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Summary project BERAS

Baltic Ecological Recycling Agriculture and Society

Research and development projects with part support from EU (BSR INTERREG) 2003-2006 and 2010 – 2013

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The agricultural and food sector in European countries is today characterised by increasing specialisation with crop production based on the use of artificial fertilizers on farms with no livestock and animal production on other farms concentrated to certain regions; a food system characterised by long transports of agricultural products, animals and foodstuffs and the use of non-renewable energy in the food chain. These characteristics are all major sources of water pollution, greenhouse gas emissions and biological diversity degradation. This situation is described in the background report to the BERAS – project. It is based on the analysis of plant nutrient balances and nutrient flows on farm, regional and country level in Sweden and Finland by Granstedt (2000)[i] The environmental situation in the Baltic Sea mirrors this non sustainable use of natural resources by humans.

The aim of the BERAS project was to build up a knowledge base and competence for a more sustainable life style within the whole agriculture and food sector. The first BERAS project started March 2003 and ended March 2006. In the project, examples of ecological and local/regional production, processing, transportation and consumption of food products have been evaluated. On some of the 48 reference farms representative of ecological recycling agriculture and the ten local food initiatives included in the project the whole food chain has been studied. The BERAS project has addressed the need to analyse the environmental and socio-economic consequences of ecological recycling agriculture as well as the opportunities and obstacles facing the various actors in the food system, i.e. producers, processors, traders and consumers. Studies of various aspects of the whole food system have been carried out with 20 partner institutions and more than 50 academic researcher in the 8 EU member states around the Baltic Sea: Sweden, Finland, Denmark, Germany, Poland, Lithuania, Latvia and Estonia.

The work included 5 Work Packages: WP1 (Case studies report 1 and 4), WP2 (Environment report 2 and 5), WP3 (Economy report 3), WP 4 (Sociology report 6) and WP 5 (Dissemination and synthesis report 7 and 8). To date seven reports have been published by the Swedish University of Agricultural Sciences (SLU) through the Centre for Sustainable Agriculture (CUL). These and the executive summary are available at: www.beras.eu.

A new project plan to study and start the conversion process from specialised agriculture to ERA within BSR is now approved and started: BERAS-implementation, 2010-2013..

Below are the main conclusions from the BERAS work 2003 -2006:

1. The main reason for the increased load of nitrogen and phosphorus from agriculture to the Baltic Sea is the specialization of agriculture with its separation of crop and animal production. This restructuring of the agriculture sector took place through out the Scandinavian countries after World War II and has resulted in farms with a high

density of animals and great surpluses of plant nutrients, particularly in certain regions in Sweden, Finland and Denmark (WP2, BERAS report 2, IV).

2. A specialization of agriculture in Poland and the Baltic states corresponding to the changes in Sweden, Finland and Denmark would lead to an increase of nitrogen pollution to the Baltic Sea by more than 50 percent (WP2, BERAS report 5,II).

3. Agriculture based on the principles of ecological recycling would, according to the results in the BERAS project, lead to a decrease in the calculated nitrogen leaching by half as well as a significant reduction in the loss of phosphorus. Ecological Recycling Agriculture (ERA-agriculture) was defined as an agriculture system based on local and renewable resources with an integration of animal and crop production (on each farm or farms in close proximity) so a large part of the nutrient uptake in the fodder production (in Europe on about 80 % of the arable land) is effectively recycled. This in effect means that each farm strives to be self-sufficient in fodder production which in turn limits animal density and ensures a more even distribution of animal to most farms (WP2, BERAS report 5, II).

4. Nitrogen losses would diminish more in countries that have an intensive agriculture than in the Baltic countries and Poland where today there is partly a more extensive form of agriculture. In Sweden the potential for diminishing nitrogen losses are calculated to be between 70 - 75% (WP2, BERAS report 5 and Granstedt, Tomsson and Seuri 2008, Biol, Agric. And Hortic,)

5. The total output of animal and crop products would not have to decrease with such an agriculture reform in the Baltic Sea Basin, if the production level on the documented ecological recycling farms in Sweden is taken as standard. (WP2, BERAS report 5, II, Larsson and Granstedt, 2010, Ecolocical Economists)

6. The proportion of leys in a future ecological recycling agriculture would increase in areas that are now mostly specialised in grain production. Leys with both clover and grass would have to be produced on all farms. This would increase the chances of diminishing plant nutrients' leaching, building up and protecting the humus content in soil and promoting biological diversity (WP2, BERAS report 5, II).

7. Increased ley production would result in the reallocation of meat production. Production of meat from non ruminant animal (poultry, pigs) would decrease by half, while beef production would increase correspondingly –assuming today's level of meat consumption. (WP2, BERAS report 5, IX).

8. Local production, processing and distribution of food products from ecological recycling agriculture could diminish primary energy consumption and green house gas emissions compared to the current conventional food system. According to a scenario based on studies of the ecological local food chain in Järna and the average consumer in Sweden, the per capita consumption of primary energy would decrease by 40% and the production of green house gases would decrease by 20 % in the food chain (WP2, BERAS report 5, V, IX; Wallgren and Thomsson, 2008, lic. th. KTH Stockholm)

9. A more vegetarian food consumption, (75% less meat and 100% more vegetables) could decrease energy consumption by 60% and green house gas emissions by 40 %, compared to Swedish conventional food consumption patterns. The area in Sweden required for food production would be reduced by 30% compared to today's in-country production area and by 50% if the area used for production of imported fodder is also included. The per capita nitrogen surplus in Sweden would be reduced by 65% in this more vegetarian scenario when compared to today's conventional food consumption. (WP2, BERAS report 5, V, IX).

10. An ecological and locally oriented food chain leads to freedom from chemical pesticides, greater diversity in the production and more grazing-based animal husbandry. All of this promotes biodiversity in the farm landscape (WP2, BERAS Report 5, VI). Agriculture based on the integration of animal and crop production and an animal density limited to on-farm self sufficiency in fodder production would prevent the disintegration of the agricultural landscape in parts of the Baltic Sea basin such as Poland where the agricultural landscape is still characterized by a high degree of diversity. In the parts of the Baltic States where large-scale agriculture production from Soviet times has collapsed and in the industrialized and grain dominated areas in Sweden, Finland and Denmark, introduction of such agriculture could lead to a restoration of the agricultural landscape (WP4, BERAS report 4).

11. Economic studies at the farm level show higher production costs when environmental costs are included (internalized) in the production costs. This includes, among other things, the restrictions on using fodder concentrates. There is a 12% lower production per cow without soy protein. Also limiting the number of animals to the farms own fodder-producing capacity has economic consequences. In the Järna study the cost for milk production was 19% higher compared to conventional agriculture (0,5 - 0,6 SEK per kg milk). The food expenditure for the 15 Järna households with mainly ecological and to a great extent locally produced food was on average 25%

higher. However, there was great variation depending on the food profile. Conventionally produced food does not include the environmental costs. They are instead pushed towards the future or to other parts of the world (WP3, BERAS report 3).

Practical examples of ecological recycling agriculture, local food processing, cooperation with schools, ecological tourism and the development of local markets have been documented in the eight countries of the project. The studies showed how private initiatives, raised awareness concerning the significance of the food chain for the environment and a more lively cooperation between people can contribute to a more ecologically, economically and sociologically sustainable society. Such a society provides more job opportunities in the countryside and strengthens the local rural economy. This is expected to be of great importance for saving and further developing a vibrant rural culture and improving the quality of life in the Baltic Sea region. Establishing such agriculture can have such positive effects both within the more impoverished rural areas in the new EU member countries as well as in the depopulated rural areas in countries with a more industrialized and specialized agriculture (

[i] *Granstedt, A. 2000. Increasing the efficiency of plant nutrient recycling within the agricultural system as a way of reducing Pollution to the Baltic Sea.. Agriculture, Ecosystems & Environment 1570 (2000) 1–17. Elsevier Science B.V. Amsterdam.*

BERAS-reports CUL Swedish University of Agriculture Sciences

Available on

http://www.beras.eu.

Baltic Ecological Recycling Agriculture and Society (BERAS)
Executive Summary (not in printed version)
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Beras report nr 1
Local and organic food and farming around the Baltic Sea
Ekologiskt lantbruk nr 40. Sepännen, L (ed.). Juli 2004.

Beras report nr 2
Effective recycling agriculture around the Baltic Sea
Ekologiskt lantbruk nr 41. Granstedt, A., Seuri, P. and Thomsson, O.. December 2004.

Beras report nr 3
Economical studies within WP3
Ekologiskt lantbruk nr 43. Possibilities for and Economic Consequences of Switching to Local Ecological Recycling Agriculture, Sumelius, J. (Ed). 2005

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Obstacles and solutions in Use of Local and Organic Food
Ekologiskt lantbruk nr 44. Kakriainen, S., von Essen H. (ed.). Augusti 2005.

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Environmental impacts of ecological food systems - final report from BERAS

Ekologiskt lantbruk nr 46. Granstedt, A., Thomsson, O. and Schneider, T. January 2006.

Beras report nr 6
Approaches to Social Sustainability in Alternative Food Systems
Ekologiskt lantbruk nr 47. Sumelius, J. & Vesala, K.M. (eds.). December 2005.

Beras report nr 7
The Power of Local - Sustainable Food Systems around the Baltic Sea
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Helmfried, H., Haden, A. and Ljung M. 2007. The Role of Action Research (AR) in Environmental Research: Learning from a Local Organic Food and Farming Research Project. Journal Systemic Practice and Action Research.

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