



## Outcome of the Eleventh Meeting of the Group on Sustainable Agricultural Practices (AGRI 11-2020)

### Table of contents

Introduction .....	2
Agenda Item 1 Adoption of the Agenda .....	2
Agenda Item 2 Matters arising from other HELCOM work of relevance for the Group.....	2
Agenda Item 3 Update of the Baltic Sea Action Plan.....	2
Agenda Item 4 Revision of part 2 of Annex III of the Helsinki Convention.....	3
Agenda Item 5 Nutrient recycling.....	3
Agenda Item 6 Progress in integration of annual nutrient accounting at farm level and initial discussion on the development of a related Recommendation/Guideline based on the best regional practices .....	4
Agenda Item 7 Reduction of ammonia emissions from agriculture - Update of the HELCOM Recommendation 24/3.....	4
Agenda Item 8 Climate change mitigation and adaptation measures – building HELCOM knowledge on climate change parameters and their impact on agriculture.....	5
Agenda Item 9 Transfer of knowledge and technology and exchange of good examples.....	6
Agenda Item 10 Future work .....	6
Agenda Item 11 Any other business .....	6
Agenda Item 12 Outcome of the Meeting.....	7
Annex 1. List of participants .....	8
Annex 2. Additional information on the BSAP actions relevant for the Agri group.....	9
Annex 3. Recommendation for amending the Annex III part II of the Helsinki Convention .....	18
Annex 4. Draft Baltic Sea Regional Nutrient Recycling Strategy .....	25
Annex 5. Status of nutrient accounting.....	31
Annex 6. Working version for the scope of the Recommendation to mitigate ammonia emissions from agriculture .....	33

## Outcome of the Eleventh Meeting of the Group on Sustainable Agricultural Practices (AGRI 11-2020)

### Introduction

0.1 The Eleventh Meeting of the HELCOM Group on Sustainable Agricultural Practices (AGRI 11-2020) was held online on 27-28 April 2021.

0.2 The Meeting was attended by all HELCOM Contracting Parties except for EU as well as by Observers from the Baltic Farmers' Forum for Environment (BFFE), Baltic Sea Action Group (BSAG), Coalition Clean Baltic (CCB), Race for the Baltic and World Wide Fund for Nature (WWF) (**Annex 1**).

0.3 The Meeting was chaired by Ms. Sari Luostarinen, Chair of HELCOM Agri group.

0.4 Mr. Dmitry Frank-Kamenetsky, Professional Secretary and Ms. Susanna Kaasinen, Associate Professional Secretary at the HELCOM Secretariat, acted as secretaries of the Meeting.

### **Agenda Item 1 Adoption of the Agenda**

1.1 The Meeting adopted the agenda as contained in document 1-1.

### **Agenda Item 2 Matters arising from other HELCOM work of relevance for the Group**

2.1 The Meeting took note of the information on the outcomes of recent HELCOM meetings of relevance for the Agri group (document 2-1).

### **Agenda Item 3 Update of the Baltic Sea Action Plan**

3.1 The Meeting took note of the progress in the update of the Baltic Sea Action Plan (**Presentation 1**).

3.2 The Meeting took note that the updated [HELCOM Explorer](#) was launched in autumn 2020 and that reporting on national actions by the countries as well as the reporting on the joint actions by the Working Groups endorsed by HOD 59-2020 has been included to the HELCOM Explorer.

3.3 The Meeting took note that HELCOM 42-2021 agreed that the additional information on the actions that was originally intended to be included in annex of the updated BSAP should be instead presented as a supporting document for the Ministerial Meeting 2021 to provide context for and support the implementation and follow up of the actions. HELCOM 42-2021 also agreed that the supporting document will be submitted for review to HOD 60-2021 and for approval to an intersessional HOD meeting in early September in 2021.

3.4 The Meeting took note of the list of activities and pressures to be linked to the BSAP actions (document 2-1-Att.1).

3.5 The Meeting took note of the clarification that the actions under consideration were endorsed by HELCOM 42-2021 in the wording which is presented in document 2-1. Other actions (coloured yellow in the document) were under review by DG BSAP when the document 2-1 was prepared.

3.6 The Meeting considered the additional information on the actions within the group's mandate and agreed on the proposed formulations as included in **Annex 2**.

3.7 The Meeting agreed that the consideration of the remaining actions needs additional time and that the time remaining for the submission deadline to HOD 60-2021 is too short to accomplish the task. The Meeting took note that most of the formulations for the remaining actions had been recently agreed by DG

BSAP 6-2021 and requested the Secretariat to compile additional information for these actions and circulate to the Agri group **by 11 May 2021**. The Meeting further agreed to arrange an additional meeting to finalize the information on 20 May, 10.00-13.00 EEST.

#### **Agenda Item 4 Revision of part 2 of Annex III of the Helsinki Convention**

4.1 The Meeting took note that HOD 59-2020 approved the revised Regulation 2 Item 3, the revised Regulation 2 Item 6 and the glossary of terms based on the proposal by the Agri group while the Regulation 2 Item 7 was agreed to remain unchanged.

4.2 The Meeting took note of the proposals by Denmark on the new paragraph on nutrient recycling in the Annex III part II (document 4-2) and agreed to update it as given in the **Annex 3** to the Outcome.

4.3 The Meeting took note of the clarification that there is no reporting requirement for the provisions of Annex III part 2 in the Convention but the action "Implement and enforce the provisions of part 2 of Annex III "Prevention of pollution from agriculture" of the 1992 Helsinki Convention" proposed for inclusion in the updated BSAP involves national reporting obligations.

4.4 The Meeting took note of the draft HELCOM Recommendation required for adopting the revised Part 2 of Annex III to the Helsinki Convention.

4.5 The Meeting agreed that the glossary of terms should be shortened to be better suitable for the Annex III part II, removing commonly used terms, as given in the **Annex 3** to the Outcome.

4.6 The Meeting agreed on the draft HELCOM Recommendation required for adopting the revised Part 2 of Annex III to the Helsinki Convention for submission to HOD 60-2021 for endorsement with subsequent adoption at 2021 Ministerial Meeting together with the updated BSAP as included in **Annex 3**.

#### **Agenda Item 5 Nutrient recycling**

5.1 The Meeting took note of the draft Baltic Sea Regional Nutrient Recycling Strategy (document 5-1) as well as the comments by EU (document 5-2) and PRESSURE 14-2021 (document 5-3).

5.2 Regarding the proposal on changing the sub-objective "Increasing nutrient use efficiency" by adding "of recycled nutrients", the Meeting agreed on the importance of addressing nutrient use efficiency of all nutrients, not only recycled nutrients, and thus agreed on keeping the sub-objective in its original formulation. Regarding the proposals to replace measures under this sub-objective, the Meeting agreed to include the proposal "Define application conditions and techniques to maximize nutrient efficiency of recycled nutrients" as an additional measure while agreeing that none of the other measures should be replaced since they are important for reaching the objective 1.

5.3 The Meeting emphasized that the Strategy concerns the whole Baltic Sea region and not only EU member states and that the Strategy is focused on the needs of the Baltic Sea region. The Meeting agreed not to refer to EU policies in the introduction noting that it is aligned and to large extent inspired by recent policy developments in the EU such as the European Green Deal or Farm-to-Fork strategy.

5.4 The Meeting agreed to delete the sentence "Recycling of nutrients from eutrophicated waters to land can also be developed" from the introduction and "Promote the development of methods and technologies to manage accumulated nutrient reserves in the Baltic Sea and inland water reservoirs" from the list of possible measures under objective 4. The Meeting agreed that recycling nutrients on land is the priority. The Meeting acknowledged the importance of measures to manage internal nutrient reserves for restoration and revitalization of ecosystems heavily affected by eutrophication but was of the view that these measures are not related to nutrient recycling. The Meeting concluded that inclusion of such measures in the Strategy might cause deviation from the strategic goal of the document.

5.5 The Meeting agreed to remove "Identify regional boundaries for N/P (nutrient badges) for setting N/P reduction/recycling targets and actions" from the list of measures under objective 6 since it is overlapping with measures under objective 1.

5.6 The Meeting agreed on the draft Strategy as included in **Annex 4** and invited the Secretariat to circulate the document for Pressure WG for editorial check, and following the editorial review, invited Finland and Secretariat to submit the final document to HOD 60-2021 for endorsement with subsequent adoption at 2021 Ministerial Meeting with the updated BSAP.

5.7 The Meeting took note of the priority measures to be included in the updated BSAP to follow-up on the implementation of the Strategy and noted that the drafting of the measures is ongoing in DG BSAP and the Segment Team on eutrophication.

5.8 The Meeting took note of the policy recommendations from the SuMaNu project platform (document 5-4). The Meeting welcomed the recommendations and agreed that they are highly relevant to the HELCOM work on nutrient recycling, the European Green Deal and other EU policies.

#### **Agenda Item 6 Progress in integration of annual nutrient accounting at farm level and initial discussion on the development of a related Recommendation/Guideline based on the best regional practices**

6.1 The Meeting took note of the information on the status of the action on annual nutrient accounting at farm level as included in the reporting on the HELCOM action in the HELCOM Explorer (document 6-1).

6.2 The Meeting took note of the update of the national information on nutrient accounting at farm level provided by Latvia, Lithuania, Estonia, Poland, Russia and Sweden and as compiled in the **Annex 5**.

6.3 The Meeting took note that CCB proposed that the countries would provide updated information on annual nutrient accounting and clarify whether national nutrient accounting requirements at farm/field-level procedures also include practices for nutrient surplus calculations. The Meeting also took note that CCB encouraged the group to embark on the work to develop a regional recommendation or a guideline to advance towards nutrient accounting.

6.4 The Meeting discussed steps to initiate the development of the Recommendation/Guideline based on the best regional practices to promote annual nutrient accounting at farm level.

6.5 The Meeting agreed that Contracting Parties will consider potential scope of a recommendation/guideline nationally by the next Agri group meeting. The Meeting requested the Secretariat to make a sketch of this documentation based on the available information on the state of nutrient accounting in the Baltic Sea region and general practices to address various issues in HELCOM documentation. The Meeting recalled that such HELCOM documents are intended to assist countries with advancement towards national application of the best practices available in the region.

6.6 The Meeting further acknowledged that the work on the recommendation/guideline can be organized when countries will contribute to the documentation according to the national developments and in line with national needs of assistance.

6.7 The Meeting further agreed that a dedicated technical HELCOM workshop will be needed to start the work. The Meeting agreed that the scope for the workshop will be developed and endorsed by the group at the next meeting and that the group will then submit the proposal to HOD 61-2021 planned in December 2021 for approval.

#### **Agenda Item 7 Reduction of ammonia emissions from agriculture - Update of the HELCOM Recommendation 24/3**

7.1 The Meeting took note of the document on possible measures to reduce ammonia emissions (document 7-1).

7.2 The Meeting took note that emissions of ammonia from biogas production based on manure should also be addressed. The EMEP guideline on calculation of emissions already included it.

- 7.3 The Meeting took note of the proposal by CCB that different types of manure storages could be considered in the updated Recommendation including temporary manure heaps. Also, time limitation for the temporary manure storage can be considered.
- 7.4 The Meeting agreed that handling and application of mineral fertilizers can be also included in the Recommendation.
- 7.5 The Meeting took note that UN Framework guide to good agricultural practice to reduce ammonia emissions [ECE/EB.AIR/129](#), the EU BREF as well as EMEP guideline are to be considered as a background for the revised Recommendation.
- 7.6 The Meeting considered the possible scope of the Recommendation and agreed on its working version as given in **Annex 6**. The Meeting agreed that a completely new Recommendation can be finally produced and that the aim is the adoption of the Recommendation at the Commission meeting in March 2023.
- 7.7 The Meeting agreed to establish an intersessional reference group for consideration of the scope of the Recommendation and providing additional input to the document. The Meeting invited the Contracting Parties and Observers to nominate experts to the reference group **by 17 May 2021** and inform the Secretariat (Susanna.kaasinen@helcom.fi) accordingly. The Meeting further requested the Secretariat to circulate a sketch of the Recommendation to the reference group when the group is established.
- 7.8 The Meeting requested the reference group to consider the sketch of the Recommendation and contribute to it proposing concrete recommendations to reduce ammonia emission which can be included in the text. The contribution is to be supplied to the Secretariat (susanna.kaasinen@helcom.fi) **by 30 September 2021**.
- 7.9 The Meeting requested the Secretariat to collate the input from the reference group in a single document and submit this document to AGRI 12-2021. AGRI 12-2021 will consider the draft Recommendation and agree on further steps for its advancement. The Meeting suggested that one of such steps could be a regional expert workshop. The date, scope, composition and contributors to the workshop will be identified at AGRI 12-2021.

#### **Agenda Item 8 Climate change mitigation and adaptation measures – building HELCOM knowledge on climate change parameters and their impact on agriculture**

- 8.1 The Meeting took note of the Climate Change Fact Sheet (document 8-1).
- 8.2 The Meeting discussed climate change mitigation and adaptation measures applied or considered for application in the Baltic Sea counties.
- 8.3 The Meeting took note of the proposal by WWF that climate change mitigation and adaptation measures, aimed at e.g. reduction of GHGs or improvement of water management etc, can be considered in connection with the reduction of nutrient losses from agriculture as a win-win solution.
- 8.4 The Meeting took note of the result of climate change modelling in Finland. The effect of climate change was estimated for agricultural nutrient loads in river basins. The main conclusion was that agri-environmental measures should become more targeted, since the modelling indicates otherwise the increase of nutrient runoff from agriculture.
- 8.5 The Meeting further took note that in the new Finnish CAP strategy one of the key measures to adapt to climate change is water management in agriculture. Finland started a governmental programme aimed at transforming water management system utilizing nature-based solutions. Change in winter temperatures and precipitation should be addressed in the development of water management systems which require in turn designing of new planning and management tools.
- 8.6 The Meeting took note that Finland also runs a project called 'Carbon Action'. The project investigates soils' potential to mitigate climate change by storing carbon and develops measures and calculation methods for carbon sequestration. More than 100 farmers are involved to the project and test method on their own fields. Information is available in English <https://carbonaction.org/en/front-page/>.

8.7 The Meeting acknowledged that climate change strongly affects agricultural activities as well as its impact on the environment and agreed to keep the discussion on the issue on the agenda of the group. The Meeting agreed that countries will regularly exchange information on national development in relation to climate change adaptation and mitigation measures.

## **Agenda Item 9 Transfer of knowledge and technology and exchange of good examples**

### **9.1 Innovative water management**

9.1 The Meeting recalled that as part of the Work Plan of the group, AGRI 8-2019 agreed to start compiling practices on sustainable water management (including assessment of efficiency to reduce input of nutrients) in agriculture which can be further developed to a relevant regional document that could take the form of a guidebook or Recommendation.

9.2 The Meeting took note that the WaterDrive project is currently finalizing the compilation of recommendations for best water management practices in rural areas. The Meeting invited the WaterDrive project to provide the outcome of this work to AGRI 12-2021.

### **9.2 Best available technology in animal farming**

9.3 The Meeting recalled that AGRI 8-2019 agreed, as part of the new Work Plan of the group, to launch an activity to collect information on national BREFs for cattle farming and that based on the results of the stock taking, a project application could be considered.

9.4 The Meeting took note that the work planned by CCB in relation to BAT for animal farming has been temporarily suspended due to COVID pandemic.

9.5 The Meeting took note that Finland has launched a national project for reviewing and stocktaking best available practices in animal farming including pigs, poultry, cattle, fur animals, sheep and horses. The project will start in the end of 2021 and is to be finished by the end of 2022.

9.6 The Meeting agreed that the issue of BAT in animal farming could be considered as a part of the workshop related to ammonia emissions. The Meeting also agreed to consider an opportunity of a regional project aimed at the issue and agreed to discuss it at the next meeting or intersessionally, if the information on a suitable project call becomes available.

9.7 The Meeting took note that in Estonia BAT conclusions for intensive cattle farming were prepared in 2015 according to [the Estonian BAT guidelines for intensive cattle farming](#) commissioned by the Ministry of the Environment. The European Union BAT conclusions were followed on the standard text (based on European Commission Implementing Decision 2012/119 / EU) as well as on the BAT reference document for pig and poultry farming to be updated under the Industrial Emissions Directive.

## **Agenda Item 10 Future work**

10.1 The Meeting took note that HOD 59-2021 endorsed the future mode of HELCOM meetings which entails including online collaboration as a more permanent feature of HELCOM work in the future. The Meeting further took note that the endorsed future mode of HELCOM meetings includes for the Agri group 1 physical and 1 online meeting a year.

10.2 The Meeting agreed that the next meeting of the group will be organized on 10-11 November 2021. The Meeting invited the Secretariat to host the meeting if COVID restriction would allow.

## **Agenda Item 11 Any other business**

11.1 The Meeting invited the Contracting Parties and Observers to check the list of contact of the Agri group (document 11-1) and inform the Secretariat ([susanna.kaasinen@helcom.fi](mailto:susanna.kaasinen@helcom.fi)) of possible changes.

11.2 The Meeting took note of the results of the round table «Towards environmentally friendly agriculture» organized as part of the XXI International Environmental Forum “Baltic Sea Day” from 23 to 24 March 2021 in Saint Petersburg, Russia (document 11-2).

11.3 The Meeting took note that Finland has embarked on the work to eliminate the agricultural hot spot in South-West Finland, which is the last remaining HELCOM hot spot on the territory of Finland. The group will be informed of the progress towards the deletion of the hot spot from the HELCOM list.

**Agenda Item 12 Outcome of the Meeting**

12.1 The Meeting adopted the draft Outcome of AGRI 11-2021 as contained in document 12-1.

12.2 The Outcome of the Meeting was finalized by the Secretariat and made available in the HELCOM Meeting Portal.

## Annex 1. List of participants

Name	Representing	Name of organization	Email address
<b>Sari Luostarinen</b>	Chair	Natural Resources Institute Finland (Luke)	sari.luostarinen@luke.fi
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<b>Sonja Pyykkönen</b>	Finland	Ministry of the environment	sonja.pyykkonen@ym.fi
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<b>Annika Svanbäck</b>	Sweden	Swedish Board of Agriculture	annika.svanback@jordbruksverket.se
<b>Josefin Hjort</b>	Sweden	Swedish Agency for Marine and Water Management	josefin.hjort@havochvatten.se
<b>Anu Suono</b>	HELCOM Observer	WWF	anu.suono@wwf.se
<b>Kjell Ivarsson</b>	HELCOM Observer	BFFE and Federation of Swedish Farmers	kjell.ivarsson@lrf.se
<b>Aleksei Lotman</b>	HELCOM Observer	WWF (ELF on behalf of WWF)	alex@elfond.ee
<b>Gunnar Noren</b>	HELCOM Observer	CCB	gunnar.noren@ccb.se
<b>Siri Maassen</b>	HELCOM Observer	Race For The Baltic	siri@raceforthebaltic.com
<b>Lotta Ruokanen</b>	Invited guest	City of Helsinki, Baltic Sea Challenge	lotta.ruokanen@hel.fi
<b>Dmitry Frank-Kamenetsky</b>	HELCOM Secretariat	HELCOM Secretariat	dmitry.frank-kamenetsky@helcom.fi
<b>Susanna Kaasinen</b>	HELCOM Secretariat	HELCOM Secretariat	susanna.kaasinen@helcom.fi
<b>Kaisa Riiko</b>	HELCOM Secretariat	HELCOM Secretariat	kaisa.riiko@helcom.fi

## Annex 2. Additional information on the BSAP actions relevant for the Agri group

Table 1. Draft supplementary information to be provided for the actions relevant for the Agri group in the eutrophication segment

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	<i>Theme: Agriculture</i>								
EN01	Establish site specific buffer zones to reduce nutrient losses from agricultural land, for example on parts of fields where surface runoff and erosion occurs, along ditches or at surface water inlets	Measure	A site-specific buffer zone (perennial crop such as grass) can be established and maintained on parts of the agricultural land where erosion and surface runoff frequently occur. It can, for example, be on erosion-prone parts of a field, along ditches, streams and lakes or at surface water inlets to the drainage system. The location, size and shape of the buffer zone is adapted to the specific site.	<del>The effectiveness depends on where the zones are placed. If they are located where surface runoff and erosion occur, they can significantly reduce erosion. They also</del> <u>Buffer zones</u> reduce the risk of <del>nutrient</del> phosphorus losses caused by soil tillage close to ditches and watercourses and fertilizers being unintentionally spread outside the field or directly into the water. <u>The effectiveness is higher in places where there is a high risk of erosion or runoff.</u>	National	AGRI	Relevant regulation or support scheme in place for establishing site-specific buffer zones. Advice and/or modelling available for farmers to find suitable sites.	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN02	Optimize fertilization rates site specifically and promote precision fertilization practices in order to increase nutrient use efficiency and reduce nutrient losses							Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN03	Develop and apply the best practices to improve soil structure	Measure	A large proportion of phosphorus losses from clay soils are in	Studies on structural liming <del>in Sweden</del> have showed 0-60% reduction	Joint/national	AGRI	Best practices to improve soil structure and aggregate stability on clay soils to	Agriculture	Input of phosphorous —

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	and aggregate stability on clay soils to reduce phosphorus losses from agricultural lands, for example by using soil structure lime or gypsum		particulate form and measures that improve soil structure and increase aggregate stability have potential to reduce phosphorus losses from these soils. Incorporation of structural lime (mix of CaO and Ca(OH) <sub>2</sub> with CaCO <sub>3</sub> ) or gypsum (CaSO <sub>4</sub> · 2H <sub>2</sub> O) into the topsoil are measures which immediately improve the soil structure. <u>There could be also other measures to improve soil structure with justified environmental effect.</u>	of phosphorus losses from clay soils. Studies <del>in southwestern Finland</del> , have demonstrated that gypsum amendment of fields reduces phosphorus loads from clay fields by around 50%. Gypsum contains sulphate, which is gradually flushed away from soil to nearby waterways, and thus gypsum can only be utilized in arable fields along waterways running into the sea.			reduce phosphorus losses from agricultural lands, <del>for example by using soil structure lime or gypsum</del> are compiled in a regional document.  The best practices are applied nationally in areas where the measures are applicable e.g. with the help of support schemes, regulation or guidelines.		diffuse sources, point sources
EN04	Increase organic farming by at least [25%] of agricultural land to reduce the inputs of nutrients and hazardous substances to the Baltic Sea							Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
									deposition, acute events
EN05	Discourage application of manure and other organic fertilizers in the autumn without sowing winter crops							Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN06	Improve knowledge exchange by establishing dialog between farmers, authorities and decision makers	Supporting action	Improved knowledge exchange from farmers to the decision makers and vice versa is important for making decisions that are applicable in the farming practices, and communicating the reasoning behind the decisions in an understandable way is important to make them better acceptable among farmers. Direct contacts should be promoted for communication between scientists, policymakers and farmers.		Joint/ National	AGRI	<a href="#">Organization of a regular Baltic Sea regional forum to exchange knowledge between farmers, authorities and decision makers</a>  <a href="#">Ensuring ways or means for regular exchange of knowledge nationally</a>	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN07	Enhance mutual learning among farmers on best practices and innovative technologies	Supporting action	Transfer of <del>technological</del> innovations and mutual learning among farmers across several BSR countries can be one of the effective and relatively cost-efficient measures that could help to disseminate and adopt nutrient abatement sensitive technologies for		National	AGRI	Farmer mutual learning groups, cross visits, demonstration activities, collaboration with researchers, advisors and technology companies in disseminating and introducing new technologies.	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
			less price and at the same time save spending in other cost categories.						
EN08	Develop BAT/BEP for reducing ammonia and GHG emissions from livestock housing, manure storage and spreading							Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition
EN09	Develop recommendations for manure management specifically for horses, sheep, goats, and fur farming							Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EE01	Apply as a minimum the updated EU's BREF document and Conclusions on BAT for intensive rearing of poultry and pigs, especially for the facilities located within areas critical to nutrient losses	Measure	The EU BAT reference document (BREF) ' <del>Intensive Rearing of Poultry or Pigs</del> ' presents the Best Available Technologies for intensive rearing of poultry and pigs. Utilizing BAT especially within areas critical to nutrient losses is important to minimize nutrient emissions.	Implementing BAT will reduce nutrient emissions. The possibility to prevent or reduce nutrient emissions by using BAT is described in the document for different technologies.	National	AGRI	The EU BREF or similar national document is utilized when permitting intensive rearing of poultry and pigs.	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EE02	Review national regulation and voluntary measures and – if relevant – implement further or revised measures, as compiled in the revised palette of	Measure	The revised palette of measures for reducing phosphorus and nitrogen losses from agriculture adopted at the Ministerial Meeting 2013 is intended to support	Implementing the measures can reduce nutrient inputs from agriculture. The potential effect of the different measures is included in the palette of measures.	National	AGRI	Review of national and voluntary agri-environmental measures. Measures included in the palette of measures implemented into regulation or voluntary	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition;

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	measures for reducing phosphorus and nitrogen losses from agriculture.		implementation of part II Annex III of the 1992 Helsinki Convention "Prevention of pollution from agriculture". The Palette contains technical, managerial and legislative measures, based on best available knowledge and sought to help in implementation of the aforementioned provisions.				measures based on the review, if found relevant.		Input of phosphorous — diffuse sources, point sources
EE03	Implement and enforce the provisions of part 2 of Annex III "Prevention of pollution from agriculture" of the 1992 Helsinki Convention	Measure	Part 2 of Annex III of the Helsinki Convention sets out provisions for prevention of pollution from agriculture. By 2021 the provisions have yet not been implemented by all HELCOM countries.	Implementing the provisions of the annex on plan nutrients, plant protection products and environmental permits will reduce the input of nutrients and hazardous substances.	National	AGRI	Provisions of part 2 of Annex III "Prevention of pollution from agriculture" of the Helsinki Convention implemented and <b>enforces enforced</b> nationally.	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events
EE04	Agreement on national level by 2023 on measures to reduce nutrient surplus in	Measure	A large nutrient surplus in fertilization practices increases the risk of nutrient losses. There are several measures,	Reducing the nutrient surplus in fertilization practices will decrease the risk of nutrient losses. The potential effect of	National	AGRI	Agreement on national level on measures to reduce nutrient_surplus in fertilization practices to reduce nutrient losses	Agriculture	Input of nitrogen — diffuse sources, point sources,

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	fertilization practices to reduce nutrient losses		technologies and restrictions that can be applied to reduce the nutrient surplus.	<del>the</del> some of the possible measures that can be utilized is included in the palette of measures.			<a href="#">Information on measures for reducing nutrient surplus, e.g. limits for surplus</a>		atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EE05	Investigate opportunities for taxation of mineral fertiliser and/or taxation of nitrogen surplus and/or payments for agri-environment measures [by 2024], and implement them building on the experiences available in various countries.	Measure	Financial instruments such as taxes or payments can be utilized to incentivise making better use of nutrients available in manure and other organic fertilizers, thus reducing mineral fertilizer use, <del>and</del> enhancing nutrient recycling and reducing nutrient losses.	Potential effects will be investigated as part of the action.	Joint/national	AGRI	A HELCOM report on experiences in the BSR countries and the effects of financial instruments such as taxation of mineral fertiliser and/or taxation of nitrogen surplus and/or payments for agri-environment measures to enhance nutrient recycling and reduce nutrient losses.  Suitable measures implemented nationally building on the experiences available in various countries.	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources
EE06	Apply innovative water management measures where appropriate, for example, lime filter ditches, sediment traps and controlled drainage, and nature-based solutions, such as two-level ditches and constructed wetlands, when upgrading and renovating agricultural drainage systems	Measure	Upgrading and renovating agricultural drainage systems is currently topical in many Baltic Sea region countries. Applying innovative water management measures where appropriate, for example, lime filter ditches, sediment traps and controlled drainage, and nature-based solutions, such as two-level ditches and constructed wetlands, can reduce nutrient losses.	Innovative water management measures can reduce the input of nutrients from agriculture. The potential effect of some of the proposed measures is included in the palette of measures.	National	AGRI	Relevant legislation, advice and/or support schemes <del>s</del> is in place to support the application of innovative water management measures.	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources

Theme: Atmospheric nitrogen emissions

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
EE16	Revise the HELCOM Recommendation 24/3 on “Measures aimed at the reduction of emissions and discharges from agriculture” ensuring reduction of agricultural ammonia emissions and considering relevant BAT and BEP	Measure	According to the EMEP assessment of emissions of nitrogen in the region and its deposition on the Baltic Sea water area, proportion of nitrogen emissions from agriculture has increased and it has been acknowledged that some countries are at risk to exceeding national ammonia emission ceilings of the NEC directive. It has been agreed that the Recommendation 24/3 is outdated and requires revision.	The revised HELCOM Recommendation 24/3 will be a tool to reduce ammonia emissions in the Baltic Sea region.	Joint	AGRI	Revised HELCOM Recommendation 24/3 on “Measures aimed at the reduction of emissions and discharges from agriculture” ensuring reduction of agricultural ammonia emissions and considering relevant BAT and BEP	Agriculture	Input of nitrogen — diffuse sources, point sources, atmospheric deposition
<i>Theme: Nutrient recycling</i>									
EE07/ EN10 a/ EN10 b	Create legal and institutional tools to advance towards making annual field-level fertilization planning and farm-gate nutrient balancing for nitrogen (N) and phosphorus (P) a requirement for all farms in the Baltic Sea Region to prevent nutrient surplus on farmlands							Agriculture;	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN11 / EE08	Implement adequate measures, especially in agriculture and wastewater management, to achieve the objectives of the Baltic Sea Regional							Agriculture; Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition;

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
	Nutrient Recycling Strategy								Input of phosphorous — diffuse sources, point sources
EN12	Optimize the use of recycled nutrients in agriculture making use of best available technologies and fertilize according to crop needs							Agriculture; Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN13	Develop safety standards for recycled fertilizer products and minimise the occurrence of harmful compounds in these products to comply with the standards							Agriculture; Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of heavy metals; Input of microbial pathogens; Input of pharmaceuticals; Input of other substances (e.g. synthetic substances, non-synthetic substances, radionuclides) — diffuse sources, point sources, atmospheric deposition, acute events
EN14	Increase the knowledge and promote education and advisory services on nutrient recycling							Agriculture; Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous —

Code	Action	Type of action	Rationale	Potential effect (if available)	Implemented by	Overseeing WG/ EG	Indicator for achievement	Activities	Pressures
									diffuse sources, point sources
EN15 / EN17	Create a market for recycled fertilizer products to support their production and use by setting incentives and making their use equally attractive to farmers as the use of mineral fertilizers							Agriculture; Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources
EN16	Enhance cooperation and share experiences between sectors and actors to create a holistic view on sustainable food systems including nutrient recycling across sectors							Agriculture; Waste waters (urban, industrial, scattered dwellings, stormwaters)	Input of nitrogen — diffuse sources, point sources, atmospheric deposition; Input of phosphorous — diffuse sources, point sources

## Annex 3. Recommendation for amending the Annex III part II of the Helsinki Convention

### **HELCOM RECOMMENDATION 42E/x**

Adopted 20 October 2021  
having regard to Article 20, Paragraph 1 c)  
of the Helsinki Convention

### **AMENDMENTS TO PART II ANNEX III “CRITERIA AND MEASURES CONCERNING THE PREVENTION OF POLLUTION FROM LAND-BASED SOURCES” OF THE 1992 HELSINKI CONVENTION**

#### **THE COMMISSION,**

**TAKING INTO CONSIDERATION** the amendment procedure for the Annexes of the 1992 Helsinki Convention, as contained in Article 32 of that Convention,

#### **RESOLVES:**

- a) to amend part II Annex III of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992, in accordance with the Attachment to this Recommendation;
- b) to ask the Depositary Government to Communicate these amendments to the Contracting Parties with the Commission's Recommendation for acceptance; and
- c) to determine that the accepted amendments shall enter into force one year after the adoption of this HELCOM Recommendation,

**REQUESTS** the Governments of the Contracting Parties to report on the progress of implementation of the amendments to Annex III in accordance with the agreed deadlines and Article 16, Paragraph 1 of the 1992 Helsinki Convention.

## Revised Annex III “Criteria and Measures Concerning the Prevention of Pollution from Land-Based Sources”

### Part II: Prevention of Pollution from Agriculture

#### Regulation 1: General provisions

In accordance with the relevant parts of this Convention, the Contracting Parties shall apply the measures described below and take into account Best Environmental Practice (BEP) and Best Available Technology (BAT) to reduce the pollution from agricultural activities. The Contracting Parties shall elaborate Guidelines containing items specified below and report to the Commission.

#### Regulation 2: Plant nutrients ~~Regulation X: Definitions~~

##### 1. Definitions.

For the purposes of the Annex III part II [Regulation 2], the following definitions are used:

1. “Environmentally friendly way” means ways (of doing something) that ensure minimal or least negative effects on adjacent waters, soils, atmospheric environments and habitats.
- ~~2. “Nutrient” means chemical element necessary for plant growth and/or plant metabolism. In its absence, the plant is unable to complete a normal life cycle or the element is part of some essential plant constituent or metabolite. There are numerous nutrients for plants, of which carbon, hydrogen, oxygen (CHO) and nitrogen, phosphorus and potassium (NPK) are considered the main components and primary macronutrients, respectively.~~
- ~~3-2.~~ “Nutrient surplus” means the positive saldo of a nutrient balance equates to the difference between nutrient inputs and nutrient outputs in relation to the utilized agricultural area (UAA). Input can contain N/P of crop residues, seed bound N/P, atmospheric N, N binding from legumes as well as mineral and organic fertilizers etc., while output consists of harvested crops/grass.
- ~~4-3.~~ “Nutrient loss” means (unintentional) (co-)transport of nutrients beyond the reach of plants in a production system by/in water, air or particles to the atmos- or hydrosphere.
- ~~5-4.~~ “Nutrient status” (of fields) means the amount of plant available nutrients in the soil (within a field), taking readily plant available and potentially plant available nutrient pools into consideration. Nutrient status can differ considerably for the various nutrients at a time (within one field/soil) and should hence be determined for the individual nutrients.
- ~~6. “Fertilizer” means any matter or product containing one or more nutrients to enhance the growth of vegetation.~~
- ~~7-5.~~ “Organic fertilizer” means any fertilizer product containing organic matter and nutrients, may be based on livestock manure, sewage sludge or other organic residual materials. Examples for organic fertilizer are compost or digestate.
- ~~6. “Solid livestock manure” means any manure from housed livestock that has a high dry matter content, does not flow under gravity, cannot be pumped and hence can be stacked in a heap. It may contain bedding material and/or fodder residues.~~
- ~~7. “Liquid livestock manure/Slurry” means any manure from housed livestock that flows under gravity or can be pumped. It may contain some bedding material or cleaning water from the housing unit or the milking system. Dry matter content is low.~~
8. “Mineral fertilizer” means any fertilizer product free of organic matter, but containing nutrients, also sometimes referred to as “chemical fertilizer” or “inorganic fertilizer”. May also be produced by processing organic fertilizers, resulting in inorganic products such as ammonia sulphate or struvite.
- ~~9. “Livestock” means domesticated animals raised in an agricultural setting to produce labour and commodities, e.g. meat, eggs, milk, fur, leather and wool.~~

- ~~10. “Livestock manure” means any liquid or solid organic material from livestock production, including excreta (faeces and urine), bedding material etc.~~
- ~~11. “Solid livestock manure” means any manure from housed livestock that has a high-dry matter content (typically above 12%), does not flow under gravity, cannot be pumped and hence can be stacked in a heap. It may contain bedding material and/or fodder residues.~~
- ~~12. “Liquid livestock manure/Slurry” means any manure from housed livestock that flows under gravity or can be pumped. It may contain some bedding material or cleaning water from the housing unit or the milking system. Dry matter content is low (typically below 12%).~~
- ~~13-9.~~ “Organic residual materials” means any organic material that supplies organic matter together with nutrients to soils, including livestock manure, sewage sludge, organic waste, industrial sludge, crop residues.
- ~~14. “Sewage sludge” means residual sludge from urban waste water treatment plants.~~
- ~~15. “Total nitrogen in livestock manure” means the sum of both the organic and inorganic nitrogen in readily plant available pools and in the organic matter, which will mineralize with time. Total nitrogen in livestock manure is determined by methods including complete decomposition, e.g. of organic matter by the Kjeldahl total nitrogen method or by total combustion (Dumas method).~~
- ~~16. “Phosphorus in livestock manure” means the sum of both the organic and inorganic phosphorus in readily plant available pools and in the organic matter, which will mineralize with time. Total phosphorus in livestock manures is determined by methods including complete decomposition.~~
- ~~17-10.~~ “Utilisation efficiency” means, in the case of nitrogen, the percentage of total nitrogen content in an organic fertilizer or an organic residual material that is and will become utilized by plants. Reflects that the total nitrogen content in organic fertilizers and organic residual materials is not immediately accessible to plant consumption. Utilization efficiency is considered to be “high” if the (utilization) percentage considerably exceeds the ammoniacal/mineral nitrogen share of the total nitrogen content.
- ~~18-11.~~ “Phytoavailability” means “Plant availability”: (degree of ) a plants’ possibility to uptake a compound, e.g. nutrient, (harmful) substance, etc., via sub- or above-surface parts of a plant.
- ~~19-12.~~ “Bioavailability” means (degree of ) an organisms’ possibility to uptake a compound, e.g. nutrient, (harmful) substance, etc.
- ~~20-13.~~ “Harmful substance” means any substance that can disturb, reduce, deteriorate or destroy the metabolism of one or more organisms or the equilibrium of an ecosystem.
- ~~21-14.~~ “Storage capacity” means the total volume of storage for liquid and solid manure living up to the criteria for environmentally favourable storing. Sufficient capacity includes the volume of waters from sources such as facility cleaning etc., and (depending on whether the storage container is sheltered from rain or not) the maximal volume of rainwater entering the storage.
- ~~15.~~ “Application/Spreading” means addition of fertilizer to land, including spreading on the soil, injection into the soil or mixing with the surface soil layers
- ~~22-16.~~ “Best available application technique” means the application technique, which – at the current state of technology development – results in the lowest (nutrient) loss and emissions, respectively.
- ~~23-1.~~ “Application/Spreading” means addition of fertilizer to land, including spreading on the soil, injection into the soil or mixing with the surface soil layers
- ~~24. “(coherent) mitigation measures” mean (a suited set of) measures, which limit, stop or reverse the magnitude and/or rate of environmental contamination.~~
- ~~25. “Emission(s)” means loss of substances to the air/atmosphere, for example of gaseous nutrient-containing compounds such as ammonia or greenhouse gases (e.g. methane).~~
- ~~26-17.~~ “Mineralisation” [in soil science] is the decomposition of organic matter in soil by microorganisms to simple inorganic substances and minerals, which may be available to plants. Its rate depends on the material to be mineralised, and the living conditions for the microorganisms such as temperature, oxygen availability, soil moisture etc.

~~27. Leaching” means the loss of plant nutrients by gravimetric water transport from the soil’s root zone, due to rain, snowmelt and/or irrigation, resulting in a downward water movement.~~

~~28. “Soil characteristics” mean entity of soil properties, such as texture, structure, porosity, pH, nutrient stocks, sorption and desorption, soil organic matter content, bulk density, etc., which determine the processes in soil and soil functions with regard to supporting plant growth, filtering water, suitability as habitat, etc.~~

~~29-18. “Bare soil” means soil without any plant cover.~~

~~30-19. “Humus” means all dead organic material in soil originating from the decay of plants and animals, being natural or anthropogenically added. Humus is mainly amorphous, causes greyish to black colours, and is relatively stable to decomposition by microorganisms. Humus can be persistent for many years. Standard measuring is the determination of organic carbon (C<sub>org</sub>; C<sub>org</sub> content [% by weight] x 1.72 = Humus content [% by weight]; in some cases the factor 2.0 is used). Humus normally decreases bulk density of soil and increases retention of water and nutrients, so it is valuable for plant growth and soil fertility.~~

~~31-20. “Growing season” means the period of the year where conditions allow for plant growth. The (climate-dependent) growing season does not necessarily coincide with periods of plant nutrient uptake during a crop’s growing cycle (crop-dependent).~~

## Regulation 2: Plant nutrients

The Contracting Parties shall integrate the following basic principles into national legislation or guidelines and adapt them to the prevailing conditions within the country to reduce the adverse environmental effects of agriculture. Specified requirement levels shall be considered to be a minimum basis for national legislation.

### 1. Animal density

To ensure that manure is not produced in excess in comparison to the amount of arable land, there must be a balance between the number of animals on the farm and the amount of land available for spreading manure, expressed as animal density. The maximum number of animals should be determined with consideration taken of the need to balance between the amount of phosphorus and nitrogen in manure and the crops’ requirements for plant nutrients.

### 2. Location and design of farm animal houses

Farm animal houses and similar enclosures for animals should be located and designed in such a way that ground and surface water will not be polluted.

### 3. Construction of livestock manure storage

Livestock manures must be stored in environmentally friendly way and should be handled in such a way that it promotes as high utilisation efficiency as possible. Co-operation among farmers in the use of livestock manures has to be encouraged.

Storage capacity shall be at least 6 months and sufficiently large to store livestock manures that accumulate during the longest period when land application is prohibited. Livestock manure processing, and/or transfer to other farms for immediate application or for sufficient storage when land application is prohibited, may be taken into account when required capacity is determined.

Livestock manure storage facilities should be constructed and regularly inspected to safeguard against spillages and be of such a quality that prevents losses. With regard to different types of livestock manures, the following principles should be considered:

- solid livestock manure should be stored in places with watertight floor and side walls;
- liquid livestock manure should be stored in containers whose bottoms and walls are made of material impermeable to moisture and resistant to impacts of livestock manure handling operations;

- manure storages should preferably be covered to prevent emissions.

It is possible to temporarily store solid livestock manure directly on utilised agricultural area, but it requires a set of coherent mitigation measures on site, which prevents nutrient losses under specific local conditions. The interim storage of livestock manure cannot be a part of required storage capacity of the farm.

These storage requirements should preferably be considered also for other types organic fertilizers.

#### *4. Agricultural wastewater, manure and silage effluents*

Wastewater from animal housing should either be stored in urine or slurry stores or else be treated in some suitable manner to prevent pollution. Effluents from manure or from preparation and storage of silage should be collected and directed to storage units for urine or liquid manure.

#### *5. Application of organic fertilisers and organic residual materials*

Organic fertilisers and organic residual materials are valuable sources of nitrogen, phosphorous, potassium and organic carbon which are required for the replenishment of nutrients and humus in soil.

In addition to the amount of these nutrients, amounts of harmful substances, phyto-/ bioavailability and mineralisation rate of different organic fertilizers types should also be considered in order to ensure the optimal supply of the plants and to avoid eutrophication and contamination.

In order to facilitate high utilization efficiency, the best available application technique should be used, depending on the type of fertilizer, crop and location characteristics.

Organic fertilisers and organic residual materials should be incorporated as soon as possible after spreading and always in case of application on bare soils.

The nutrients should be available to the plants during the growing season taking into account the turnover rate of different fertilizers. If soils are frozen, water saturated, flooded or covered with snow no application of organic fertilisers and organic residual materials is permitted. Further periods with high risk of leaching shall be defined when no application is accepted.

#### *6. Application rates for nutrients*

The application of nutrients in agricultural land shall be limited, based on a balance between the foreseeable nutrient requirements of the crops and the nutrient supply to the crops from the soil and the nutrients with a view to minimise eutrophication.

National guidelines should be developed with fertilising recommendations and they should make reference to:

- soil conditions, soil nutrient content, soil type and slope;
- climatic conditions and irrigation;
- land use and agricultural practices, including crop rotation systems;
- all external potential nutrient sources

The amount of livestock manure applied to the land each year including by the animals themselves should not exceed the amount of manure containing:

- 170 kg/ha nitrogen
- 25 kg/ha phosphorus

with a view to avoiding nutrient surplus, taking soil characteristics, agricultural practices and crop types into account.

#### *7. Winter crop cover*

In relevant regions the cultivated area should be sufficiently covered by crops in winter and autumn to effectively reduce the loss of plant nutrients

#### *8. Water protection measures and nutrient reduction areas*

Protection measures should be established to prevent nutrient losses to water particularly as regards

- Surface water: buffer zones, riparian zones or sedimentation ponds should be established, if necessary.
- Groundwater: Groundwater protection zones should be established if necessary. Appropriate measures such as reduced fertilisation rates, zones where manure spreading is prohibited and permanent grassland areas should be established.
- Nutrient reduction areas: Wetland areas should be retained and where possible restored, to be able to reduce plant nutrient losses and to retain biological diversity.

#### 9. Ammonia emissions

In order to reduce ammonia emissions from animal husbandry, a surplus of nitrogen in the manure should be avoided by adjusting the composition of the diet to the requirements of the individual animal. In poultry production, emissions should be brought down by reducing the moisture content of the manure or by removal of manure to storage outside the housing system as soon as possible.

Programmes including strategies and measures for reducing ammonia volatilisation from animal husbandry should be developed.

Urine and slurry stores should be covered or handled by a method that efficiently reduces ammonia emissions.

#### 10. Nutrient recycling

In order to reduce nutrient loss to the Baltic Sea and to achieve nutrient saving, efficient use of nutrient resources in agriculture and recovery of nutrients from various flows in society back to agriculture, countries are encouraged to design and implement national nutrient recycling strategies/plans, which should include:

- ~~providing~~ current sub-national level information about production of organic residual materials, especially livestock manure and sewage sludge;
- ~~providing~~ current sub-national level information of the nutrient status of fields, and national soil maps particularly in regard to phosphorus;
- enabling the development of markets for recycled organic fertilizers with the aim of promoting sub- and/or transnational level reallocation of nutrients, including replacement of mineral fertilizers;
- developing actions for improved recycled fertilizer production, including information of product safety, usability, production technologies and logistical solutions;
- encouraging close cooperation between livestock and crop producers to use nutrients efficiently and to secure soil fertility.

### Regulation 3: Plant protection products

Plant protection products shall only be handled and used according to a national risk reduction strategy which shall be based on BEP. The strategy should be based on an inventory of the existing problems and define suitable goals. It shall include measures such as:

#### 1. Registration and approval

Plant protection products shall not be sold, imported or applied until registration and approval for such purposes has been granted by the national authorities.

#### 2. Storage and handling

Storage and handling of plant protection products shall be carried out so that the risks of spillage or leakage are prevented. Some crucial areas are transportation and filling and cleaning of equipment. Other dispersal of plant protection products outside the treated agricultural land area shall be prevented. Waste of plant protection products shall be disposed of according to national legislation.

#### 3. Licence

A licence shall be required for commercial use of plant protection products. To obtain a licence, suitable education and training on how to handle plant protection products with a minimum of impact on health and the environment shall be required. The users' knowledge regarding the handling and usage of plant protection products shall be updated regularly.

#### *4. Application technology*

Application technology and practice should be designed to prevent unintentional drift or runoff of plant protection products. Establishment of protection zones along surface waters should be encouraged. Application by aircraft shall be forbidden; exceptional cases require authorisation.

#### *5. Testing of spraying equipment*

Testing of spraying equipment at regular intervals shall be promoted to ensure a reliable result when spraying with plant protection products.

#### *6. Alternative methods of control*

Development of alternative methods for plant protection control should be encouraged.

### **Regulation 4: Environmental permits**

Farms with livestock production above a specified size should require approval with regard to environmental aspects and impacts of the farms.

Installations for the intensive rearing of poultry, pigs and cattle with more than 40,000 places for poultry, 2,000 places for production pigs (over 30 kg), 750 places for sows or 400 animal units cattle shall have a permit fully co-ordinated by the relevant authorities.

The permits must take into account the whole environmental performance of the enterprise, covering e.g. emissions to air, water and land, generation of waste and prevention of environmental accidents. The permit conditions must be based on BAT.

The competent authorities, in determining permit conditions, can take into account the technical characteristics of the enterprise, its geographical location and the local environmental conditions.

These large animal enterprises shall be considered as point sources and shall have adequate measures.

For installations with more than 100 AU the Contracting Parties shall put in practice general rules or a system corresponding to a simplified permit system to ensure the implementation of the requirements in this Annex.

Both of these permit systems shall be applied to existing installations and new installations and existing installations which are subject to substantial changes by 2012.

### **Regulation 5: Monitoring and evaluation**

The Contracting Parties shall describe the implementation and monitoring of measures in this Annex in their national programmes.

To evaluate the effectiveness of the measures, the Contracting Parties shall develop projects to assess the effects of measures and the impacts of the agricultural sector on the environment.

### **Regulation 6: Education, information and extension service**

The Contracting Parties shall promote systems for education, information and extension (advisory service) on environmental issues in the agricultural sector.

## Annex 4. Draft Baltic Sea Regional Nutrient Recycling Strategy

### Content

1. Introduction
2. Vision
3. Objectives
4. Measures
5. Follow-up

### 1. Introduction

Circular economy is one of the keys to more sustainable production and consumption systems of the future. Agriculture and food production rely on natural resources and cycles. As demands on natural resources grow, we risk depleting them beyond sustainable limits while simultaneously causing environmental problems due to leakage and loss. We therefore need to be more resource-efficient in the way we use and re-use resources, improving feedback loops and integrating circular economy principles. The recycling of nutrients is essential element of circular economy and sustainable food production.

Nutrients that have leached into the Baltic Sea cause eutrophication. This is the most serious challenge to the Baltic Sea. Phosphorus and nitrogen are essential nutrients to the growth of plants and the food production. The valuable resources have turned into a serious problem, when in the wrong place, in surplus to need, and not efficiently used. There is a need to improve recycling of nutrients on land and to reduce their losses to the sea to minimize the harmful impact on the Baltic Sea. ~~Recycling of nutrients from eutrophicated waters to land can also be developed.~~ These measures would help to preserve phosphorus resources for the future generations.

In nutrient recycling biomass or other matter containing nutrients is utilized and managed by man so that it will end up back to the cycle for the use of the plants. Recycled matter can be used as such or be processed to products, materials or raw materials.

Nutrient recycling and efficient use aim at creating a systemic approach to optimal use of nutrients in plant production while also minimizing nutrient loss in all parts of food system from field to fork. Key issues are

- fertilization according to the plant needs and soil nutrient content,
- good soil structure and other conditions for optimal nutrient intake,
- efficient manure management,
- efficient management to reduce impact from animal grazing and trampling,
- returning nutrients from food industry side streams back to the fields,
- reduction of food waste from the whole food system, and
- proper treatment of sewage sludge from waste water treatment plants returning nutrients back to the cycle without risks to human health and the environment.

The development of the Baltic Sea Regional Nutrient Recycling Strategy was stipulated by the decision of the HELCOM 2018 Ministerial Meeting which also recognized that, in addition to abating eutrophication,

recycling of nutrients could contribute to reducing greenhouse gas emissions and securing phosphorus resources. The Ministerial Declaration also pointed out that environmentally safe nutrient recycling in the Baltic Sea region is to be based on the best available scientific knowledge.

## 2. Vision

Nutrients are managed sustainably in all HELCOM countries, securing the productivity of agriculture and minimizing nutrient loss to the Baltic Sea environment through efficient use of nutrients and cost-effective nutrient recycling.

## 3. Objectives

Objectives and sub-objectives
<p><i>Baltic Sea region as a model area for nutrient recycling</i></p> <ul style="list-style-type: none"> <li>- Increasing nutrient use efficiency <del>of recycled nutrients</del></li> <li>- Increasing the circulation of the available nutrient resources and reducing nutrient inflows to the region</li> <li>- Utilizing nutrient rich organic residues originating from areas with high nutrient surplus for production of fertilizer products</li> </ul>
<p><i>Reducing environmental impacts</i></p> <ul style="list-style-type: none"> <li>- Reducing nutrient losses to the Baltic Sea area and closing nutrient cycles</li> <li>- Reducing greenhouse gas emissions</li> <li>- Reducing ammonia emissions</li> <li>- Utilizing appropriate solutions to recycle nutrients for the specific conditions preventing contamination of the environment</li> <li>- Improving soil quality and enhancing carbon sequestration by using organic fertilizers</li> <li>- Promoting/advancing site specific optimized fertilization plans</li> </ul>
<p><i>Safe nutrient recycling</i></p> <ul style="list-style-type: none"> <li>- Minimizing the risks for humans and environment posed by contamination</li> </ul>
<p><i>Knowledge exchange and awareness raising</i></p> <ul style="list-style-type: none"> <li>- Promoting new research and technological development</li> <li>- Increasing research and knowledge sharing on risks and safe practices</li> <li>- Facilitating knowledge transfer and information exchange on nutrient recycling</li> <li>- Cooperating with other regions and global organizations to exchange information on the most up-to-date knowledge and techniques</li> <li>- Raising awareness of the benefits of nutrient recycling</li> <li>- Promoting holistic view of food production</li> </ul>
<p><i>Creating business opportunities</i></p> <ul style="list-style-type: none"> <li>- Encouraging new business models with cross-sectoral cooperation</li> <li>- Improving the economic viability of nutrient recycling</li> </ul>
<p><i>Improving policy coherence</i></p> <ul style="list-style-type: none"> <li>- Increasing cooperation of governmental agencies to improve policy coherence</li> <li>- Updating legal framework to facilitate nutrient recycling</li> </ul>

#### 4. Measures

Each objective of the Strategy has a prioritized measure that is included in the updated Baltic Sea Action Plan. In addition, each sub-objective of the Strategy contains a longer list of possible measures, which the HELCOM Contracting Parties can implement according to their specific needs and circumstances. The list of possible measures is a toolbox which gives Contracting Parties expert advice and ideas how to develop nutrient recycling in their respective countries.

##### *Objective 1. Baltic Sea region as a model area for nutrient recycling*

- *Sub-objective: Increasing nutrient use efficiency*

*Possible measures:*

- Enhance fertilization planning and optimization according to crop need instead of amount of nutrients
- Define application conditions and techniques to maximize nutrient efficiency of recycled nutrients
- Define clear joint goals for plant nutrient balances

- *Sub-objective: Increasing the circulation of the available nutrient resources and reducing nutrient inflows to the region*

*Possible measures:*

- Prioritize the use of manure and other recycled nutrients as fertilizers
- Promote the use of manure and recycled nutrients by e.g. increasing the cooperation between crop and livestock farmers
- Promote the development and application of new technologies for removal and recovery of nutrients from WWTPs
- Promote production and use of locally produced feeds and reduce import of nutrients

- *Sub-objective: Utilizing nutrient rich organic residues originating from areas with high nutrient surplus for production of fertilizer products*

*Possible measures:*

- Create regional nutrient balance and nutrient recycling strategies for each country
- Introduce incentives for use and production of recycled nutrients
- Recognize the benefits of a balance between livestock and available agricultural land when planning the development of livestock production

##### *Objective 2. Reducing environmental impacts*

- *Sub-objective: Reducing nutrient losses to the Baltic Sea area and closing nutrient cycles*

*Possible measures:*

- Optimize the use of recycled nutrients in all agricultural production making use of best available technologies and fertilize according to crop needs
- Advice and assist farmers in sustainable farming including e.g. soil tests and using the results as a basis for fertilization planning
- Promote strengthening nutrient reduction requirement for WWTP implementation and cleaning level (97 % P)

- *Sub-objective: Reducing greenhouse gas emissions*

*Possible measures:*

- Calculate the impact of nutrient recycling on local, national and regional level Carbon Footprint
- Promote research to clarify the role of nutrient recycling for carbon neutrality
- Specify rules for reduced climate impact regarding farming and fertilization on peatlands

- *Sub-objective: Reducing ammonia emissions*

*Possible measures:*

- Promote air treatment/scrubbing, acidification and other technologies for animal housing and fertilizer spreading systems
- Support the use of Best Available Technology (BAT) to reduce ammonia emissions for all farms
- *Sub-objective: Utilizing appropriate solutions to recycle nutrients for the specific conditions preventing contamination of the environment*  
*Possible measures:*
  - Promote upstream separation of sewage water
  - Establish common quality standards, e.g. certification systems for fertilizer trade
- *Sub-objective: Improving soil quality and enhancing carbon sequestration by using organic fertilizers*  
*Possible measures:*
  - Raise awareness among farmers about benefits of organic fertilizers, including soil improvers, and appropriate farming methods for carbon sequestration
  - Support research on carbon sequestration methods in nutrient recycling
- *Sub-objective: Promoting/advancing site specific optimized fertilization plans*  
*Possible measures:*
  - Support precision farming

### Objective 3: Safe nutrient recycling

- *Sub-objective: Minimizing the risks for humans and environment by contamination*
- *Possible measures:*
  - Raise awareness on the need to address the risks related to nutrient recycling when processing and reusing variable biomasses in relation to
    - Inorganic harmful substances
    - Organic harmful substances, including antibiotics and antimicrobial resistance
    - Hygiene
  - Support research on
    - the migration and transformation of pathogens and harmful substances during the management, processing and use of recycled fertilizer products
    - the impact of pathogens and harmful compounds in recycled fertilizer products on the environment and human health
  - Use the scientific data to set and reinforce limit values/quality criteria for safe production and use of recycled fertilizer products in relation to hygiene and harmful substances
  - Develop measures to reduce pathogens and harmful substances entering the biomasses used for producing recycled fertilizer products
- *Sub-objective: Increasing research and knowledge sharing on risks and safe practices*  
*Possible measures:*
  - Increase awareness of stakeholders on the health and safety perspective

### Objective 4. Knowledge exchange and awareness raising

- *Sub-objective: Promoting new research and technological development*  
*Possible measures:*
  - Include education on nutrient recycling especially in agricultural universities and colleges
  - Promote research to improve fertilizer value and management practices for recycled nutrient products
  - {Offer seed funding for technology development and up-scaling}
  - ~~Promote the development of methods and technologies to manage accumulated nutrient reserves in the Baltic Sea and inland water reservoirs~~

- Support development, up-scaling and implementation of nutrient recovery technologies (incl. energy capture)
- *Sub-objective: Facilitating knowledge transfer and information exchange on nutrient recycling*  
*Possible measures:*
  - Educate agricultural advisors on nutrient recycling
  - Open a best practice information and collaboration platform with e.g. demo farms and WWTPs
  - Support open access to and popularization of nutrient recycling research
  - Enhance market information availability on nutrient recycling (open access to data)
- *Sub-objective: Cooperating with other regions and global organizations to exchange information on the most up-to-date knowledge and techniques*  
*Possible measures:*
  - Establish closer cooperation with international phosphorus platforms
  - Create innovation funds for nutrient recycling and cross-border technology development
- *Sub-objective: Raising awareness of the benefits of nutrient recycling*  
*Possible measures:*
  - Organize focused projects and knowledge campaigns for different stakeholders and groups
- *Sub-objective: Promoting holistic view of food production*  
*Possible measures:*
  - Promote balance between animal production and plant production via education and advisory service
  - Design environmental labels that include nutrient recycling (e.g. implement in existing labels)
  - Design a quality system to increase traceability in food production

#### *Objective 5. Creating business opportunities*

- *Sub-objective: Encouraging new business models with cross-sectoral cooperation*  
*Possible measures:*
  - Organize grant policies and financial support (seed-funding / investment support) to prioritize applications with documented cross-sectoral cooperation (vertically and horizontally), which connects at least two of the following: companies, universities, research institutions, etc.
  - Create incentives for biogas producers to process digestate in order to optimize the use of nutrients
  - Create guidelines regarding environmental safety and support central testing and knowledge facilities for start-up companies rather than sector- or product-oriented financial support. (Businesses should meet minimum criteria to access)
- *Sub-objective: Improving the economic viability of nutrient recycling*  
*Possible measures:*
  - Develop economical tools and incentives for making organic fertilizers to be more attractive for the end users, by creating and securing an appropriate legal framework
  - Enhance economic feasibility of nutrient recycling by supporting bio-methane production and use
  - Identify targets for the share of recycled nutrients a) in fertilizers and/or b) on the land area of a farm holding.

#### *Objective 6. Improving policy coherence*

- *Sub-objective: Increasing cooperation of governmental agencies to improve policy coherence*

*Possible measures:*

- Ensure cross-sectoral policy cooperation between sectors (agriculture, WWT, businesses)
- Define clear roles and responsibilities for policymakers around nutrient recycling
- Create joint verification systems for nutrient recycling technologies (BAT)
- Create policy instruments targeting regional key problems and policy incoherence.

- *Sub-objective: Updating legal framework to facilitate nutrient recycling**Possible measures:*

- {Create policy framework to substitute ~~limit~~ the use of mineral fertilizers ~~and not only manure~~ by ones based on recycled nutrients where feasible}
- Facilitate the trade and use of recycled fertilizer products
- Strengthen regulation that promotes balanced crop and livestock production and/or prevents/offers solutions for regional manure surplus/ high livestock density
- ~~[Identify regional boundaries for N/P (nutrient badges) for setting N/P reduction/recycling targets and actions] Requires clarification~~
- ~~[Find regional key problems for targeted policy instruments, and for targeted implementation and incoherence of existing policies.] Requires clarification~~

## 5. Follow-up

The Strategy will be followed up by following the implementation of the priority measures that are included in the updated Baltic Sea Action Plan. The reporting on the implementation of the priority measures will be organized as part of the follow-up of accomplishment of the BSAP measures.

## Annex 5. Status of nutrient accounting

**Estonia:** Nutrient balance calculation tool (both for farm-gate and field level balance) has been developed by the Estonian University of Life Sciences but it is in the form of Excel. The aim is to develop more comfortable tool to the users. Under LIFE IP CleanEST project recommendations for balance calculation are being developed. Also, practical seminars to farmers on how and why to use calculation tool are planned and available through CleanEST Project. Additionally, in the Estonian Water Act there is a provision that a person engaged in agriculture who uses 50 hectares or more of area under cultivation and uses fertilisers containing nitrogen is obligated to prepare a fertilisation plan every year before sowing, or in case of perennial crops, before the beginning of a vegetation period.

**Latvia:** There already are requirements for farmers to make fertilization plans for the farms in nitrate vulnerable zone and for those farmers who use second class plant protection products. Farmers keep the fertilization plans at the farm, they are checked only if the controlling institutions arrive on place and fertilization plans are not collected electronically at the national level.

Regarding this, currently the Agricultural land management system is under development. The aim of the system is to create sustainable, agronomically justified effective system for the management of the utilized agricultural lands. System will offer the possibility for farmer to prepare balanced fertilization plan, calculate field level nutrient balances.

Principles for making balanced fertilization plan in this system will be the following:

Necessary amount of nitrogen and phosphorus for fertilization will be based on justified national scientific data for each of the crops, taking into account planned yield, N and P status/supply in the soil, utilization coefficients of the livestock manure applied in the previous year, post-impact of leguminous plants as precrops, applied after-harvest residues, data on the mineral nitrogen content in soil in the nitrate vulnerable zones according to mineral nitrogen monitoring data, prepared by State Plant protection Service. The soil analyses for preparation of the plan must not be older than 5 years and it will be checked whether the planned fertilization amount for nitrogen and phosphorus will correspond to the applied amount.

This system will be linked to implementation of next CAP and there will be a requirement for eco-schemes and agri-environmental measures to submit fertilization plans and field history electronically in this system. It will allow to collect the information electronically. The implementation of this system will be one step more towards farm-gate nutrient balance.

**Lithuania:** The current legal framework obliges farmers, who fertilize 30 ha or more, to prepare fertilization plans and keep them for at least 2 years. There are currently undergoing digitization projects, which aim to create tools for used fertilizer registration and preparation of fertilization plans.

**Poland:** In Poland from 2018 when Nitrates Program has started, the nitrogen fertilization plan is mandatory for animal producers covered by the IPPC Directive, farms with an area of over 100 ha of agricultural land, or area of intensive crops on arable land over 50 ha, farms keeping livestock stocks above 60 LSU, and producers who purchase natural fertilizer or digestate for direct agricultural use for fertilization or improvement of soil properties from other entities. Smaller farms are obliged to apply fertilizers based on the maximum justified and documented nitrogen doses, while the nitrogen fertilization plan is voluntary for them. In 2021, the work started with extension of nutrient accounting also for phosphorus.

**Russia:** In large farms, there are specialists in agrochemistry who calculate the doses of fertilizers and manage their use. In private farms, this work is done by the farmer himself. In the regions, there are agrochemical services that regularly take soil samples of farms' agricultural land and analyze them. This work is paid for by the regional authorities. The calculation of fertilizer doses is made according to recommendations and special tables. Special welfares are used in the agrochemical services and large farms. This calculation takes into account the planned yield, soil properties, and nutrient balance in the soil. When using fertilizers, the content of nitrates should not exceed 76.8 mg / kg of absolutely dry soil and mobile phosphates should not exceed

27.2 mg/kg of absolutely dry soil. Statistical data on the amount of fertilizers used, the yield and the volume of products collected of the farms are collected by the district departments of agriculture. Gate balances in farms are calculated for special purposes or for projects. The issues of efficient and environmentally safe use of fertilizers will be discussed at the regional meeting in the near future.

**Sweden:** Sweden do not require that all farms calculate annual nutrient accounting at farm level. Within nitrate vulnerable zones, the nitrogen fertilisation is limited to crop nitrogen need and it is required that the calculation of the crop need is documented. About 75% of the agricultural land is located within the nitrate vulnerable zones. Farmers outside the nitrate vulnerable zones should also be able to describe how they decided the crop nitrogen need and how fertilization was done. This is part of the self-monitoring. The Swedish board of agriculture make recommendations for fertilisation every year (<https://webbutiken.jordbruksverket.se/sv/artiklar/jo2012.html>). Free advisory services are available for farmers, including calculation of nutrient balances. A tool for calculating nutrient balances is available.

## Annex 6. Working version for the scope of the Recommendation to mitigate ammonia emissions from agriculture

Category	Measure
N management taking into account the whole N cycle	N fertilization plan and N balance
Livestock feeding strategies	Low-protein animal feeding
	Adopting phase feeding of livestock
	Animal feed supplementation (amino acids)
Animal housing techniques	Reducing manure surfaces such as soiled floors
	More frequent removal of manure
	Partly slatted floors in pig housing
	The collection of manure on belts and drying it in housing of laying hens
	Keeping the litter dry in broiler housing
	Treatment of exhaust air by acid scrubbers or biotrickling filters
	Lowering the indoor temperature and ventilation as animal welfare and/or production allow
	Acidifying the manure
	Cooling the manure
Manure storage	Covering the manure storage
	Adequate storage capacity for the manure produced
	Replacement of lagoons by tanks/silos
	Covering/bottom layer of temporary (time limited) manure heaps
Fertilizer/manure application techniques	Avoiding the spreading of fertilisers and manure during high-risk periods
	Taking into account soil quality
	Low-emission manure spreading technique (trailing hose, trailing shoe or injection)
	Replacing urea-based fertilisers by ammonium nitrate-based fertilisers
	Using urease inhibitors with nitrogen fertilizers
	Fast incorporation of manure, urea and mineral fertilizers
Other measures related to agricultural N	Grazing
Manure processing	Biogas production
	Composting