

Nutrient recycling in agricultural sector – why, what, how?

EUSBSR Annual Forum Workshop: Unlocking the nutrient recycling potential in the Baltic Sea Region 30.9.2020

Minna Sarvi, coordinator of SuMaNu platform
Natural Resources Institute Finland Luke
minna.sarvi@luke.fi



SuMaNu aims

Environmentally and economically more sustainable manure management in the BSR:

1

- More holistic **recommendations on best practices** for farmers, advisors etc.

2

- More holistic **policy recommendations**

3

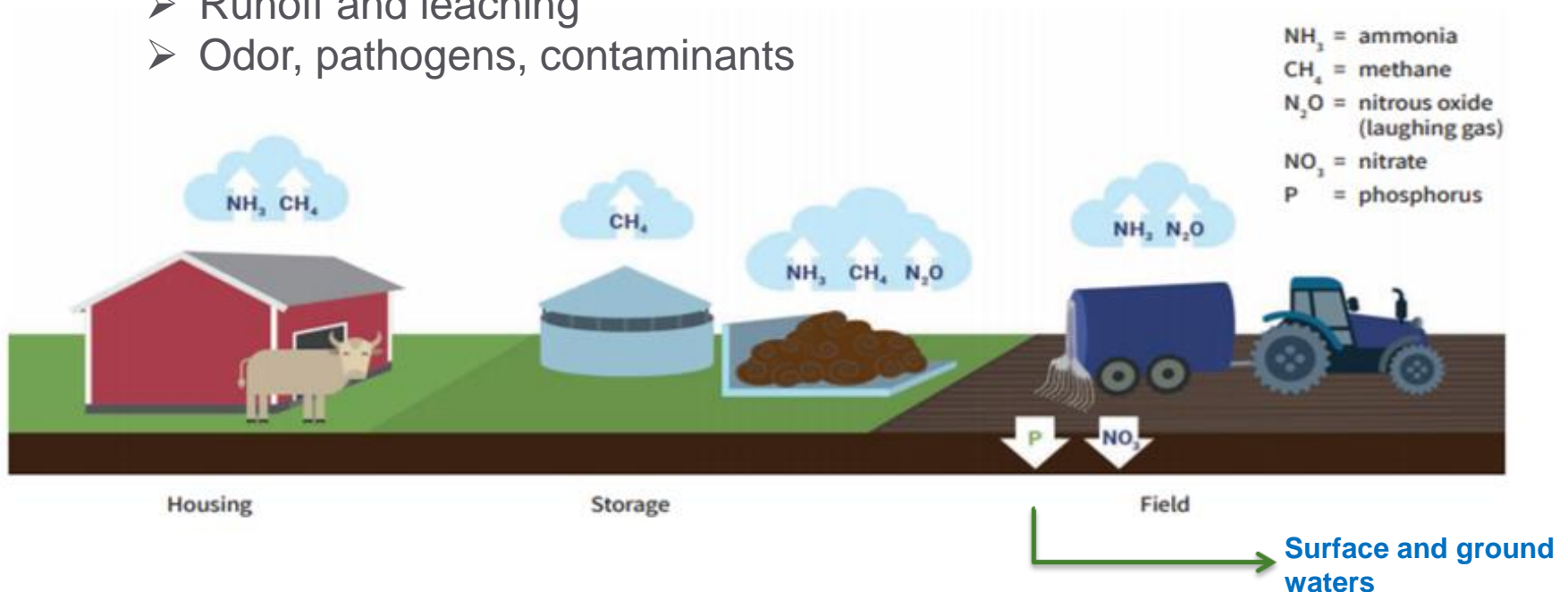
- **Supports** together with BSR Water platform
 - the process of **developing the HELCOM Nutrient Recycling Strategy**
 - **Gives input for EUSBSR**

Background

Measures needed both at local and regional level

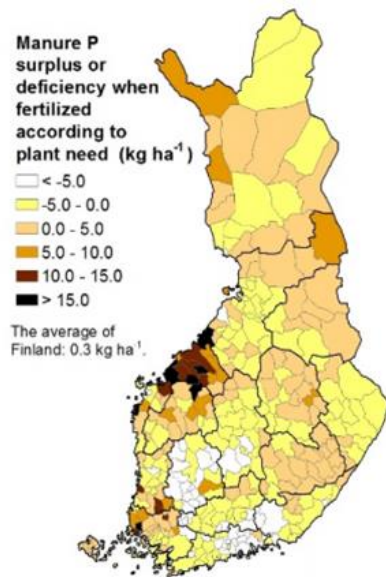
- Good practices in farm can effectively minimise potential losses into environment

- NH_3 and GHG emissions
- Runoff and leaching
- Odor, pathogens, contaminants

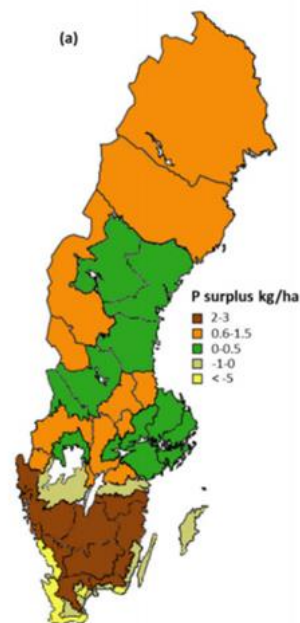


How to make most of manure? – Handbook on good manure management practices; www.luke.fi/manurestandards/en

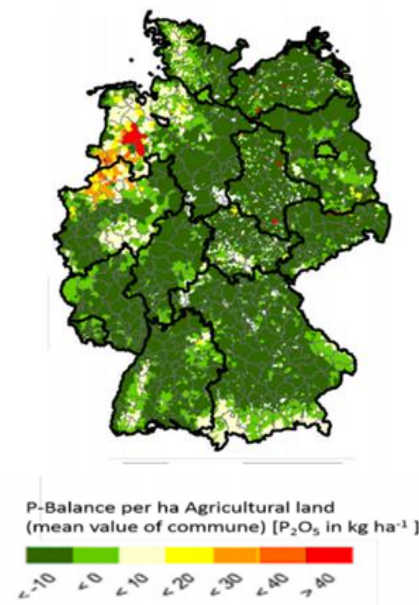
Measures needed both at local and regional level



Finland



Sweden



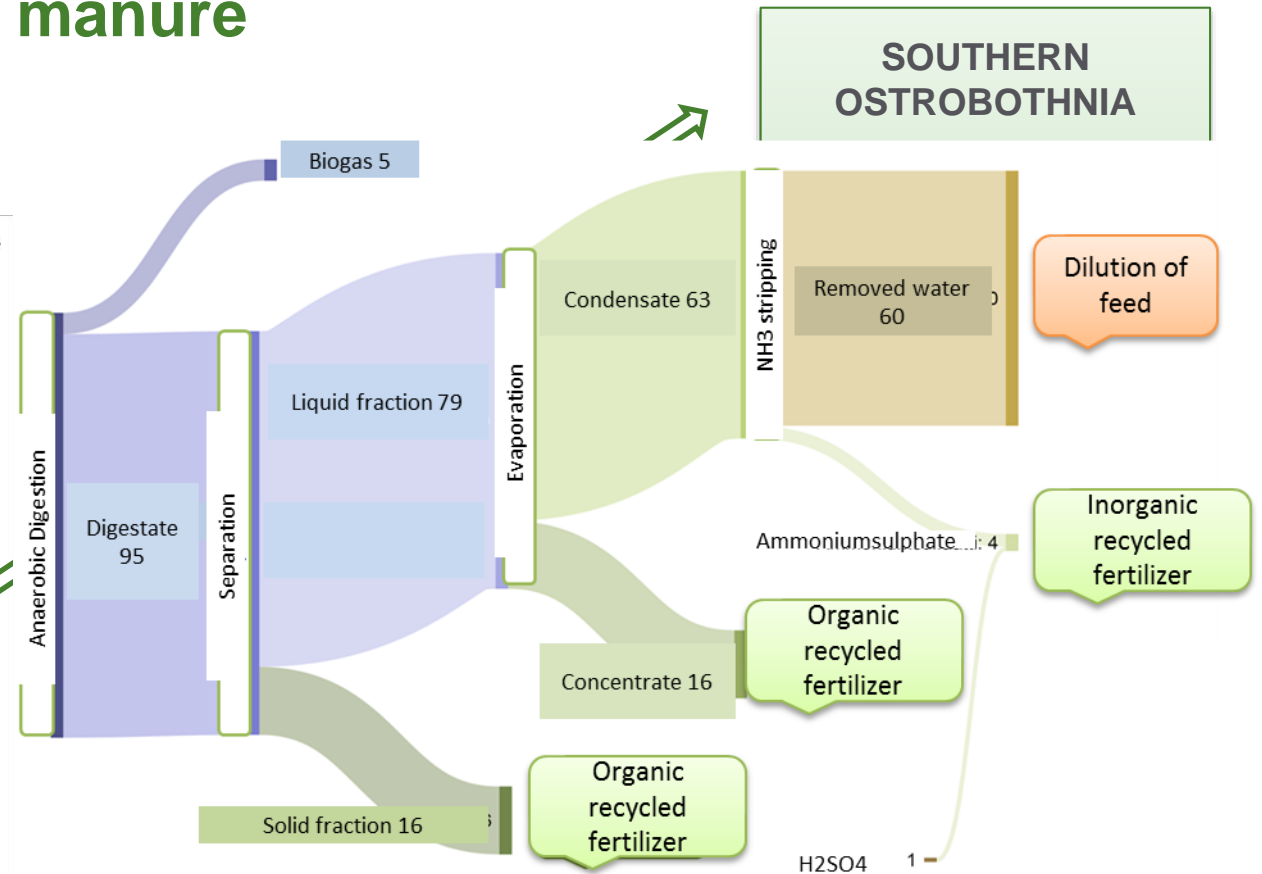
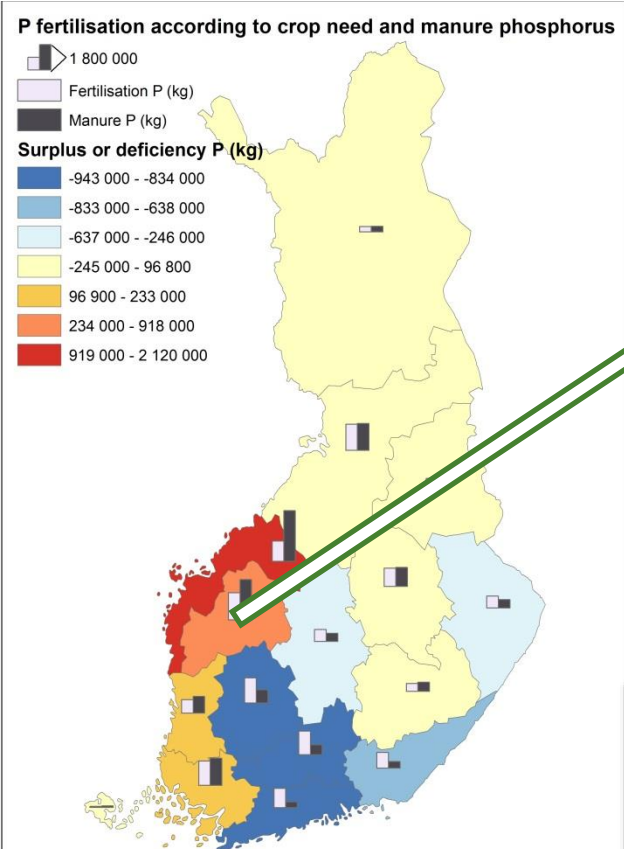
Germany

Table 1. EU nutrient recycling potential, total amounts and average amounts per year on agricultural land in the EU if spread evenly (Eurostat 2016, Leip et al. 2014, Velthof et al. 2015, van Dijk et al. 2016, Sutton et al. 2011, Buckwell & Nadau 2016). For comparison, annual mineral fertilizer use (Eurostat 2016).

	N total Mt	N average kg/ha/a	P total Mt	P average kg/ha/a
Manure	7–9	41–52	1.8	10.5
Biowaste	0.5–0.7	2.9–4.1	0.1	0.6
Slaughterhouse waste	ND	ND	0.3	1.7
Sewage	2.3–3.1	13.3–18.0	0.3	1.7
Mineral fertilizer	10.9	63	1.4	8.1

ND = no data

Example on need for manure processing: regional surplus manure



2 processing plants (200 000 t/a, feed 70% manure)

→ 432 000 t/a of manure P in a transportable form

→ **half of the surplus**

Administrative borders © National Land Survey Finland 2017

Source: RavinNelaskuri. A calculation tool for planning regional manure processing (Natural Resources Institute Finland & Finnish Environment Institute)

Policy recommendations for more sustainable manure and nutrient management

Farm-scale measures

1. Fertilization planning

- Annual fertilization plan on a field plot level according to crop N&P need
- Guidelines for economically optimal N&P fertilization rates for relevant crops
 - Soil analysis (soil P!), plant availability of manure P
- Development of P index model (= P leaching risk)

2. Farm-gate nutrient balancing

- Creates information on nutrient flows and nutrient use efficiency

3. Storing and spreading of manure

- Sufficient storage capacity
- Application
 - rates based on manure nutrient content and fertilization plans
 - Autumn spreading only for the establishment of winter crops



System scale measures

4. Regional nutrient reallocation

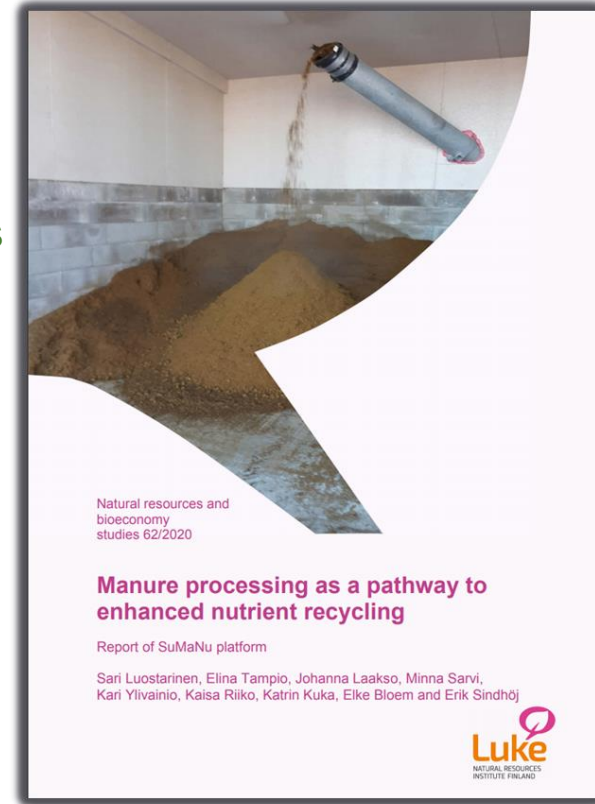
- Based on regional crop nutrient need
- Need for
 - Knowledge on biomass quantities and characteristics
 - National strategies

5. Creating a market for recycled fertilizer products

- Supporting **both** the production and use

6. Safe manure use

- No unnecessary use of trace elements (e.g. Cu, Zn, As) in feed & antibiotics in animal rearing
- No co-processing with sewage sludge



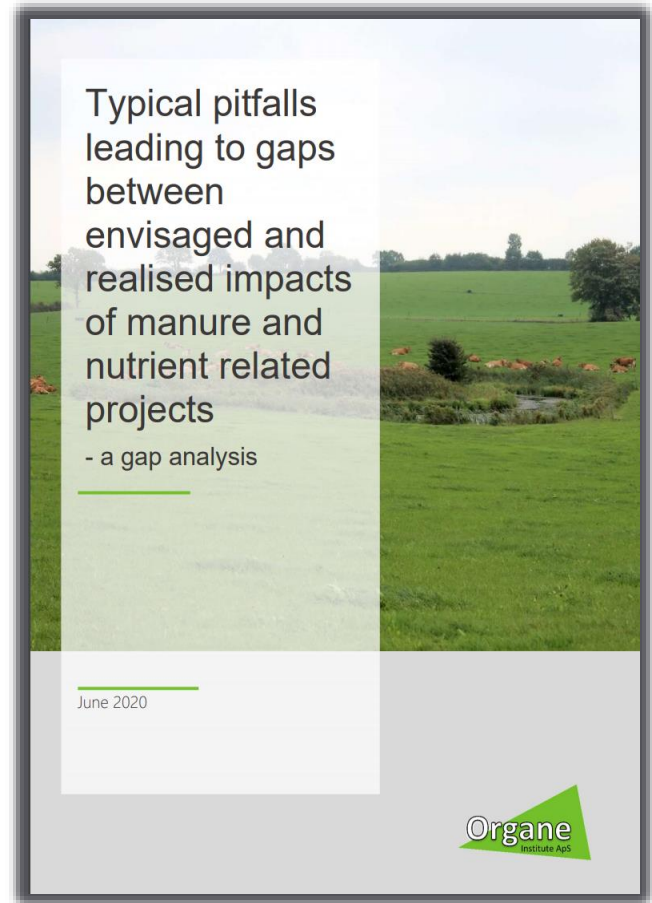
Luostarinen et al. 2020.
<http://urn.fi/URN:ISBN:978-952-380-037-3>

Knowledge transfer

- Enables successful implementation in practice
- Cooperation between farmers, advisory services and scientists
 - End-user involvement in project partnership & activities
- Clear messages and a holistic approach



Photo: Green Agri project



Lyngsø Foged et al. 2020.
https://www.organe.dk/docs/SuMaNu_Report_2-3_Gap_analysis_Organe_Report.pdf



Thank you!

- Partners

- **LUKE** - Natural Resources Institute Finland (*coordinator*)
- **RISE** – Research Institute of Sweden
- **HELCOM** - Baltic Marine Environment Protection Commission – Helsinki Commission
- **BSAG** – The Foundation for a Living Baltic Sea – Baltic Sea Action Group, Finland
- **ECRI** – Estonian Crop Research Institute
- **ZSA** – Union Farmers Parliament, Latvia
- **CDR** – Agricultural Advisory Center in Brwinow, Poland
- **Organe Institute Aps** - Denmark
- **JKI** - Julius-Kühn-Institut, Federal Research Centre for Cultivated Plants, Germany

- Associated organizations:

- **EUSBSR** Policy Area Bioeconomy & Nutri
- **CBSS** - The Council of Baltic Sea States Secretariat
- **ESPP** - The European Sustainable Phosphorus Platform
- **IEEP** - Institute for Engineering and Environmental Problems in Agricultural Production – branch of Federal State Budgetary Scientific Institution, Federal Scientific Agropengineering Center VIM, Russia

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