Actual results from the EU part supported project

Baltic Ecological Recycling Agriculture and Society (BERAS)

Surplus of plant nutrients in the agriculture of today compared to Ecological Recycling Agriculture (ERA) in the Baltic Sea Drainage area (2002-2004)

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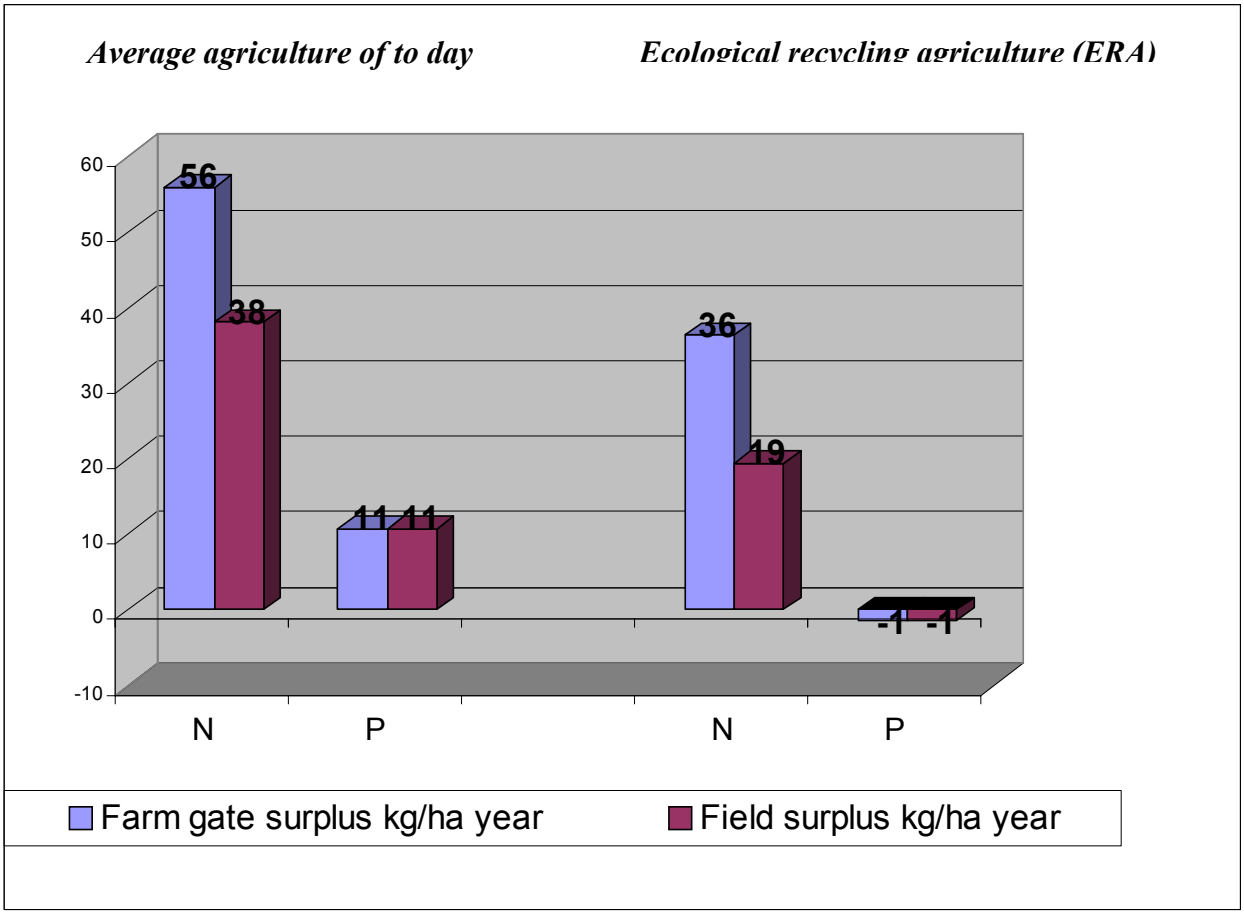
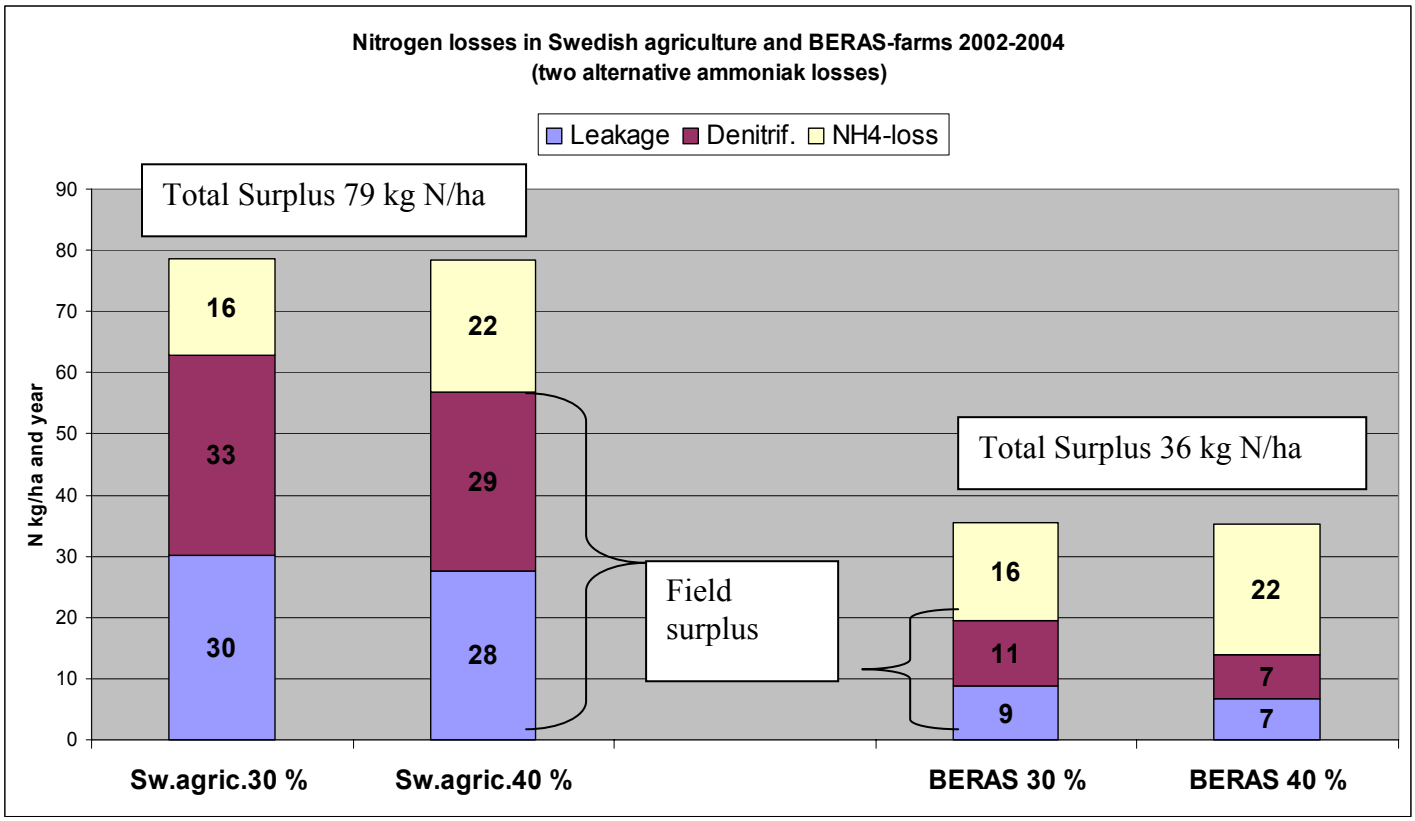
The largest proportions of the total water born nitrogen and phosphorus load to the Baltic Sea came from the agriculture. The difference between the support of plant nutrients to agriculture in form of bayed fertilizers, fodder, nitrogen fixation and export of agricultural products is a surplus which loads the environment and subsequently the Baltic Sea. The area specific surplus was highest in Denmark, Sweden, Finland and the west part of Germany which all have a predominately conventional and high productive agriculture. The Baltic countries have a significantly lower production. The eight studied Baltic Sea countries had an average total surplus of nitrogen and phosphorus of 56kg and 11 kg per ha respectively per year. In the studied ERA farms the average total surplus of nitrogen was 35 % lower and on field level estimated to be 50 % lower. There was no surplus of Phosphorus on ERA-farms.

Nitrogen (N) och phosphorus (P) surplus



Ecological Recycling Agriculture (ERA) is a self-sufficient ecological (organic) agriculture without use of pesticides and artificial fertilizers and an animal production restricted to be based only on the own fodder production.

Conventional Swedish agriculture of today compared with BERAS-farms 2002



– 2004

The graph shows the average total nitrogen surplus of 36 kg per ha on the 12 BERAS farms, comparing the 79 kg per ha average in Sweden (which is predominately conventional agriculture).

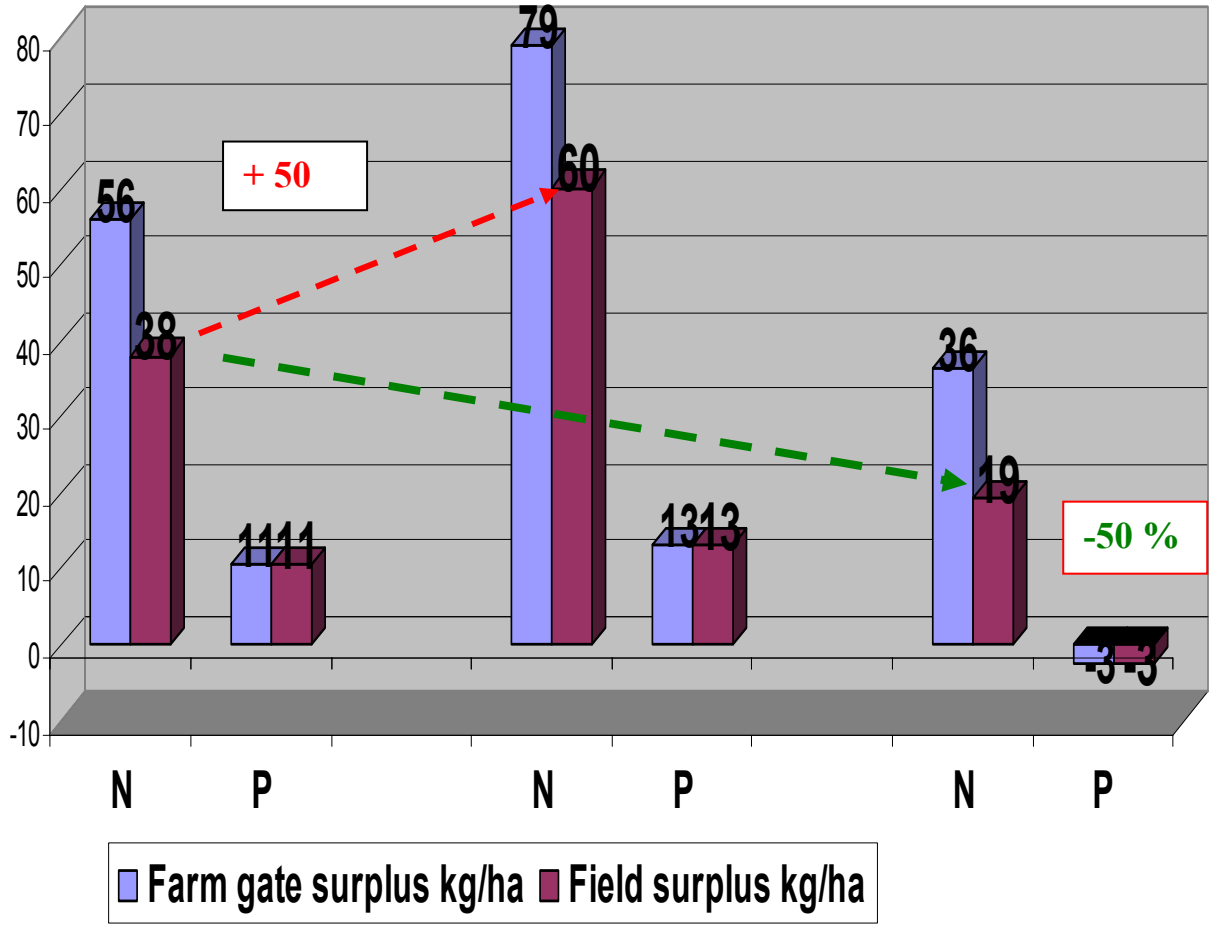
This indicate 55 lower emissions of nitrogen from BERAS-farms compared to the conventional agriculture assuming a steady state of immobilised humus nitrogen content.

Ammoniac emissions from (animals and) manure can be calculated to be between 30 - 40 % of the exudates nitrogen, depending mainly of manure managing technique. The losses from soil can be divided in leakage and losses mainly trough denitrification of nitrogen with emissions of dinitrogen oxide to the atmosphere.

The results indicate 70 – 75 % lower leakage of nitrogen from BERAS-farms compared to the conventional agriculture.

Agric. of today Conv scen. ERA scen

Road choice for the Agriculture of tomorrow - the Baltic Sea Catchment Area



If conventional agriculture, like Sweden's, is introduced to the Baltic countries, the nitrogen output into the Baltic Sea may increase by 50%.

If, however, the Baltic Sea catchments area converts to ERA, the studies show the nitrogen output will decrease by 50%.

In the ERAS-scenario with adapted fodder and animal production there will be no surplus of Phosphorus.

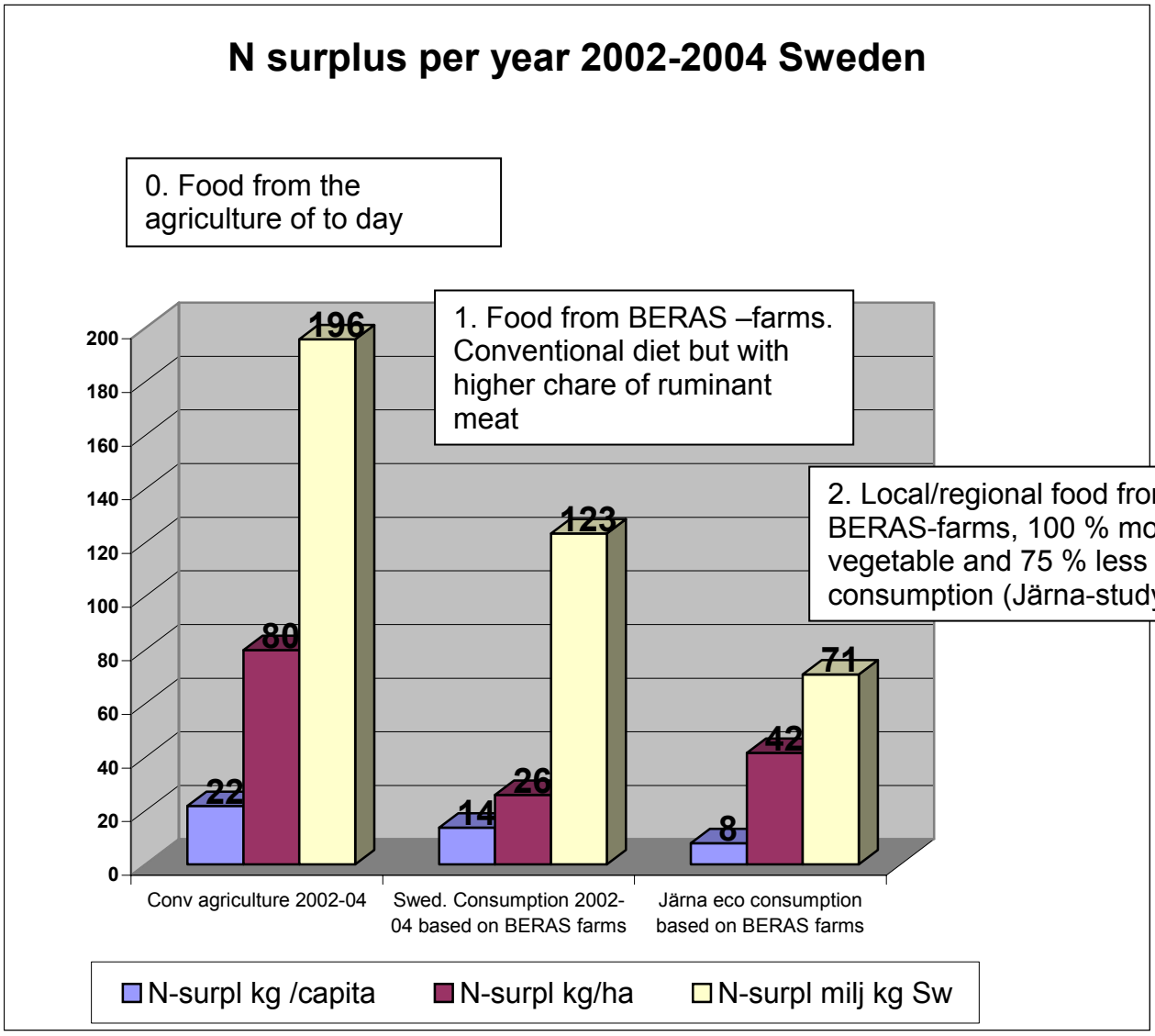
The environmental impacts into the Baltic Sea area

of alternative Food baskets scenarios

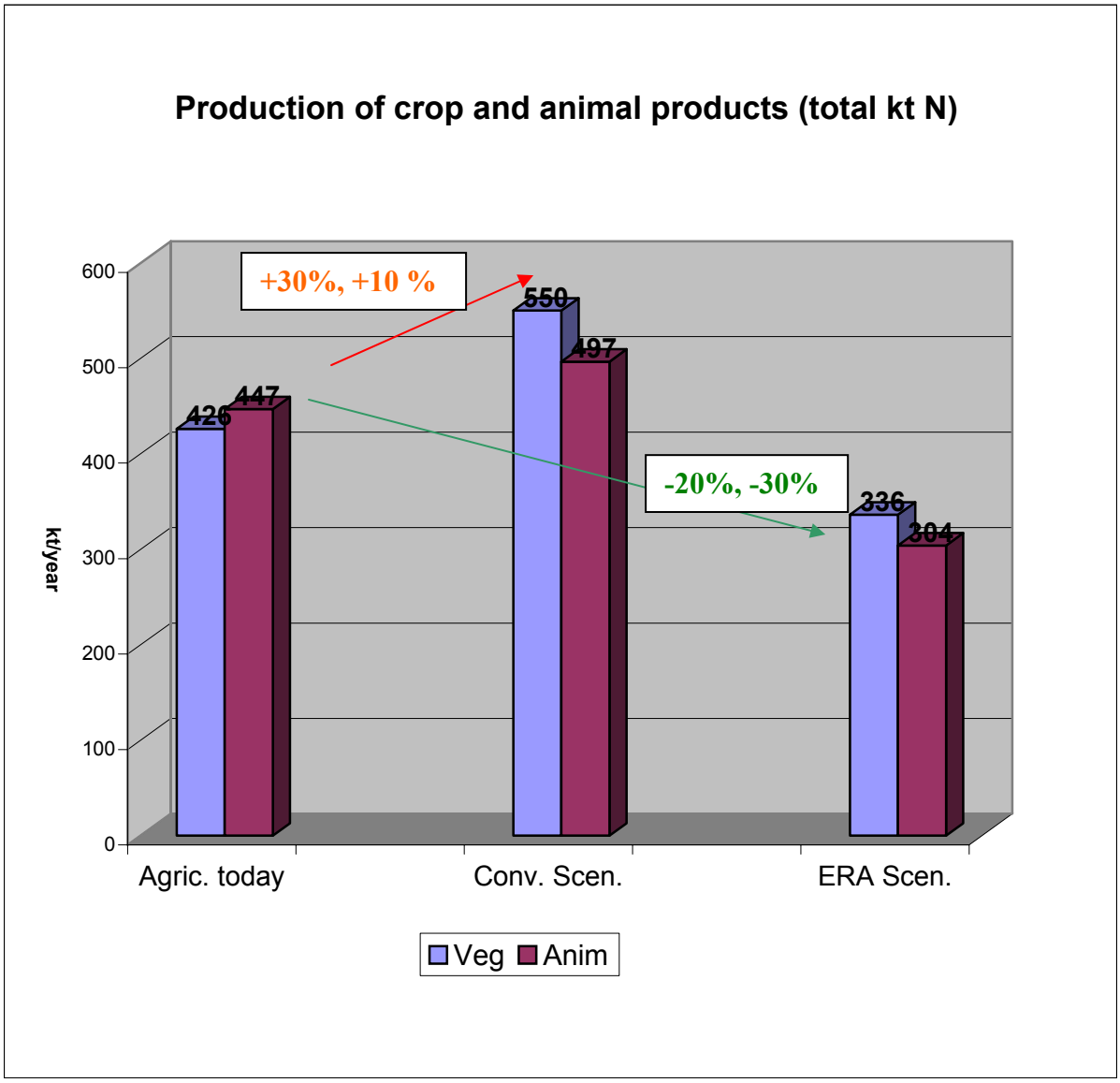
- **Nitrogen surplus per capita would decrease with about 35% and leakage would decrease with about 50% if all consumed food are from Ecological Recycling Agriculture (ERA), like the BERAS farms.**
- **Nitrogen surplus per capita would decrease with about 65% as an effect of 75% less meat consumption and that all consumed food are from BERAS farms according the consumer study in Järna**

The reduced meat consumption will mainly be based on ruminant meat in these scenarios. Reduced meat consumption reduces also the need of arable land per capita with 30 – 45% compared to conventional agriculture. The global warming emissions are reduced with 10% in the first step, with 20% if the food also is locally produced and with 40% in the second step as consequence of changing to less meat and more vegetables). Consumption of primary energy resources will be reduced with about 40% in the first step and 60% in the last step.

Observe that in figure for conventional Swedish agricultural area is not 1 milion ha (netto) for imported fodder included.



Conv. consumption conv. food comp. 2002-2004		Rel-value	Conv. cons. Based on BERAS food	Rel-value	Järna case based on BERAS food	Rel-value
Agr area milj	2,45	1,00	4,76	1,94	1,70	0,69
Tot ha/capita	0,27	1,00	0,53	1,94	0,19	0,69
Capita/ha	3,67	1,00	1,93	0,52	5,29	1,44
N-surplus/capita	22	1,00	14	0,63	8	0,36
N-surplus/ha	80	1,00	26	0,32	42	0,52
N-surpl milj kg Sw	196	1,00	123	0,63	71	0,36



Scenarios of agricultural production, comparing the average conventional agriculture of today and a conventional alternative of tomorrow, based on the BERAS farm studies.

Comment: Less production in ERA agriculture I a consequence of self sufficiency with fodder (no imported agricultural land), higher chare of ruminant meat production based on grass-clover, and 20-30 % lower yield of cereal crop per ha. In an ERA Scenario, the risk of agricultural surplus production will be reduced. Unused agricultural land could be re-cultivated, special important also for restoration of to day not used agricultural land in the Baltic countries.

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