EIP-AGRI Workshop 'Opportunities for Agriculture and Forestry in the Circular Economy'

28-29 October 2015
Naantali, Finland

All information of the workshop available on www.eip-agri.eu at the event webpage

https://ec.europa.eu/eip/agriculture/en/content/eip-agri-workshop-opportunities-agriculture-and-forestry-circular-economy

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The Circular Economy in Agriculture and Forestry in Finland

28.10.2015 EIP-AGRI Workshop

Opportunities for Agriculture and Forestry in the Circular Economy

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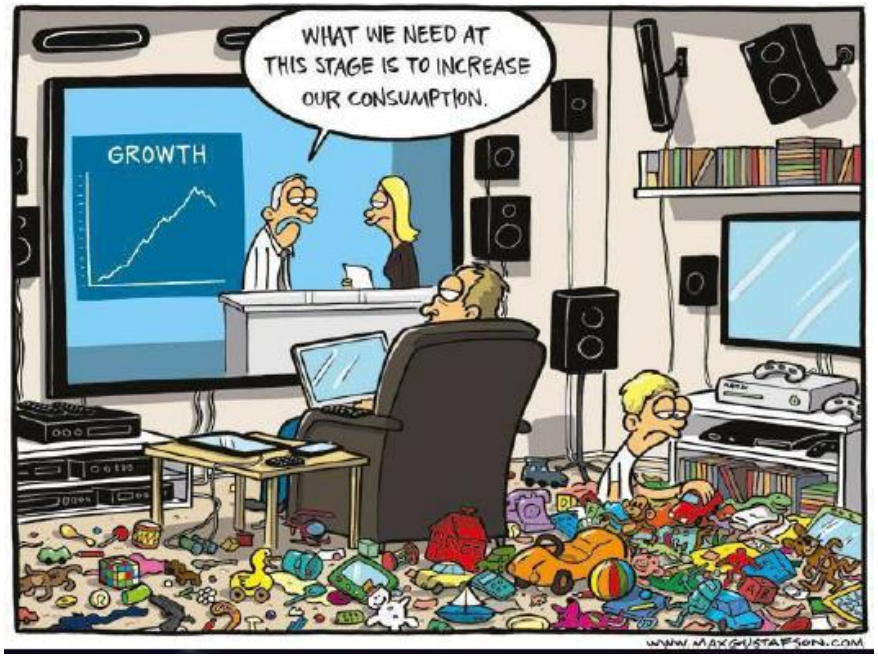
Every year the Earth overshoot day comes earlier

- Earth Overshoot Day is the date when we have exhausted nature's budget for ongoing year. For rest of the year we will be operating in overshoot.

- Globally we need one and half planets to provide the resources we use and to absorb our waste.



Circular economy

- Waste becomes a resource.
- Products are designed to be reused and recycled.
- Nonrenewable natural resources are replaced by renewable.
- Energy is produced by renewable energy sources.
- People and industry are sharing items and services instead of ownership.

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Economical possibilities of circular economy for Finland

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The early bird catches the worm

- Countries that are proactive in moving into circular economy will get the largest economical benefits.
- The Finnish Innovation Fund Sitra has estimated that circular economy represents an opportunity for Finland worth **1.5 to 2.5 billion euros.**

Nutrient recycling in agriculture

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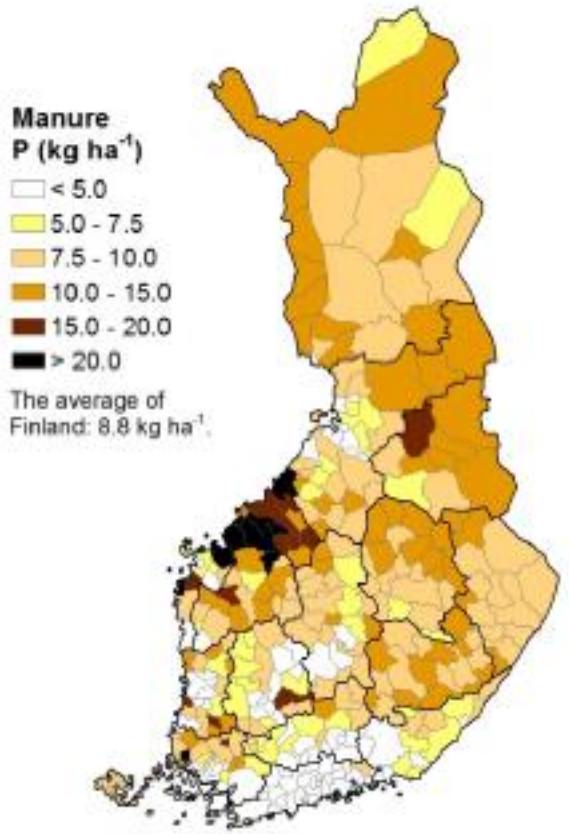
Nutrient recycling in agriculture

- EU Commission has added the phosphate rock to the list of 20 critical raw materials.
- Production of nitrogen fertilizers is highly energy-intensive and generates a lot of greenhouse gases.
- Nutrient recycling protects waters and soils.
- Nutrient recycling creates new businesses. There is a demand for technologies promoting nutrient recycling.

Manure is a valuable fertilizer

- In Finland 20 mill. tons of manure is produced annually containing 17.5 mill. kg phosphorus.
- Manure produced in Finnish animal farms would be sufficient to cover plant phosphorus needs at national level.



Ylivainio Kari & al. 2014. Regional P stocks in soil and in animal manure as compared to P requirement of plants in Finland. MTT:n reports 124. http://www.mtt.fi/mttraportti/pdf/mttraportti124.pdf

Manure processing

- Manure processing facilitates more profitable transportation of manure to regions in need of nutrients.
- One method doesn’t fit for all – variety of technology options is needed.
- Separation, composting, granulation, biogas, pyrolysis…

Managing the big picture

- Processing of manure does not guarantee more efficient recycling of nutrients - also markets and division of work and logistics are needed to get the nutrients to the right place.

- Agroecological symbiosis = Farms and enterprises aiming at profitable, integrated, local co-operation based on recycling of nutrients and renewable energy.

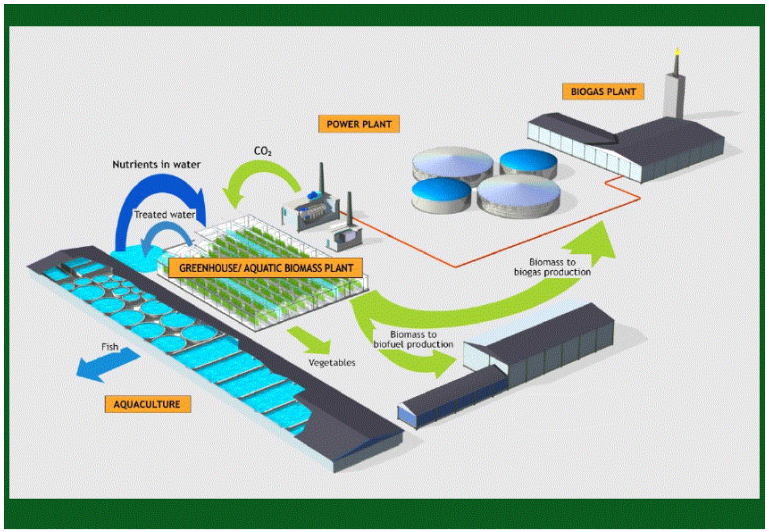
- The concept of nutrient and energy self- sufficient farm.

Agroecological Symbiosis

- Sybimar Integrated aquaculture, greenhouse and bioenergy production
  http://www.sybimar.fi/en/product_categories/sustainable_solutions/closed_circulation_concept

- Honkajoki Kirkkokallio Agroecological Symbiosis
  http://www.honkajokioy.fi/eng/articles?issue=33

- Palopuro Agroecological Symbiosis
  http://blogs.helsinki.fi/palopuronsymbiosi/english/



http://www.sybimar.fi/files/150/Sybimar_brochure_closed_circulation_concept.pdf

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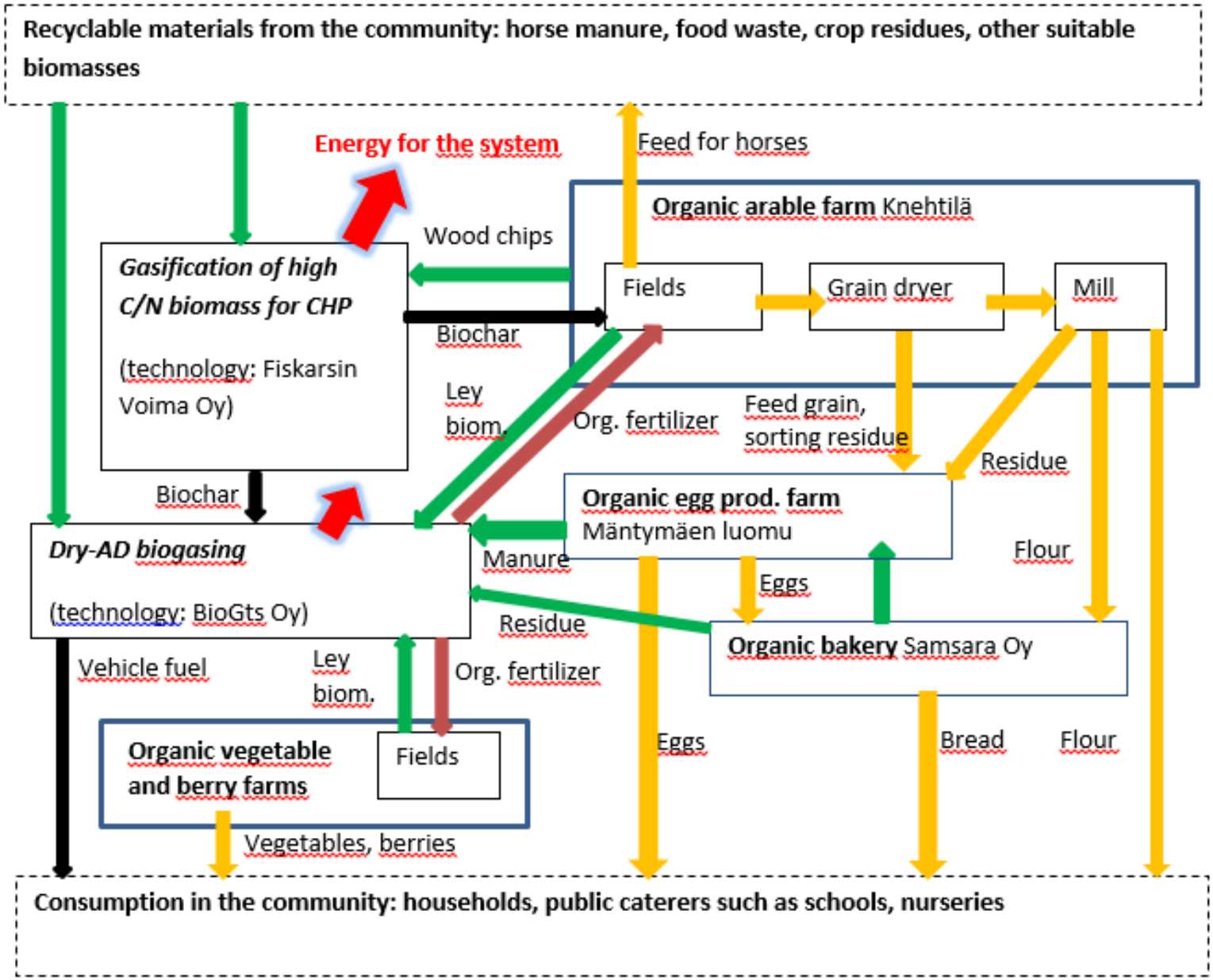
Palopuro Agroecological Symbiosis



Circular economy in forestry

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Circular economy in forestry

- Economical potential of circular economy in **pulp and paper industry** in Finland estimated to be **220-240 mill. euros.**

- Paper industry has got big material flows and high energy intensity. Even small improvement in efficiency or in recovery and utilization of by-products lead to savings and new business opportunities.

- Most interesting possibilities to enhance circular economy are in by-products of paper industry.

Potential of by-products and processing wastes in paper industry

	Description	Assumpitions	mill. euros/year
Drop in products	Biofuels and biochemicals **Circular economy application** The utilization of materials for high value applications, utilization of renewable raw materials in other value chain	Not estimated	
Functional products	Lignin, nano-cellulose, special fibres, biochemicals **Circular economy application** The utilization of materials for high value applications, utilization of renewable raw materials in other value chain	25 % of lignin is recovered. 40 % of that is processed to lower value products, 50 % to middle value products and 10 % to high value products.	210-220
Processing Waste Flows	Sludges, ashes, other processing waste **Circular economy application** Minimising the amount of materials that are leaking out of the system	All the by-products will be utilized. Changes in the regulation and technologies will make ash and other wastes valuable inputs in production (for example fertilizer).	10-20

The Strategic Programme of the Government 2015-2018

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Strategic priorities of the Goverment programme 2016-2018

1. Employment and competitiveness, EUR 170 million
2. Knowledge and education, EUR 300 million
3. Well-being and health care, EUR 130 million
4. **Bioeconomy and clean technologies, EUR 300 million**
5. Digitalisation, experimentation and deregulation (procedures), EUR 100 million

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Key projects of the Bioeconomy and Clean Technologies theme

1. Towards carbon-free, clean and renewable energy cost-effectively

2. Wood on the move and new products from forests

3. **Breakthrough of a circular economy, restoring waters to good condition**

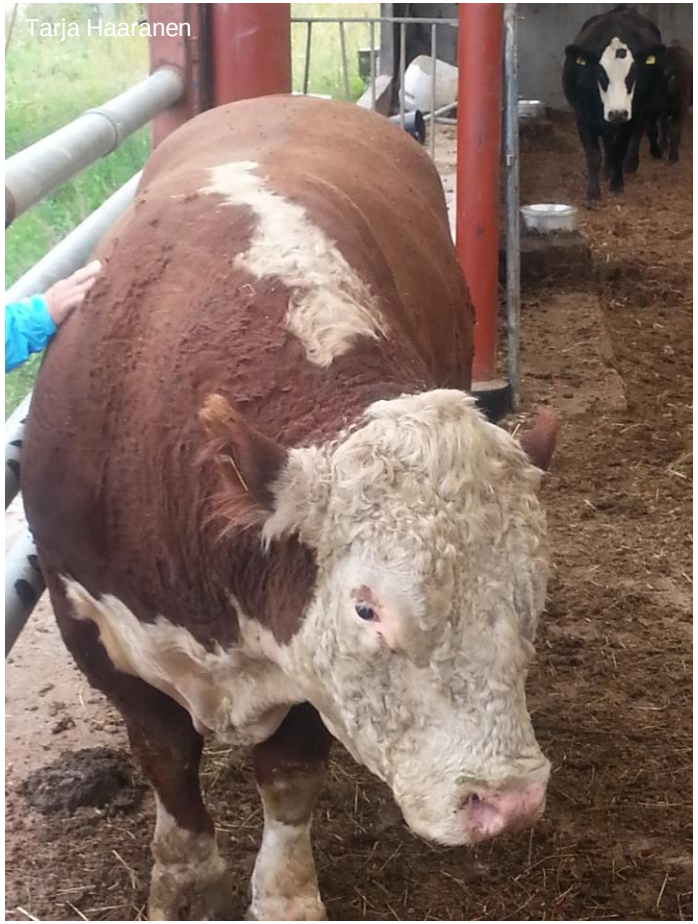
4. Finnish food production will be profitable, trade balance on the rise

5. Nature policy based on trust and fair means

Key project
Breakthrough of a Circular Economy

- Nutrient and energy self-sufficiency in agriculture to be enhanced.

- Recycling of nutrients to be increased aiming at processing 50 % of farm manure and community wastewater sludge in sensitive areas by 2025 so that the nutrients can effectively utilized.



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Key project
Breakthrough of a Circular Economy

- **Trial and piloting programme for nutrient recycling 2016-2018,** EUR12, 4 mill.

  - Development of new biomass processing technologies
  - Enhancing the production of recycled fertilizers
  - Developing the logistics and new service models in nutrient recycling
  - Enhancing agriecological symbiosis
  - Processing high value products from different biomass

How does the change happen?

- Information,
- operating models,
- minimising of administrative obstacles,
- business expertise,
- practical trials and piloting,
- co-operation,
- networks,
- capacity to take responsibility,
- innovative thinking,
- enthusiasm.


Thank you for your attention!
Tarja Haaranen