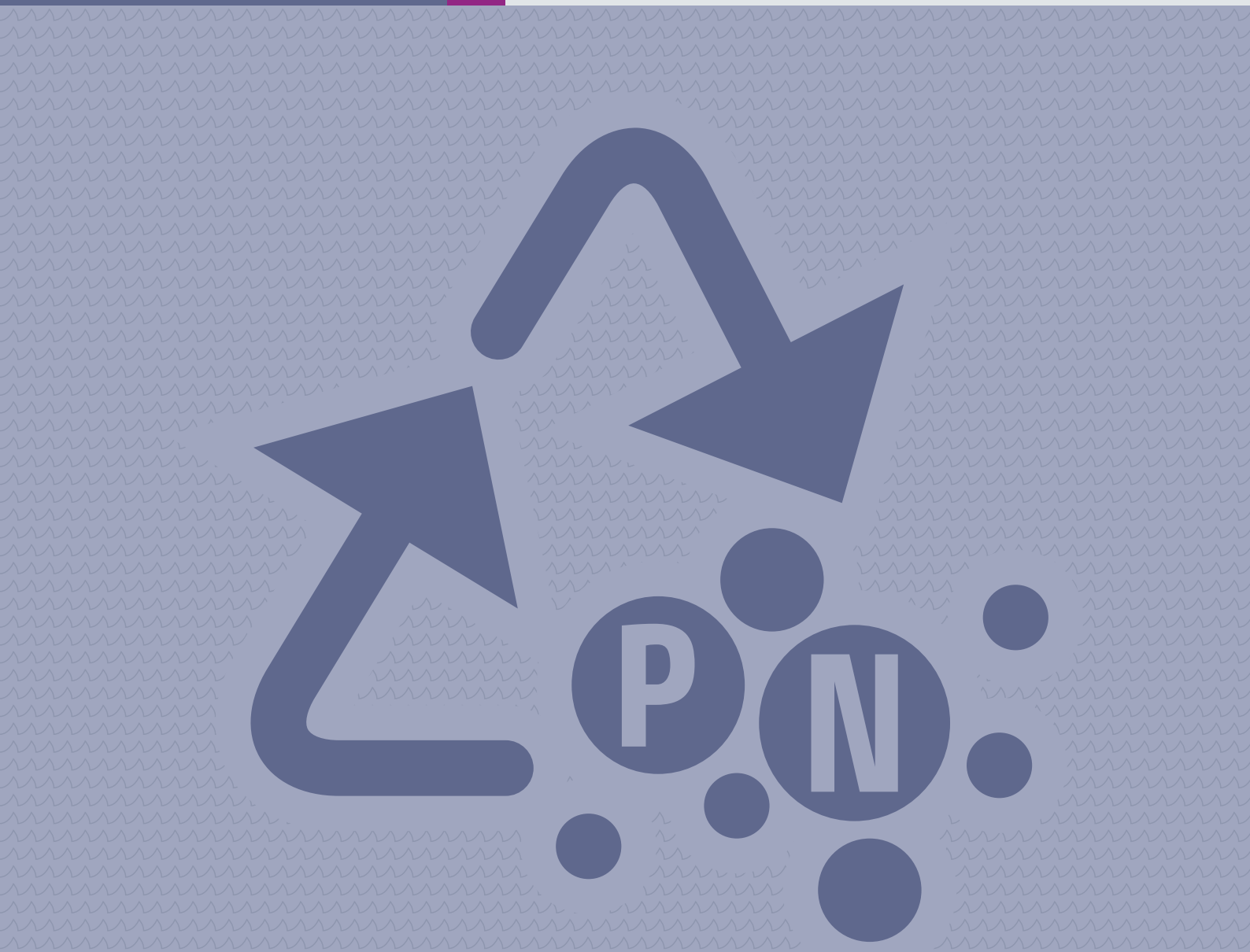
Baltic Sea Regional Nutrient Recycling Strategy

Baltic Marine Environment Protection Commission

Nutrients

October 2021



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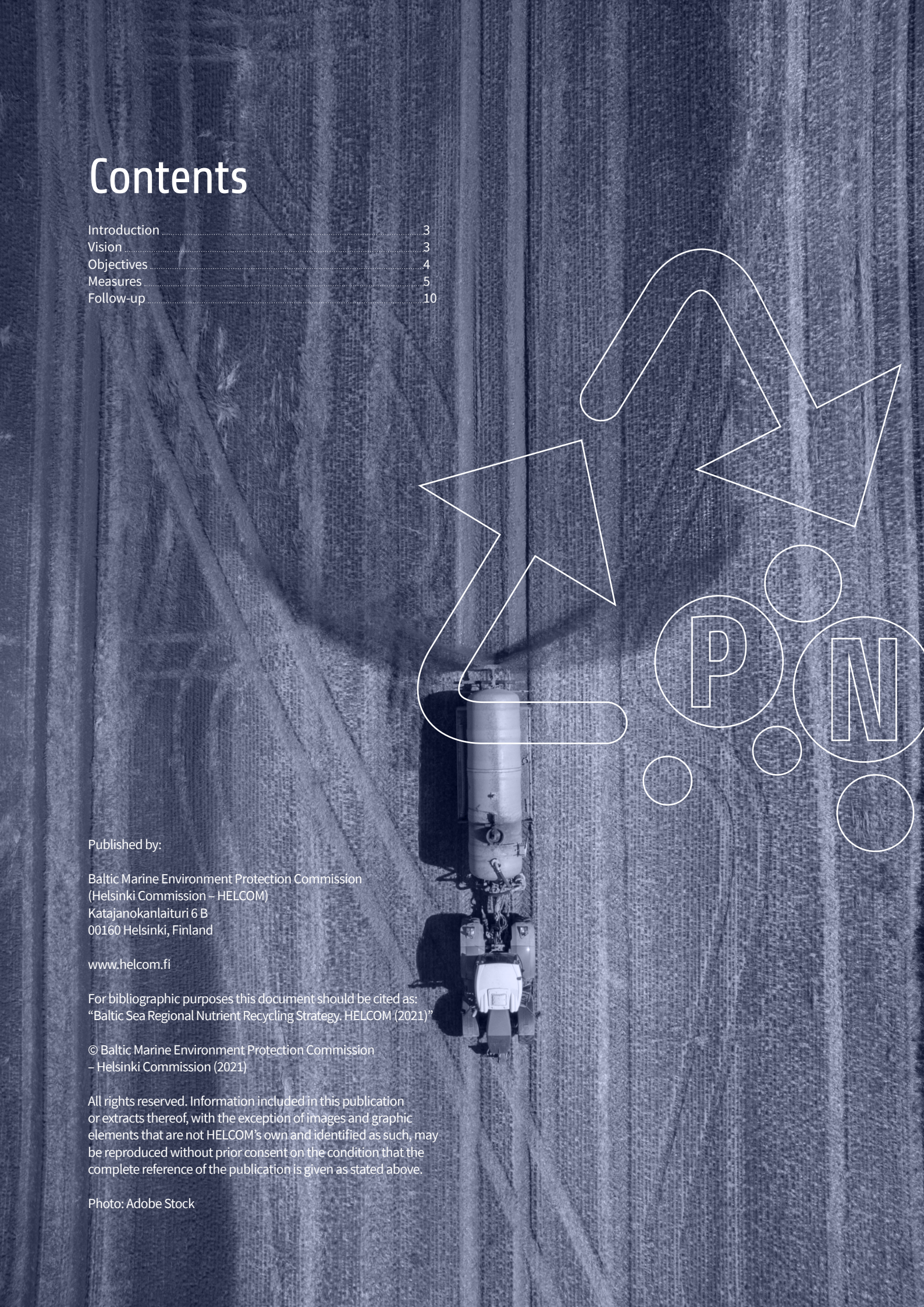

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Introduction

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 an 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 turn 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. These measures would help to preserve phosphorus resources for future generations.

In nutrient recycling biomass or other matter containing nutrients is utilized and managed by man so that it will end up back in the cycle for the use of 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 the 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.

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.

Objectives

OBJECTIVES AND SUB-OBJECTIVES

OBJECTIVE 1 — Baltic Sea region as a model area for nutrient recycling

SUB-OBJECTIVES

- *Increasing nutrient use efficiency*
- *Increasing the circulation of the available nutrient resources and reducing nutrient inflows to the region*
- *Utilizing nutrient rich organic residues originating from areas with high nutrient surplus for production of fertilizer products*

OBJECTIVE 2 — Reducing environmental impacts

SUB-OBJECTIVES

- *Reducing nutrient losses to the Baltic Sea area and closing nutrient cycles*
- *Reducing greenhouse gas emissions*
- *Reducing ammonia emissions*
- *Utilizing appropriate solutions to recycle nutrients for the specific conditions preventing contamination of the environment*
- *Improving soil quality and enhancing carbon sequestration by using organic fertilizers*
- *Promoting/advancing site specific optimized fertilization plans*

OBJECTIVE 3 — Safe nutrient recycling

SUB-OBJECTIVES

- *Minimizing the risks for humans and environment posed by contamination*
- *Increasing research and knowledge sharing on risks and safe practices*

OBJECTIVE 4 — Knowledge exchange and awareness raising

SUB-OBJECTIVES

- *Promoting new research and technological development*
- *Facilitating knowledge transfer and information exchange on nutrient recycling*
- *Cooperating with other regions and global organizations to exchange information on the most up-to-date knowledge and techniques*
- *Raising awareness of the benefits of nutrient recycling*
- *Promoting a holistic view of food production*

OBJECTIVE 5 — Creating business opportunities

SUB-OBJECTIVES

- *Encouraging new business models with cross-sectoral cooperation*
- *Improving the economic viability of nutrient recycling*

OBJECTIVE 6 — Improving policy coherence

SUB-OBJECTIVES

- *Increasing cooperation of governmental agencies to improve policy coherence*
- *Updating the legal framework to facilitate nutrient recycling*

Measures

Each objective of the Strategy has a prioritized action 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 the 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 s*ystems 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*
- *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 a 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 the use of mineral fertilizers 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*

Follow-up

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