of SWBs since the 2nd RBMPs (Figure 2). Only 36.4% of SWBs are still in good or higher ecological status, down from 51.9% in 2nd RBMPs. A more granular assessment shows that the ecological status by biological quality elements shows an overall downward trend for phytoplankton, macrophytes, phytobenthos, and benthic invertebrates while quality elements for fish are improving. Note that morphological parameters and thermal conditions in coastal waters are monitored but not used for status classification and many physico-chemical quality elements are not consistently measured across all water categories.

Figure 3. Ecological status/potential of SWBs in 1st, 2nd, 3rd RBMPs



Source: WISE electronic reporting

More granular data suggest considerable differences between RBDs:

- Nemunas RBD: 57% of rivers and 63% of lakes not in good status
- Lielupe RBD: 94% of rivers and 95% of lakes_not in good status
- Venta RBD 66% of rivers and 90% of lakes not in good status
- Dauguva RBD: 22% of rivers and 44% of lakes not in good status.

It is of particular concern that Lithuania's second largest and most Northern RBD, the Lielupe RBD, fails to achieve good status for almost all of its 129 river and 20 lake water bodies.

Since less expert judgement has been used and the status assessment has been increasingly based on newly monitored data, so this deterioration could be partly attributed to better monitoring of ecological status.

Overall, by 2021, 63% river water bodies and 64% of lake water bodies failed to reach good ecological status/potential. Moreover, all of Lithuania's transitional and coastal waters fail to achieve good ecological status.

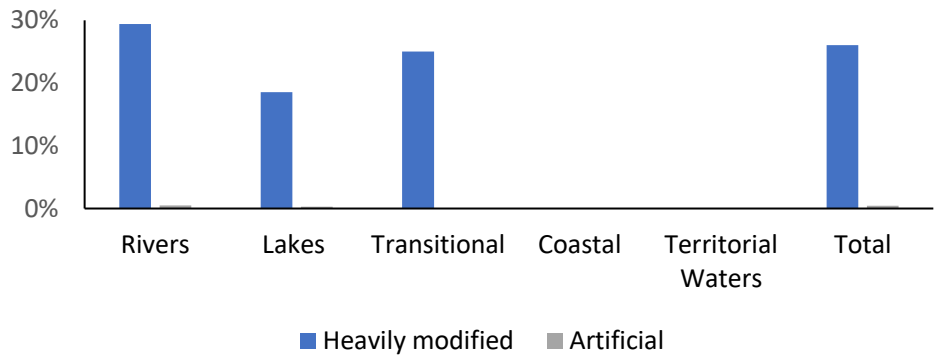
Thus, Lithuania appears far from reaching the WFD objectives for the ecological status of SWB. Yet, the authorities consider that by 2027, ecological status/potential is expected to improve from now 36.1% to then 50.8%. This means that the implementation of the Programme of Measures described in the 3rd RBMPs is expected to only close around 14% of the gap.

3.2 Hydromorphological changes and artificialization (HMWBs and AWBs)

Hydromorphological characteristics of surface water bodies concern the quantity and dynamics of water flow, the connection of surface water bodies to groundwater bodies, continuity of rivers, as well as river depth, river width and their variation in structure as well as the substrate of the riverbed structure of the riparian zone.

The percentage of heavily modified water bodies in Lithuania in the 3rd RBMPs stayed overall the same as in the 2nd RBMPs. Figure 4 shows the high level of human intervention in the Lithuanian water system. Compared to other Member States, Lithuania has the fifth highest percentage of heavily modified water bodies[8]. There are almost no artificial SWBs (only 0.42%).

Figure 4. Percentage of heavily modified and artificial water bodies per category and total



Source: WISE reporting

The main uses of heavily modified river water bodies are agricultural land drainage, urban development, tourism, and hydropower. The RBMPs explain that HMWBs are those water bodies that are regularly dredged and modified for agricultural purposes. The main physical alterations of river water bodies are land drainage and weirs/dams/reservoirs.

For HMWBs, Member States are bound to define and achieve a good ecological potential (GEP). It is the Member States' responsibility to define at the level of each water body this "potential" based on

[8] Based on the 20 reported MSs.

CIS Guidance Documents No. 4 and 37. In respect of this GEP, Lithuania has defined biological elements, and it has compared good ecological potential to good ecological status of not heavily modified water bodies. Regrettably, the reported data, 13% is in GEP, 64% moderate ecological potential (MEP), 19% poor ecological potential (PEP), and 5% bad ecological potential (BEP).

3.3 Groundwater bodies - have they sufficient water – quantitative status

Monitoring

There are no significant changes as regards monitoring, assessment, and classification of groundwater quantitative status compared to the 2nd RBMPs.

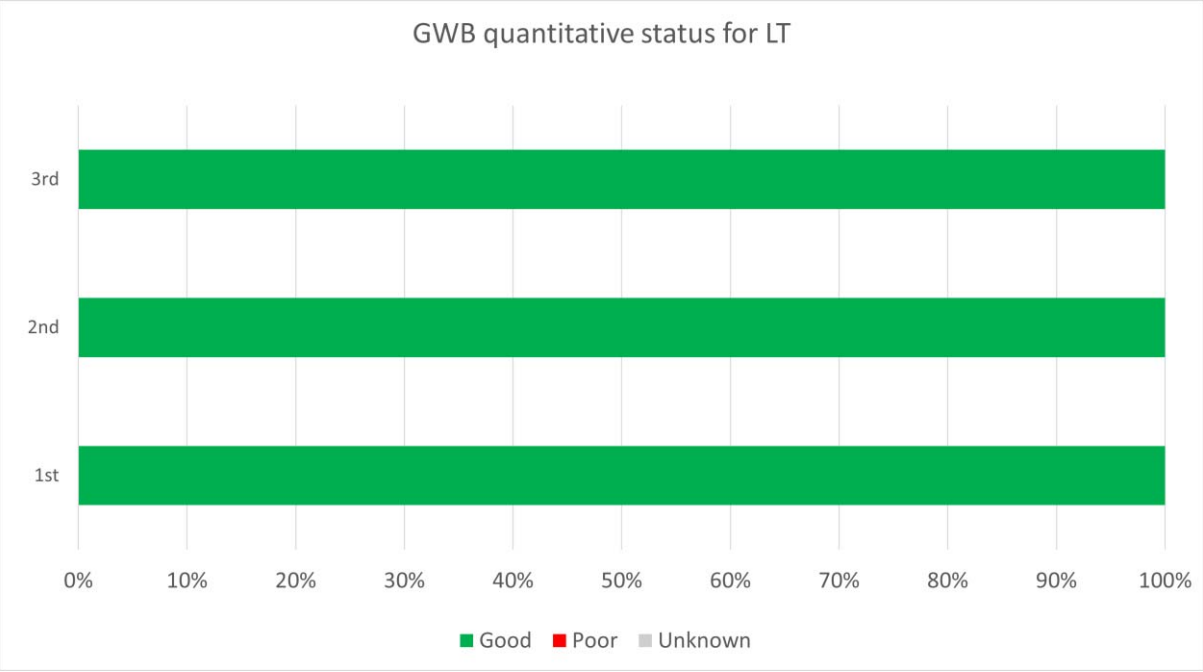
It is noted positively that 90% of groundwater bodies are monitored for the quantitative status, increasing from 70% in the 2nd RBMPs. The remaining 10% of the GWBs which are not monitored, are classified based on expert judgement. Classifications with high confidence are 70 % of the assessments, and for all remaining assessments (30%) confidence is medium. It is uncertain whether this represents a decrease of confidence since the 2nd RBMPs[9]. Groundwater associated surface waters and/or groundwater dependent ecosystems have been considered in the Nemunas RBD, but not in the other three RBMPs where they have not been identified. This is regrettable because the WFD (Annex 2 and 5) requests that the quantitative status of GWBs is always assessed taking into consideration the ecological needs of sensitive associated aquatic ecosystems (GWAAs) and dependent terrestrial ecosystems (GWDTEs).

Status assessment

Just as for the previous cycle, all 20 GWBs are considered to be in good quantitative status, (Figure 5). However, there is a risk that Lithuania's reporting on the quantitative status of GWBs in the RBDs of Venta (LT2300), Lielupe (LT3400), and Dauguva (LT4500) maybe an too optimistic since the needs linked to GWAAEs and GWDTEs are not taken into account.

[9] Lithuania declared that the confidence level remained the same, despite the numbers reported through WISE which suggests that high confidence has decreased from 100% (2nd RBMPs) to 70% (3rd RBMPs). It is unclear, therefore, if the confidence level was already only 70% in the 2nd RBMPs.

Figure 5. Quantitative status of groundwater bodies in 1st, 2nd and 3rd RBMP



Source: WISE electronic reporting

Lithuania has not classified any groundwater body at risk of failing to achieve good quantitative status in 2027. However, pressures on GWBs are apparently increasing. For instance, water abstraction for public water supply has been identified as a significant pressure. Moreover, saline (or other intrusions) impact 25% groundwater bodies (i.e., 5 of 20 GWBs). This is normally a sign of over abstraction in the present conditions (and poor quantitative status) and requires adaptation of the abstractions for a sustainable management, unless the saline impact can be related to other issues[10]. It is unclear from the 3rd RBMPs reporting if there are measures planned to reduce these groundwater pressures since a gap analysis for groundwater is missing.

3.4 Protected Areas (identification, monitoring, objectives and measures)

Lithuania has several designated protected areas including areas for the protection of bathing waters (Bathing Water Directive), habitat or species Natura 2000 sites (Birds and Habitats Directives) and Drinking Water Safeguard Zones. Rivers are mainly connected to Natura 2000 sites while groundwater bodies are mainly connected to drinking water protected areas. Two coastal and two transitional water bodies are linked to a protected bathing water area. In Lithuania, 17.1% of land is covered by protected areas[11], which is below the EU average of 26%.

[10] Saltwater Intrusion - an overview | ScienceDirect Topics and Climate Change Is Making Saltwater Intrusion Worse in Coastal Areas | Scientific American

[11] https://biodiversity.europa.eu/countries/lithuania

Table 2. Number of protected areas in Lithuania (2021)

Protected area type	Number of Water Bodies Associated with protected areas in					
	Rivers	Lakes	Coastal	Transitional	Territorial	Groundwater
Bathing waters	13	45	5	8		
Drinking water protection area	123	30				162
Natura 2000	313	138	5	16	10	

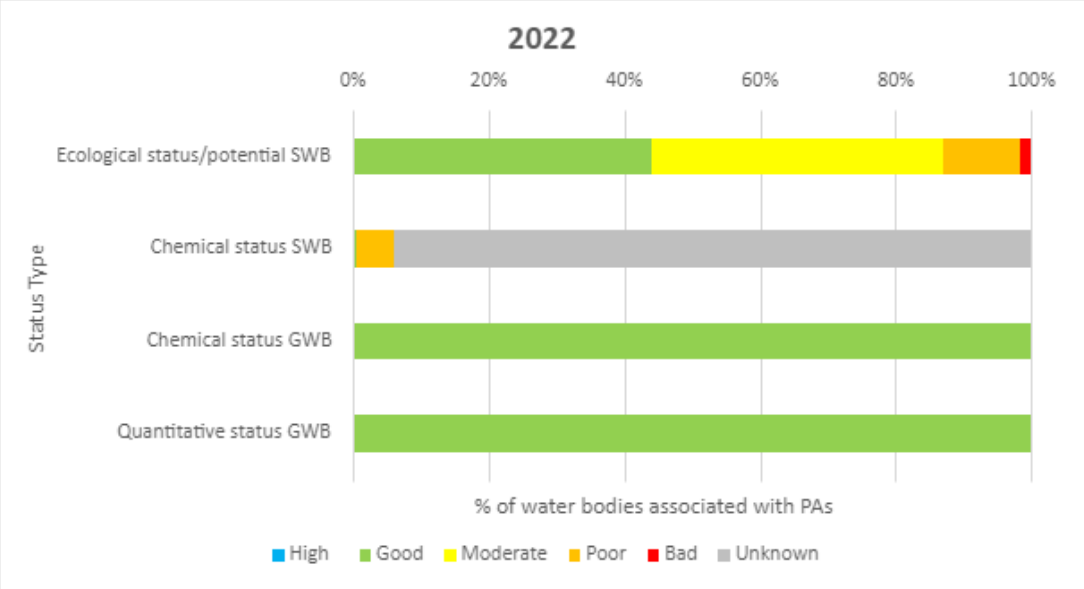
Source: WISE e-reporting

The data provided align with the number of protected areas and there seems to be a good coverage of bathing waters, drinking water protected areas, and Natura 2000 sites with almost one monitoring site per water body associated with protected areas.

It is noted with concern that for surface water bodies associated with protected areas, there has been a deterioration in the ecological status, with high status water bodies deteriorating to good status and good status to moderate status. That said, the ecological status of SWBs linked to protected areas is a few percentage points better (ca. 42%) than the one of SWBs in general (36.1%). So, this may lead to conclude that while the additional measures in protected areas may be stricter than in non-protected areas they do not seem to be sufficient to compensate for the increase in pressures, which would explain the deterioration that is observed.

As regards the chemical status of SWBs linked to protected areas, the Commission had recommended to reduce the number of SWBs in unknown chemical status during the last cycle. Regrettably, the opposite has happened. For the chemical status of surface water bodies, almost all SWBs linked to protected areas are reported as in “unknown” chemical status.

Figure 6. Status of water bodies associated with protected areas by 2022.



Source: WISE electronic reporting

3.5 What is being done to prevent/reduce hydromorphological pressures

The planning and implementation of hydromorphological measures in the 3rd RBMPs include measures to improve longitudinal connectivity (fish ladders, by-pass channels, fish friendly turbines and fish screens), as well as other measures, though clear evidence on the degree of progress was not found in the revised documents although they are linked to implementation deadlines. Measures are planned to be funded from EU and national funds and private operators in all RBDs.

There is no clear link between the costs identified to close the gap on good ecological potential and specific sources of funding. Some of these measures are a continuation from the previous cycle and have already undergone evaluation concerning their cost and feasibility of implementation. Selections of hydromorphology measures have been made based on various studies conducted. Measures related to hydropower and fish passes have been chosen using information derived from studies and analyses conducted by scientists.

The 3rd RBMPs report that there is an authorisation and/or permitting regime in place to control physical modifications in all four RBDs, which covers changes to the riparian area of water bodies according to WFD Article 11(3)(i) WFD. Whether permits have been / are subject to periodic review remains very uncertain, though, as permits can still be granted for an unlimited time.

Lithuania plans to redefine its permitting regime based on a new definition of ecological flows ("e-flows")[12] based on a national methodology for e-flows which has been developed through cooperation with Latvia in the cross-border project "Ecoflow". Such transboundary cooperation should be saluted.

[12] E-flows are considered within the context of the WFD as "*an hydrological regime consistent with the achievement of the environmental objectives of the WFD in natural surface water bodies as mentioned in Article 4(1)*". Assessment of the hydrological regime is not only compulsory under the WFD for assigning high ecological status to SWB, but also plays an important role for water permits. The WFD requires that available groundwater resources exceed the long-term annual average rate of abstraction. To achieve this, abstraction permits for SWBs must be granted knowing the minimum flows of surface water bodies that connect with ground water bodies.

However, implementation does not appear to have started yet and information on the timeframe was not found.[13]

3.6 What Lithuania is doing for abstractions and water scarcity

A concession, authorisation, and / or permitting regime to control surface and groundwater abstractions and impoundments is in place. Furthermore, there is a register of abstractions from surface water and groundwater and a register of impoundments. Small abstractions are defined with certain thresholds and those under the threshold are exempted from reporting and controls.

Regrettably permits are still issued for an unlimited period. Yet permits can be refused or reviewed ad hoc under specific conditions, such as administrative and legal breaches or emergency environmental situations. E-flows have not been implemented in the country, which implies that reviews of permits lack a benchmark against which to verify if water abstractions negatively affect the ecological status of surface water bodies. There are plans to fully define and implement ecological flows by 2027 (see above, section 3.2 hydromorphological changes). At international level, it seems there is no transboundary coordination specifically on water abstraction and scarcity issues with neighbouring countries.

There are no basic measures mapped to reduce pressures on groundwater. Even though all groundwater bodies are in good quantitative and chemical status, basic measures are important in the preservation of the good status of these groundwater bodies. Examples of basic measures include the control of groundwater abstraction and discharges.

3.7 Adaptation to climate change

Climate change in the second FHRMs

As regards **flood risks**, no changes were identified since the first FHRMs.[14] While the second FRMP and the National Water Sector Plan refer to Lithuania's policy documents for climate adaptation, they do not discuss climate change issues in depth. The FRMP provides a brief overview of projected climate change impacts on the hydrological regime and flooding (both short-term and long-term), noting that recent studies do not change previous assessments. The brief descriptions of climate trends are presented in the FRMP, however, neither the FRMP nor the National Sector Water Plan include references to specific research. Additionally, no climate change scenarios are cited or described. The three planning documents do not refer to specific measures to address climate change, nor do they mention climate change within their measures or as a justification for specific measures. For example, for the measure to develop the third PFRA, FHRMs and FRMP in the National Water Sector Plan, it is not specified whether further climate change studies or modelling would be carried to support this work. Some measures – for example, those for nature-based solutions – may support adaptation to climate change, but this is not specified in their descriptions.

[13] See Annex II, section 2.1.2 definition of quantitative status.

[14] At the time of the first FHRMs, the results of assessment of climate change suggested that spring floods will start earlier and the maximum discharge and intensity will show a decreasing trend. At the end of the 21st century, autumn and spring floods will almost merge and form a winter flood. It is expected that the frequency of hurricane storms and of storm water floods will increase. The water level in the Baltic Sea (Klaipeda Straight) has increased by 14.7 cm since 1898. At the end of the 21st century, the average water level of the Baltic Sea may increase by 100 cm, and in the Curonian Lagoon the average water level is expected to increase by 27-63 cm.

In regards of **drought risks** and water scarcity, Lithuania's 3rd RBMPs does not seem to include specific climate related action points in the Programmes of Measures (PoMs). While Lithuania produced a series of background documents outlining the ongoing impacts of climate change on water bodies, little progress has been made in integrating the findings of these reports in the 3rd RBMPs and their PoMs. No information could be found in the RBMPs showing that climate change predictions had influenced the design of the measures. It rather appears that evaluation of climate change impacts remains focused on agriculture. There is limited information in the 3rd RBMPs on climate change related pressures on river basins and no specific climate change adaptation measures could be identified in the RBMPs.

A report by the Lithuanian Environmental Protection Agency[15] projects increased water temperatures[16], insufficient groundwater recharge (due to lower snow melt waters), changes in water quality and increased concentrations of nitrogen and phosphorus. Another study[17] found that absolute nitrogen loads across all river basins are projected to increase. Yet another study[18] outlines that the effectiveness of measures in the agricultural sector to reduce nutrient pollution will be impacted by climate change.

In conclusion, it seems that Lithuania has conducted some research on the impact of climate change of relevance to water management. However, the 3rd RBMPs do not more comprehensively build on these findings to define measures and/or to future-proof planned measures.

4. Policy elements contributing to zero pollution

4.1 Surface Water: what is their chemical status

Monitoring

Lithuania's monitoring network remains very insufficient as Lithuania reported an extraordinarily high number of surface water bodies in "unknown chemical status" (94.6%) due to the limited density of sites for monitoring the chemical status of surface water bodies[19].

Table 3 shows the chemical monitoring coverage (length/area) for rivers, lakes, coastal bodies, transitional bodies, and territorial water bodies. Surveillance monitoring is only in place for 8.4% and operational monitoring for only 5.2% of the river lengths. The level of monitoring is even worse for lakes (6% and 0.2% respectively). It was argued that the monitoring of lakes was very limited as it was considered that the risk of chemical pollution was not present or minimal. For coastal, transitional, and territorial water bodies, Lithuania conducts only operational monitoring but no surveillance monitoring.

It is regrettable that only few stretches of rivers are subject to monitoring at all, and that surveillance monitoring is completely absent for some categories of SWBs.

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[15] 'Assessment of the impact of climate change on water bodes in Lithuania based on the latest scientific works and research', available at: https://vanduo.old.gamta.lt/files/Klimato_kaita.html

[16] Even though the Environmental Protection Agency expects increased water temperature, Lithuania did not report thermal conditions as physico-chemical QE for all surface water body types.

[17] 'Impact of climate change on Lithuanian surface water bodies', available at: https://vanduo.old.gamta.lt/files/report.html

[18] 'Assessment of options for measures to reduce pollution from agricultural sources in the perspective of climate change', available at: https://vanduo.old.gamta.lt/files/report1627991771354.html

[19] Lithuania declared: the chemical status was assessed according to the monitoring results, except for certain transboundary water bodies, where the chemical status was assessed according to the assessment made by neighbouring countries.

Table 3. Percentage (of length/area) included in chemical monitoring (2021)

Chemical status monitoring		3rd RBMPs
River length %	Surveillance monitoring	8.4%
River length %	Operational monitoring	5.2%
Lake area %	Surveillance monitoring	6.0%
Lake area %	Operational monitoring	0.2%
Coastal area %	Surveillance monitoring	0.0%
Coastal area %	Operational monitoring	100.0%
Transitional area %	Surveillance monitoring	0.0%
Transitional area %	Operational monitoring	100.0%
Territorial area %	Surveillance monitoring	0.0%
Territorial area %	Operational monitoring	100.0%

Source: WISE electronic reporting

The Commission had already flagged the need to improve monitoring previously in the 2nd RBMPs, calling upon Lithuania "to improve its monitoring of surface water, and especially coastal and transitional waters, to ensure that all relevant quality elements in all water categories both in surveillance and operational monitoring are covered." However, in practice, the coverage of Lithuania's monitoring network did not improve much. It must be noted that for the Dauguva RBD, Lithuania derives status assessment completely from neighbouring countries without doing its own monitoring as well[20].

Lithuania has transposed the EQS Directive and has incorporated all 45 priority substances into national legislation. However, the frequency of Lithuania's monitoring varies between monthly, quarterly, or annual intervals while the Water Framework Directive requires as minimum interval a monthly monitoring. On the positive side, monitoring in biota and sediment is undertaken for a majority of substances if surveillance monitoring takes place.

While for the 2nd RBMPs the confidence was mostly low (>95%), the confidence in 3rd RBMPs is now largely unknown (>90%). For the remainder, the confidence level was a mixture of high, medium, and low level.

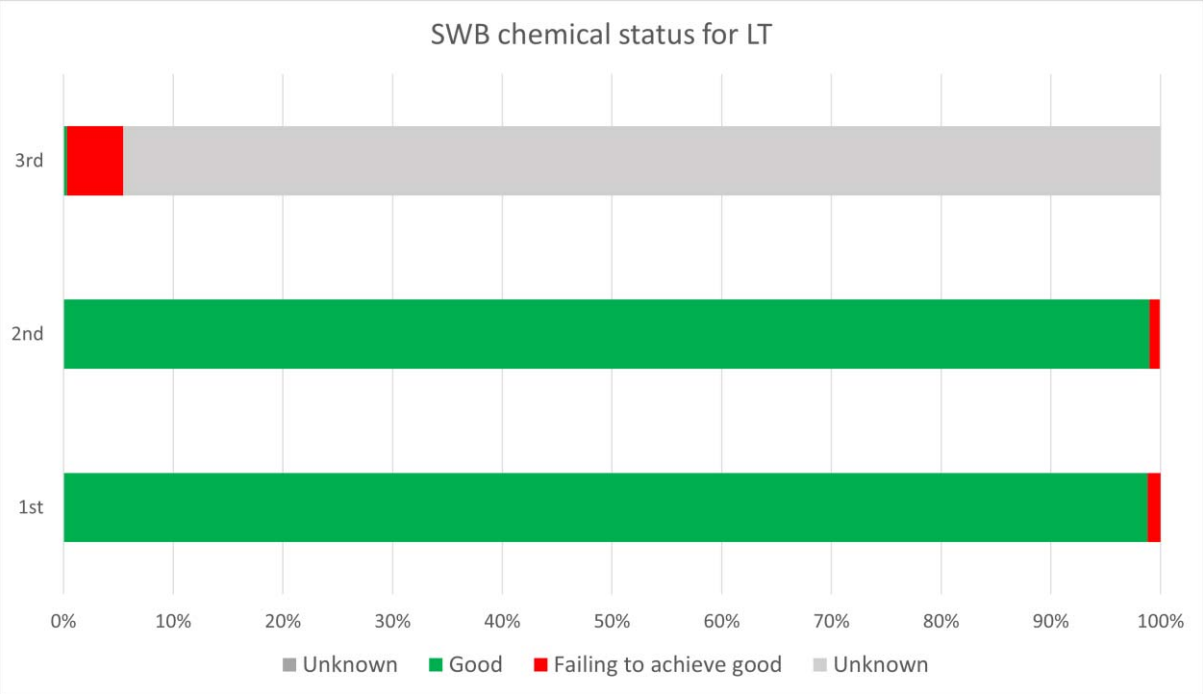
Status assessment

[20] Lithuania declared: the risk of chemical pollution was not identified or assessed as minimal, including lakes, in the Dauguva RBD, so monitoring is not carried out here for the time being. The chemical status in Dauguva RBD was assessed according to the assessment made by neighbouring countries.

In contrast to the 2nd RBMP, 94.6% of the surface water bodies are now considered in "unknown status"[21], 5.1% in poor chemical status and less than 1% (0.3%) in good chemical status (Figure 8).

In the past, in the 1st and 2nd RBMPs, Lithuania reverted to grouping and extrapolations to assume that almost 100% of Lithuania's surface water bodies were in good chemical status. Now, Lithuania reports that the chemical status has largely become "unknown". There is no explanation given on why this methodology changed.

Figure 7. Chemical status for surface water bodies in 1st, 2nd and 3rd RBMP



Source: WISE electronic reporting

It is of great concern that all (100%) coastal and transitional water bodies are reported to be in a poor status. Also, for rivers and lakes, the status is almost entirely unknown, most likely due to the extraordinarily low density and coverage of Lithuania's surveillance monitoring network (coastal and transitional water bodies have 100% monitoring) and the absence of expert judgement and grouping methods.

Where monitoring is in place, the majority of water bodies fail to achieve good chemical status due to the presence of ubiquitous Persistent Bioaccumulative and Toxic substances (uPBTs) (Figure 9 and Figure 10). This is the case in the Venta, Lielupe and Dauguva RBD. For the Nemunas RBD, the failure to achieve good status is due to DEHP (phthalates used as plasticisers, which are not considered uPBT) which causes failure to achieve good chemical status in 5 out of the 14 water bodies where monitoring was undertaken and cybutryne in two water bodies. Even if uPBT substances were not to be taken into account, only 5% of the surface water bodies would be in good status and 1% would fail to achieve good status, due to DEHP in the Nemunas RBD.

[21] Determining the justification of this extraordinary high number is difficult. Lithuania did not comment or response on this data. However, looking at the RBMPs, there is contradictory information and data which uses non-standard terminology. E.g., the Venta RBMP states that no monitoring for chemical status in lakes took place, and then later the RBMP provides statements about monitoring chemicals in lakes.

Figure 8. The top-ten Priority Substances causing failure to achieve good chemical status including substances 1-33.

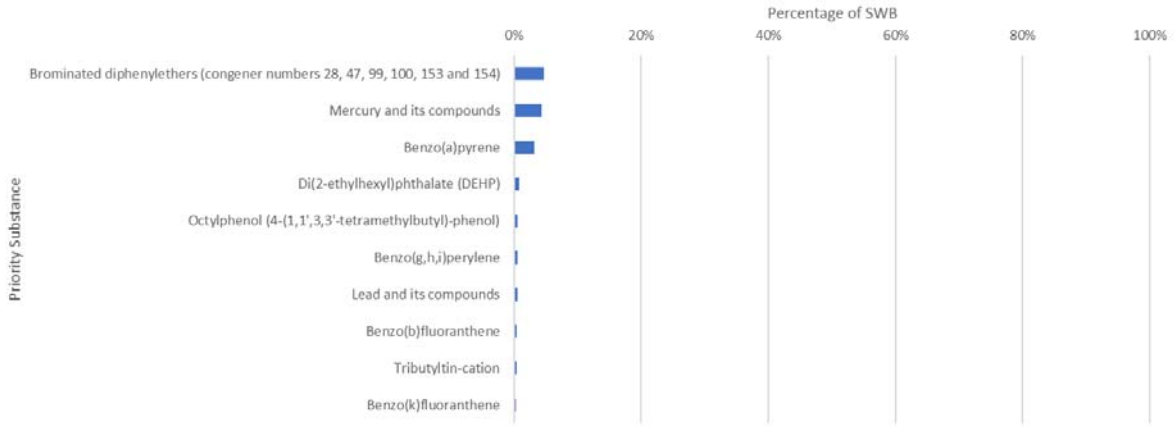
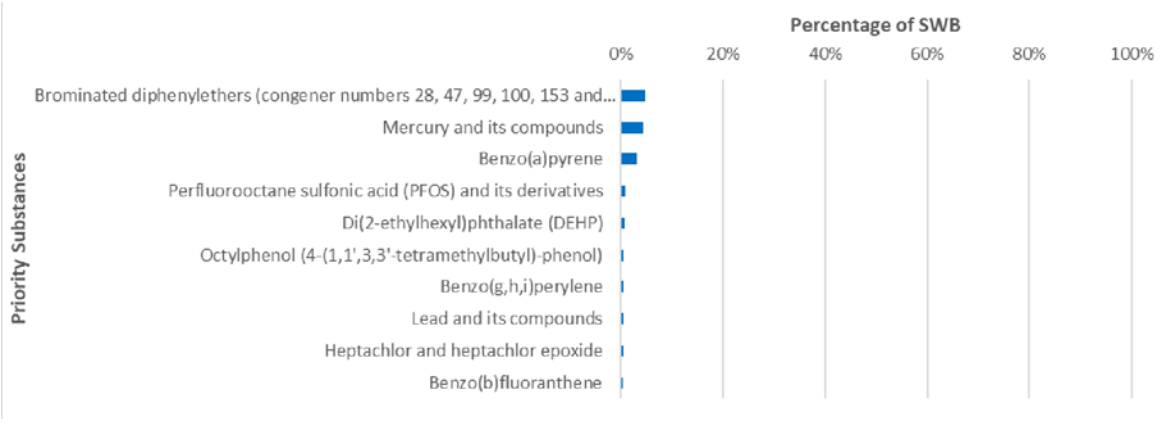


Figure 9. The top-ten Priority Substances causing failure to achieve good chemical status including substances 1-45[22].



Source: WISE electronic reporting

Unsurprisingly, Lithuania expects that by 2027, 0.6% of the surface water bodies will be in good status, while the other 99.4% will fail to reach good chemical status.

In terms of progress with closing the gap, it is welcome that Lithuania followed up on the Commission's recommendation to include in its inventories of pollution loads also aspects of diffuse emissions. The 3rd RBMPs now contain sections on diffuse emissions, including GIS mapping and details of the potential risks and impacts associated with diffuse emissions from agriculture and atmospheric deposition. Regrettably, though, information about the amounts of hazardous substances released into the water environment and their sources remains insufficient. The specific sources of pollution hampering the good chemical status of waterbodies remain unidentified and Lithuania failed to compile a complete inventory of pollution loads for priority substances.

[22] Directive 2008/105/EC as amended by Directive 2013/39/EU added 12 new substances i.e. numbered 34 to 45 to the priority substance list. For the 3rd RBMP, Member States have only had the obligation to monitor them. Compliance with the Environmental Quality Standard values for these 12 new priority substances will be assessed in 2027.

Furthermore, it is important to note that Lithuania did not replace expert judgement and grouping with actual monitored data. Instead, no assessment, unfortunately, has been made for 94.6% of the SWBs at all. This does not appear to be compatible with requirements of the Water Framework Directive.

In conclusion, the spatial and temporal scale of monitoring is insufficient to characterise the chemical status of surface water bodies in Lithuania according to the WFD. To close the gap, surveillance monitoring must be established at the requisite density and depth of parameters observed. It is to be regretted that Lithuania did not follow up on the earlier Commission's recommendation and thus without appropriate data from surveillance monitoring, Lithuania reports 94% of SWBs being in "unknown" status.

4.2 Groundwater Bodies: what is their chemical status

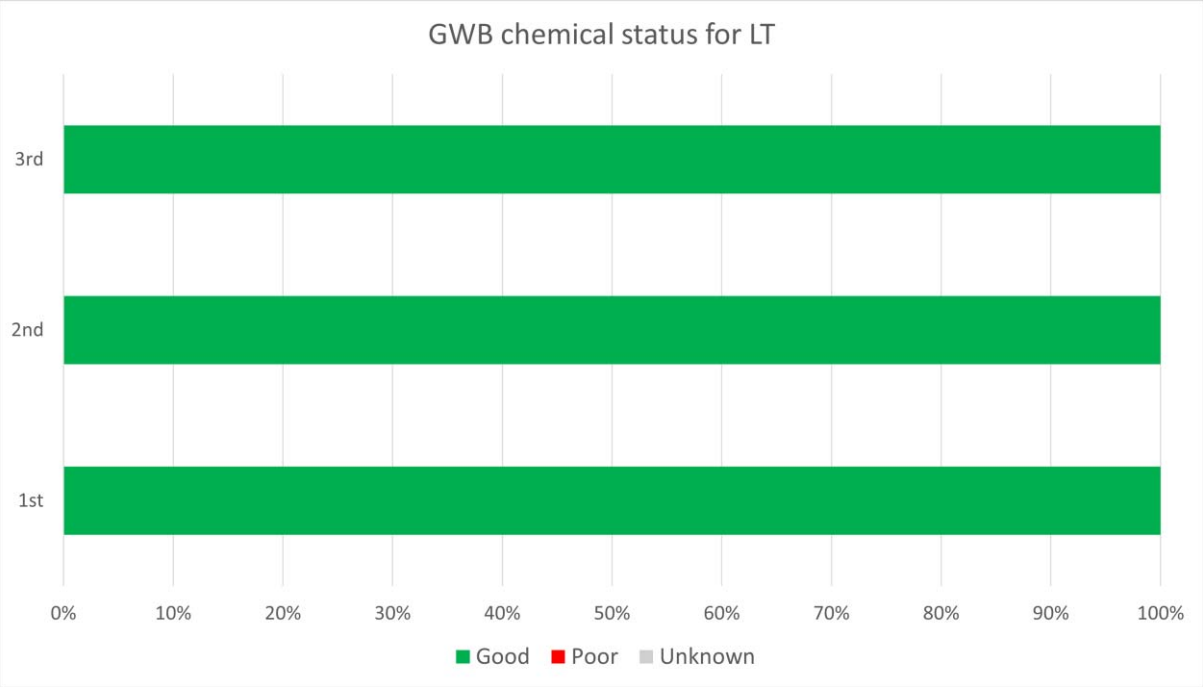
Monitoring

All substances causing risk of deterioration in chemical status (i.e. GWD Annex I and Annex II (Part B) substances and WFD Annex V (Point 2.4.2) core parameters) are subject to monitoring.[23] It is welcomed that all 20 GWBs (100% of GWBs) are subject to surveillance monitoring, compared to 90% in the 2nd RBMPs. However, the number of monitoring sites subject to surveillance monitoring is now 189, decreasing from 278 in the 2nd RBMPs. Potentially, the decrease in monitoring density has driven the decrease in confidence level. Indeed, Lithuania's confidence in its assessment of the chemical status of groundwater bodies has decreased in the 3rd RBMPs. Classification with high confidence amounts to 70.0 % of the assessments, decreasing from 100.0 % in the 2nd RBMPs. For the remaining assessments, the confidence is medium.

Status Assessment

Just as in previous cycles, all 20 groundwater bodies are considered to be in good chemical status in the 3rd RBMPs (Figure 11). Moreover, no groundwater body is at risk of failing to achieve good chemical status by 2027. However, the pressures are increasing, as seen in Chapter 2.2 and the RBMPs mention that groundwater chemical status may be affected in the future by pollution from fertilisers and pesticides and metabolites. There are no measures planned to reduce the pressures on GWBs.

Figure 10. Chemical status for groundwater bodies in 1st, 2nd and 3rd RBMP



Source: WISE electronic reporting

4.3 What Lithuania is doing to combat pollution from agriculture

Nutrient pollution is a pressure on ca. 40% of surface water bodies Lithuania as performed a thorough gap assessment for nutrients which includes an estimate of the necessary load reduction for each surface water body. The gap assessment shows that the nutrient loads need to be reduced for 33% of surface water bodies and the load of phosphorous needs to be reduced for 10% of water bodies. Lithuania's gap for nutrients appears significant. According to the 3rd RBMP, it concerns a surface of 50.038 km[224].

Lithuania's measures to reduce nutrient loads from agriculture include requirements for manure pits and slurry collectors, a prohibition to use fertiliser outside certain periods, requirements to use balanced fertilisation based on fertilisation plans, prohibitions to apply slurry or liquid manure in protection zones of SWBs, and in particular quantitative caps on using nitrogen and phosphorus per hectare of soil per year. Lithuania has addressed the recommendation of the 2nd RBMPs to improve the manure management by describing funding of measures and improving management of mineral fertiliser. However, the recommendations on additional control (enforcement) do not seem to have been followed.

Lithuania included descriptions of measures taken under the Nitrates Directive in the RBMPs and assessed how different measures will contribute to the reduction of nutrient loads. For some of the RBDs, there is an assessment of expected impacts of the measures. This assessment suggests that not all water bodies where nutrient loads are risk factors will achieve good ecological status by 2027. Thus, the recommendation of the 2nd RBMPs to provide information on the measures under the Nitrates Directives, has been fulfilled. However, the measures are likely not enough to achieve good ecological status for all water bodies. One noteworthy problem in Lithuania seems that rules on

[24] Measure P2-2.

manure and slurry treatment are not being complied with sufficiently by farmers. Indeed, according to the Dauguva RBD baseline scenario assessment, inspections related to the Nitrates Directive found 16% to 31% non-compliance in the period from 2016 to 2019[25]. Such high numbers of breaches are a reason of concern and should be considered for Lithuania's Programme of Measures under the 3rd RBMPs in all RBDs.

As regards pesticides, regrettably, no comparable gap analysis (load reductions needed to achieve good status) exists. The RBMPs include only basic measures to address the issue of pesticides. In the assessment of pesticides based on groundwater monitoring, only a few cases of exceedance are observed. The surface of organic farming in Lithuania also accounts for approximately 8% of total utilised agricultural land[26], well below the EU-target of 25% by 2030. In the CAP SP 2023-2027 Lithuania reserves budget and measures to support the maintenance and new conversion to organic agriculture to reach 13% of the agricultural land. More organic farming will allow Lithuania to reduce agricultural pressures on ground and surface waters by reducing the use of pesticides and mineral fertilisers.

To close the gaps for phosphorous and nitrates , the RBMPs rely both on mandatory and voluntary measures. The mandatory measures are set by law and most of the voluntary come as eco-schemes in the national agricultural strategic plan.

Also, the RBMPs contain the basic measures and the supplementary measures funded by the CAP and that are part of the CAP strategic plan. There are also assessments made on how these measures will deliver in terms of water bodies achieving good ecological status.

There is information on the planned measures and the funding sources are described for all of them. This includes basic and supplementary measures. This means that the recommendation of the 2nd RBMPs is fulfilled. However, from the 3rd RBMPs it is not clear how far previous measures under the 1st and 2nd RBMPs have achieved progress, and how planned measures will reduce loads to close the gap.

4.4 What Lithuania is doing to combat pollution from other sectors

Information on drivers causing chemical pollution is not provided for Dauguva RBD (see above on the absence of surveillance monitoring, section 4.2). For the other three RBDs, drivers causing chemical pollution are given, but the relationship between measures and drivers of pollution could not be found and it is difficult to ascertain which measure links to a specific pressure.

Measures have been reported for all RBDs in Lithuania. Basic measures related to water efficiency, including for irrigation, industry, energy and households were not implemented in the previous cycles, and no such measures are planned for the 2021-2027 period either. For chemical pollution, there are measures to improve the control of discharges with permits and to revise permits if needed. There are also measures to improve the knowledge on emissions of chemical substances as well as measures on information campaigns on the use and potential emissions of hazardous substances. The information is not detailed, and it cannot be assessed whether all relevant hazardous substances (priority substances and the RB specific substances) are covered by appropriate measures. There is limited information on the expected impacts of the planned measures.

[25] https://aaa.lrv.lt/uploads/aaa/documents/files/Dauguvos%20UBR%20bazinis%20scenarijus(2).docx
[26] Developments in organic farming - Statistics Explained (europa.eu).

More specifically in relation to industrial waste waters, currently, 99% of Lithuania's sewage is treated in line with EU legislation[27] in particular with the Urban Waste Water Treatment Directive. According to the Lithuanian Environmental Protection Agency urban wastewater treatment plants would need to additionally reduce by 5% nitrogen and 31% phosphorus loads[28]. Lithuania reported the following types of measures: industrial waste water release must no longer be located close to specific water bodies (to be implemented no later than 2025); carry out an inventory of the wastewater discharges which are not registered in the integrated pollution prevention and control permits, ensure that waste water is not discharged into lakes; review the Integrated Pollution Prevention and Control Permits and Pollution Permits for economic entities where high concentrations of pollutants have been identified in the discharged wastewater; review pollution permits, after the reconstruction of sewage treatment plants and/or the expansion of sewage networks and to specify the concentrations and quantities of discharged sewage in the permits, taking into account the water protection goals set for water bodies. Moreover, to prevent wastewater pollution from storm overflows, Lithuania foresees measures for 13 water bodies. The 3rd RBMP, however, provides rather limited information on the expected impacts of these planned measures, and their funding.

4.5 What Lithuania is doing to combat significant pressures – overall assessment of the Programmes of Measures

In the electronic reporting, Lithuania has mapped supplementary measures against KTMs in all four RBDs. Lithuania has mapped a total of 157 national supplementary measures against 12 predefined KTMs and 12 nationally defined KTMs. The application of supplementary measures varies between RBDs.

Lithuania's 3rd RBMP's Programme of Measures 2022-2027 suggests that a prioritisation of measures in the RBMPs has taken place based on a cost-effectiveness analysis. Reducing sources of diffuse pollution ranks highest and is tackled through a regulation of fertilisers to reduce leaching of phosphorus and nitrogen into surface and ground water bodies.

5. Exemptions and economics

5.1 To what extent are exemptions applied in Lithuania

It is important to note that Lithuania has invoked in the 3rd RBMPs the exemptions of Article 4(4) (time related exemptions to delay deadlines) for all water bodies that are not in good status. On the other hand, Lithuania has not invoked exemptions to lower the environmental objectives under Article 4(5) WFD. The exemptions under Article 4(4) were applied based on:

- *Technical unfeasibility* in 747 SWBs (62.6 %) for ecological status/potential and in 12 SWBs (1 %) for chemical status.
- *Natural conditions* in 473 SWBs (39.6 %) for ecological status/potential and in 60 SWBs (5 %) for chemical status.

There are some changes, however, as to how the exemptions of Article 4 (4) WFD were invoked in this third cycle. In the 2nd RBMPs, the exemptions were still applied as follows:

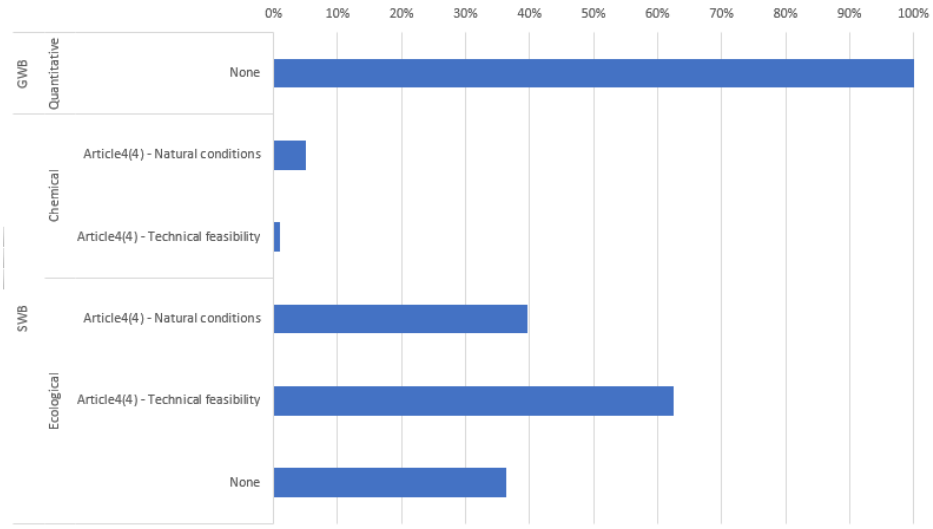
[27] https://water.europa.eu/freshwater/countries/uwwt/lithuania
[28] Detail data can be found in infographics, tables and maps: https://vanduo.old.gamta.lt/files/ataskaita.html#rezultatu-santrauka.

- *Technical feasibility* in 565 SWBs (47.7 %) for ecological status/potential and in 12 SWBs (1 %) for chemical status.
- *Natural conditions* in 145 SWBs (12.2 %) for ecological status/potential.

It can be concluded that in the 3rd RBMPs, the exemptions under Article 4 (4) WFD have been invoked more often on grounds of "technical feasibility" to achieve good ecological status and more often also on grounds of "natural conditions" than before.

It is also noted that, differently from the 2nd RBMPs, for chemical status and for the few SWBs where the status is unknown, Lithuania has used exemptions pursuant to Article 4(4) on grounds of natural conditions. It is worth recalling, that the same water body can be subject to several exemptions, which makes a direct comparison difficult.

Figure 11. Exemptions applied to Lithuania's water bodies in the 3rd RBMPs.



Source: WISE electronic reporting

Justifications for the use of exemptions have been provided at the water body level in annexes. However, the justifications are only briefly explained and are generic meaning that they are repeated over many water bodies.

No exemptions according to WFD Article 4(5), Article 4(6), Article 4(7) of the WFD and Article 6(3) of the Groundwater Directive have been applied in the 3rd RBMPs.

It should be noted, though, that Lithuania cannot invoke the exemption of Article 4 (4) WFD for reasons other than natural conditions after 22/12/2027, because Article 4 (4) (c) WFD foresees that time extensions shall be limited to a maximum of two further updates of the river basin management plan except in cases where the natural conditions are such that the objectives cannot be achieved within this period. The term 'natural *conditions*' refers to the conditions which dictate the rate of natural recovery. It recognises that it may take time for the conditions necessary to support good ecological status to be restored and for the plants and animals to recolonise and become established. This must be demonstrated at the level of each water body.

5.2 Use of economic analysis and water pricing – cost recovery

Lithuania presents a detailed economic analysis in a supporting document to the 3rd RBMPs. For all 4 River Basin Districts, there are long-term forecasts of water supply and demand which are differentiated over type of supply sources and user types / sectors; volume, costs and price estimates associated with the various water services, all differentiated over the broad water user sectors (agriculture, industry and households); as well as estimates and forecasts of the relevant investments. The RBMPs appear not fully rigorous in distinguishing the concepts water services, water uses and water user sectors.

The RBMPs do not present a clear cost-effectiveness analysis (CEA) that has informed the selection of measures to be included in the Program of Measures. However, Lithuania's National Water Sector 2022-2027 action plan talks about 'performing a cost-effectiveness analysis' by comparing costs of alternative options to achieve a good status. Yet, the scope of this analysis remains unclear because there are hardly any references to background documents on the CEA carried out.

The economic analysis gives a detailed account of the water pricing policies, many aspects of which contribute to providing adequate incentives for an efficient water use. The water abstraction permit's fee as well as drinking water tariffs have a volumetric component; the unit rate increases over consecutive consumption volume brackets; the water bill for water services provides a transparent specification of the various price components; and prices vary across regions differing in cost and water status profile. However, irrigation water is charged with a flat rate, probably per hectare of arable land, and in all RBDs there are some specific water services provided well below the cost price, justified by a specification of the economic, social and environmental effects of using prices conform full cost recovery. The design of the water pricing policies is informed by empirical price elasticities.

The RBMPs provide overall cost recovery figures for collective water supply services, namely water supply and sanitation services combined and for each service separately. The account of the calculations of the cost recovery rate present figures on costs and revenues in a transparent manner, also reporting on subsidies. For water supply services as a whole, the RBMPs compare prices implied by (nearly) full cost recovery in a so-called "current scenario" and cost-recovery levels in a "potential scenario" where investment costs covered by EU grants are considered as depreciation costs. On this basis, the choice has been made to set prices conform the "current scenario;" the reported calculations indicate that this still results in recovering most of the water services' costs, with the exception of the Dauguvo RBD (about 40% rather than about 85% cost recovery).

While the background documents report on the revenues obtained from the broad water user sectors and also on subsidies, the RBMP's appear to lack a clear statement on the overall adequacy of their contributions to the water services' costs as well as the application of the polluter-pays-principle.

The economic analysis also reports on the appraisals of the environmental costs and how they have informed water prices and other pricing policies. For the water user sectors agriculture and hydropower, two methods have been used: the tax rate on nitrogen emissions and on natural resources respectively have been used to appraise these sector's environmental costs (benefit method), supplemented by the costs of the other measures to achieve good status to the extent incurred by these sectors (cost-based method). For the other sectors, namely the collective water services (hence households), industry and aquaculture, only the benefit method has been used.

Note that this assessment is based on the stringent assumption that the unit rates adequately reflect the costs of the actual pollution and that these taxes are levied on the actual polluters rather than users. However, the RBMP assessment recognises that for important pollution pressures, this is not

the case. For industrial wastewater, the rate if pollution fees do not reflect the ensuing environmental damage while hazardous substances released by industry are often insufficiently accounted for and therefore the related damage is not compensated in any way through the cost recovery mechanism. Both cases indicate that further improvements in the application of the polluter-pays-principle are possible.

6. WFD recommendations

Recommendations - Lithuania should:

1. accelerate action and enhance the overall level of ambition for restoring to good ecological status (natural water bodies) or good ecological potential (heavily modified water bodies) and good chemical status of surface bodies to reduce the compliance gap as much as possible by 2027. This presupposes that Lithuania:
2. addresses the density of its entire monitoring network for surface water bodies as a matter of urgency. Despite Lithuania's overall progress on other aspects, the spatial and temporal scale of Lithuania's monitoring network remains by far insufficient to provide reliable information on the chemical status of surface water bodies in line with Annex II, Section 1.3 WFD. This shortcoming already existed in the 1st and 2nd RBMPs and has not been addressed so far contrary to preceding Commission recommendations. Lithuania's monitoring network should be upgraded speedily to fully meet the requirements of Article 8 so that the network can provides a coherent and comprehensive overview of the chemical and ecological status within each river basin district and permits a reliable classifications of water bodies.
3. adopts more specific and more targeted measures to reduce the pollution of its surface water bodies regarding nitrogen and phosphorus from intensive agricultural activities to reduce pressures. Furthermore, Lithuania should more regularly review the effectiveness of the existing and future measures to reduce pressures from diffuse agricultural pollution to establish a feedback loop between measures taken and impacts achieved to allow for continuous improvements;
4. accelerates measures to improve wastewater treatment in particular by connecting septic and sewage storage tanks in lower populated areas with wastewater treatment facilities.
5. maps more effectively measures to improve the ecological status of coastal and transitional water bodies, including measures to reduce nitrate and nitrogen pollution.
6. Regarding the use of economic tools, funding and cost-recovery for water services, Lithuania should:
7. provide more detailed information on the prioritisation of the measures together with a judgement on the most cost-effective combination of measures. Lithuania should explore in more depth how polluters can be made to pay for cleaning up chemical and ecological pollution of surface water bodies, in particular for industrial wastewater discharges.
    a. make polluters pay for cleaning up pollution by covering costs of waste-water treatment plants such that good chemical status of surface water bodies can be achieved.
8. Regarding additional measures to reduce the existing environmental challenges and pressures, Lithuania should:
9. adopt time-bound measures and earmark sufficient resources to identify and sanction breaches of compulsory rules constraining the use of mineral fertilisers, slurry and manure in all RBDs. Lithuania should

ensure regular inspections to ensure that the sector complies with requirements under the WFD and the Nitrates Directive for manure and slurry treatment;

10. assesses comprehensively and implement alternatives to intensive agriculture and uses eco schemes to promote organic farming (which is still below EU average) in regions where pressures on the ecological status of surface water (and the chemical status of ground water bodies) are high;
11. link measures to reduce pollution from industry, transportation, and the urban sector more clearly to pressures and quantify more precisely the gap;
12. accelerate the revisions of permits and ensure that these permits are periodically reviewed as required by the law and upgrade urban and industrial wastewater discharges and reduces chemical pollution from urban run-off.
13. accelerate the recovery periods by reducing pressures and taking action at the level of each water body by reducing pressures and cleaning up pollution;
14. use all programmed amounts for sustainable water management and climate adaptation under the Cohesion Policy 2012-27.
15. As regards adaptation to climate change and water scarcity, Lithuania should:
16. make permits for abstractions from surface water bodies dependent on the respect of ecological flows based on an agreed and binding methodology to calculate ecological flows.
17. timely limit water abstraction permits because unlimited permits hamper are difficult to reconcile with the obligation to ensure periodic reviews of abstraction controls (Article 11(3)(e) and 11(3)(g) WFD).
    a. For the five GWBs in the Lielupe and Nemunas RBDs which are under significant pressures from abstractions for public water supply, it is recommended to adopt measures for enhancing efficiency and reducing water consumption per capita to prevent that the five groundwater bodies run the risk of failing good quantitative status in the future.
    b. map basic measures to groundwater pressures to preserve the good quantitative and chemical status of its groundwater bodies.
18. should establish more explicit links between, on the one hand, the national climate adaptation strategy, and related background documents on climate change impacts, and the RBMPs and its Programme of Measures, on the other hand;
19. Regarding transboundary cooperation, Lithuania should:
    a. continue its effort on transboundary cooperation to increase comparability on reference conditions, monitoring and classification with its neighbouring countries.
20. Regarding the use of exemptions, Lithuania should apply these in line with ECJ jurisprudence on the restrictive interpretation of exemptions and better justify the use of exemptions, providing sufficiently detailed justifications at the level of the water body and ensure that their application is regularly reviewed. This implies in particular:
    a. Recognising that the possibilities for time extensions (Article 4 (4)) are extremely limited and will no longer be allowed after 2027 (except if duly justified for natural conditions).
    b. Where Lithuania intends to invoke “natural conditions” as reason for exempting surface and/or ground water bodies according to Article 4 (4) WFD after 2027, it will be necessary to demonstrate the recovery period for ecological and chemical status at the level of each individual water body failing good status in 2027.

c. Where new projects, including dams and water transfers, are carried out, these should be made subject to a thorough assessment of the impact on water bodies, in accordance with Art 4(7), and where so required because potential deterioration of status /potential may occur, a thorough justification by detailing cumulative effects, the assessment of better environmental options, and the measures taken to mitigate the adverse impacts of new developments.

21. Regarding the classification, monitoring and assessment problems, Lithuania should:

22. consider GWAAEs and GWDTEs in the establishment of threshold values (and establishing the quantitative status of GWBs) in all RBD; consider saline or other intrusions in the establishment of threshold values in all RBDs (not only in Nemunas RBD - LT1100); coordinate threshold values with neighbouring countries.

a. further improve monitoring to increase confidence in the classification of ecological status of surface water bodies where good status / potential is made with low confidence and where expert judgment is used instead of data (as the Commission already recommended in the assessment of the 2nd RBMPs)

b. further improve the monitoring of the quantitative status of GWBs so that confidence increases overall, considering that 30% of GWBs are still assessed with medium confidence and that 10% of all GWBs are not quantitatively monitored.

c. include specifically for surveillance monitoring sufficiently representative number and types of SWBs in its surveillance monitoring program to provide a reliable assessment of the overall surface water status within each catchment and sub-catchment of the river basin district.

d. make a precise gap analysis (load reductions needed to achieve good status) for pesticides; and commit funding for concrete and specific measures to reduce pressures form pesticides in surface and groundwater water bodies.

e. adopt more measures to improve the poor chemical status of Lithuania's coastal, transitional, and territorial water bodies, based on a source-to-sea-approach that also identifies origins of coastal pollution inland.

f. include all QEs in assessing the ecological status for all surface water bodies, in particular, improve the monitoring of RBSPs in rivers and lakes and hydromorphological and physico-chemical QEs in coastal and transitional waters.

g. monitor and contain invasive alien species and in particular adopt measures to constrain the spreading of American crayfish.

h. foresee sufficient funding to achieve a good ecological potential for each heavily modified water body.

i. implement ecological flows and make water permits for abstractions dependent on the respect of ecological flows.

23. consider the GWAAEs (groundwater associated aquatic ecosystems) and GWDTEs (groundwater dependent terrestrial ecosystems) for assessing the quantitative status of GWBs in all four river basin districts and ensure designated protected areas are afforded adequate objectives and measures for their protection.

j. should (continue to) accurately quantify nitrate-, nitrogen-, phosphorus- and phosphate loads per sector in the RBMPs gap analysis for calibrating its programme of measures.

k. Very considerably improve monitoring such that its confidence in the results of chemical status assessments of groundwater increases to understand why concentrations of pesticides and their metabolites from agriculture are increasing in groundwater bodies and take effective measures to reduce that pressure.

SECTION B:

FLOODS DIRECTIVE

7. Flood risk management under floods directive (FD)

The Directive requires each Member State (MS) to i) scan its territory for flood risks, ii) assess the potential adverse consequences of future floods for human health, the environment, cultural heritage and economic activity, iii) identify the significant risks, iv) map the flood extent and the potential adverse consequences, and v) take measures to reduce the flood risk. These activities are reflected in (a) the preliminary flood risk assessments, or PFRAs (including the identification of areas of potential significant flood risk, or APSFRs), (b) the preparation of flood hazard and risk maps, or FHRMs, and (c) the establishment of flood risk management plans, or FRMPs. The preliminary assessments, mapping and planning for flood risk are repeated in six-yearly cycles.

There are four Units of Management (UoMs) in Lithuania, which are the same as the Water Framework Directive's River Basin Districts (RBD). The possible sources of floods considered are: fluvial, pluvial, groundwater, sea water, and those coming from Artificial Water Bearing Infrastructure.

Lithuania has designated 129 Areas of Potential Significant Flood Risk (APSFRs). The impacts of climate change on flood risk have been considered in Lithuania. Indeed, for all UoMs, an analysis of the latest hydrometeorological data and scientific publications of Lithuanian experts was conducted in order to review potential climate change impacts. This analysis has confirmed the findings from the first cycle indicating that spring floods tend to decrease in Lithuania while the significance of floods originating from rainfall events constantly grows. No new data was found which would allow to predict any changes in water level in the Baltic Sea and the Curonian lagoon. The report comes to a general conclusion that flood risk trends in all UoMs remain the same as those depicted in the first PFRA.

7.1 Flood hazard and risk maps

Lithuania is using a web map covering the whole territory29 for their FHRMs. Such maps were prepared at the national level and cover all four UoMs. The website of the EPA of Lithuania30 informs that the APSFRs remain the same as in the first cycle. The Lithuanian EPA's webpages on the management of floods31 provide links to the PFRA and to the GIS data sets used for the FHRM, which show the APSFRs. Maps for floods with low probability (1/1 000 years), with medium probability (1/100 years) and with high probability (1/10 years) are provided. Flood extent is shown on the maps. The report on the Update of the Flood Hazard and Risk Maps Data32 states that depth is mapped, however, it is not possible to see it on the online FHRM33.. The maps show the number of inhabitants and the potential costs from flood damage, but not the type of economic activity. The report on the Update of the Flood Hazard and Risk Maps Data states that all the data on economic activities (potential damage costs) was updated taking into account inflation since 201334. The maps also show the industrial installations covered by the Industrial Emissions Directive. as well as the

[29] https://potvyniai.aplinka.lt/
[30] Preliminarus potvynių rizikos vertinimo atnaujinimas 2011-2018 m. (English: Update of the Preliminary Flood Risk Assessment 2011-2018), website of the EPA of Lithuania, https://vanduo.old.gamta.lt/files/Preliminary_flood_risk_assessment_2011_2018.pdf
[31] https://aaa.lrv.lt/lt/veiklos-sritys/vanduo/upes-ezerai-ir-tvenkiniai/potvyniu-rizikos-valdymas/
[32] ibid
[33] Lithuanian subsequently clarified that depth information is only available in the data for download - https://potvyniai.aplinka.lt/duomenys/Potvyniu_gyliai_01_1_10proc.zip In the future, it is planned to update the public online map and provide more valuable information.
[34] Lithuania subsequently informed that type of economic activity is only available in downloadable FHRM layer sets https://potvyniai.aplinka.lt/duomenys/Potvyniu_rizikos_zonos_01_1_10proc.zip;layer "Riz_ekon_priekrantes_text", "Riz_ekon_sniegoliciu_text"

potentially affected protected areas identified. The FHRM background information is found in two different documents – the Report on the Update of the Flood Hazard and Risk Maps Data and on the website of the EPA of Lithuania[35].

In terms of the way in which information about the maps is conveyed to the public, compared to the first FHRMs, the new maps do not hardly provide contextual information, but there are links to the websites of the Ministry of Environment (MoE), the EPA and documents describing the update of the FHRMs and related information[36].

As stated in the report, compared to the previous cycle, the methodologies used to prepare flood hazard maps have remained the same. However, for the second FHRMs the data related to the risk maps were updated, e.g. the indicative number of inhabitants affected was calculated using 2021 population census spatial data.

As regards the consideration of climate change effects in the preparation of flood hazard and risk maps, reference is made to section 3.7 on 'adaptation to climate change'.

7.2 Flood risk management plans

Objectives and measures

The FRMP, the National Water Sector Plan and the Action Plan can be downloaded from a web page37 of the Environmental Protection Agency of Lithuania. These three planning documents set i) one common objective and ii) one common task (a sort of sub-objective) for all four UoMs. The common objective calls for the reduction of flood risks. The common task calls for risk assessment, though further details are not provided. The second FRMP's objective (and the National Water Sector Plan's task) are linked to indicators, making the objective more measurable. The links to measures are now provided more clearly in the three planning documents.

There has been a big effort done of streamlining. Indeed, the second FRMP has a simpler structure for its objective and task compared to the 17 objectives presented in the first FRMP; however, this has made the objective in the second FRMP (and the related task in the National Water Sector Plan) less specific than those in the first FRMP. The achievement of the second FRMP's objective will be monitored using quantitative indicators (which are however included in the National Water Sector Plan and not in the FRMP itself). These indicators are not linked to specific measures, and Lithuania's three planning documents do not provide information specifically on the monitoring of measures. The FRMP states that flood prevention, risk management and education about threats are important for human health, economic activity, the environment, and cultural heritage. Lithuania reported 12 measures. All three planning documents list measures (though the numbers are different across the three documents and different to the number of measures reported). The National Water Sector Plan identifies the following three groups of measures: i) strengthen flood prevention in flood risk areas; ii) reduce potentially flooded populated areas; and iii) prepare strategic documents for the new cycle of implementation of the Floods Directive. Lithuania reported all of its measures as high priority. None of the three planning documents assessed provide information on priorities assigned to measures or on methods of prioritisation. The second FRMP depicts the progress of implementation

[35] Preliminarus potvynių rizikos vertinimo atnaujinimas 2011-2018 m. (Update of the Preliminary Flood Risk Assessment 2011-2018), website of the EPA of Lithuania, https://vanduo.old.gamta.lt/files/Preliminary_flood_risk_assessment_2011_2018.pdf

[36] https://aaa.lrv.lt/uploads/aaa/documents/files/Metodika_20220509.pdf

[37] https://aaa.lrv.lt/lt/veiklos-sritys/vanduo/upes-ezerai-ir-tvenkiniai/potvyniu-rizikos-valdymas/potvyniu-rizikos-valdymo-planas-2023-2027-m/

of the measures taken in the first FRMP. However, Lithuania's three planning documents do not provide information specifically on the monitoring of measures.

The Action Plan provides investment costs for some measures: specifically, for 41 actions that are structural measures. No description was found in the documents on how the investment costs were calculated. The National Water Sector Plan (in its annex 1) and the Action Plan (in section 3 of its main table) identify funding sources for each flood measure or action. The funding sources cited are: the state budget, state forestry office, EU funds, municipal budgets, and the owners of movable cultural heritage (this includes artworks, books and other artifacts), though for the latter source of funding the types of entities who hold the heritage are not specified. The National Water Sector Plan provides three indicators for overall benefits expected from flood risk management, but they are not linked to specific measures. The FRMP briefly refers to the use of cost-benefit analysis, without providing details on the methods or results. It states that coordination between the FRMP and the WFD was ensured, but it does not include details on how the this was done for the development of the second FRMP and the third RBMPs under the WFD. Yet, is briefly mentioned in the FRMP that flood measures do not hinder the achievement of the objectives of the WFD.

As regards the types of measures, one of the three measure groups in the National Water Sector Plan is to strengthen flood prevention in flood risk areas. Lithuania reported 12 measures in total. Out of which: four prevention measures, eight preparedness measures and none for protection. The plan states that its overall aim includes preparation for floods. The Action Plan lists four preparedness measures. No information was found, however, on measures for flood forecasts or early warning systems. The FRMP mentions that one of the most important flood prevention measures was implemented during the first cycle of the FD implementation: the Law on Special Conditions for Land Use was amended with restrictions for new construction in flood hazard areas. This law limits the construction of new, non-essential and unprotected buildings in flood hazard areas. This includes 18 structural actions that were designated as the highest priority. After implementation of these measures, approximately 8 000 inhabitants[38] will be protected.

As regards progress on implementation, second FRMP reviews the implementation of measures in the first FRMP. It notes that many key measures set out in the first FRMP have been or were being completed and a few had been abandoned. Lithuania reported the progress of implementation of its 12 measures: four preparedness measures were reported as not started; four preparedness measures were reported as ongoing (recurrent e.g., maintenance works); and four prevention measures were reported as undergoing construction. The plan explains that most of the highest priority actions from the first plan were implemented or they would be under implementation in 2023[39]. Some of the difficulties quoted to implement some measures are: in some areas, it became clear that some measures may cause irreparable damage to cultural heritage, in other heavily built-up areas, there was not enough state land available to build structural measures, in other cases, local communities or municipalities did not support a measure. Also, some measures were abandoned because a detailed assessment of their feasibility (also considering increases in construction costs and other factors) showed they were no longer cost-effective, as the potential damage avoided would be less than construction costs of structural measures. The FRMP does not, however, provide information on the number of measures affected, nor further detail on the measures not implemented. Nonetheless, the 41 measures in the Action Plan include the lower priority structural actions from the first FRMP that were not implemented but remain planned.

[38] pp.11-12.
[39] pp.11-12

Governance

It is noted very positively that Information on the draft FRMP was submitted to the neighbouringneighbouring competent authorities of Latvia and Poland, and vice versa. Lithuania's FRMP states that none of its measures would increase the risk of flooding in the downstream or upstream regions of the same river in neighbouring countries.

The plan states that the public was able to review documents prepared for the implementation of the Floods Directive and provide comments. It provides brief information on the consultation for the draft second PFRA and the draft FHRM. While the FRMP provides the comment periods for the PFRA and FHRM consultations, it does not indicate the period for the FRMP consultation. There is no information in the FRMP itself whether comments from stakeholders were received, nor is there information on meetings or other direct consultations with public.

Progress identified in the second FRMPs

The second FRMP's objective (and the National Water Sector Plan's task) are linked to indicators, making them more measurable. Achievement of the second FRMP's objective will be monitored using quantitative indicators (which are however included in the National Water Sector Plan and not in the FRMP itself). The links to measures are now provided more clearly. Also, the second FRMP has a simpler structure for its objective and task compared to the 17 objectives presented in the first FRMP. The planning documents related to the second FRMP include natural water retention and cultural heritage protection related measures. While the second FRMP and the National Water Sector Plan refer to Lithuania's policy documents for climate adaptation (they did not previously), climate change issues are discussed briefly.

As regards the consideration of climate change effects in the preparation of flood risk management plans, reference is made to section 3.7 on 'adaptation to climate change'.

8. FD recommendations

Recommendations – Lithuania should:

reflect in the FHRM all identified APSFRs.

show in the FHRM the type of economic activity of the area potentially affected.

specify in the FRMP how the FHRM was used in setting objectives and choosing measures;

provide links in the FRMPs to the national map portal showing the FHRMs as well as summary maps of the APSFRs;

ensure that the FRMP are a self-standing document, with clear links and references, where relevant, to other national planning documents, and vice versa;

make an assessment of the progress made towards the achievement of the objectives in the FRMP;

provide cost information for all measures, not just structural measures in the FRMP;

provide information on the methods used to prioritise measures in the FRMP;

discuss the likely impact of climate change on flood risk in detail in the FRMP, including any updates since the PFRA;

consider Insurance as a measure for adaptation to climate change;

clearly set out in the FRMP the number of measures/actions being implemented, how_they will be monitored and should be in agreement with the National Water Sector Plan and its Action Plan;

where relevant, incorporate CBA for the prioritisation of measures and provide a clear description of the methodology used in the FRMP;

a) provide detail on the public consultation and stakeholder involvement, such as the duration, specific stakeholders that participated, the meetings and advisory groups convened, the comments received, and how they were taken into accoun

b) where appropriate should consider flow velocity or relevant water flow and the FRMP flood conveyance routes, as these are relevant to emergency response.