

Nordic - Baltic - Belarus solutions in farming for biodiversity



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Edited by Jānis Reihmanis

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Introduction

Jānis Reihmanis, *Latvian Fund for Nature*

The long history of agricultural land management in Europe is linked to its large impact on biodiversity. Farming has, over the centuries, created and maintained traditional landscapes and semi-natural habitats hosting considerable biodiversity. Until today, agriculture has been and still is one of the main driving forces influencing biodiversity in Europe, both in the European Union 27 countries and on the whole continent. It is a support and source of considerable biodiversity and at the same time a source of considerable pressure on it.

The changes in farming practices over the past century and especially in the past decades have been recognised as a major cause for the decline of biodiversity in Europe. In order to boost yield, farmers are applying intensive agricultural practices such as heavy use of pesticides and fertilisers, large-scale drainage, multiple cropping and heavy machinery. Modern agricultural practices triggered the decline of grazing livestock, land abandonment, homogenization of landscapes and ecological impoverishment; all those processes being largely unfavourable to farmland biodiversity. Whereas on nutrient-rich and easily accessible lands farming systems have become more intensive, nutrient-poor soils and peripheral lands have been subject to abandonment or afforestation.

However, ecological relationships between wildlife conservation and farmland management provide common ground for the enhancement of biodiversity on farmland. Many scientific works on this issue have been done to explore complex links between farming and nature. Generally, it can be said that most of them suggest that farmland biodiversity cannot be preserved or restored without continuation of traditional land management. It is promising that in recent years these findings are becoming more and more accepted by society (farmers, consumers, NGOs). As a result, farmland biodiversity issues are addressed by many political documents on national and EU level. However, there are still considerable differences between the levels of their implementation in different countries even within region covered in this book.

This book has been prepared within the Nordic Council of Ministers funded project “Strengthening Nordic-Baltic-Russia/Belarus partnership in farming for biodiversity”. Most project activities were carried out during the

year 2010, which was pronounced the International Year for Biodiversity and became the year of setting new biodiversity targets at European and global level. A new target for the post 2010 period has been adopted by the EU: “Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss”.

Articles in this book have been written by experts in biology, agriculture and rural development from five countries – Belarus, Finland, Latvia, Norway and Sweden. Articles contain summary translations in Nordic, Baltic and Russian languages (according authors’ country of origin). Each chapter contains a separate article on specific issue, so this book is as collection of best experience cases and best practice guidebook containing NGO experience identified during the project on:

- management of high nature value grasslands;
- adaptation to climate change issues in rural areas;
- environmental technologies and solutions in biodiversity farming;
- use of hay and bio-energy possibilities;
- promotion of specialized markets for top quality produce to support nature friendly production.

Our experiences from different Nordic, Baltic countries and Belarus show that it is possible to farm for biodiversity while performing in economically viable manner in an increasingly competitive agriculture market.

One of the solutions for combing nature friendly and economically viable land use is organic farming. An explicit goal of organic farming is to preserve environment and to provide high quality food and one of the most important environmental aspects of organic farming is the reduction of water pollution. In this book, authors from Latvia and Belarus analyze development of organic farming in their countries. By comparing the situation in these two countries it can be seen that organic farming is very dependent on the political regulations, the Agri-environmental policy in Latvia and the state legislation in Belarus.

Development of niche products such as goat wool products also can be used as tool for successful biodiversity farming and sustainable rural development. Example from Norway shows viable grazing schemes on mountain grasslands where products with added value contribute to preservation of natural and cultural heritage. This example also indicates that biodiversity farming has more added value to maintaining traditionally rich biodiversity of Nordic, Baltic regions and Belarus. It enhances cultural values and supports traditional lifestyles of rural people as well.

Conservational and restoration projects where grazing is used as grassland management tool can provide long-lasting results due to fact that meat production linked to this measure provides more financial incentives for management even after the end of the restoration projects. Examples of such sustainable grazing projects are demonstrated by Swedish and Finnish NGOs.

An important component of biodiversity-oriented grazing projects is labeling of products. There are examples of few labels such as “pasture beef” or “meadow meat” discussed in this book. High quality of meat and biodiversity-targeted production process are the main strongholds of products having these labels. Higher price of these top-quality products enables farmers to keep traditional, low-intensity farming systems with high nature value.

One of the agricultural impacts on the environment is eutrophication. In order to tackle this problem, it is important to reduce nutrient leaching from agricultural lands. It can be done by better planning and developing targeted Agri-environmental schemes as demonstrated in article from Association for Traditional Rural Landscapes in Southwest Finland. Another method for reducing eutrophication is a removal of biomass from water-bodies. Biomass, usually reeds, can be removed and used in a way providing both, ecological and economical benefits. Examples for this approach are described in articles from Association for Traditional Rural Landscapes in Southwest Finland and Minsk Division of International Association of Ecologists, using reeds in construction as effective environmental technology for conservation of biodiversity and for rural economy as well.

Practices of using straw or hay in construction of Zero-Carbon houses provide another example on how agricultural products can be used in a sustainable way and contribute to adaptation to climate change issues in rural areas.

Rural tourism helps to develop economically viable biodiversity farming. Examples provided by the Ark Foundation and the Union of the Dviete Valley Municipalities have proven the attractiveness of year-round grazing Scottish Highlander cattle and *Konik polski* horses for tourists in Latvia.

All the best Nordic-Baltic-Belarus experiences compiled in this book have great potential for transferring knowledge and experience between countries on traditional and innovative methods in farming for biodiversity. This book also provides the basis for strengthening long-term regional partnership of NGOs active in biodiversity conservation in the region.

Semi-natural grasslands in Sweden

Ola Jennersten, *WWF-Sweden*
Sven-Olov Borgegård, *Ekologiplan*

Abstract

The surface of Sweden is 449 000 km² and it is mainly forested (53%), with spruce *Picea abies* and pine *Pinus silvestris* as dominants. Bogs and mires constitute 9% of the surface, lakes, rivers and creeks 9% and mountainous areas 10%.

Agricultural areas cover 8% and are made up by four larger agricultural areas and several small “islands” in the forest landscape. Traditionally agriculture has been based on dairy production. The cattle grazed in the forest and calves, young animals and horses were kept in pastures close to the farm houses.

Semi-natural grasslands, unfertilised meadows and pastures used by man and his companions, horses, cattle and sheep, for hay production and grazing, are central to most Swedes because of historic, natural, cultural and recreational values. Over centuries plants and animals have become adapted to disturbances caused by cutting scythes and grazing muzzles, which have formed one of the most species rich habitats in Northern Europe. Here, cultural and natural values are intimately connected and interdependent.

During the last 100 years due to intensification of agriculture many of these valuable habitats have been abandoned or even transferred to forests with state subsidies.

Remaining well-managed grasslands and wetlands are nature’s “sponges”, soaking up and storing water, carbon and nutrients such as Phosphorus (P) and Nitrogen (N). Destroying, draining, or ploughing such habitats thus strips the landscape of that function, and results in additional water entering the hydrological cycle downstream (sometimes causing floods), carbon into the atmosphere (contributing to global warming), and nutrients into the Baltic sea (contributing to eutrophication).

Semi-natural grasslands should therefore be conserved. Their services are worth millions of Euros per year to society. Yet their economic value does not end there. Grazing animals actually increase their biodiversity,

since the species richness increases if the grass is maintained short, allowing a whole range of plants to thrive in what would otherwise turn into scrub.

This plant diversity attracts a wide range of insect life, which in turn attracts other species including invertebrates, small animals and birds. Many waterfowl graze the new shoots of grass as well. In fact the agricultural landscape holds approximately 50% of the red listed species in Sweden.

Background

The surface of Sweden is 449 000 km² and it follows France and Spain as the third largest country in Europe. It is mainly forested (53%), with spruce *Picea abies* and pine *Pinus silvestris* as dominants. Bogs and mires constitute 9% of the surface, lakes, rivers and creeks 9% and mountainous areas 10%.

Agricultural areas cover 8% and are formed by four larger agricultural areas and several small “islands” in the forest landscape. Traditionally agriculture has been based on dairy production. The cattle grazed in the forest and calves, young animals and horses were kept in pastures close to the farm houses.

Semi-natural grasslands, unfertilised meadows and pastures used by man and his companions, horses, cattle and sheep, for hay production and grazing, are central to most Swedes because of historic, natural, cultural and recreational values. Over centuries plants and animals have become adapted to disturbances caused by cutting scythes and grazing muzzles, which have formed one of the most species rich habitats in Northern Europe. Here, cultural and natural values are intimately connected and interdependent.

Valuable semi-natural grasslands (meadows and unfertilized pastureland) can be found on regularly flooded land along northern rivers, Baltic coast and nutrient-rich lowland lakes. South eastern Sweden (especially the county of Småland), eastern part of the county of Uppland (Roslagen), lime-rich areas (the islands of Öland and Gotland, and part of the county of Jämtland), and the Baltic archipelago harbours are the most valuable semi-natural grasslands in the country.

Semi-natural grasslands and wetlands

Well-managed grasslands and wetlands are nature’s “sponges”, soaking up and storing water, carbon and nutrients such as Phosphorus (P) and Nitrogen (N). Destroying, draining, or ploughing such habitats thus strips the landscape of that function, and results in additional water entering the hydrological cycle downstream (sometimes causing floods), carbon into



Figure 1. Seminatural grassland fenced by traditional wood fence. The traditional Swedish agricultural land is characterized by a mosaic of small production units.
Photo: Ola Jennersten.

the atmosphere (contributing to global warming), and nutrients into the Baltic sea (contributing to eutrophication).

Grasslands should therefore be conserved. Their ecosystem services are worth millions of Euros per year to society. Yet their economic value is not fully calculated and is undervalued. As a man-modified habitat, shaped over centuries by agriculture, semi-natural grasslands and their associated wetlands are actually renewed, enriched, and maintained by human use. Grazing by animals actually increases their biodiversity, since the species richness increases if the grass is maintained short, allowing a whole range of plants to thrive in what would otherwise turn into scrub.

This plant diversity attracts a wide range of insect life, which in turn attracts other species including invertebrates, small animals and birds. Many waterfowl graze the new shoots of grass as well.

This creates a conservation strategy that – after a modest initial investment and if the enabling environment is supportive – eventually can pay for itself, through the sales of meat and other products.

Besides, shifting the animal production away from cereal-fed stall-reared systems to outdoors, pasture fed, semi-natural grasslands have all sorts of additional benefits in terms of nutrient reduction, over and beyond the direct nutrient trapping and re-cycling functions noted above.

This is a money-generating business activity which, in addition to its unique product, also delivers nature conservation and nutrient reduction. It sounds almost too good to be true, yet it is very, very real and very possible.

Many factors need to be considered: selection of the best breed, choice of pasture, availability and quality of the source of winter fodder, age at slaughter, marketing of the high quality meat products and so on. WWF has worked all of these factors out – together with partners – and has learned how to avoid pitfalls and problems.

Rich in species

According to the latest EU-wide survey conducted by the European Commission, grasslands are the most threatened habitats on the European continent. In a Baltic context, restoration and wise use of these grasslands is important if the challenge of reducing agricultural pollution are to be met.

A typical semi-natural grassland in Sweden is home to hundred of plant species. This is why they are so beloved of people, birds, insects and other wildlife. Out of a total of 2,000 vascular plant species found in Sweden, 500-600 are found in these grasslands. Two-thirds of the country's 110 butterfly species lay their eggs in grasslands, according to the Swedish Red list.

As a result, many types of grassland around the Baltic are recognised for their conservation importance and are protected as nature reserves or listed in the European-wide Natura 2000 network. Despite this protection, grasslands and their species remain under grave threat: in Sweden alone at least 500 species of grassland mammals, birds, butterflies and other insects, vascular plants, lichens and mushrooms are on the “Red List” of threatened species.

Furthermore, the economic importance of these areas is currently under-utilised. It is possible to manage these areas in ways which are good for the economy and good for the ecology. Thus cattle breeding on grasslands produces not only high-quality, hormone-free, low-food-miles beef or other meat products, but also produces more nature.

Managing wetlands and grasslands in this way then enables other key environmental functions to take place. Plenty of scientific evidence now shows that grasslands and wetlands re-cycle and store nutrients, thus preventing diffuse agricultural pollution entering the hydrological system. Besides such management also stores carbon, meaning that what's good for nature and good for business is also good for climate change mitigation.

Semi-natural grasslands are disappearing

Today, area of semi-natural grasslands is rapidly decreasing as the number of livestock farms is decreasing. As a consequence the existence of

unfertilised meadows and pastures and their biological and cultural values is seriously threatened.

We believe that modern farmers have a double mission:

- the production of food, and
- the production of species-rich landscapes and other ecosystem services.

The ability to make a living on the farm is naturally a precondition for a farmer's long-term interest to engage in agriculture. Food produced by using sustainable methods and marketed as local and of high quality can fetch a premium on the market. The production of a species-rich landscape should be paid by the state as it cannot be monopolized and thus will be enjoyed and used by all people. In order to safeguard the future of environmentally high value agricultural land development of the common agricultural policy is of outmost importance.

Since 1990 WWF Sweden has worked with the concept of *the farmer's double mission* in several regional projects dealing with long-term management of valuable semi-natural grasslands in Sweden with the following goals.

Overarching goals:

- Sustainable use of natural resources.
- Conservation of biological diversity.
- Increased knowledge, participation and involvement of the local stakeholders.

The goal of the projects:

- Restore and maintain semi-natural grasslands with high natural value.
- Develop quality meat production with added conservational value.
- Create long-term sustainable agricultural enterprises.
- Disseminate project ideas among other local and regional stakeholders.

Evaluation criteria:

- The area of restored and well-maintained pastures and meadows with high natural values.
- Number of cattle produced.
- Positive development in the area's flora and fauna (through field surveys).
- Attitude to conservation amongst local stakeholders.

General layout of all Semi natural grazing projects

Increase the area of well-managed semi-natural grasslands

The conservation aspect has been to increase the area of semi-natural grasslands in Sweden. In cooperation with partners and landowners the most valuable areas are identified and discussions started with present and future farmers concerning restoration and grazing. Systems for evaluations (species surveys) are planned.

Increase the economy of the farm

In order to secure future management of the grasslands it is important to aim for a sustainable economy on the farm. Without profitability grazing practices will cease and the grasslands will be overgrown. The main idea is the production of premium “pasture meat” as the commercial part of the project whilst lobbying for state payment for landscape management as the political part. WWF has developed educational material and organized study tours to other areas to broaden the planning horizon of the local farmers. The concept “*from grass to entrecote*” has been central, implying the need to have a holistic view of semi-natural grassland management. This includes cooperation between farmers to decrease costs and the production of a “green” product with “conservation”, locally produced and high meat quality as added values.

The breeds used in the WWF “Natural Grazing Project” are mainly light British breeds and their crosses (Aberdeen Angus, Hereford, Scottish Highland), which has proven to be particularly efficient for conservation as well as for quality beef production (marbled meat). Castrated bulls, steers, and heifers are particularly well suited for pasture based beef production. The dairy breeds are suitable for cross breeding with the above breeds. Pure bred dairy steers of the Swedish Red variety also produces well marbled meat and is a valuable source of meat throughout the year. Suckler cows with calves, steers and heifers graze very effectively and thus are the best conservationists.

In order to achieve long-term sustainability it is often necessary to make investments in buildings and machinery. A number of stables for loose housed cattle have been built for efficient winter housing. The investments have been shared among the farmers, authorities and the project. Investments have also been made in necessary machinery – which have been owned and maintained by farmer-owned machine-holding companies.

Definitions of the terms semi-natural pasture and pasture beef are as shown below.

Semi natural pasture:

- Meadows and pastures with high biological values (species rich in flora & fauna) that are not and have not been artificially fertilised, limed, irrigated, nor treated with herbicides in recent history.

Production criteria for pasture beef:

- The animals are out on grasslands during the whole vegetation period.
- At least 50 % of the land on the farm used for grazing is categorized as semi natural pastures (as above).
- Each animal spends at least 50 % of the grazing period on the semi natural pastures.
- The winter feed is forage based, minimum of 70 % forage in total winter rations.
- The forage is produced on the farm or near neighbours.
- Only meat from heifers, steers and young cows is marketed as “Pasture Beef”.
- The meat should be well marbled.



Figure 2. Entrecote of cattle that grazed on seminatural grassland, note marbling structure of intramuscular fat. Photo: Ola Jennersten.

Increase in sale and quality of pasture beef

To ensure long-term sustainability in both grassland management and meat production it has been important to develop the production chains between farmers and consumers. The project has a long-term co-operation with the international retailers ICA/Ahold which are the main food retailers in

Sweden. The cooperation includes both monetary support for the project and development of a premium meat brand “ICA Naturbeteskött” sold nationally in all ICA stores. There are also a number of smaller farmer run initiatives to produce and sell Pasture Beef under local labels.

Secure communication between farmers and public

The project has started dialogues among non-governmental organisations, authorities and the public concerning the value and management of semi-natural grasslands. Permanent nature- and culture trails, information posters, surveys of plants, birds and insects as well as study visits to well-functioning farms are important tools in these activities.

Naturliga gräsmarker I Sverige

Sammandrag

Sveriges yta är 449 000 km² och, efter Frankrike och Spanien, det tredje största landet i EU. Skogsmark dominerar och täcker drygt 50% av ytan. Olika typer av våtmarker utgör 9% lika mycket som sjöar och vattendrag. 10% av ytan är fjäll.

Endast 8% av ytan är jordbruksmark och huvuddelen av den ytan består av 4 stora sammanhängande jordbruksmarken och resten är mindre områden i ett i övrigt skogsdominerat landskap. Traditionellt var produktionen inriktad på mjölk.

Ogödslade hag och ängsmarker använda av människan för bete och höproduktion har stark ställning i böcker, visor och annan kultur i Sverige.

Under århundraden har vegetationen anpassats till människans djur och en av de mest artrika naturtyperna i Sverige har formats. Kultur och natur är i de traditionella gräsmarker tätt sammanlänkade.

Välskötta gräsmarker och våtmarker är naturens “tvättsvampar” som suger upp vatten och lagrar kol och näringsämnen. Att genom dikning, plöjning eller på andra sätt förstöra dessa naturtyper och de tjänster de bidrar med leder till ökade vattenflöden nedströms, ökade utsläpp av klimatgaser och näringsämnen.

Dessa naturtyper måste därför bevaras. De ekosystemtjänster de levererar är värda miljoner Euros för samhället. Men det är inte den enda ekonomiska värdet. Genom betet som är en nödvändighet för att bevara dessa markers värde produceras också kött.

Den rika växtligheten attraherar många insekter och fåglar. Totalt så är cirka 50% av den svenska rödlistans arter hemma i jordbrukslandskapet.

Three regional Swedish grassland cases

Ola Jennersten, *WWF-Sweden*
Sven-Olov Borgegård, *Ekologiplan*

Abstract

The River Vindel (County of Västerbotten, Lapponia), The Bird Lake area (County of Närke, south-central Sweden), Roslagen (County of Uppland, eastern Sweden including archipelagos of the Baltic Sea) are three very different areas within the WWF Sweden “Green Meat” or semi-natural grasslands project.

The yearly natural flooding of the free-flowing River Vindel, in the county of Västerbotten, Lapponia, creates a spectacular and species-rich riparian landscape, maintained and enhanced by livestock grazing and hay cutting for winter feed. During recent decades this valuable landscape is threatened because of abandonment of cattle farms. In 1997 WWF started a project in the village of Ammarnäs up in the mountains and close to the springs of the river, in order to reverse the negative trends. The project has then spread downstream.

Roslagen is situated along the Swedish Baltic Sea coast just north of Stockholm. Except for the mainland part, Roslagen consists of 13 000 islands with island Gräsö being one of the biggest. Thanks to the maritime climate, the alkaline soil, the continuing elevation (land lift) of the once glacier covered Swedish landscape and unchanged small-scale agriculture and local forestry traditions Roslagen has developed into many species-rich habitats for plants, birds and butterflies. The landscape is flat, rich in wetlands and shallow Baltic bays are important for fish spawning.

The county of Närke is situated in south-central part of Sweden. The central parts are flat and are used mainly for cereal production and as pasture land. In the north-east the fourth largest lake in Sweden is situated, Lake Hjälmaren – which was drained and lowered during the period 1882-86 in order to generate agricultural land. 15 000 hectares of wetland were transformed to fertile agricultural fields. The high value nature in this area is mainly connected to the lakes and wetlands. Lake Kvismaren, Lake

Tysslingen, and parts of Lake Hjälmarén around the delta of River Svartån with Oset och Rynninge Bay, are all EU Natura 2000 sites, and included in Birdlife's Important Bird Areas, (IBA).

Three examples, The River Vindel (County of Västerbotten, northern Sweden), The Bird Lake area (County of Närke, south-central Sweden), and Roslagen (County of Uppland, eastern Sweden including archipelagos of the Baltic Sea) will describe both natural values as well as ways to enhance, manage and secure these values.

The River Vindel – delta management at River Vindel in northern Sweden

Background

The yearly natural flooding of the free-flowing River Vindel, in the county of Västerbotten, northern Sweden, creates a spectacular and species-rich riparian landscape, maintained and enhanced by livestock grazing and hay cutting for winter feed. During recent decades this valuable landscape is threatened because of abandonment of cattle farms. In 1997 WWF started a project in the village of Ammarnäs close to the springs of the river, in order to reverse the negative trends.

History

About 4000 years ago the first people started to cultivate the soil along the coast in northern Sweden and some 3000 years ago the first cattle farmers settled at the coast, also growing barley, wheat, and oats. Much later, people started to colonise the inland along the large rivers.

During the 1500s Swedish agrarian colonisers had reached the present village of Vindel and not until the 1800s did they colonise the small Sámi municipality of Ammarnäs in the mountains, 400 km upstream from the coast. Many river valleys of northern Sweden became the natural routes for colonising Swedes when entering the dark forested western taiga. Floodplains along the northern rivers and delta land were particularly important because these areas were easy to cultivate compared to adjacent unproductive forested areas. Grazing and mowing increased biological values by supporting higher species diversity.

Sámi people have lived as hunters along the Scandinavian mountain ridge for a very long time and they started to domesticate reindeer only

some five hundred years ago. During the last century some Sámi people also began to work as cattle farmers maintaining alluvial meadows along northern Swedish rivers.



Figure 1. Aerial photo of the delta landscape of River Vindel in the village of Ammarnäs, Swedish Lapland. The seminatural grasslands were traditionally harvested during summer and the hay was stored in the small barns. During winter the hay was transported by horse and sledge to the farm. Photo: Ola Jennersten.

The River

The River Vindel (*Vindelälven*) is one of four large free-flowing rivers left in Sweden. It has a length of 452 km and drains an area of 11 898 km². The river has its origin in the mountains of the borderland between Sweden and Norway. It follows the valleys shaped by the last glaciation on its way down to the coast. Along the river several alluvial meadows create a characteristic riverine agricultural landscape making the area unique in Sweden and Europe. Today only some 50 farmers are active along the river, most of them are located close to the coast. The River Vindel has been designated as one of four Swedish national rivers by the Swedish Government and is an EU Natura 2000 site. Several nature reserves along the river are also included in the Natura 2000 network, including one of the largest nature reserves in Europe, *Vindelfjällens nature reserve* comprising 550 000 ha.

Riparian hydrology and ecology

The River Vindeln has a water discharge of on average 174 m³/sec but it varies between 16 during extreme low to as much as 1651 during extreme high water following rich snow melting in late spring – a 10-fold difference. The yearly natural flooding with increase in water level of between two to five times is unique among Swedish rivers. The flooding creates an optimal situation for a complex plant life. A characteristic zoning of vegetation is formed with as much as ten different vegetation zones from crustaceous lichens on rocks to lush riparian forests. The flora is considerably richer in the riparian zone compared to adjacent areas. The richest area has 138 plant species per 200 m transect compared to only 10-15 in adjacent transects above the highest water level. The annual flooding deposits both litter (mineral particles attached with fertilising organic material) and diaspora (seed and spores) explaining the high biodiversity along the rivers. Typical tree species are alder, birch, and pine. The bush layer is dominated by different willow species (e.g. *Salix myrsinifolia*, *S. phlyicifolia*, *S. hastata*). One species of dandelion is endemic to the area *Taraxacum crocoides*. Blueberries shape the upper border of the riparian zone, because they cannot survive being submerged by water.

Alluvial meadows (*raningar*, in Swedish) characterise the River Vindeln and together with the delta in Ammarnäs they form the most species-rich areas. The lower parts of these meadows are flooded yearly shaping a productive habitat that makes yearly hay cutting and cattle grazing possible. The delta harbours more than 100 vascular plant species, with Water sedge *Carex aquatilis*, *Calamagrostis purpurea*, Purple Small-reed *C. canescens*, and Tufted Hair-grass *Deschampsia caespitosa* as dominating grass species in a succession from wet to dry areas. The alluvial meadows are important grazing grounds for ungulates like European Elk *Alces alces*, Roe Deer *Capreolus capreolus* and semi-domestic reindeer. Birds like Whooper Swan *Cygnus cygnus*, Lesser White – fronted Goose *Anser erythropus*, Short-eared Owl *Asio flammeus*, Great Snipe *Gallinago media* can be seen around the meadows and in the mountains one can meet golden eagle and gyrfalcon.

The Problem – agriculture today

The number of farmers is rapidly decreasing, around year 1970 some 150 farmers were active and in 1985 it had decreased to one hundred. The abandonment of meadows and pastures in northern Sweden results in a fast colonisation of bushes (mainly willows, *Salix* spp.) and, thus a degradation of biological values of the riparian agricultural landscape. Area wise, these

habitats can be considered as tiny islands in a sea of forested taiga, but they are very important biodiversity hotspots.

Today only some 50 farmers are active along the river. Twenty of them are dairy farmers producing altogether about 2 400 tons of milk annually and 30 are meat farmers producing 120 tons of meat annually. Most of the farmers live close to the coast. The negative environmental effect of agriculture is very limited because of nutrient poor river water and very low amounts of fertilisers on the few cultivated fields (70 kg N/ha). Pesticides are almost not used along the river. Grain production is limited to the coastal region.

The Project – phase 1

In 1997 WWF started a rural development project in order to turn the negative trends in the village of Ammarnäs close to the springs of the river. The goals were to restore and maintain the valuable delta and surrounding alluvial meadows, increase and sustain natural values, increase the attractiveness of Ammarnäs as the gate to the mountain ridge, and to create living conditions for people involved with agriculture in sparsely populated areas.

An action plan was developed and rapidly implemented in order to show people that WWF interest was genuine (Ammarnäs has experienced several investigations but few have been implemented). Therefore, tractors were supplied with double tires for wetland driving and started to clear over-grown alluvial meadows only two weeks after the initial visit.

To summarise, a plan for the development of quality meat was implemented. The project facilitated initial investments, solved land lease problems, restored and maintained most of the valuable alluvial meadows (app. 100 ha), gave advice on quality beef production and on how to apply for EU support, as well as initiated biological surveys.

The Project – phase 2

The project attracted attention both among other farmers along the river, authorities and conservationists. Therefore, an enlarged project covering the entire river was developed in 2001 in order to maintain all valuable alluvial meadows along the whole river. The idea was to use the same main concept of quality beef production but also include regional processing and sale. In cooperation with partner organisations the project acquired EU support through the Structural Funds (Goal 6) from 2001 to 2006.

Summary of project

Main results:

- 187 ha semi-natural grasslands has been restored adding to the approximately 400 ha grasslands of high value in the county of Västerbotten.
- Plant and bird surveys have been conducted during the course of the project indicating a positive development of grazing-favoured flora and fauna.
- 26 farmers participated in the project.
- Seven stables were planned and built resulting in an increase of 250 grazing cattle along the river.
- Four farmer-owned machinery-holding companies established.
- One “production ring” for pasture meat production established producing 150 carcasses annually (2009), pasture meat is sold in several local stores.
- Increase in income, cooperation, as well as awareness of natural and cultural values among participating farmers.

Partner organisations:

- Attending farmers.
- The Sorsele Alliance – Regionally-owned EU-administration.
- County Administrative Board – Regional state authority.
- Nyhléns Hugossons – The regional slaughter company and meat processor.
- LRF – The regional section of the Farmers Association.
- ICA – The main Swedish food retailer including local shops.
- EU Structural funds.

Roslagen – a small-scale agricultural landscape in eastern Sweden

Background

Roslagen is situated along the Swedish Baltic Sea coast just north of Stockholm. Except for the mainland part, Roslagen consists of 13 000 islands with island Gräsö being one of the biggest.

Thanks to the maritime climate, the alkaline soil, the continuing elevation (land lift) of the once glacier covered Swedish landscape and unchanged small scale agriculture practises, Roslagen has developed into many species-rich habitats for plants, birds and butterflies.

Undulating forested areas stretch between the hamlets with their open landscape. These forests are sparse with a rich herbaceous flora. These physical characteristics have made it impossible to make any major changes to farming practises. This is why in many places in Roslagen are many old characteristic remains that have disappeared in other parts of Sweden.

The people and nature of Roslagen has been described by many writers and composers and holds a special place in the heart of many Swedes. In contrast to its closeness to Stockholm Roslagen has always been sparsely populated. The inhabitants often live in hamlets with the cultivated land surrounding it. However, the population in Roslagen multiplies tenfold in the summertime when the townspeople move out to their second homes (summer houses).



Figure 2. The island of Gräsö (meaning “Grass island”) with grazed coastal grasslands. The area is still recovering from the last glaciation and effects of land lift still can be seen. Photo: Ola Jennersten.

Geology

The rock foundation of Roslagen is made up of a pediment that is slightly sloping to the east. The highest areas reach 25 m over sea level. Narrow valleys run south-westerly – north-westerly and south-easterly – north-easterly through Roslagen. In the shallow valleys postglacial clays have sediment whilst the surrounding areas are moraine or rock face areas. The soils are alkaline. The limestone has its origin from the Baltic and has been

transported here by the glacier ice. The cultivated land is concentrated to the valleys and the grazing and dwellings are situated on the moraine.

Flora and fauna

The small scale farming practise, the lime rich soil and the archipelago environment has created a very high biodiversity. Character species are White-tailed Sea-Eagle *Haliaeetus albicilla*, Caspian Tern *Hydroprogne caspia*, Common Eider *Somateria mollissima*, Elk *Alces alces*, Roe Deer *Capreolus capreolus*, Eurasian Otter *Lutra lutra*, Pool Frog *Rana lessonae*, Clouded Apollo *Parnassius mnemosyne*, Ash *Fraxinus excelsior*, White Beam *Sorbus intermedia*, Common Sea-buckthorn *Hippophaë rhamnoides* and several species of Orchids (e.g. Narrow-leaved Helleborine *Cephalanthera longifolia*).

Vegetation

Four of the Roslagen nature types are listed in the EU Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora.

These are:

- Sea shores of Baltic Sea type.
- Species-rich dry to moist lowland grasslands of Fennoscandinavian type.
- Grasslands partly covered by trees.
- Species-rich, forests rich in nutrients with spruce of Fennoscandinavian type.

Some prominent land types

Along the Baltic beaches there are coastal meadows. During the middle ages these were very important type of vegetation and a big reason for colonising the islands from the mainland. Land that today is cultivated or grazed started out as coastal meadows due to the impressing land rise, 0.6 m/100 year.

The grazing is often situated close by the farmsteads. Some of the pastures are sparingly forested whilst others lack trees completely. Practically all areas of Roslagen that has postglacial clay or sandy soils were used as traditional hay meadows. The meadows dominated the farming landscape for centuries whilst arable fields only made up a very small percentage of the farmed areas. One can still find a few meadows that are managed in the

traditional way and also, especially on the island Gräsö (translates to *Grass Island*), remnants of coppiced meadows with pollard trees.

The pine forest dominates. Pine trees grow very sparsely and their roots find there way down through cracks in the cliffs and boulders. The trees grow very slowly and the ground is often covered with lichens such as *Cladonia* lichens. Where the soil is somewhat thicker shrubs grow such as heather *Calluna vulgaris*, lingonberry *Vaccinium vitis-idea*, and blueberry *Vaccinium myrtillus*.

Cultivated fields in Roslagen are mainly used for forage production. There has never been much arable cropping along the coast. The fields were traditionally used as hay meadows and are situated in the long, narrow valleys created by cracks in the rock face. Today's cultivated fields correspond very well with the location of the traditional hay meadows as they were 300 years ago.

Roslagen – from dairy cows to suckler cows

The numbers of dairy cows fall rapidly in Roslagen. The farmers are old, the herds are small, and the farmlands are small scale and few young people want to take over running the farms. This causes overgrowing of grasslands and wooded pastures.

As late as in 1920's forest grazing dominated in grazing practises in Sweden. A law was then enforced that stipulated that forestry activities were the economical basis of forestland. The animals were removed from the woodlands and put to graze in grasslands. Some farmers had not enough grassland for the animals and continued to graze the forests.

To fight the diminishing biodiversity of the agricultural landscape, the World Wide Fund for Nature (WWF Sweden) and Upplandsstiftelsen (The Upland Foundation) are, since the early 1990-s working for an agricultural production that ensures the livelihood for both rural people and the wild species of the agricultural landscape. The project stands up for full range grassland management involving both grazing, production and marketing of grass fed meat – meat produced on semi-natural grassland.

Summary of project results

Main results:

- Totally 5000 ha has been surveyed of which 1800 are evaluated as highest priority for restoration and approximately 1000 ha medium priority.
- 122 ha overgrown semi-natural grasslands were restored in order to safeguard specific threatened species (e.g. Lepidoptera such as

Clouded Apollo *Depressaria nemoletta* and *Agonopterix bipunctosa*). All target species populations have increased after the grassland restoration.

- Seven stables have been constructed for some 500 hundred cattle and sheep, which are grazing approximately 800 ha of high value semi-natural grasslands.
- Four nature trails have been established in order to introduce the area to the public, several study days for farmers, and some 25 field walks for the public have been arranged.
- A market analysis for "pasture beef" showed good opportunities and in 2009 the first regionally produced pasture beef was sold in shops.
- Machinery for grassland maintenance has been purchased for a farmer-owned machinery-holding company.

Partner organisations:

- Attending farmers.
- Upplandsstiftelsen – Regional foundation owned by e.g., municipalities.
- Östhammars municipality.
- Tierps municipality.
- County Administrative Board – Regional state authority.
- ICA – The main Swedish food retailer incl. local stores.
- LIFE NATURE.
- INRERREG III, A Skärgården.

The Bird-lakes of Närke

Background

The county of Närke is situated in south-central part of Sweden. The central parts are flat and are used mainly for cereal production and as pastures. They are surrounded by higher often forested areas. In the north-east is the country's fourth largest lake, Lake Hjälmaren – which was drained and lowered during the period 1882-86 in order to generate agricultural land; 15 000 hectares of wetland were transformed to fertile agricultural fields. The bedrock is of cambrosilure origin, mainly covered by clay and with occasional "islands" of moraine.

The high value nature in this area is mainly connected to the lakes and wetlands. Lake Kvismaren, Lake Tysslingen, and parts of Lake Hjälmaren around the delta of River Svartån with Oset och Rynninge Bay, are all EU Natura 2000 sites, and are included in Birdlife's Important Bird Areas

(IBA). The area is particularly famous for large quantities of migrating birds such as Common Crane *Grus grus*, geese (e.g. Bean Goose *Anser fabalis*, Greylag Goose *A. anser*) and Whooper Swan *Cygnus cygnus*.

Agriculture in the county of Närke

Agriculture has been present in the central parts of the area for thousands of years. The colonisation of the forests is of much later origin. Dairy and animal production dominated until hundred years ago often combined with forestry, hunting and fishing. Nowadays traditional agriculture has been more and more marginalized except in the plains where cereal production is competing with meat and dairy production. Thus, natural values connected to traditional agriculture are decreasing because of abandonment and overgrowing or intensification.



Figure 3. The agricultural land surrounding the bird lake Lake Tysslingen.
Photo: Ola Jennersten.

The Problem

To maintain its attractiveness for staging or nesting birds the nutrient-rich bird lakes have to be managed in order to avoid overgrowing of wetlands. Disturbance such as grazing is necessary to halt invasion of bushes and shrubs. Most farms in the county are, like in most parts of Sweden, rather small and thus have difficulties to be economically sustainable.

Project cooperation

The project *Semi-natural grasslands of Närke* was started by WWF in 2005 and included farmers with meat-production, the municipality of Örebro and the County Administrative board. The project was designed to “*strengthen long-term conditions of rural living with viable agricultural enterprises and strengthening of natural and cultural values*”.

The municipality of Örebro had already started a spectacular restoration of an old industrial and two garbage dump areas along the mouth of River Svartån into an “artificial” wetland landscape, giving the project a flying start. The main concept was the same as for other WWF grassland projects described above, including restoration of overgrown land, increase in number of grazing animals, establishment of a production ring including farmers, the local slaughter house, meat processing company and the local ICA stores. Several innovative ingredients have been introduced in order to reach the project goals.

The challenges to be overcome when searching ways to place product on the market are scale and availability. In today’s world, retailing is dominated by large companies which use their size and capacity to maintain competitiveness. Large-scale procurement contracts are therefore commonplace, favouring large-scale suppliers. More localised and smaller-scale operations, whilst possibly of better quality and less environmentally-harmful, sometimes find it difficult to guarantee a sufficient and stable quantity of meat.

The establishment of a share-holding company

Naturbeteskött i Mellansverige AB (translates as *Pasture Beef in central Sweden ltd*) is a limited share-holding company that was formed in January 2009. The company is owned by three beef farmers, a slaughter company, a butchering company and an owner of three major food retailer shops. The work on forming *Naturbeteskött i Mellansverige AB (NBK AB)* was started in 2007 on the initiative of one of the participating farmers, Torbjörn Eriksson, who had been selling pasture beef locally in the city of Örebro for 3-4 years. He saw the potential on the market but also the need for larger business in order to carry the cost of transport and a salesperson who could keep the production chain together and smooth operation. WWF Sweden engaged an economic advisor aimed to consult building of the new company and a second group of pasture beef farmers from an adjacent area also got involved in building the business concept.

The budget work was done assuming reaching a volume of selling 15 animals/week with most of the meat being sold as whole meat and not refined in to products. The business plan states the intention of NBK AB

to develop more refined products since that would greatly increase the profitability of the company. NBK AB buys in animals only after they are ordered by a customer and hence cannot accommodate small customers who only want to buy best cuts very easily. Instead NBK AB aims to find customers who are willing to take on whole or half carcasses. However, the regional councils only want to buy cheaper cuts so there is a certain amount of better cuts available for being sold individually.

After a rocky start in 2009 which included the tragic death of one of the major share-holders and the economic crisis making the market for quality meats uncertain, NBK AB has now reached a somewhat better balance. Ten animals are slaughtered per week and the customers are both food shops, a nationwide restaurant retailer and local county councils who buy mince meat and less expensive cuts for serving in school canteens and old people's homes. The cooperation with the restaurant retailer is especially exiting because it brings the pasture beef to a very knowledgeable and high profile customer; the top restaurant chefs in Sweden. Unfortunately the development of more refined products has not been successful so far. The volumes are still too small to make the production profitable even though the pilot products, such as meatballs, hamburgers and smoked meat have proven to be of excellent quality.

So, the economic results of the company are still not as good as they should be. In 2010 NBK AB made the employee redundant and is now selling through contractors but hopes to go back to having its own staff as soon as the volume reaches 15 animals sold per week. The farmers started off receiving a 5 SEK premium on top of the average carcass price paid by the slaughter company. This sum has increased over time and has now doubled to a premium of 10 SEK/kg carcass weights which has created a big interest from the farmers. From 2010 NBK AB demands that the farmers become quality assured through *Svenskt Sigill* (Swedish Seal of Quality). This has become a necessity because of competition on the market from less conscientious competitors who wish to ride on the wave of locally and environmentally friendly produced foods. It is also necessary when the company grows and the previous personal knowledge of the farmers involved is impossible to maintain. In the future NBK AB also hopes to implement more differentiated payment scale vis-à-vis the farmers. The very best animals, based mainly on amount of marbling in the meat, can be paid even a higher premium, whilst the more mediocre animals should receive less.

Wetlands for nutrient reduction, for harvesting biomass, and nature

Wetlands are centres of biodiversity, performers of multiple ecological roles of value to society, climate change moderators, and potential locations for profitable green enterprise.

With – by definition – abundant water and nutrient-rich soils, wetlands are amongst the world’s most productive natural systems. This high level of metabolism stimulates rapid growth in plants, including fibrous wetland vegetation such as reeds and rushes. Harvesting and processing this vegetation – as biomass – performs two valuable functions. First, the biomass itself can be burnt to produce electricity or (more efficiently) processed into biofuel, to replace fossil sources of petrol and diesel. Second, this then concentrates the nutrients (especially nitrogen) into an accessible and useable form for removal from the water cycle.

Innovation and evolving technological developments are moving extremely fast. New equipment for harvesting and new conversion facilities are continually appearing, driving down the cost of this “green energy” compared to conventional sources. Today the project harvest wetland grass and deliver it to a fermentation plant in the city of Örebro for the production of biogas.

Restoration and re-connection of wetlands and floodplains

Over the last decades, many wetlands have been drained in the name of agricultural intensification, dykes have been made alongside rivers and streams, and precious floodplain land has been taken up by urban development, often for housing, commercial buildings, and roads and railways. Even where wetlands and floodplains do remain, they are often no longer connected to the river upon which they depend for their health.

The project has re-connected existing wetlands and made connecting rivers and creeks more slow-running and hence more absorbent of nutrients.

Lengthening of crop rotation cycles on lays for nutrient reduction

Mainstream agricultural practice advocates ploughing up arable fields every four years. This procedure is done in order to maintain soil fertility. The field is ploughed, seeded, fertilised, tilled, and left to grow back.

When an arable field is ploughed, the nutrients retained in the soil are released. They make their way as run-off into the surface waters, much eventually ending up in the Baltic Sea.

Merely lengthening the rotation cycle from four to five years significantly reduces average annual diesel costs and likewise reduces the average annual nutrient load delivered into the hydrological system. Experience elsewhere shows this does not result in overall financial losses to the farmer, since the proportionately lower average yield per year is offset by savings in diesel and labour.

Summary of project results

Main results:

- 465 ha semi-natural grassland with high nature values has been restored, and four stables for altogether 500 cattle have been built.
- Some 350 cattle graze around Lake Tysslingen and approximately 100 around Lake Kvismaren.
- Örebro Municipality works according to plans and has restored both wetlands and drier grasslands, and has built a nature information centre in Oset Nature Reserve serving and informing hundred of daily visitors.
- Nature walks and bird-viewing platforms have been built.
- Growing number of visitors regularly visit all areas, also these areas are important place for increasing number of staging and nesting birds.
- Farmer network is established for the management of grasslands, wetlands and rearing of cattle for pasture meat production.
- The wet grasslands of Lake Tysslingen are cut and the grass is delivered to the biogas fermentation plant – biogas is used by city buses.
- Since 2005 pasture meat (Naturbeteskött) has been sold in local shops, delivered to several schools and elderly peoples home as part of environmentally-friendly public purchasing – the pasture beef is defined and acknowledged within the roles for national public procurement since year 2006. A share-holding meat production company is established. Nine animals are slaughtered and sold as pasture beef weekly. Two of the farmers have been rewarded as the meat producers of the year in Sweden (2008).

Partner organisations:

- Attending farmers.
- County Administrative Board – Regional state authority.
- Örebro municipality.
- Närkes slakteri – The regional slaughter house.
- Två styckare – The regional meat processing plant.
- ICA – The main Swedish food retailer including regional stores.

Tre svenska exempel

Sammandrag

Vindelälven i Västerbotten och Lappland, fågelsjöområdet i Närke och Roslagen är tre mycket olika områden inom ramen för WWFs naturbeteskött koncept.

De årliga översvämningarna i Vindelälven har skapat ett rikt och varierat strandnära landskap, som upprätthålls genom bete och slåtter. De senaste årtiondena har detta landskap hotats genom nedläggning av jordbruk och djurhållning. 1997 initierade WWF ett projekt i den lilla fjällbyn. Ammarnäs, nära norska gränsen och Vindelälvens källor för vända den negativa utvecklingen. Projektet var framgångsrikt och har sedan spridits nedströms, ned mot kusten.

Roslagen vid Östersjökusten norr om Stockholm är på många sätt unikt. Förutom fastlandsdelen består området av 13000 öar, med Gräsö som en av de största. Tack vare ett gynnsamt klimat, kalkhaltig jord, landhöjningen samt det traditionella jord och skogsbruket är artrikedomen stor. Landskapet är flackt, rikt på våtmarker och grunda havsvikar, viktiga för fiskreproduktion. I samarbete med Upplandsstiftelsen har WWF utvecklat projektet i Roslagen.

Centrala Närke domineras av spannmålsproduktion med inslag av betesmarker. Sveriges fjärde största sjö, Hjälmarén, som sänktes i slutet på 1800-talet för att vinna åkermark, förlorade i samband med sänkningen värdefulla våtmarker. De höga naturvärdena är idag koncentrerade till Kvismaren, Tysslingen, Oset samt Rynningeviken. Alla är idag Natura 2000 områden och sk Important Bird Areas.

De insatser som gjorts av brukare vid sjön Tysslingen har blivit en modell för flera andra områden.

Integrated coastal planning and management in Southwest Finland

Iiro Ikonen, *Association for Traditional Rural Landscapes in Southwest Finland*

It is important to find out how we can create optimal ecosystem service network in our coastline habitats via sustainable planning and management. We should urgently prepare new kind of sustainable financing incentives for management and utilisation of reed beds and coastal meadows. In win-win situation nature and local people and entrepreneurs can all gain profit.

Southwest Finland Regional Environment Centre led interdisciplinary Interreg IIIA project “Reed strategy in Finland and Estonia” in order to enhance sustainable management of the coastlines of South Finland and Estonia. The project had several themes connected to coastal areas and reed beds such as bioenergy, construction, biodiversity and water protection. The focus was in finding balance between utilisation, management and preservation of reed beds and coastal meadows. The pilot areas were Turku and Salo towns and Vainämere region in West Estonia.

The results of reed mapping showed that reed bed area has increased and covers even 10% of total area of some coastal municipalities in Southwest Finland. The total area of reed stands of Southern Finnish coastal sea areas was estimated via GIS – analysis of selected satellite images and there were appr. 30 000 hectares of reed beds (Pitkänen 2006). The total number of reed beds in Finland is estimated to be appr. 100 000 hectares. Reverse side of reed beds is area of managed coastal meadows in Finland that has decreased from 40 000 hectares (1950s) to present 4000 hectares which has led to unsustainable network of coastal meadow habitats causing decline of typical and rare coastal meadow species and ecosystem services connected to recreation, water protection and landscape values (Ikonen and Hagelberg 2007b).



Figure 1. Within 50 kilometres of Turku Cathedral one can find over 13 000 hectares of reed beds.

Reed Strategy project revealed an obvious need for more extensive and accurate planning, and practical management of larger selected areas along coastlines. The main question is how we could gain optimal ecosystem service network of coastline (recreation, biodiversity, water protection, air protection) via sustainable planning and management? Could we prepare new kind of sustainable financing incentives (investment supports, Agri-Environmental supports or others) for management and utilisation of reed beds and coastal meadows?

The Reed Strategy seminar in Tallinn 04.05.2007 (“1+1=3”) tried to find solutions and emphasized need for further regional development fund projects and agricultural fund projects. It was agreed that Southwest Finland Regional Environment Centre (after organisation reform Centre for Economic Development, Traffic and Environment in Southwest Finland) should apply for funding for sustainable coastal management of coastlines and selected Natura 2000 wetland areas, and Turku University of Applied Sciences promised in turn to apply for funding for enhancing reed utilisation (construction and bioenergy). During spring 2009 results of Reed Strategy and idea of integrated coastal planning was presented for Finnish Agri-Environment group responsible for changes in the Rural Development Programme for mainland Finland in 2007-2013 (Anon.

2007). The work of Reed Strategy partners was seen excellent but testing of measures for new incentives and competition bidding models within the frame of new projects before 2014 was still seen crucial.



Figure 2. Reed in focus in Halikonlahti. Photo: Eija Hagelberg.

As a result new challenge was taken and four new established international and national projects (Natureship, Cofreen, ProNatMat and Velho) applied by ELY-centre and Turku University of Applied Sciences are co-operating during 2010-2013. The common aim is to introduce model for integrated coastal planning for Finland and search for new kind of environment investment supports and Agri-Environment supports for keeping up optimal ecological networks in our coastal areas.

ProNatMat (Interreg IVA Central Baltic Programme)

- main partner Turku University of Applied Sciences;
- duration: September 2009 – August 2012;
- budget 1.1 million Euros;
- focus in utilisation and promotion of use of nature materials.

Natureship (Interreg IVA Central Baltic Programme)

- main partner Centre for Economic development, Traffic and Environment in Southwest Finland;
- duration: October 2009 – September 2012;
- budget 1.4 million Euros;
- focus in ecosystem services and sustainable integrated planning of coastline.

Cofreen (Interreg IVA Central Baltic Programme)

- main partner Turku University of Applied Sciences;
- budget 1.1 million Euros;
- duration May 2010 - April 2013;
- focus in sustainable use of reed for bioenergy and construction.

Velho (European Agricultural Fund for Rural Development EAFRD)

- main partner Centre for Economic development, Traffic and Environment in Southwest Finland;
- budget 3.05 million Euros;
- duration June 2010 – December 2013;
- half of the budget is allocated for management planning and restoration of Natura 2000 wetlands, integrated coastal management and test of new Agri-Environmental Schemes' supports.

Thus powerful work with this project cluster has started full steam. Projects co-operate during several years and the spearhead targets into new kind of Central Baltic coastal area investment supports and Agri-Environmental supports for keeping up optimal ecosystem service and ecological networks.

The joint work of previous project includes:

- development of coastline management machinery. Dissemination of information is taking place via platforms/blogs such as reed blog ("ruokoblogi") that have already been established <http://ruoko.vuodatus.net/>
- bioenergy and construction tests of reed material;
- competition biddings of different kind of management packages (100-500 hectare reed beds) for entrepreneurs for both winter and summer reed cutting;
- comparison of cost-effectiveness of different management actions;
- Finnish guidebook for integrated coastal management;
- several publications;
- numerous seminars;
- meetings with responsible ministry people, preparation of decree texts for new supports.

In the frame of integrated coastal planning project cluster has the following targets:

- optimal ecosystem service network of coastline shall be defined and established in three pilot areas (Oukkulanlahti-Mynälahti, Pori-Eurajoki coastline and Paimionlahti Bay);
- historical information and old data of species distribution shall be connected to landscape change data (old maps, aerial photos,

satellite images) and areas where restoration would be most needed shall be identified;

- permission to manage common land parcels (from several to several hundred landowners) shall be arranged for management packages;
- new reed cutting investment supports for entrepreneurs shall be tested (competition bidding model, management packages of 100-500 hectares) in reed areas;
- suitable areas for artificial wetlands (biodiversity and water protection) shall be mapped;
- selected threatened habitats and species shall be inventoried.



Figure 3. New machinery of Lännen Järviperkaus that can crush and harrow coastline reed beds. The machinery was used in important areas for Dunlin *Calidris alpina* in Mietoistenlahti Bay in 2010. Photo: Iiro Ikonen.

Different web platforms of project cluster already in 2010 were under construction but information about reed bed management and integrated planning can already be found in the following Reed Strategy pages:

- project publications <http://www.ruoko.fi/index.php?page=julkaisut>
- Read up on Reed (Ikonen & Hagelberg 2007a).
<http://www.ymparisto.fi/default.asp?contentid=247909&lan=FI>
- Reed energy – possibilities of using the common reed for energy generation in Southern Finland (Komulainen et al. 2008).
<http://julkaisut.turkuamk.fi/isbn9789522160355.pdf>



Figure 4. Reed storage in the Netherlands. Photo: Reed Thatchers' Association of the Netherlands.



Figure 5. Reed village. Photo: Reed Thatchers' Association of the Netherlands.

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Rannikon integroiva suunnittelu ja hoito Lounais-Suomessa

Tiivistelmä

Rannikkoalueillemme on tärkeää luoda kokonaisvaltaisen ja käytännönläheisen integroivan suunnittelun ja kohdennetun ja räätälöidyn hoidon avulla optimaalinen ekosysteemipalveluverkosto. Oikein toimimalle saamme win-win tilanteen jossa luonto sekä paikalliset asukkaat ja yrittäjät hyötyvät toiminnasta. Lounais-Suomessa on Varsinais-Suomen ELY-keskuksen ja Turun ammattikorkeakoulun toimesta käynnistetty useita laajoja projekteja, jotka toimivat 2010-2013 yhteistyössä valmistellen uusia aiempaa tehokkaampia kohdennettuja maatalouden erityistukimuotoja ja investointitukia (2014-) rannikkoalueiden ruovikoiden hyödyntämiseen ja merenrantaniittyjen hoitoon.

Interreg IIIA – projektin ”Ruovikkostrategia Suomessa ja Virossa” (2005-2008) tuloksia esiteltiin maatalouden ympäristötuen muutostyöryhmälle v.2009 keväällä. Ruovikkostrategian työ nähtiin hyväksi perustaksi, mutta jatkokehittäely katsottiin vielä tarpeelliseksi uusien tukien ja hoitomenetelmien kehittämiseksi.

Varsinais-Suomen ELY-keskuksen ja Turun ammattikorkeakoulun vetäminä käynnistettiin neljä suurempaa laajapohjaista yhteistyötä tekevää projektia 2009-2013 (Natureship, Cofreen, ProNatMat ja Velho).

Tavoitteena on tehdä laajapohjaista yhteistyötä. Päämääränä on kehitellä integroivan suunnittelun malli Suomen rannikkoalueille. Lisäksi kehitetään tarjouskilpailumallia ruovikoiden leikkuulle ja luodaan uusia ehdotuksia investointituiksi ja maatalouden ympäristötueksi, jotka voitaisiin ottaa käyttöön 2014.

Holistic watershed and landscape area level planning methods to enhance biodiversity and water protection in rural areas

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Abstract

The Agri-Environmental Scheme (AES) plays an important role among Finnish farmers. More than 90 % of farmers have committed themselves at least in the basic measures of AES. The AES holds also special measures including establishment of wetlands, restoration of traditional rural landscapes and enhancement of biodiversity. Unfortunately, these measures have been poorly used in Finland, partly because of bureaucracy and lack of knowledge regarding suitability of the site for subsidies.

So called participatory general planning in selected high nature value rural areas was carried out during 10 years aimed to increase knowledge on important sites where special measures could be used. The main aim of the planning process is to get farmers involved to the special measures of AES to enhance farmland biodiversity and to recognize the most suitable sites for subsidies. The main methods are mapping the sites, discussions with farmers about possibilities to start suitable management of those sites and to boost cooperation between farmers.

There is also need for more holistic and wide-scale planning process in rural areas. Many farmers also own forests. There is strict separation between agricultural and forest sector subsidies and advisable limits for farmers to carry out, for example, large-scale wetland projects stretching from fields to forests. To improve the current situation combined general planning of rural and forest areas has been carried out. In SW Finland this combined general planning process is done with the help of financing from METSO-Programme (The Forest Biodiversity Programme for Southern Finland). The experience has been encouraging.

Introduction

In Finland the Agri-environmental Schemes (AES) are the main financing source for management of biodiversity in rural areas. The Agri-environmental policy scheme is divided into basic measures and voluntary special measures. The best measures to enhance biodiversity in agricultural environments are found among the contracts concerning special measures (management of traditional biotopes, promoting biological and landscape diversity, organic production), and non-productive investments (establishment of wetlands, restoration of traditional biotopes). Even if the special measures are often the most efficient subsidy forms for enhancement of rural biodiversity, they still are quite poorly known and used. Also the areas in those contracts have remained fairly limited.

One of the weaknesses of Finnish subsidy systems is also strict separation of agricultural and forest subsidies for management of biodiversity and water protection, which discourages the efficient usage of implementation of best wide-scale management practices. Also advisory organizations and services are quite separate in rural and forestry sector. Thus, there is need for holistic planning and advisory projects.



Figure 1. Good place for water protection wetland in forest environment.
Photo: Kimmo Härjämäki.



Figure 2. Establishment of artificial wetland in Viikki fields, Helsinki. Photo: Kimmo Härjämäki.

Overview planning makes potential management sites visible

There has been going on nearly ten years so called participatory overview planning in rural areas to boost landowners' interest towards voluntary subsidy system and to recognize potential habitats for enhancement of rural biodiversity and water protection. With the help of farm visits and by presenting and targeting potential sites for management of rural habitats in the map, the sites are becoming easier under management commitments of AES.

There has been slightly different scale used for planning methods in different areas. The applicability of various issues has fluctuated from area to area and from year to year. More than ten years ago, planning started with assessing the need for buffer zones along water courses and flood areas. Very soon it was found necessary to map also the agricultural biodiversity, and from 2007 onwards also wetland sites came in.

More holistic touch for planning biodiversity in rural areas

In the area of SW Finland there has been goal to get more holistic and wide scale planning which takes into account wide landscape- and watershed scale point of view. General planning is financed by Ministry of Agriculture and Forestry. The money is reserved from state budget every year approx.

200 000 €. With the money there will be carried out about 8-10 overview planning projects in Finland. Until this year, about 80 general plans have been carried out in all around Finland. The wideness of planning has varied from a few villages and a landscape areas to several municipalities wide plans.

In Finland quite a big percentage of farms own also forestland and over 20 % of all forest owners are farmers. However, Agri-environmental support system has been very strictly limited to biodiversity management planning in agricultural regions and forest biodiversity planning accordingly to forestland. Thus, problem has also complicated the water protection and establishment of wetlands. Holistic, catchment-area-specific planning has hardly been able to take account.

The new thing in SW Finland is the combined planning process. Centre for Economic development, Traffic and Environment in Southwest Finland has started co-project where the overview planning in rural areas is combined also with forest biodiversity and catchment level planning. The project is financed from The Ministry of Agriculture and Forestry as a wide-scale networking project. The Forest Biodiversity Programme for Southern Finland (METSO) aims to halt the ongoing decline of forest species and habitats and establish favourable biodiversity networks by 2016. The main challenge is forests in Southern parts of Finland.



Figure 3. Potential METSO-Programme habitat with dead spruces. Photo: Kimmo Härjämäki.

Basis for good network is conservation of forest biodiversity and promotion of rural wellbeing. Networks help forest owners maintain forest landscapes, develop recreational activities related to forest biodiversity and manage valuable habitats. Additionally, the programme includes conservation schemes that are largely based on voluntary participation from landowners who are willing to safeguard biodiversity in their forests. The METSO Programme will boost in creating network of permanently protected and voluntary protected areas (METSO-Programme 2010).

The cooperation between forestry and environmental organisations will be further improved and official advisory services for forest owners will be developed. This kind of network project is very essential where the participatory overview planning method is carried out at the same time in the same area.



Figure 4. “Open house events” where the mapped sites are presented are often very popular. This kind of happenings gives to landowners chance to comment potential management sites and discuss with authorities, planners and advisors. Photo: Mikko Jaakkola.

The overview planning process in a nutshell

- Selection and defining planning area (Ideal situation: suggestion is coming from local actors).
- Establishment of steering group.
- Statement of objectives.
- Selection of planners for different themes (forest biodiversity, rural biodiversity and wetland mapping).
- Existing inventory data collecting.

- Information for landowners by mail and in the press event.
- Field work (mapping of potential sites, meeting landowners).
- Office work for a draft map.
- Presentation of found objects to landowners.
- Publication and distribution to all farmers/forest owners in planning area.



Figure 5. Example map form overview planning publication. Numbering refers to description of site and management proposals in the plan. Triangles are potential places for constructed wetlands, horizontal and vertical striped are already contracted, for example, in management of traditional rural landscapes or riverside buffer zones. All other habitats are, for example, edge zones, forest islets, reedbeds, wooden pastures and so on. There were no potential METSO-Programme sites on this sheet.

Involving landowners is a key issue of planning process

The goal of the regional overview planning is to increase participation of farmers in the Agri-environment Scheme and METSO-Programme specially designed for biodiversity enhancement and establishment of artificial wetlands. Further the planning aims to develop more active collaboration between various stakeholders in implementation of the Agri-environment Programme (AEP). Overview planning for biodiversity enables flexible movement between the farm and regional level. Results from evaluation of this kind of planning method show up, that the regional planning facilitated local learning. With the help of planning legal conditions of the AEP are interpreted into locally meaningful goals and specific actions on farms. At the same time, regional planning is able to take into account specifics of local environment as well as benefit from farmers' practical and site-specific knowledge, which is central to their relationship with nature.



Figure 6. Visiting good examples in overview planning is crucial for inspiring landowners to put into practice management measures. Photo: Kimmo Härjämäki.

Experiences of overview planning processes

It has proved to be difficult to get farmers involved in new contracts under the AEP to new sites. The most important output of the regional planning for biodiversity is related to increased awareness and enhanced cooperation. Maximizing the output is directly linked to the planning practices. Obvious

tensions between the following choices under the planning process has been noticed: 1) level of accuracy of the field inventories, 2) role of on-farm visiting density and time 3) role of the AES requirements in selection potential sites, and 4) integration of biodiversity management into rural development. The ways in which the choices on the above aspects were made led to the different types of planning processes and their outcomes. The best results in increasing awareness of biodiversity management were obtained with the bottom up approach, which emphasizes the role of extension in planning (Härjämäki & Kaljonen 2007).

The focus of the regional planning should be increased in areas where the landscape structure allows it, and concentrated in regions, where the structure of agricultural production facilitates further management of the sites. Also the regional overview planning processes for biodiversity, riparian zones, wetlands and forest biodiversity sites should be merged whenever possible. Finally, the regional planning for biodiversity and water protection should be closely integrated into other rural development process. This will become more and more important as practical measures and farming for enhancing biodiversity under the new horizontal rural development programme remained rather limited.



Figure 7. Also tiny valuable habitats and landscape sites, such as stone walls are sometimes mapped in overview planning. Overview planning helps often to avoid habitats “blindness for their every-day-landscape”. Photo: Kimmo Härjämäki.

For farmers, wildlife management is a welcome component alongside to farming, but the objectives, goals and especially subsidy systems have to be clear enough. Active assistance and innovative projects are required in enforcement of biodiversity conservation both in agricultural and forest environments. Also Centre for Economic development, Traffic and Environment in Southwest Finland has started big Interreg IVA-projects addressing to promote optimal management of coastal zone areas and designing new reed cutting subsidy for Finnish AES.

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Maatalousalueiden kokonaisvaltainen yleissuunnittelu: vesiensuojelua ja monimuotoisuuden edistämistä maisema - ja valuma-alueilla

Tiivistelmä

Suomessa viljelijät ovat varsin laajasti sitoutuneet maatalouden ympäristötukijärjestelmään. Yli 90 % maatiloista kuuluu ainakin ympäristötuen perustukien piiriin. Ympäristötuen erityistukiin sitoutuminen on kuitenkin jäänyt huomattavan alhaiselle tasolle, vaikka tutkimuksissa on todettu näiden toimenpiteiden olevan ympäristön kannalta kaikkein vaikuttavimpia ja merkityksellisimpiä toimia (esim. kosteikkojen perustaminen, perinnebiotooppien hoito ja luonnon monimuotoisuuden edistäminen). Erityistukijärjestelmän heikko hyödyntäminen johtuu osittain toimenpiteiden byrokraattisuudesta, osittain tiedon puutteesta kohteiden soveltuvuudesta tukien piiriin.

Maatalousalueiden luonnon monimuotoisuuden yleissuunnittelun avulla on pyritty pääsemään eroon ainakin maanomistajien sopiviin hoitokohteisiin liittyvästä tiedonpuutteesta. Osallistavaa ja vuorovaikutteista yleissuunnittelua on eri teemapainotuksin tehty Suomessa noin kymmenen vuoden ajan. Yleissuunnitteluprosessin keskeinen tavoite on saada viljelijät huolehtimaan viljelyalueiden ympäristöhoidosta ja hakemaan taloudellista tukea sen ylläpitoon erityistukijärjestelmän kautta. Maanomistajatapaamisten, kohteiden karttaanmerkityksen

ja kohdentamisen avulla on pyritty saamaan suunnittelualueilla uusia erityistukihoitosopimuksia.

Yleissuunnitelmaprosesseihin on kaivattu lisää kokonaisvaltaisuutta. Suomessa on perinteisesti ollut jyrkkä jako niin maa- ja metsätalouden tukien kuin neuvonnankin osalta. Kokonaisvaltaisen ja esimerkiksi valuma-alueittain etenevän suunnittelun ja rahoitusvälineiden puute on rajoittanut maanomistajien kiinnostusta laaja-alaisia toimiakohtaan. Tässä artikkelissa on esitelty Lounais-Suomessa toteutettua yleissuunnittelumenetelmää, jossa samalla suunnittelualueella on kartoitettu niin kosteikot kuin monimuotoisuuskohteet sekä maa- ja metsätalospainotteisista ympäristöistä samanaikaisesti. Kokonaisvaltaisen yleissuunnittelun kokemukset ovat olleet rohkaisevia.

Koskis Estate: one-step ahead

Iiro Ikonen, *Association for Traditional Rural Landscapes in Southwest Finland*

Abstract

Agriculture is much more intensive today than it has ever been in history. Society, including farmers, is becoming more and more interested in the maintenance of grasslands and landscapes with high nature value. Targeted conservation grazing shall keep up animal well-being, biodiversity, landscape, cultural, recreation and meat quality values. All these ecosystem services should be more recognized and valued in the nowadays farming. Financing incentives, such as investment supports, should be more targeted on the production of these services. People gradually start to become aware of the meaning of loss of these values. Finnish beef cattle association (Pihvikarjankasvattajien Liitto ry) has just established working group for this matter. It is possible to produce “meadow meat” with better quality and good environment effects.

One of the forerunners of sustainable farm production can be found in South-West Finland in Salo municipality: Koskis Estate. The farm is a modern agricultural and forestry enterprise where biodiversity and water protection has become an integral part of the business concept. In this article questions addressed to the owner of Koskis Estate, Mr Fredrik von Limburg Stirum are presented.

Introduction

Agriculture is much more intensive today than it has ever been in history. The society, including farmers, is becoming more and more interested in the maintenance of grasslands and landscapes with *high nature value*. Usually these areas are bind with high cultural values as well. Recent introduction of beef cattle grazing (combined with the sale of “meadow meat” products) with the help of the EU agro-environmental support system has increased the amount of managed biotopes, thus, giving hope for a bigger change in Finland.

Grazing is a key action in avoiding overgrowth of the meadows and, for instance, encroachment of reed beds in shore meadows. The nutrient load into the Baltic Sea shall be lower from a grazed area than from an unmanaged area, if a grazed parcel is managed appropriately which means: no additional fodder is given to the animals during a season and an area is not fenced together with fertilized fields. Thus, correct management of meadows by mowing and grazing shall decrease a flux of nutrients into the Baltic Sea.

In addition, a targeted conservation grazing shall keep up animals' well-being, biodiversity, a landscape, cultural, recreation and meat quality values. All these ecosystem services should be more recognized and valued in modern farming. Financing incentives, such as an investment support, should be more targeted on the production of these services. People gradually become more aware of the meaning of losing these values. The Finnish beef cattle association (Pihvikarjankasvattajien Liitto ry) in 2010 has established its own working group for this matter.

It is possible to produce "meadow meat" with better quality and good environment effects. Unfortunately, most people in Finland do not know anything about an origin of meat and a price value above other qualities, ending up buying mostly bulk products. Perhaps, it would be possible to launch a quality farm label and start marketing high quality products under this label by telling everyone a story behind each product even on a farm level. Then, people would know what they are buying and what kind of positive effects their decision to buy will have on the environment. It is crucial that a story behind the product is true. It is ethically wrong to sell products with, for example, images of wooded pastures on the tags, but, in reality, bulls inside the package have not merely been outside during the production period.

One of the forerunners of a sustainable farm production may be found in South-West Finland in the Salo municipality: Koskis Estate. The farm is a modern agricultural and forestry enterprise where biodiversity has become an integral part of the business concept. The Koskis Estate holds high cultural and historical values, situated in the area where was enough water power (river Kiskonjoki) and wood to serve several ironworks during 1679-1890. The Koski village entity with an old church and farm buildings is a unique place where one can feel the spirit of historical industrial community.

Lupines are gradually taking over road verges in the Koski area. It is advisable to be cautious with this alien species, because of its ability for dense monocultures. In addition, the root bacteria binds nitrogen and "spoils" ground for several decades for important dry meadow species favoring nitrogen-poor environments. The Koskis Estate has started the control of this unwanted "alien" in June 2010.



Figure 1. Grazing Hereford cattle in the restored area on the verge of the Perniö-Kisko road. Photo: Iiro Ikonen, 2010.



Figure 2. Lupines emerging on the Koski road verge. Photo: Iiro Ikonen, 2010.

An interview with the owner of the Koskis Estate

Fredrik von Limburg-Stirum, a present owner of the Koskis Estate, sees good possibilities for sustainable production in future and wants to be in the frontline transferring novel solutions. Senior Advisor Iiro Ikonen asked him seven questions in order to discuss the challenges of an environmentally friendly sustainable farm production now and in the future.

This article is based on the interviews with Mr. Fredrik von Limburg-Stirum on November 11, 2009 and June 23, 2010.



Figure 3. The owner of the Koskis Estate Fredrik von Limburg-Stirum. Photo: Elisa Koivumaa.

Question 1: Please tell how your farming methods ensure sustainability and support water protection and enhancement of biodiversity.

Fredrik: In the Koskis Estate organic farming is based on crop rotation and use of cattle manure; the crop production became organic in 2002 and the cattle production in 2005. The area of arable land is 200 hectares and 80 hectares are used for organically produced hay and silage, better tasting food for cattle and game! The total forest area is approximately 1000 hectares.

Careful and targeted management solutions are enhancing both biodiversity and water protection in our estate. We have opened up the edges of the forest and roads in order to keep them up and create important

habitats and corridors and a sustainable network for the species living in semi-open environments. Altogether, these areas cover 10 hectares. The management work respects the old open environment of Ironworks. The restoration work serves as an example for others, whose lands are situated alongside the Perniö-Kisko road. These transition zones with bushes and young trees are cut regularly and wood is chipped for energy purposes. Approximately 800 m³ of woodchips are used every year in order to heat all buildings in the farm. New 250 KW wood chip furnace was ready in 2004 and, now, it has paid already back the price.

We have increasingly carried out some restoration work of important traditional rural biotopes, such as wooded pastures, grazed forests, and riverside meadows. Special measures of the Rural Development Programme for Mainland Finland (Anon. 2007) have been applied for already restored areas (mainly, 5-year agreements about riparian zones, enhancing biodiversity, and management of traditional rural biotopes). We are grazing 50 hectares of hayfields and 50 hectares of traditional rural biotopes for production of *Hereford* meadow meat. In addition, we have 5 hectares of artificial wetlands, 10 hectares of riparian zones and several game fields. We are also fencing this year a part of Lake Saarenjärvi coastal areas and will start grazing of this important Natura 2000 bird area. In our cultivated fields we use winter cereals, such as ray and winter wheat.



Figure 4. The biggest butterfly in Finland – Swallowtail (*Papilio machaon*) - in late June condition has lost tails. The photo is taken in the Koskis Estate road verge on June 26, 2010. Photo: Iiro Ikonen, 2010.

Question 2: Your farm was one of the first to introduce Hereford grazing in Finland during 1960s. What have been the benefits?

Fredrik: *Herefords* are peaceful, very easy to handle, and the product is obviously excellent: marble meat! Eating habits of *Herefords* are also easy and it does surprisingly well in different circumstances. In addition, meat is now easy to market. Thus, *Herefords* are known and we have long traditions of livestock breeding and it is almost a hobby for us. Of course, it is fantastic to see the biodiversity and landscape results as well.

Question 3: How do you perform a basic restoration of traditional rural landscapes in your estate?

Fredrik: First, we must select areas by looking at the practicality and the land use history. Then, we must make a plan and can also ask for an advice of special experts. Practically, we have used harvesters and chainsaws in sensitive areas. So far, we have restored 8 hectares of meadows and wooded pastures. We prefer to keep and enhance deciduous tree stands.

There is intention to increase number of cattle and a size of the area. We have lately applied Agro-Environment support for 10 additional hectares (enhancing biodiversity, 5-year agreements). In future, we might consider a possibility to restore previous fields and meadows that were afforested during 1960s. There are 100 hectares of such an area, but the right restoration time should be no earlier than in 20 years, in order to take round logs out first.



Figure 5. Riverside meadow forestation in 1960s now clear-cut and restored back to meadow. Photo: Fredrik von Limburg-Stirum.

Question 4: How do you enhance meadow meat production in Finland?

Fredrik: We have lots to do in different forums. We should deliver information about good practices to everyone through established efficient networks. We should develop marketing, increase planning, advising, and research. It is also important to demonstrate production methods to key persons and to allocate investment support for right areas in Finland. We must still sell this idea to a bunch of people! Central Union of Agricultural Producers and Forest owners (MTK) is in a key position in Finland. One should lay facts on the table, such as health values: the proportion of right Omega fatty acids is ideal in animals fed with grass. Of course, there are a lot of other values such as biodiversity, landscape and cultural values....

Question 5: How do you slaughter and market your meat?

Fredrik: We slaughter animals in the Paimio municipality (less than one hour drive from the estate). Further processing and packing takes place in the Salo town, approximately a half an hour drive from home. We could do this in our farm, but official hygienic requirements are just too strict for us. Processes cost about 3-4 EUR for a slaughter weight kilo. We use straight marketing because, otherwise, profits would be low, and, of course, we can, in such way, market better meadow meat as well. We have used the Internet but also “jungle drums” – information passing from one people to another – has been an excellent method for us. We sell, mainly, 30 kg of meat boxes, including minced meat, steak and fillet and average price of this mixed package is 14.50 EUR/kilo. We sell ca. 200 packages each year. Animals graze on the organic cultivated hayfields, but we plan to establish also meadow meat products.

Question 6: What kinds of networks are important for you now and what is the need for the future?

Fredrik: I believe that the Finnish Beef Cattle Association could participate in a good way. In addition, international cooperation would be important, for example, we want to learn about meat marketing experiences of the Swedish WWF. Some wholesales sell beef cattle meat distinguishing it from dairy cattle meat. There is a focus on the quality of meat, but, maybe, some wholesales could in the future take into account environmental values as well.

It is also important to be in the right place in the right time, to know where trend makers move and to brand your product right. Nowadays,

beef cattle's grazing is not so profitable, if you do not find any additional value. If the support level of EU drops, there will emerge difficulties for many farms. You must keep eyes on the past, present and future and try to find balanced, sustainable, and reasonable solutions that are respecting traditions and biodiversity – and still would be profitable. I take upon that challenge.



Figure 6. An established artificial wetland in spring 2006. Photo: Fredrik von Limburg-Stirum.

Question 7: You have been a frontline man and participated in the Countdown 2010 as a first partner from Finland. Do you want to continue this effort in Finland and how could farmers participate?

Fredrik: Just in spring 2010, I visited the IUCN (International Union for Conservation of Nature) seminar where the continuation of the Countdown 2010 was planned. Consequently, if there is something such as Countdown 2020, I am ready to step in. I believe that all people, including farmers, are “buying” the concept of biodiversity of the Countdowns more than some years ago: enhancing biodiversity and “ecologonomy” is not any more something suspicious and dangerous, but a necessity and a quality way of living and production.



Figure 7. The forest harvester action on the road verge. Photo: Fredrik von Limburg-Stirum.

More information on www.koskis.fi

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Kosken Kartano: aikaansa edellä

Tiivistelmä

Maatalous on nykyisin intensiivisempää kuin koskaan ennen historiansa aikana. Yhteiskunta, mukaan lukien viljelijät, on toisaalta tulossa tietoisemmaksi ja kiinnostuneemmaksi kauniiden maisemien ja luonnon monimuotoisuuden ylläpidon merkityksestä. Harkittu suurien kokonaisuuksien laiduntaminen perinnemaisemien hoito-ohjeiden mukaan ylläpitää eläinten hyvinvointia, luonnon monimuotoisuutta, maisema-arvoja, kulttuuriarvoja, virkistyskäyttöarvoja ja lihan huippulaatua. Kaikki nämä laiduntamisen luomat ekosysteemipalvelut tulisi tunnistaa ja riittävästi arvottaa. Rahoituskeinojen, kuten investointitukien ja maatalouden ympäristötukien, tulisi ohjata viljelijöitä näiden arvojen tuotantoon. Eri tahot ovat vähitellen tajumassa alueiden umpeen kasvun ja luonnon monimuotoisuuden menettämisen merkityksen. Suomen pihvikarjakasvattajien Liitto ry. on perustanut oman työryhmänsä ajamaan luonnonliha-asiaa. Niittylihan tuotanto on mahdollista ja kannattavaa.

Edelläkulkija modernin ja kestäväen maataloustuotannon saralla voidaan löytää Varsinais-Suomesta Salon kaupungin alueelta: Kosken kartano. Tila on moderni maa- ja metsätalousyrittäjä, jossa biodiversiteetti ja vesiensuojelu on otettu osaksi yritys-konseptia. Artikkelissa on esitetty kysymyksiä Kosken kartanon omistajalle Fredrik von Limburg-Stirumille.

A cooperational model of year-round grazing for the benefits of farmers and floodplain habitats: an example from the Dviete Floodplain Nature Park, Latvia

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Abstract

This report highlights the development of a cooperation model of semi-natural grazing for the benefits of farmers and floodplain habitats at the Dviete Floodplain Nature Park in South-East Latvia. The cooperation model is based on long-term agreements between a local NGO and local landowners about the use of their abandoned floodplain meadows and pastures for a year-round grazing by cattle and horses. The principal aim of this cooperation is restoration and nature-friendly maintenance of the species-rich floodplain meadows of the Dviete River, which were abandoned during the 20th century and are partly covered by the stands of bushes today. These meadows are critically important breeding and nesting sites for such endangered bird species as Corncrake *Crex crex* and Great Snipe *Gallinago media*.

Due to the initiative of the Latvian Ornithological Society and the *Ark Foundation*, a herd of semi-wild *Highlander* cows and *Konik polski* horses was brought from the Netherlands to this area in 2006. NGO called “*The Union of the Dvietes Valley Municipalities*” is responsible for its well-being and day-by-day management according to the local regulations. The landowners are responsible for the repair of the fence, especially after the floods. They are also asked to prepare and provide some amount of dry food for the winter feeding period. In reward, the landowners receive the majority of subsidies, which are available for the grassland management in nature-protected areas.

The size of the grazing area, as well as the number of animals, significantly increased since their introduction. In 2006, there were just 18 cattle and 22 horses on 22 ha, which belonged to two private landowners. Today, there are 110 animals in a wire-fenced grazing area of 230 ha in total. The area is now split into two independent parts and belongs to 14 private landowners and the local municipality.

The day-by-day control of the grazing area and repair of the fence is performed by the NGO members or local people employed by the municipalities or the NGO using available funds from the Latvian social budget scheme or foreign funds. Until now, most expenses for repair materials, as well as for the control and repair work of the fence, were covered by the *Ark Foundation* and the Bebrene municipality. In recent years, significant help has been received also from the Netherlands Society for the Protection of Birds (*Vogelbescherming Nederland, VBN*).

To increase the survival potential of the herd during winter, pressed or rolled hay is given to the animals regularly, usually from January until March. Local farmers prepare the hay and sell or donate to the NGO.

The introduction of semi-wild grazers like the *Highlanders* and *Koniks* has a distinct positive effect on the vegetation layer and the landscape structure of the Dviete floodplain. Because of the year-round grazing practice, grass vegetation is eaten prior to winter, and a considerable amount of small bushes is eaten during the winter grazing period. This results in opening of the landscape, which offers suitable habitats for a great variety of bird species.

Besides benefits to the floodplain habitats, the semi-natural grazing has also a significant economic potential. The subsidies governed by the Latvian Rural Support Service are available for those farmers who are using the nature-friendly methods in grassland management. The NGO is receiving also some subsidies for the suckling cows. In addition, the quickly increasing number of cattle has also a great meat selling potential.

In addition to these benefits, such cooperation stimulates the local economy as well. Since the beginning of the grazing practice in this area, the number of visitors has increased quickly, and skilled guides are needed to manage the tourism activities. An information centre was established next to the grazing area in 2008, and a bird watching tower was built in 2009.

Today, the NGO members on a voluntary basis, supported by the foreign investments and local enthusiasm, manage these activities. However, such model has its disadvantages, and more effective self-supporting model is needed for sustainable development of this area.

Introduction

The Dviete Floodplain Nature Park

The Dviete Floodplain Nature Park is located on the left side of the Daugava River within the Ilūkste and Jēkabpils districts (South-East Latvia). It is famous for its well preserved floodplain meadows, which cover about 12 km² here, as well as for the high diversity of rare and endangered bird and plant species (Račinskis, 2005). This is also a *Natura 2000* site and an internationally important area for migratory waterfowl (Račinskis, 2004). The largest floodplain lake of the Daugava River basin (Lake Skuķu) is also located here (Gruberts, 2003). This territory belongs to the largest natural floodplain system in Latvia, which controls the flood pulse of the Daugava River, its magnitude and timing (Škute et al., 2008).

Management history of the Dviete floodplain meadows

Floodplain meadows of the Dviete valley are semi-natural by their origin, and, therefore, in a dynamic equilibrium with the human activities. Due to regular and prolonged flooding, these meadows were maintained over the millennia by low-intensity farming methods, such as hay moving and livestock grazing (pasturing). Until the middle of the 20th century, almost all available land on the Dviete floodplain was managed that way.

Later, the traditional farming system collapsed. During the “*Soviet times*”, the traditional hay moving and pasturing was significantly reduced. The reasons were both political and technological ones. On one hand, the land and livestock was expropriated and their former owners were repressed. On the other hand, the new collective agricultural system preferred intensive farming methods: heavy machinery and artificially cultivated grasslands on dryer soils. Therefore, former floodplain meadows and pastures were abandoned in many parts of the Dviete floodplain, especially in wetter places. Because of natural succession, which lasted for decades, they are covered by dense stands of bushes now.

Recent initiatives

In the beginning of the 90ies, the priorities changed once more. The land became private again, and many people left their state-paid jobs at villages and established their own family farms. The old farming traditions had not been forgotten, and the remaining floodplain meadows were in use again.

However, enthusiasm of new farmers vanished soon, partly because of the low incomes from the small-sized farms. In the beginning of the 21st century, many private floodplain meadows became abandoned once more, this time – voluntarily.

Later, ecotourism activities spread quickly across the Latvian countryside. Latvian Ecotourism Society and Daugavpils University acknowledged the ecotourism potential and the natural and historic heritage of the Dviete valley. In 2002, the Ecotourism Development Plan for this area was jointly prepared. For the first time, local municipalities acknowledged a high natural value of the floodplain meadows and a need for their protection and maintenance. At the same time, Latvian ornithologists included the Dviete floodplain in the list of Important Bird Areas of European Union Importance (Račinskis, 2004) and justified the need for establishing a nature-protected area here. In 2004, the Dviete Floodplain Nature Park with total area of 4989 ha was officially established. In 2005, Latvian Ornithological Society prepared the Nature Protection Plan for this site (Račinskis, 2008).

The idea of cooperation

The current Nature Protection Plan is operative until 2015. Among other objectives, it contains goals of restoration and maintenance of floodplain meadows (Račinskis, 2005; 2008). Moreover, the plan also sets the aim to develop a nongovernmental organization, whose main purpose would be the coordination of floodplain restoration and management activities. Such cooperation is essential, because there are hundreds of landowners in the Dviete Floodplain area, and because there is no administration in the nature parks financed by the state in Latvia today.

Fortunately, such organization was established already by the initiative of local municipalities a few years earlier. The NGO called the Union of the Dviete Valley Municipalities (*Dvietes senlejas pagastu apvienība* or the DSPA in Latvian) was established in Bebrene in 2003. Its mission was to promote and coordinate cooperation between local municipalities in the field of ecotourism development, nature protection and environmental education. Six representatives from the Bebrene, Pilskalne, Dviete, Rubene, Asare and Zasa municipalities signed its establishment and were its first assigned members. Therefore, it was possible to delegate the functions of implementation of the Nature Protection Plan to this organization. According to the plan, the DSPA was also delegated to encourage landowners to introduce nature-friendly grassland management and farming, as well as to coordinate research and monitoring in this area.

The model of cooperation

The principle of voluntary participation

The DSPA, which is a society now with more than 20 members on the list, welcomes anyone, who is interested to join it and to help to fulfill its goals. However, joining the society means almost no financial benefits for its member. The society functions entirely on the principle of voluntary participation. Besides their enthusiasm and sense of personal responsibility, there are no other stimuli for its members. All regular activities are conducted voluntarily in the free time, and there are no paid positions in its structure.

The structure and responsibilities

According to its rules, all activities of the DSPA are coordinated by its Board, which is formed by the chairperson and two assigned members. The Board makes all actual decisions, develops and implements the projects, signs the agreements, and informs other members about its work during a general meeting once a year. Other members are free to assist the Board in its efforts and have an obligation to pay a symbolic membership fee.

The agreement with the Ark Foundation

According to the Nature Protection Plan of the Dviete Floodplain Nature Park, some abandoned floodplain meadows at Lake Skuķu could be restored and maintained more effectively by the means of natural grazing (Račinskis, 2005). For this purpose, long-term cooperation between the Latvian Ornithological Society, the *Ark Foundation (Stichting Ark)* from the Netherlands and the DSPA started in 2006 (Račinskis 2008). The agreement was signed between the DSPA and the *Ark Foundation* about introduction of the first herds of the Scottish *Highlanders* and *Konik polski* (a horse breed with *Tarpan*-like, the extinct European wild horse, appearance) in the Dviete floodplain area. According to the agreement, the DSPA is responsible for well-being and day-by-day management of the herd according to the local regulations. After six years of uninterrupted growth, a half of the herd or at least the initial number of introduced animals has to be given back to the *Ark Foundation*. There is also an obligation to inform the partners about any decision, which may affect the size and structure of the herd. Only after 2012, the DSPA will have a full ownership and control over the herd.

Agreements with landowners

Initially, there were only verbal agreements between the DSPA and the landowners about the use of their land for semi-natural grazing, partially, because some of them were already the DSPA members. The owners also agreed to include their unused pastures and floodplain meadows in grazing area, because it resolved the long-standing management problems and promised new incomes in the form of subsidies becoming available under agro-environmental scheme. Later on, much more landowners allocated their lands based on well-intentioned verbal agreements. However, the lack of written agreements was a wrong way to do that, which evolved into a problem for the DSPA very soon. It was not very clear, who is responsible for the day-by-day monitoring of the herd, inspection and repair of the fence, winter feeding and so on. To clarify all these things, written agreements were soon introduced.

The first written agreements were signed in 2007. According to them, the landowners rent certain part of the herd from the DSPA and in turn receive the majority of subsidies, which are available for the grassland management in nature-protected areas. From their side, the landowners are responsible for the repair of the fence, especially after the floods. They are also asked to prepare and provide some amount of dry food for the winter feeding period. Such written agreement provided an opportunity for the land owners to receive the subsidies from the Latvian Rural Support Service.

Development of cooperation

Initially, the grazing area was located entirely within the boundaries of the Bebrene municipality and belonged to two private landowners. In autumn 2006, five new owners were involved from the Bebrene municipality. In 2007, when the grazing area was extended along Lake Skuķu, two more landowners became involved. In 2008, four new landowners joined, all from the Dviete municipality. Finally, two owners from Bebrene municipality joined the project in 2009. In summer 2010, there were 14 private landowners, whose pastures and floodplain meadows are included into the grazing area. A part of the area belongs also to the Bebrene municipality.

The grazing area

The location and size

Due to the support from the *Ark Foundation* and high enthusiasm and voluntary help of many local people, the first fenced grazing area of about 22 ha was established at an old settlement called *Putnu sala* (the Bebrene municipality) in May 2006. In September of the same year, it was extended further into the Dviete floodplain, and about 22 ha more of abandoned floodplain meadows were added. One year later, there was an urgent need for the area enlargement. About 56 hectares were added to the existing grazing area along the western coastline of Lake Skuku in May 2007. For the first time, the grazing activities crossed the municipality border and were developed also within the Pilskalne municipality.

In October 2008, the grazing area was extended also across the River Dviete and established on the territory of the Dviete municipality. This as well was split into two independent parts. The largest part remained on the right bank of the River Dviete (~ 100 ha), whereas the new one with the approximate size of 80 ha was established on the eastern coastline of Lake Skuku (See Figure 1).

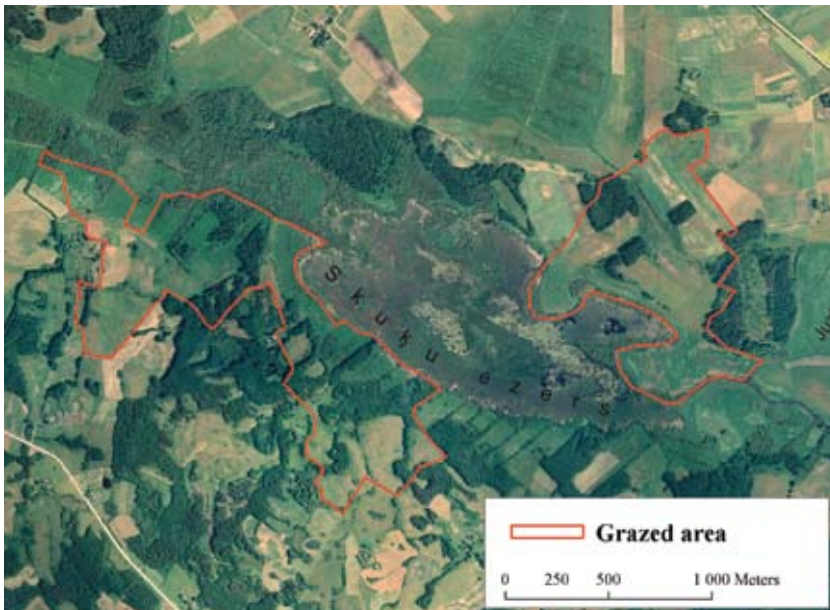


Figure 1. The location and size of the grazing area in April, 2010.

In June 2009, the fenced area was enlarged further upstream, and 50 ha more of floodplain meadows along the River Dviete were added. Today, there are about 230 ha of abandoned floodplain meadows, old pastures, wetland habitats and stands of bushes, which are available for the year-round grazing (See Figure 2).

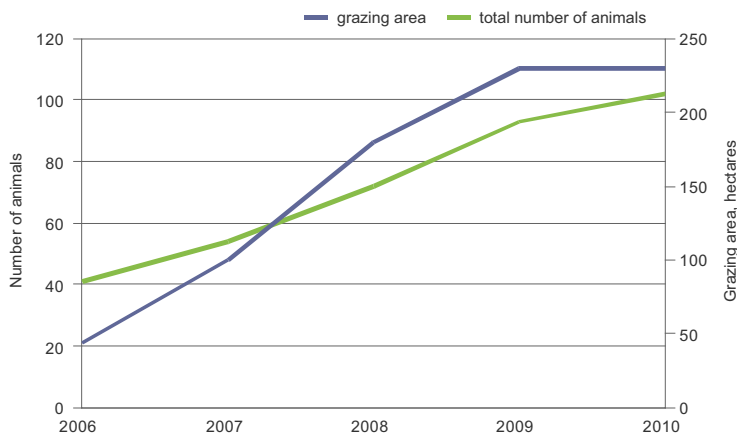


Figure 2. Enlargement of the grazing area and increase in the number of animals.

The grazing area is fenced and no person may enter it without a guide except the landowners. The fence is a permanent construction of wooden poles located 4-5 m apart from each other and 3, 4 or 5 rows of barbed wire are attached to the poles. At the time of writing, the total length of the fence is about 8 km. Because open water and very wet places act as a natural border which stops the cows and horses, the grazing area is fenced from the upland side only. According to the first experience, the fence was repeatedly destroyed by fluctuating floodwaters and drifting ice in lower places. Therefore, the coastlines of the Dviete River, as well as of Lake Skuķu, are not fenced at all.

Safety considerations

Because of the natural hydrological connection of this area to the Daugava River floodplain, there are large fluctuations of the water level observed in the Lake Skuķu during the year (Gruberts, 2003). The spring floods start in late March, during the period of intense snowmelt within the Eastern

part of the Daugava River's catchment area. The highest level of the spring floods usually is observed in mid April, when the water table in the floodplain lakes of the Dviete valley is approximately 4-5 m above its summer level. During the floods, large portion of the Dviete floodplain is inundated, sometimes for months, and floodplain meadows become temporarily inaccessible for the herd (See Figure 3).



Figure 3. An aerial photo of Lake Skuķu during the floods in April 2010. Photo: Dāvis Gruberts.

Therefore, it is important to enclose also some upland places within the grazing area. Today, about a half of the grazing area is located outside the Dviete floodplain – on the gentle slopes of the Dviete valley and hills of the Augšzeme upland. These elevated places act as the refuges for the herd during the spring floods, and as the principal grazing areas during winters, when the floodplain meadows are covered with ice.

Monitoring and repair

DSPA members and their families on a voluntary basis perform regular monitoring of the grazing area. The fence is controlled once a week and repaired when necessary. Sometimes this job is trusted to unemployed people, who are temporarily employed by the Bebrene and Dviete municipalities. However, these people often do their job carelessly, and anyway DSPA members need to carry out day-by-day monitoring of the grazing area.

Most often, the fence has to be repaired after wild animals (elks, wild boars) have crossed the area. It is also necessary to rebuild some part of the fence located in lower places, where it is damaged by floodwaters or drifting ice. Until now, the most of the costs for the repair materials, as well as for the control and repair of the fence, were covered by the *Ark Foundation* and the Bebrene municipality. In recent years, significant help has been received also from the Netherlands Society for the Protection of Birds (*Vogelbescherming Nederland*).

The herd

Year-round grazing cattle and horses

The first 18 semi-wild cattle and 22 horses were brought into this area from the Netherlands in 2006. The herd of cows living in this area is a part of a dedomestication program governed by the *Ark Foundation*.

It consists of the Scottish *Highlanders* as well as their crossbreeds with the Latvian *Brown* and the Hungarian *Gray*. Such mix of genes probably has better survival potential under local climate conditions, which are more continental (long and cold winter with deep snow cover, warm and wet summer, etc.) than in Western Europe.

The semi-wild horses introduced here are of the breed *Konik polski*. They are believed to be direct descendants of the extinct European horse: the *Tarpan*. Thanks to many genetical and physiological adaptations they are well equipped to live under natural conditions.

The herds form different social structures. The horses form 2-3 harem groups with one leading stallion. The remaining stallions make a separate group. On the opposite, the cattle have a maternal social structure with the older cows and their calves. The bulls live in separate territorial groups.

The rate of growth and death

Since the beginning of the project, a steady rise in the total number of all animals has been observed (See Figure 2). The number of horses has doubled in three years (Fig. 5), while the number of cattle has doubled after only two years of grazing in this area (Fig. 4). In May 2010, there were 56 heads of cattle and 46 horses in total.

On average, there are 11 calves and 9 new *Koniks* born each year. The number of dead animals per year has been very low (2-5), except for the last winter, when more animals were lost due to the extremely severe weather conditions. According to the air temperature measurements in January and February 2010, performed by the weather station located next to the

grazing area, it was much below 0°C for months. At the end of January, it dropped below -30°C. There were still some very cold nights in March, when the temperature dropped to -20°C. To conclude, the last winter was too severe for the less adapted and weak animals.

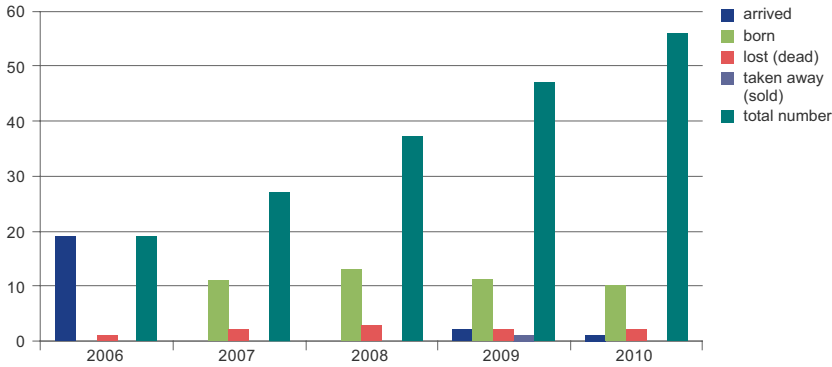


Figure 4. The number of cattle per year.

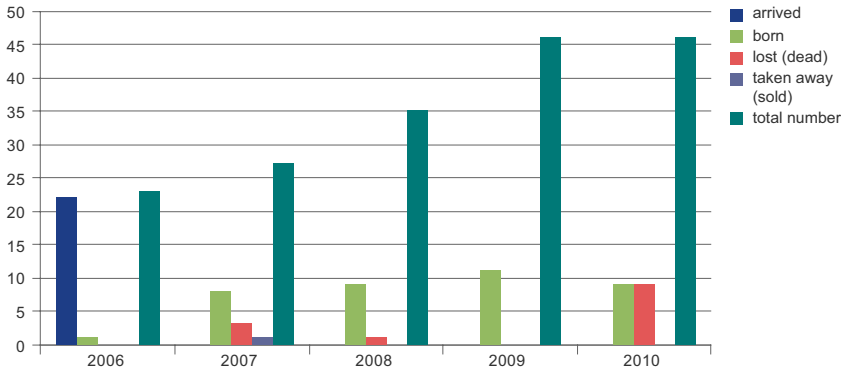


Figure 5. The number of Konik polski horses per year.

The meat selling potential

Obviously, there are too many animals for this area today. For example, the number of bulls has increased from one, which was introduced in 2006, to 19 in 2010 (See Figure 6). The first calves were born in spring 2007, and they are 3 years old now. According to the recommendation from the *Ark*

Foundation, these bulls may be sold for meat at this age. However, as the animals are too weak after the winter, the best selling season for them is autumn.

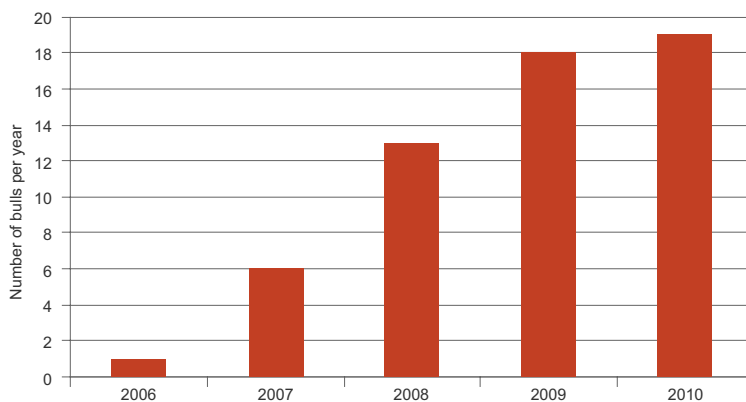


Figure 6. The raise in the number of bulls per year.

The grazing practice

Food availability

The amount of animals living in the grazing area is determined by the amount of food that the area can provide through the year. Because of the steady increase in the size of the grazing area, the intensity of grazing has significantly dropped comparing with the initial situation in 2006. There are about 0.4 animals per hectare now (See Figure 7). However, the grazing area is composed of different vegetation, and the intensity of grazing in spring and summer is much higher in the cultivated grasslands and much lower in the floodplain meadows. The stands of bushes and trees are almost untouched until the winter comes. Besides, the availability of food and intensity of grazing is also influenced by the water level within the Dviete floodplain. The herd is very disperse during dry summers and quite compact during the floods and the winter feeding period.

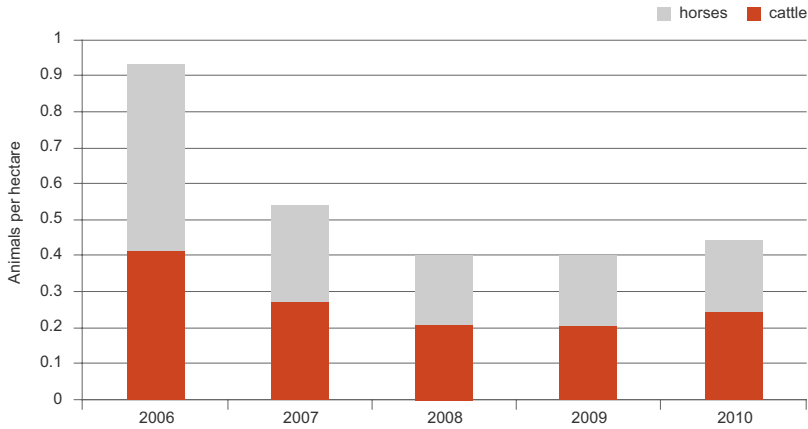


Figure 7. The intensity of grazing (the number of cattle and horses per ha).

The winter feeding

As the floodplain meadows of the Dviete River are often inundated in late autumn and early winter, they are almost inaccessible for the herd at this time. In such cases, the grazing occurs mostly on dry uplands, where the available vegetation is quickly fully grazed. To avoid food shortage, additional dry hay (rolled, pressed or disperse) is given to the herd. The winter feeding period usually starts in January and ends in March. However, there is a large variation in the first and last dates of this period (See Figure 8), which depends on the physical conditions of the animals, the amount of food still available for the grazing, and the weather conditions. The amount and quality of hay also varies from winter to winter, but its total amount increases in line with the herds size (See Figure 9). For example, during last winter 2009 - 2010, about 230 rolls of hay were given to the herd.

The hay reserves are stocked up at the grazing area each autumn, but there are many practical difficulties arising each year. At first, the DSPA has no equipment for the hay preparation and transportation. The majority of the rolled or pressed hay is prepared by local farmers, who sell or donate it to the society. The landowners who have an agreement with the DSPA prepare some reserves also. Therefore, usually there is enough fodder for feeding in winter. However, their transportation and distribution in winter is very expensive, because there are almost no roads within the grazing area nowadays. Large tractors are used for this job, and technical support from the Bebrene municipality is very important during this period. However, some places are almost inaccessible even for those tractors because of the accumulated snow and ice on the hilly roads.

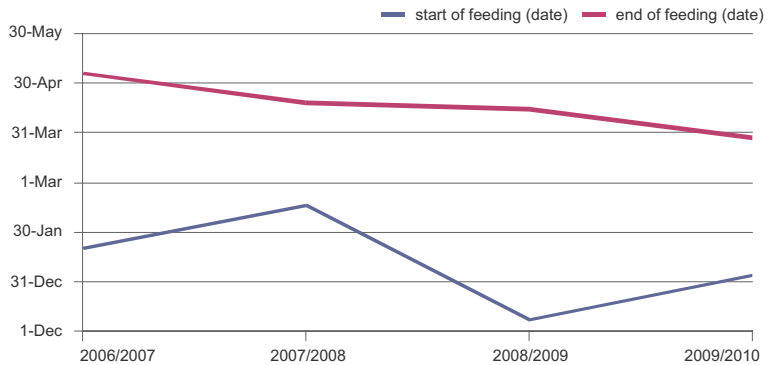


Figure 8. Variation in the first and last dates of the winter feeding.

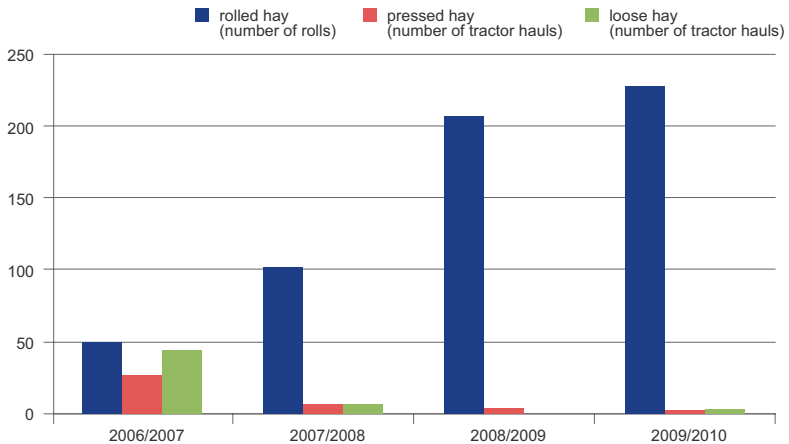


Figure 9. The amount of hay used for the winter feeding.

The benefits

Opening of the landscape

Grazing by cattle and horses has a distinct positive effect on the vegetation cover and the landscape structure of the Dviète floodplain. After just one year of continuous grazing, landscape of this area started to change. The previously dense stands of bushes and trees became semi-transparent. Small bushes as well as a bark and lower branches of the trees were partly

eaten. Uniform structure of the tall grass vegetation was transformed into the patched mosaic. In addition, a completely new pattern of natural paths emerged.

Consequently, such changes offered more suitable habitats for a great variety of bird species like Corncrake *Crex crex*, Great Snipe *Gallinago media*, Lapwing *Vanellus vanellus* and White Stork *Ciconia ciconia*.

The subsidies

Besides the natural benefits, the floodplain grasslands have a large economic potential. The subsidies governed by the Latvian Rural Support Service are available for those farmers who are using nature-friendly methods in grassland management. The amount of money available per hectare depends on the location of a land, its natural value, a nature protection status and management methods (cutting or grazing). According to the signed agreements, the majority of these subsidies are channeled to the landowners of this grazing area.

In addition, the herd owners also receive some subsidies, which are available, for example, for the suckling cows. In 2009 DSPA received about 3000 Ls for its 14 cows and 9 calves. Thus, the winter-feeding expenditures could be covered by the DSPA itself for the first time.

New jobs

The grazing area of this size needs at least 2 or 3 persons to manage it on the daily basis. Therefore, there are potential job positions for local people, who might be employed as guides or grazing area inspectors. However, these jobs must be adequately rewarded, and significant financial sources should be at hand. Unfortunately, the DSPA has little income coming from symbolic membership fees, small donations and cheap entrance fees for the tourists, who arrive to the grazing area and wish a guided excursion. This income is too small when compared to the expenditures, such as the winter transporting services. Therefore, some other, external, sources are needed. From time to time, such sources become available. From the very beginning, the *Ark Foundation* has supported the daily inspection of the grazing area. Some additional money has been received from other sources, like the Bebrene municipality, which is also a DSPA member.

Several people were employed as the guides and grazing area inspectors during last four years. Unfortunately, there are almost no people, who are willing to work here temporarily and receive 100 Ls per month. This money is available for unemployed people from the Latvian social budget. Thus, the DSPA members or their families do all those jobs by themselves at their free time and, often, with no reward.

The added value

Tourism development

Introduction of the cattle and horses in floodplain meadows of the Dviete valley stimulated fast growth of tourism in recent years. After the arrival of first animals, the number of tourists started to rise quickly in the Bebrene municipality and reached its peak in 2007, when approximately 2000 visitors were counted (See Figure 10). They visited not just the grazing area, but, also, the nature and historic sites at Bebrene (the Park, the Castle and the Catholic Church, the Akmeņupes Nature Trail). The local economy was also stimulated because of more shopping done by the visitors, more requests for the guided tours and so on. In 2008, the number of visitors started to decrease, most likely due to economical crisis. However, in 2009 about 1200 people visited the grazing area.

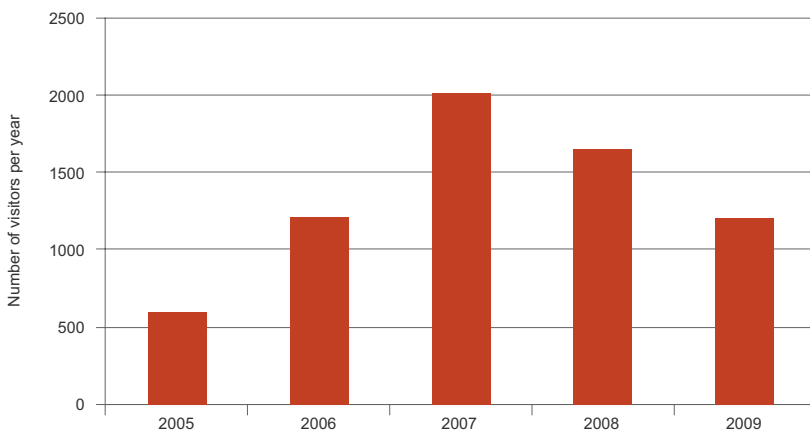


Figure 10. Dynamics in the number of tourists (visitors) in the Bebrene municipality.

The information centre

The huge interest of tourists in the semi-natural grazing activity in the area resulted in the establishment of the Dviete Valley Information Centre next to the main entrance of the grazing area, at the *Putnu Sala* on August 16, 2008. The Centre was established in the abandoned wooden living house “*Gulbji*” of the 19th century, which was renewed due to the support from the *Ark Foundation*, the *Vogelbescherming Nederland*, the Latvian

Ornithological Society, and the Bebrene municipality. Many local people were employed there during the renewal process. In order to manage this centre in a sustainable way, the DSPA signed an agreement with an owner of the house for long-term cooperation (15 years), which is convenient for both sides.

The centre is open for visitors at their arrival with prior arrangements. Primarily, it is used as an exhibition room for local nature values. The Centre informs about the grazing area and its main inhabitants: cattle, horses, and beavers. The visitors can buy some locally produced souvenirs here. Guided tours to the grazing area usually start from this site. The renewed house is also used for educational seminars and the Environmental Class activities organized by the DSPA, the Bebrene Secondary School, the Latvian Ornithological Society, and other organizations. The Centre is also available for ornithologists, archaeologists and other scientists as a guesthouse. Since last year, traditional Latvian annual feasts, such as the Winter Solstice and the Easter, have been celebrated here¹. However, the Centre has no permanent staff, and the DSPA members or their families usually manage all these activities at their free time.

Besides tourists, the Dviete Valley Information Centre has been visited also by several hundred specially invited people. In 2008, 237 children and their teachers from nearby schools attended the Environmental Class activities, and 182 local people participated in six educational seminars. In 2009, 207 persons attended the Environmental Class, and 73 persons – the seminars.

In addition, there were several joint activities of the area cleaning (cutting of bushes, collecting of waste etc.) organized by the DSPA and the Latvian Ornithological Society, which were voluntarily attended by many people. For example, 16 students and staff members of Daugavpils University and Institute of Systematic Biology arrived and assisted the DSPA in April 2009.

The bird watching tower

Thanks to foreign investments, the first bird watching tower was also built in this area. The *Vogelbescherming Nederland* collected 25200 EUR during the Birds Festival in the Netherlands in 2008. This money was donated to the Latvian Ornithological Society for the tower building and a nature trail establishment (Račinskis, 2008). In the result of this donation, a wooden watching tower was built by Latvian specialists inside the grazing area at the western end of the Lake Skuķu. Latvian Ornithological Society and the

¹ For more information, visit www.ark.lv

DSPA Board coordinated this job. The new tower was open for the first visitors on October 4, 2009. Today, the tower is included into the guided tours to the grazing area as an additional option.

What next?

There are many advantages and disadvantages of such cooperation model. Some of them are related to the legal status and structure of the DSPA, some – to the legal requirements for grassland management in Latvia.

A non-governmental organization, like the DSPA, can apply for more projects and funds than a private person can. It also has more capacity to develop a large-scale cooperation for the nature protection goals. It also works more efficiently and less formally than any state agency. Therefore, actual problems can be solved more quickly. On the other hand, it needs its own income and is forced to apply for all available funds. Moreover, The DSPA needs a qualified staff, which is enthusiastic enough to work extra hours and, quite often, at weekends. There are not many such people in the Latvian countryside today, and the present few activists are too busy to do all the things by themselves.

Additional difficulties are related to the constantly changing regulations of the herd registration, maintenance, and meat selling in Latvia. Besides, there are many uncertainties about the subsidies for the grassland management. Today, it is rather difficult to apply for such funds, if the year-round grazing cattle and horses are used as grazers. At first, there are no standards for the number of such animals per hectare in Latvia. In general, each *Highlander* or *Konik* needs much larger grazing area to survive than the animals that are kept in the barn during the wintertime. On the other hand, they are grazing also in bushes and forests. Only the long-term grazing practice will show how many animals per hectare are able to survive under natural conditions in this area.

However, these are not good news for the landowners, which have the written agreements with the DSPA for their land use. In order to receive the available subsidies now, these landowners should be the cattle owners too. Besides, they have to declare the year-round grazing cattle and horses under the same rules as animals in the intensive and conventional farms. According to present regulations, they are asked also to cut the pasture grass in autumn. Such practice is probably good for grassland in general, but year-round grazing cattle and horses are left with no food at the dawn of winter, and their survival is threatened. Therefore, present regulations of agricultural subsidies in Latvia do not stimulate the semi-natural grazing practice as a nature-friendly method for the floodplain management. Because of such situation, further cooperation between the DSPA and the involved landowners is questionable.

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Dabiskās ganīšanas sadarbības modeļa priekšrocības zemniekiem un palieņu biotopiem: dabas parka "Dvietes paliene" piemērs Latvijā

Kopsavilkums

Šis pārskats atklāj, kā ir attīstījies un darbojas sadarbības modelis dabiskās ganīšanas jomā dabas parkā "Dvietes paliene" ar mērķi veicināt palieņu biotopu aizsardzību un vietējo zemes īpašnieku labklājību. Modelis ir balstīts uz ilgtermiņa līgumiem starp nevalstisku organizāciju un zemes īpašniekiem par tiem piederošo palieņu pļavu un ganību pastāvīgu izmantošanu, noganīšanai izmantojot govus un zirgus. Sadarbības galvenais mērķis ir sugām bagāto Dvietes upes palieņu pļavu atjaunošana un dabai draudzīga uzturēšana. 20. gadsimtā šīs pļavas tika pamestas un tagad ir daļēji aizaugušas ar krūmiem, taču tās ir ārkārtīgi nozīmīgas kā rieta un ligzdošanas vietas tādām apdraudētām putnu sugām kā grieze un ķikuts.

2006. gadā, pateicoties Latvijas Ornitoloģijas biedrības un Nīderlandes Dabiskās ganīšanas fonda Stichting Ark (ARK) iniciatīvai, šajā vietā tika ieviests pirmais Highlander šķirnes govju un Konik polski zirgu ganāmpulks. Par tā labklājību un ikdienas aprūpi saskaņā ar Latvijas likumiem ir atbildīga biedrība „Dvietes senlejas pagastu apvienība” (DSPA), kuru 2003. gadā nodibināja Bebrenes, Dvietes, Pilskalnes, Zasas, Rubenes un Asares pagastu pašvaldības. No otras puses, zemes īpašnieki ir atbildīgi par ganību aploka labošanu, it īpaši pēc pavasara paliem. Tiem ir arī jā sagatavo un jāpiegādā noteikts daudzums siena ziemas periodam, taču

pretī zemes īpašnieki saskaņā ar līguma noteikumiem saņem lielāko daļu subsīdiju, kuras ir pieejamas pļavu apsaimniekošanai īpaši aizsargājamās dabas teritorijās.

Kopš ganāmpulka ieviešanas gan dzīvnieku skaits, gan ganību teritorijas lielums ir ievērojami pieaudzis. 2006. gadā šeit bija 18 govys un 22 zirgi uz 22 hektāriem zemes, kas pieder diviem privātipašniekiem. Šodien tie jau ir 230 hektāri zemes, uz kuriem kopā ganās 110 govys un zirgi. Ganību teritorija ir arī sadalīta divās neatkarīgās daļās, kuras pieder 14 privātipašniekiem un vietējai pašvaldībai.

Ganību teritorijas ikdienas uzraudzību un aploka labošanu līdz šim veica DSPA biedri vai vietējie iedzīvotāji, kurus nodarbināja vietējās pašvaldības vai pati biedrība, pateicoties Latvijas sociālā budžeta vai ārzemju finansējumam. Līdz šim lielāko daļu materiālu, kuri nepieciešami aploka uzturēšanai un labošanai, kā arī pašus šos darbus ir apmaksājis ARK fonds un Bebrenes pašvaldība. Pēdējos gados ļoti nozīmīga palīdzība ir nākusi arī no Nīderlandes putnu aizsardzības biedrības (Vogelbescherming Nederland).

Lai palielinātu ganāmpulka izdzīvošanas potenciālu ziemas periodā, dzīvnieki tiek regulāri piebaroti ar sienu. Piebarošana ir nepieciešama no janvāra līdz martam. Sienu parasti sagatavo vietējie zemnieki un pārdod vai ziedo to biedrībai.

Minēto dzīvnieku ganāmpulka ieviešanai ir skaidri izteikta pozitīva ietekme uz Dvietes palienes veģētāciju un ainavas struktūru. Pateicoties tam, ka ganīšana notiek visu cauru gadu, līdz ziemei tiek noēsta zālāju veģētācija, savukārt ziemā tiek apēsts arī ievērojams daudzums krūmu. Tā rezultātā ainava kļūst klajāka, un tas, savukārt, nodrošina piemērotus barošanās un ligzdošanas biotopus dažādām putnu sugām.

Bez pozitīvās ietekmes uz palieņu biotopiem dabiskajai ganīšanai ir arī nozīmīgs ekonomiskais potenciāls. Zemniekiem, kuri izmanto dabai draudzīgas metodes pļavu apsaimniekošanā, ir pieejamas subsīdijas no Latvijas Lauku atbalsta dienesta. Arī biedrība var saņemt zināmu subsīdiju daudzumu, piemēram, par zīdītājgovīm. Savukārt strauji augošais bullīšu skaits nozīmē ievērojamu gaļas pārdošanas potenciālu.

Bez tam, šāds sadarbības modelis veicina arī vietējas ekonomikas attīstību. Kopš ganīšanas sākuma šeit ir strauji pieaudzis dabas parka apmeklētāju skaits, kā rezultātā ir radusies nepieciešamība pēc kvalificētiem gidem un tūristu plūsmas kontroles. Šim nolūkam 2008. gadā blakus ganību teritorijai tika atvērta Vides informācijas centrs, bet 2009. gadā – uzcelts putnu novērošanas tornis.

Pašlaik šīs aktivitātes kontrolē un veic DSPA biedri brīvprātīgā kārtā, pateicoties galvenokārt ārvalstu finansējumam un pašu entuziasmam. Tomēr šādam modelim ir savas nepilnības, tāpēc, lai nodrošinātu šīs teritorijas ilgtspējīgu attīstību, ir nepieciešams daudz efektīvāks un uz pašfinansējumu orientēts modelis.

Organic farming in Latvia: examples from the Amata municipality

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Abstract

Organic farming started in Latvia in the early 1990s. Today 4031 farms are managed with organic methods. This number constitutes to 5% of the total number of the farms in the country, and the organic farming covers 8% of the agricultural lands. The largest number of organic farms is located in districts Cēsis (330 farms), Madona (220 farms) and Alūksne (156 farms). Organic farming includes many agricultural sectors, but main branches are crop farming and cattle breeding. Organic farmers work according to sustainable development principles. Examples of organic farming in the Amata municipality are discussed in this paper as it represents landscape and land use forms typical for Vidzeme.

There are 17% of farms working as organic in the Amata municipality, where part of the territory, due to its hilly relief and high proportion of nature protected areas and forests, creates limited conditions for intensive agriculture. Individual farmsteads are typical for the hilly region landscapes in Vidzeme. One typical example of Latvian organic farmers is owners of the farm “Ozoliņi”, Brigita and Dmitrijs Lūkini, who run the herbal tea business in a remote area in Zaube. In the same time they ensure conservation of grassland biodiversity as well as diverse agricultural and forest landscape.

A small cooperative “Zaļais grozs” (Green Basket) joins 18 organic farms in the Amata municipality and represents local small-scale producers. The farmers implement the mission of sustainable development: environmentally friendly farming together with organic production. Farmers put the produce (organically grown vegetables, greens, fruits, berries and other products) into a ‘joint basket’ and deliver it to customers in towns and cities. They offer about 50 different ‘green’ products. Crop farming for these farms is an additional sector; but mainly they deal with cattle breeding. The cooperative helps farmers to diversify their production, to generate more income and to manage farms more effectively.

The organic farm “Kalna Smīdes”, located on the bank of the Amata River, belongs to Jānis Sietiņšons, who is a beekeeper. Organic beekeeping is the sector showing significant increase during the last five years. The farm produces different kind of honey, pollen, and other products and sells organic products in local and foreign market. The farm supports a key ecosystem service – pollination. In addition, the owner promotes environmentally friendly farming by participating in exhibitions, fairs and other public events.

To sum up, organic farmers in Amata municipality work flexibly in different agricultural sectors. Organic farmers admit that the number of the produced tons and the income statements do not always provide precise data that the business is moving in the right direction. Environmental and social services provided by organic farming also are important part in this farming practice. In order to secure a long-term production and life in the countryside, more business innovations and solutions for sustainable, ecologically oriented agriculture are to be found.

Development of organic farming in Latvia: a background

Intensive agriculture has different influence on environment than organic farming. The most widespread impacts of intensive agriculture on nature are soil degradation, pollution and erosion on the local scale, fresh water shortage, problems with food security and climate change on the global scale. These problems motivated farmers to look for other ways of farming.

Organic agriculture started in Latvia in the early 1990s. First group of farmers began to work with organic methods in the Liepāja district, then in other parts of Latvia (Cēsis, Ogre, Gulbene, etc.). Professor Wolfgang Jorge from Germany supported this movement. In Latvia, Imants Henackis was the very first agronomist who started organic farming. During the first three years, many practical seminars were hold in the farms. Farmers learnt how to work with natural fertilizers, compost, crop rotation, biodynamical substances, learnt about agro-technical practices and other practical things. It was not easy, because majority of the farmers’ society looked with lack of understanding and had little credibility for this farming. Local organic farming organisations cooperated and established an association in 1995. In 2003, the government accepted the Organic Farming Development Programme. Then, the Latvian Organic Farming Organisation joined the International Federation of Organic Agriculture Movements (IFOAM).

In 1998, the concept of organic farming was included in the state legislation. From that time, organic farming started to develop. Organic agriculture in Latvia is based on:

- Efficient use of resources available on the farm, for instance, using of locally grown forage, effective utilization of manure, etc;

- Selection of plant and animal varieties adaptable to the local conditions, thus, being disease-resistant;
- Growing different kind of crops in pre- planned succession for the most efficient usage of the available resources;
- Strict limits on using chemically synthesized pesticides, artificial fertilizers, antibiotics, feed nutrition enhancers, processing aids and other raw materials;
- Prohibition of the use of genetically modified organisms;
- Livestock farming system with the cattle grazing on pastures and their provision with organic livestock feed;
- Livestock farming considering the needs of different livestock breeds.

The objectives of organic farming are the following:

- To ensure sustainable production of high-quality healthy food (instead of concentrating on maximizing yield), while maintaining crop and livestock diversity and preserving the environment (including plants, animals, soil, water and air);
- To ensure the fulfillment of requirements for livestock welfare (providing the animals with access to daylight, air, clean water, natural pastures and sufficient space, etc.);
- To use direct solar energy more efficiently and, as much as possible, to reduce use of fossil energy.

Opponents of organic farming declare that there is a threat of famine in the world and organic farms with low yield capacity cannot fight it. However, research shows that in many unfavourable conditions organic farming is more successful than intensive agriculture. Urs Niggli from the organic farms' certification organisation Research Institute of Organic Agriculture FiBL, Switzerland, said that in the regions with favourable conditions for agriculture the decrease of yield might be from 0 till 20%, but in the regions with broken humidity regime, productiveness grows for 116% (Niggli 2009).

In Latvia there were 39 organic farms registered in 1998, 550 farms – in 2003, 1043 – in 2004, and since the year of 2006 up to 2009, the number of farms has reached slightly over 4000 (Figure 1).

The increase of the number of organic farms has become more rapid in the last years. At the beginning of 2010, there were 4218 organic farming enterprises in Latvia with 161 650 ha of certified organic agricultural land in total. The number of companies dealing with processing of organic food has also increased from three companies in 2002 to 56 companies in 2009. However, these are small companies and their number is not

sufficient. Difficulties in the processing of organically grown products are associated with the production capacity, certification of particular products and logistics, as majority of customers concentrates in Rīga, while farms are located in remote rural areas. Other challenges for organic farmers include:

- unstable investments and income;
- high agro-technical requirements;
- less productive business;
- crop rotation,
- high requirements for animal welfare;
- nutritive security;
- the small size of the farms and weak cooperation;
- monitoring, traceability, control and certification.

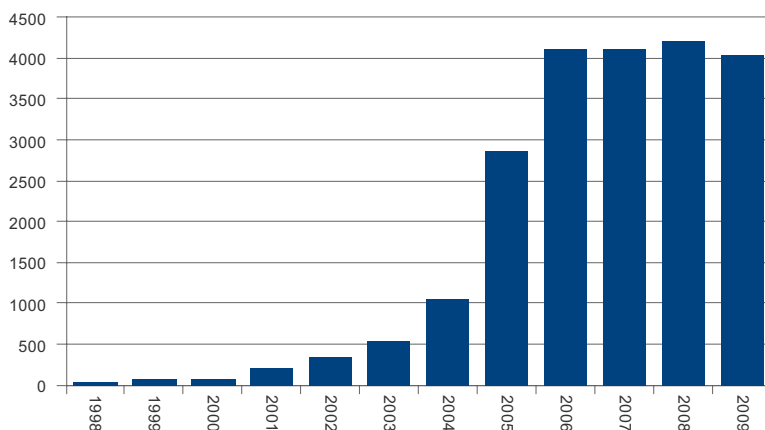


Figure 1. A number of certified organic farms in Latvia. Source: Association of Latvian Organic Agriculture (ALOA).

Organic farmers in Latvia work in different branches of crop breeding and livestock farming. The highest proportion in organic agriculture in 2009 belongs to grain production and dairy products (Figure 2).

In Latvia, there are approximately 80000 farms, and only 5 % of them are practicing organic agriculture. In general, there is a negative trend in amount of organic farming production produced per year in Latvia (Figure 3). However, some products such as honey and meat start to have higher proportion of total agricultural production (Figure 4).

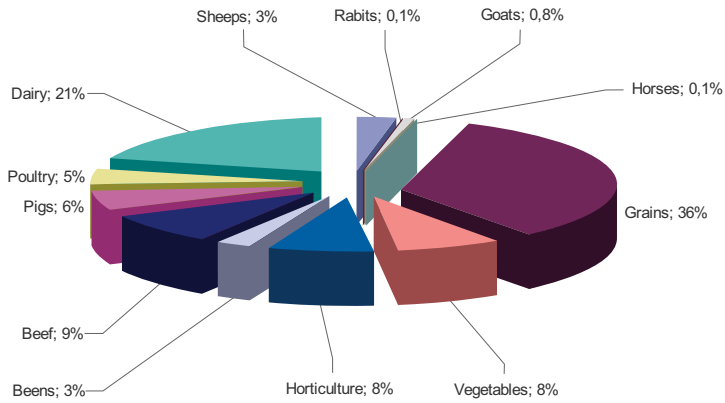


Figure 2. The proportion of various sectors in organic agriculture
 Source: Association of Latvian Organic Agriculture (ALOA), 2009.

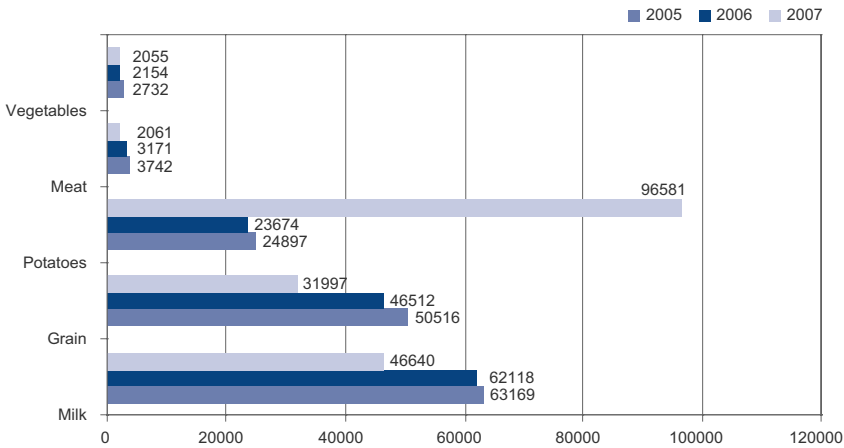


Figure 3. The amount of agricultural production (in tons) produced by organic farms. Source: The Ministry of Agriculture of Latvian Republic, 2009.

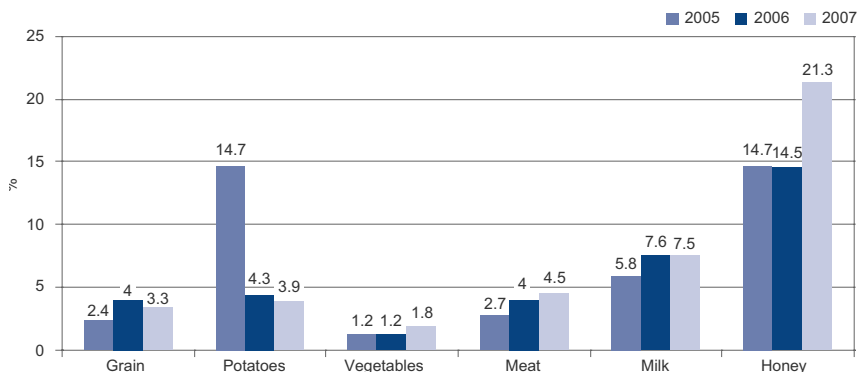


Figure 4. The percentage of agricultural production by the organic farms out of total agricultural production in Latvia. Source: The Ministry of Agriculture of Republic of Latvia, 2009.

The municipality of Amata: a place for environmentally friendly farming

The Amata municipality is located in central part of Vidzeme, 80 km from Rīga. The total area of the municipality is 74190 ha and the total population is about 6370. The Amata district has five villages: Amata, Drabeši, Nītaure, Skujene and Zaube. The Amata municipality represents landscape and land use forms typical for Vidzeme region.

Agriculture and rural environment

The Amata municipality has diverse landscape consisting of hills, small rivers, bushes, and forests (Figure 5). The forest occupies 52 081 ha or 70.2% of the area, of which more than 30 000 ha belong to private landowners. The fragmented and mosaic landscape is not favourable for intensive agriculture. Besides, large part of the municipality is included in protected nature areas.

The most remarkable protected nature areas in the Amata municipality include:

- Gauja National Park (10% of the municipality area);
- 19 micro-reserves;
- local nature reserves – Melturi Pine Forest, Amatas Paleja, Kārļu Protected Landscape, Ķaubju Protected Landscape and Gauja River Valley.

Agricultural land comprises 22108 ha with 410 registered farms, 17% or 71 of them are organic farms. The distribution of organic farms in villages is the following: seven – in Amata, 12 – in Drabeši, 19 – in Nītaure, 12 – in Skujene, and 21 – in Zaube.

Organic farms work in both sectors – traditional agricultural (i.e. dairy farming, beef production, beekeeping) and not so widespread agricultural sector, such as rabbit breeding and aquaculture.



Figure 5. The natural landscape from Amata municipality. Photo: ALOA, 2009.

Herbal teas from the farm “Ozoliņi” in the Zaube Parish

One of the typical examples of Latvian organic farmers is owners of the farm “Ozoliņi”, Brigita and Dmitrijs Lūkini, who have their business in a remote area in Zaube. There are no industrial facilities, no traffic and recreation complexes or noisy and chemically polluted agricultural areas around the farm. The farm was certified as organic farm in the year of 2004. The total area of agricultural land certified for organic farming is 14 ha. The soil in the farm has been improved by using hardwood chips and microbiological supplements for plants. The agricultural land includes 8 ha of biologically valuable grasslands. Approximately 0.5 ha are occupied by fields for cultivation of medicinal herbs. The rest of the area is semi-natural grasslands where medicinal plants are collected.

At the beginning, the landowners collected wild plants and a few garden plants for herbal tea production. The first tea was prepared from

fermented apple leaves following old recipes. Today, the organic farm “Ozoliņi” has widened its offer of teas: “Traditional”, “Anna”, “Cumin”, “The Golden Dream”, “Peppermint”, “Raspberry”, as well as they offer customized teas. The products offered by the farm are 100% herbal products. About 90% of the farm’s income comes from the sales of tea and 10% from various subsidies. Herbal teas are distributed to shops specialised in selling organic food, to supermarkets, open markets and “green markets”.

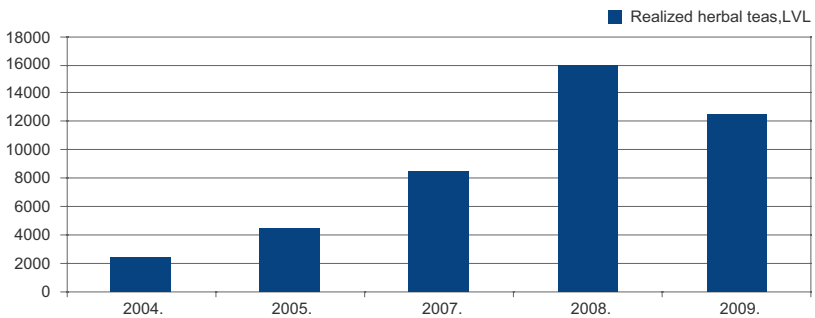


Figure 6. The turnover of herbal teas produced by the farm “Ozoliņi”. Source: the farm “Ozoliņi” household data, 2010.



Figure 7. Farmers with herbal teas and honey in the “Green Market”, Rīga. Photo: ALOA, 2008.

The drop in turnover in 2009 (Figure 6), is connected with the overall economic situation, when the amounts of products and their selling prices declined.

During the period from 2006 – 2009, entertaining and educational tours for people interested in herbal and medicinal teas were introduced. There have been various excursions to this biological farm organised by the organization “Environmental Health Farms”. Students of the University of Latvia and the Daugavpils University were invited to participate in the educational seminars on different herbs’ growing in grasslands, methods of tea growing and processing of plants. On average, 10 students participated in each seminar. The largest number of seminar participants reached 43 people. During the last four years, about 20 trainings have been organised in addition to individual visitors. In 2008 – 2009 there were nine seminars organised for different groups.

Within the farm, there is a local nature reserve “Amatas paleja” established to preserve the landscapes of Vidzeme Upland: boreal spruce forests, bog woodlands, and semi-natural grasslands. A micro-reserve in the forest was established to protect Beak Sedge *Carex rhynchophysa*. The species listed in Annex I of the Birds Directive (Anon. 1979) breed in forests of the farm “Ozoliņi”, such as Black Woodpecker *Dryocopus martius*, White-backed Woodpecker *Dendrocopos leucotos*, Three-toed Woodpecker *Picoides tridactylus*, Grey-headed Woodpecker *Picus canus*, Black Grouse *Tetrao tetrix*, and European Nightjar *Caprimulgus europaeus*. In the grasslands and fens, several species of orchids have been found, including *Dactylorhiza sp.*, European Common Twayblade *Listera ovata*. On marshy shores of a lake, there is Early Coralroot *Corallorhiza trifida* growing. Biodiversity is precondition for the economic development of the farm. Therefore, the existing restrictions related to biodiversity protection have not limited the development of the farm.

Different measures have been taken to restore traditional agricultural landscape, for example, shrubs and trees have been cut around single oak trees and their groups; scattered oaks in grasslands or other broadleaved trees have been preserved to maintain the landscape of wooded meadows. An inventory and mapping of elements of cultural heritage around the old farm (bases of buildings, ditches, and land borders) was carried out.

The cooperative “Zaļais Grozs” – a good example of successful cooperation

The cooperative “Zaļais Grozs” (Green Basket) offering agricultural services was established in the farm ‘Lušēni’ in the Nītaure Parish in 2003. It has united organic farms from the surrounding parishes: Nītaure,

Skujene, Vecpiebalga, Zaube, and Sigulda. “Zaļais Grozs” is one of the smallest cooperatives in the country.

It is not a coincidence that the cooperative’s name comprises the word “green”. From the very beginning of the cooperation, farmers agreed upon the mission of sustainable development – environmentally friendly farming and organic production. The second part of the name “basket” means that the farmers in the cooperative were able to agree upon a common idea – to put the production into a “joint basket”. The cooperative was established to address tensions between farmers and sellers in the conditions of strong competition. The cooperative allows its members to realize organically grown vegetables, fruits, berries, and other “green” products. Consumers can buy healthy, certified, biologically packed and labeled products.

Each year the cooperative verifies its compliance with the requirements for organic farming. Each farm that belongs to the cooperative is responsible for the quality of their products and their storage in the farm. Upon a request, the products are delivered to the cooperative’s storage: a pre-packaging place in “Lušēni”.

The products are sold in the “Green Market” in *Berga Bazārs*, Rīga, other markets, the online store “Dabas dobe” (Nature Bed), in the shop *Ekoprodukti*, in the café *Ekovirtuve Ltd*. The network with regular customers for direct sales has been established. There are 50 different products offered to customers. Members of the cooperative plan to brand their products.

Organic farms that participate in the cooperative mainly specialize in dairy and beef production. There are few farms (“Jautrīši” and “Kronīši”) owning more than 40 cattle. Number of cattle in other farms usually varies between 10 and 20 cows. Cattle are mainly bred for dairy production. Two farms “Gailīši” and “Lejas Suces” breed sheep. In these farms, organic livestock breeding and crop cultivation complement each other. Crop farming constitutes as an additional sector to cattle breeding as organic grains are mainly used for cattle feeding. Therefore, the cooperative’s turnover in the crop sector is not big (Figure 8).

There was a decrease in turnover in 2009 that is associated with the general economical situation in the state: a drop in crop-farming production prices and decrease of a trade turnover (Figure 8).

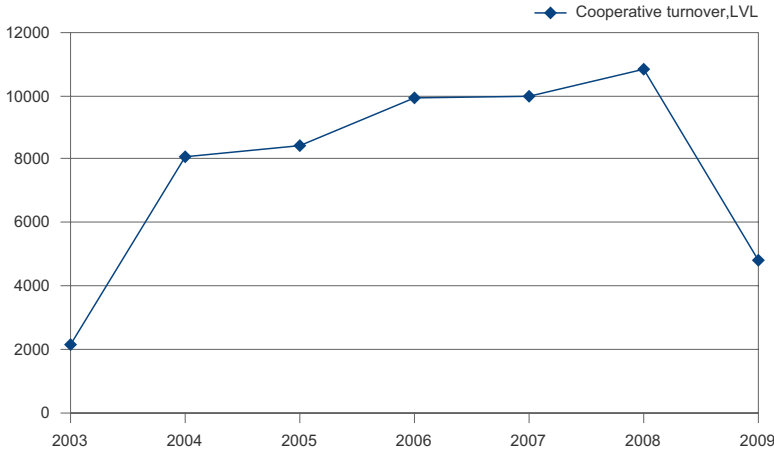


Figure 8. The turnover (LVL) of “Zaļais grozs” from 2003 until 2009. Source: The cooperative “Zaļais Grozs”, 2009.

Two years ago the cooperative started dried vegetable, fruit and berry processing (Table 1). Currently, the realized production does not fully meet the demand, so there are opportunities for growth.

Table 1. The offer of products (in tons) by the cooperative “Zaļais Grozs” by years.

Year	Potatoes	Corn	Fruit & berries	Vegetables	Jam	Grassland seeds
2007	1.83	5.41	0.32	5.81	0	
2008	12	24.56	0.21	3.27	0.24	0.08
2009	5.52	23.93	0.1	1.77	0.24	0.25

From 2004 until 2009 the number of members in the cooperative increased from 13 to 20. The goal of the cooperative is to attract more members and to increase productivity of the farms. The cooperative’s financial surpluses are small because of its size and the prices for vegetables. Members of the cooperative when selling products apply the principle of proportionality.

Remotely located farms are typical for the hilly landscapes of Vidzeme. Joint family work in these farms and the farm itself are what organic farmers rely on. Farmers, who live far away from their customers, acknowledge that the cooperation was the solution allowing them to continue production. The members of the cooperative are pleased with young people becoming involved in the cooperative. It shows an evidence of viability and further development of the cooperative.

Bee-apiary in the 'Kalna Smīdes' in the Drabeši Parish

Organic beekeeping is the sector showing increase in the last five years. The farm “Kalna Smīdes” shows an example how family beekeeping knowledge is being delivered to the next generations. The farm is currently managed by the family of Jānis and Iveta Sietiņšons. The farm has its roots as far back as 1871. In 1938, Jānis’ grandparents, Mārcis and Mīle Sietiņšons, together with their five children, managed the farmland of 95 ha. The farm already had a bee-apiary consisting of approximately 40 bee families. The Sietiņšons have always been occupied with beekeeping. Unfortunately, their life at the beautiful banks of the Amata River was short, as in 1940 they were deported to Siberia where they stayed for 50 years.

In 1990, the family came back; the farm “Kalna Smīdes 1” was established and environmentally friendly farming was launched. At the beginning, 25 beehives were prepared for honey production on 12 ha of land for nectar production and seed farming. The farm was certified as an organic farm since its very beginning and the family actively promoted environmentally friendly farming. The farm is a good example of successful farm management: the family organizes educational seminars in the farm, participates in competitions and exhibitions and has received public recognition. Currently, the number of beehives has increased to 150. The business of raising bee-queens has been launched. Twenty-three ha of land are cultivated for bee pasture by growing buckwheat, phacelia and sweet clover.

The landowners actively promote environmentally friendly farming through participation in exhibitions, fairs and other public events. Sales of organic products in foreign markets (European farmers’ markets in Germany) have been launched. Due to implementation of the EU project and to national support, the farm has become more up-to-date; a honey extractor, a packer, a device for production of creamed honey and a queen-bees incubator have been obtained. The owners established the cultivated bee pasture and started to use the mobile pavilion for diversification of honey extraction in five sites within the territory of the Gauja National Park. Such products as wild flower honey, buckwheat – sweet clover flowers honey, creamed honey, heather flower honey, comb honey, and pollen are produced at the farm.

Customers can buy these products in 30 supermarkets and 13 hypermarkets: *RIMI Latvia* (in Rīga and 14 regions); in four *Baltic Sky* supermarkets, the shopping centre *mc²*, *Ekovirtuve Ltd.*, the shop *Ekoprodukti*, the shop at the Rīga airport, “Green Market” in *Berga Bazārs* in Rīga, the online shop “Dabas dobe”.



Figure 9. The bee products of “Kalna Smīdes”. Photo: ALOA, 2008.

The farm owner highlights five reasons to choose organically produced honey:

- Bees are not fed on sugar;
- When treating and sustaining the health of bees, the means of natural origin are applied;
- Beehives and materials are of natural origin;
- Bee gardens are placed outside the intensive agriculture areas;
- The production chain has traceability and identification.

Now the farming process in “Kalna Smīdes” has stabilised. The number of beehives does not change; the landowner is currently working on the bees’ productivity and the selection of right nectar and sorts of herbs. In addition, some aspects of agro-technology are investigated and the tests are carried out. The landowner acknowledges that the previous experience and intuition is of utmost importance, which leads to important findings.

Organic farmers in the Amata municipality and the farmers around the world

In general, human impact on the environment in the countryside in Europe is increasing: intensive farming causes soil degradation, chemical pollution, erosion, water shortage, climate change, and decrease of biodiversity. Consequently, challenges in food safety emerge. European consumers’ expenditures for organic food stood at EUR 17.8 billion in 2002, while in

the year 2007 – EUR 34.5 billion, which grew faster than expenditures on conventional food. The turnover of organic food in Europe in 2007 rose by 10%, and in 2008 – by 15%. Most likely, in the coming years, the effects of economic crisis will reduce demand for organic food. However, the feedback from the International Organic Movement Federation congress participants (LBLA, February 2010) confirms that consumers show interest in organic production despite the low price and the extensive offer of conventional food.

International Federation of Organic Agriculture Movements (IFOAM) considers that organic agriculture includes all aspects of sustainable farming and it must become the norm, not an exception. There are 1 billion people suffering from famine every day. About 70% of the world's population are poor and live in rural areas. It has been observed that the quality of soil deteriorates every year. Only by changing farming custom and practices, it is possible to ensure people's long-term wellbeing (LBLA, February 2010).

The organic farmers in the Amata municipality work flexibly in different sectors. Thanks to their careful work, the biodiversity in Latvian countryside is preserved and even stimulated. However, which food to choose, organic or conventional, remains a consumer's decision.

The farmers in the Amata municipality have diversified farming practices after joining the Environmental Health Farms organization. In addition to production process, the farmers learn new farming skills regarding human health aspects, the use of medicinal plants, ecological construction, etc. Afterwards, they invite interested people and tourists on tours around the farm, thereby, performing educational work.

The organic farmers admit that the number of the produced tons and the income statements do not always provide precise data that the business is moving in the right direction. In order to secure a long-term production and life style in the countryside, more business innovations and solutions for sustainable, ecologically oriented agriculture are to be found.

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Bioloģiskā lauksaimniecība Latvijā: Amatas novada saimniecību piemērs

Kopsavilkums

Bioloģiskās lauksaimniecības aizsākumi Latvijā meklējami 20.gadsimta 90 gados. Pašlaik bioloģiski visā valstī saimnieko 4031 saimniecība. Tas aptver 5% no visām saimniecībām un šādi tiek apsaimniekoti 8% no lauksaimniecībā izmantojamās zemes. Vislielākais bioloģisko saimniecību skaits Latvijā ir Vidzemē un Latgalē, jo saimniecības ir salīdzinoši nelielas (vidēji 25 ha), saimniekot nākas daudzveidīgākos reljefa, klimatiskos, kultūrvēsturiskos apstākļos. Bioloģiskajā lauksaimniecībā ir daudznozaru saimniekošana, pārsvarā ir lopkopība un augkopība.

Amatas novada izteikti paugurainais reljefs un lielais īpaši aizsargājamo dabas teritoriju īpatsvars nosaka to, ka intensīvā lauksaimniecība šeit nav populāra, tāpēc daudzi izvēlas saimniekot bioloģiski. Amatas novadā 17% saimniecību strādā kā bioloģiskās saimniecības. Daļa šo saimniecību atrodas vai nu valsts nozīmes vai vietējas nozīmes īpaši aizsargājamās dabas teritorijās. Turklāt Vidzemes paugurainei ir raksturīga viensētu dzīvojamo māju apbūve, no kurām daudzas atrodas nomaļās vietās tālu no pagastu centriem.

Tipisks piemērs ir Zaubes pagasta bioloģiskā saimniecība “Ozoliņi”, kas atrodas nomaļā mežu ieskaudā vietā. Saimniecības bizness ietver zāļu tēju ražošanu. Saimniekojot videi draudzīgi, īpašnieki saglabā bioloģisko daudzveidību zālājos un raksturīgo Latvijas lauksaimniecības zemju ainavu, kā arī mežus.

Savukārt nelielais kooperatīvs “Zaļais grozs”, kas apvieno 18 Amatas novada bioloģiskās saimniecības, ir piemērs veiksmīgai bioloģisko lauksaimnieku sadarbībai. Zemnieki kopā īsteno ilgtspējīgas attīstības uzdevumu – videi draudzīgu saimniekošanu un bioloģiskās lauksaimniecības produkcijas ražošanu. Šie zemnieki savu produkciju (bioloģiskos dārzeņus, zaļumus, augļus, ogas un citu augkopības produkciju) liek „kopējā grozā” un piegādā patērētājiem, kuri dzīvo pilsētā. Kooperatīvs piedāvā 50 veidu augu izcelsmes produkciju. Augkopība šajās saimniecībās ir papildus nozare, taču pamatā ir lopkopība. Ar kooperatīva palīdzību zemnieki dažādo savu ražošanu, gūst vairāk ienākumu un saimnieko efektīvāk.

Bioloģiskā saimniecība “Kalna Smīdes” pārstāv progresējošu bioloģiskās ražošanas nozari – biškopību. Saimniecība atrodas skaistā vietā Amatas krastā un saimnieks Jānis Sietiņsons ir pieredzējis biškopis. Zemnieku saimniecība ražo dažāda veida medu un ziedputekšņus. Saimnieks popularizē un veicina bioloģisko saimniekošanu, piedaloties izstādēs, tirdziņos un citos sabiedriskos pasākumos. Bioloģisko produkciju

pārdod ne tikai vietējā, bet arī ārvalstu tirgū, kas nav bieža prakse Latvijas bioloģiskajiem lauksaimniekiem.

Bioloģiskie saimnieki uzskata, ka ne tikai saražotās produkcijas tonnas un ienākumu līmenis nosaka, ka uzņēmējdarbībai ir pareizais virziens. Saimniekošana ar bioloģiskās lauksaimniecības metodēm rada vairāk darba vietu laukos, taupa un saudzē resursus, saglabā ainavu un kultūrvēsturi, veido ilgtspējīgu lauksaimniecību..

The statistic frame of extensive grazing in Latvia and the recent development in the farm Brīvnieki as an example

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Abstract

Animal husbandry and, therefore, pasturing is historically traditional to the Latvian countryside. There is 1 551 000 ha of agricultural areas in Latvia, 26% of which are grasslands. Out of the area of 400000 ha of permanent meadows and pastures, 198 000 ha are used for grazing (cattle, horses, sheep and goat); and there are no registered animals in the area of 202 000 ha.

The number of herbivorous livestock has been comparatively stable in Latvia from 2005 until 2010. Overall number of livestock is estimated at ca 380 000 heads. The number of sheep and goats has increased, while the number of horses has decreased. The number of suckling cows has tripled within the last 6 years. The number of cattle herds has decreased, while the number of animals per herd has increased.

There are several support schemes available that can be used for extensive grazing. A subsidy payment (single area payment) is available for any agricultural land while an additional payment for farming in less favourable areas is available in municipalities that have been recognised as being “less favorable for farming”.

One of the activities of the sub-measure “Maintaining Biodiversity in Grasslands” of the Agro-environment measure of the Rural Development Programme 2007 – 2013 is specially designed to support extensive grazing. In 2005 there were 19346 ha of biologically valuable grasslands. In 2010 there were 66 655 ha of biologically valuable grasslands eligible for this support (Rural Support Service data).

Combining these funds allow farming that is sustainable both financially and also from environmental perspective. The current country statistic shows that there are pre-conditions for the extensive grazing to grow.

The farm Brīvnieki, located in Vidzeme, the Priekuļi region, the Veselava local municipality engaged in cattle (beef) and sheep farming. Cattle and sheep are grazing in all seasons. Animals graze within a mobile fence; the area of permanent meadows and pastures are 80 – 100 ha per year. There are 4 ha of biologically valuable grasslands, the part of which is located in the Gauja National Park. Grasslands are grazed by cattle herd in which most of animals are beef crossbreeds and Limousine breed. The number of sheep grows slowly. The sheep serve as a grass mower and as a landscape feature. Due to grazing, the pastures stay open, the biodiversity of grasslands improves. There are more legumes, e.g. clover, which is a manifold plant typical for semi-natural grasslands. The farm collaborates with the farmers' cooperatives when marketing and selling beef. There are some advantages for the cooperative members. The farmers look for new, diverse farming methods, therefore, they get involved into different projects. The farm Brīvnieki sustains and preserves the values of the local rural environment.

Grazing and herds in Latvia: a general overview

Animal husbandry and, therefore, pasturing is historically traditional in the Latvian countryside. According to the data of Rural Support Service (RSS), currently there are 1 551 000 ha of declared agricultural areas in Latvia. Of this, 400 000 ha or 26% are grasslands. Most grasslands are located in the regions of North Vidzeme, Latgale and North Kurzeme.

According to the data from the applications for the area payments submitted by farmers to Rural Support Service, permanent meadows and pastures with an area of 400000 ha have been declared by 48168 farmers in 2009. Out of that area of 198000 ha are in the ownership of 22602 farmers and are used for herbivore grazing (cattle, horses, sheep, goat), but in the area of 202000 ha there were no registered animals.

According to the Agriculture Data Centre (ADC) data, the overall number of herbivorous livestock has been comparatively stable with no significant fluctuations in Latvia from 2005 till 2010. However, numbers in some of the categories changed considerably. Thus the number of sheep increased from 36190 to 70658, as well as the number of goats – from 8786 to 13247, but the number of horses within the same period decreased from 15250 to 12616 (see Table 1).

There have been changes in the distribution of livestock in herds during the years from 2005 to 2010. The number of cattle herds has decreased from 67 482 to 39 956 (Figure 1), while the number of the animals per herd in some positions has increased. Such trend can be explained by overall decrease in number of smaller farms and milk producers (Source: The Agriculture Data Centre).

Table 1. Dynamics of numbers of cattle and holdings.

Year	Cattle	Sheep	Goat	Horse
2005	371 234	36 190	8 786	15 250
2006	390 660	45 496	10 190	14 701
2007	398 836	55 187	11 495	14 040
2008	390 756	62 507	12 416	13 446
2009	380 815	72 936	13 487	12 735
2010	378 213	70 658	13 247	12 616

Source: The Agriculture Data Centre (ADC), 2010.

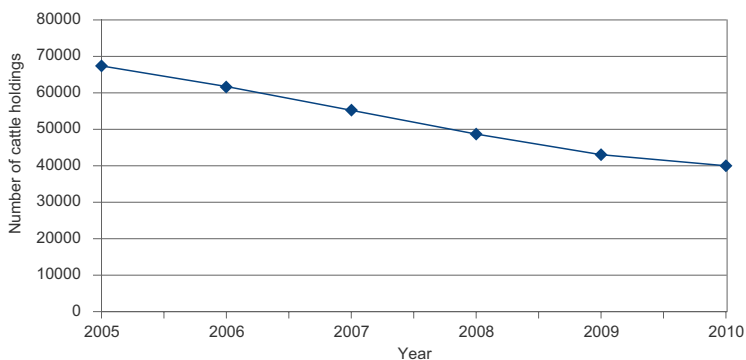


Figure 1. Number of farms with registered cattle herds. Source: The Agriculture Data Centre (ADC), 2005- 2010.

Due to the increased interest from citizens regarding non-traditional agricultural activities, the number of registered game and non-game wild animal (elk, deer, moufflons, year-round grazing horses) herds have increased from 15 to 77 during the last 6 years (Figure 2).

Due to the changes in the economic situation in the country, many farmers have chosen to move from milk production to suckling cow and feedlot stock farming. For the same period, the number of suckling cows has tripled (Table 2).

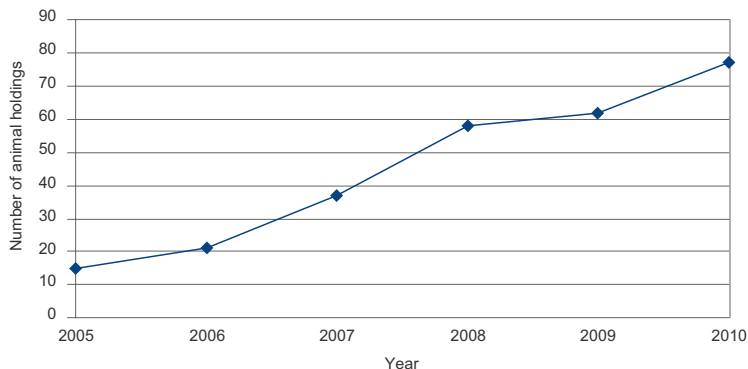


Figure 2. Dynamics of registered wild animal holdings. Source: The Agriculture Data Centre (ADC), 2005-2010.

Table 2. Number of suckling cows and feedlot stock.

Year	Suckling cow	Feedlot stock
2005	5057	77
2006	5672	95
2007	8395	82
2008	10841	70
2009	12690	55
2010	15436	107

Source: The Agriculture Data Centre (ADC), 2005- 2010.

Every year the farmers may submit applications for the subsidy payment, if the farming activities and the land management quality comply with the legislation and the environmental requirements (Anon. 2009; Anon. 2007b.).

In a large part of the country, farmers may apply for the support for pasturing the herds in pastures located in less favourable areas². To be eligible, the pasture has to be located in a municipality that has been recognized as being “less favorable for farming” and the density of registered animals on registered permanent grasslands should be at least

² Payments to farmers in areas with handicaps, other than mountain areas.

0.2 livestock units per hectare (Anon. 2007a.). In the whole country, there are 39000 ha of grasslands with less than 0.2 registered livestock units per ha.

This promotes pasturing in territories that are not suitable for intensive agriculture, such as hill slopes, wet riverbanks, etc. and without this support most likely would be abandoned.

If grasslands in a farm have been certified as biologically valuable, farmers can apply for the financial support within the sub-measure “Maintaining Biodiversity in Grasslands” of the Agro-environment measure of the Rural Development Programme 2007 – 2013. The objective of this sub-measure is to encourage the conservation of grasslands rich in biodiversity and to maintain wild plants, wild animals, bird populations, and landscapes within that part of the utilized agricultural land, which is covered by biodiversity rich grassland. Thus, biodiversity of the grasslands is conserved, as well as the characteristics of the rural landscape.

The biologically valuable grasslands are being identified by trained botany and ornithology experts and in the period of 2002 – 2008 a total of 66 655 ha have been recognized as eligible for this scheme. However, the process is not finished yet and new inventories may increase this area. The experts estimate that biologically valuable grasslands in Latvia may exceed 100000 ha (Lārmanis 2008).

For these grasslands certain requirements have to be met. The financial support to applicant may be granted, if:

- a farmer is a private or a legal person engaged in agricultural activities;
- at least 1 ha of the cultivated agricultural farmland is composed of fields not smaller than 0.3 ha;
- good farming practices or cross-compliance obligations (Anon. 2010.) are being applied throughout a farm;
- a farmer undertakes voluntary agro-environmental commitments for the respective area/meters/animals for the period of five years including the first year of payment approval.

The support in this sub-measure is provided for the following activities:

- extensive grazing. Biologically valuable grassland has to be extensively grazed with 0.4 to 0.9 livestock extensive grazing. Biologically valuable grassland has to be extensively grazed with 0.4 to 0.9 livestock units per 1 ha of biologically valuable grassland. Pasturing intensity must be chosen within the permitted interval and according to a grassland type, location, climate and other conditions to prevent grassland over-pasturing. The number of the herbivorous animals is set by the Regulations of the Cabinet of Ministers (Anon. 2010.). Measurements are calculated in the

livestock units where one cow corresponds to one livestock unit, a sheep and a goat – to 0.1 livestock unit, a horse – to 0.8 livestock unit.

- late mowing of grasslands. Mowing has to be performed between August 1 and September 15, and the mown grass has to be collected and removed from a field, or chopped³.

An example of extensive grazing in Vidzeme

The farm Brīvnieki is located 15 km from old town Cēsis in the nice hilly area in Vidzeme, the Priekule region, the Veselava local municipality. The farm was established in 1990, when the owners Andris and Dzintra Actiņi moved from Riga to the land property once owned by Andris' grandfather. In the beginning, there were only 25 ha of land, which by now have grown to 260 ha, including 160 ha of agricultural lands. The landscape is rather hilly; the soils are medium rich. The owners of the farm prefer organic farming methods. They have been practicing this type of farming since 2002.

The part of agricultural lands – 22 ha – is located in the Gauja National Park; these are pastures and permanent grasslands. There are 153 ha of grasslands. 50 ha of grasslands are improved, sown by red clover, ryegrass, red fescue and timothy. Cereals (oats, barley, buckwheat) are grown for owners' and herd's needs in area of the 53 ha.

In the Brīvnieki farm, the basic business from the very beginning was cattle breeding. It started from only one horse and one goat, but, by the year 2003, the number increased, and there were 19 dairy cows in the farm. The milking process required more and more investments. Moreover, due to depopulation of rural areas it became problematic to recruit milkers and workers. The farm's owners gradually introduced beef-cattle breed into their herds, and since 2004, the dairy herd has been replaced with the beef-cattle herd.

The herd is grazing on pastures in all seasons. The cattle feed on browse and branches in spring, autumn and winter. In addition, they are fed with hay. In wintertime, the herd gets grain, bran, and chaff. Still the animals rely more on themselves regarding food.

Dynamics of the change is shown in Table 3. During the last winter, the owner decreased the number of cows due to unfavorable climate and keeping conditions.

³ Since 2010, management requirements in this sub-measure have been changed and now these grasslands shall be mowed within the period from August 15 until September 15.

Table 3. Changes in the composition of herds in the farm “Brīvnieki” from December 2004 to January 2010.

Year	Calf(male)	Calf(female)	Cow	Bull	Total
2004	9	10	15	0	34
2005	19	17	16	1	53
2006	14	19	22	1	56
2007	4	20	24	1	49
2008	15	28	33	2	78
2009	17	38	40	2	97
2010	21	28	30	2	81

Source: The Agriculture Data Centre (ADC), 2004- 2010.

At the beginning, there were five cows of beef crossbreed. The farmer is forming the beef herd by crossbreeding. The owner prefers extensive beef breeds, such as Hereford, Sharole, Aberdinangus, and Limousine. These animals are able to produce high quality beef meat. The data is collected regularly to monitor the growth of the herd.

The owner obtained the first Limousine breed bull in 2005. In 2009 the Limousine breed bull from Belgium, A Salera breed bull was obtained in 2008. Advantage of the Salera breed is the small size of calves during their birth, which does not require a special veterinary service. This fact is very important for the herd being kept on pastures year-round.

At present, there are 81 animals in the herd. The breed dynamics are shown in Table 4.

Table 4. Dynamics of the beef breeds in the farm Brīvnieki.

Year	Sharole	Hereford	Limousine	Aberdinangus	Crossbreed
2004	6	7	5	3	13
2005	5	7	4	3	34
2006	3	5	5	4	39
2007	4	6	6	4	29
2008	5	6	11	3	53
2009	4	5	14	2	72
2010	4	5	13	2	57

Source: The Agriculture Data Centre (ADC), 2003- 2010.

There are two bulls now in the herd, so it has been divided in two groups. One group is with the Limousine breed bull, the other – with the Salera breed bull. The mobile fence with the electrical battery, covering the area of 20 ha, is currently used for cattle grazing. In near future a permanent fence will be built to cover 50 ha of grasslands. During grazing, animals can freely choose a shelter. They do so in hot summer days as well as in winter, when it is very windy. Cattle were supplied *ad libitum* with water and salt with microelements.

The farmers cooperate for the beef marketing. The farm Brīvnieki is a member of beef cooperative “*Zaubes kooperatīvs*”. The bulls from the herd are used for beef production in the cooperative; the heifer stay in herd for reproduction. Young stock (from the age of 5 months) is exported, mainly to Germany. It is more profitable to become a member of a cooperative, as there are better conditions and higher purchase prices for the members.

Sheep farming in the farm Brīvnieki has been developed since 2007. It began with a flock of five sheep. There are 47 animals of Latvian dark-head sheep now, including 23 sheep females. After shearing the sheep, the fleece is stored. The wool market is very limited, mainly for local craftsmen and for household needs. Customers are more interested in lamb; however, the herd must still grow.

According to the farmer a small sheep herd is not profitable. However, they are considered to be an attractive landscape feature and a “good grass cutting device” in the hilly surroundings. The sheep grazing area covers 30 ha of grasslands.

The field management: grasslands and meadows

Extensive grazing in Brīvnieki has already lasted for six seasons. There are some results that were recorded by the farmer: due to grazing the pastures become more open, the landscape improves, the shrubs disappear from the pastures, and their botanical diversity increases. There is more clover *Trifolium sp.* in sward. Many meadow plants are growing, such as *Ranunculus auricomus*, *Geranium sanguineum*, *Thymus serpyllum*, *Viscaria vulgaris*; *Dactylorhiza sp.*, *Plantago media*, *Galium boreale* *Briza media*, *Campanula rotundifolia*, *Polygala*, in wet places – *Filipendula vulgaris*, *Cardamine pratensis*. The plant species richness has increased while the number of broad-leaved plant species is declining in the meadows.

There are 4 ha of pastures certified as biologically valuable grasslands. They are used for extensive pasturing. Pasturing intensity is chosen within the permitted interval and according to the type and location of grassland, weather and other conditions, in order to prevent overgrazing of the grasslands.

Looking for perspectives

As economic changes affect the farm, the owners are constantly looking for new methods to diversify farming; thus, they get involved in different projects.

The farmers participate in the EU funded projects as European Fisheries Fund that aims to raise standards of water supply for cattle in pastures, too. The farmers have been participating in the state programme “Support to the producers of the organic products”. Farm Brīvnieki owner is active to prepare new projects. Within the programme “Investigation for aqua cultural farms”, the farms will receive support to renovate two ponds - the Small Zunda pond and Small Lubāna pond.

To attract tourists and raise public awareness, the farmers are developing a nature trail through the forests and grasslands to demonstrate local natural values, diversity of plants, trees and animals. The project for the trail’s infrastructure improvement has been prepared in cooperation with a local lifelong educational non-governmental organization.

The farm is developing slowly. Currently only the landowner Andris, his wife Dzintra and one laborer are working in the farm. Seasonally, a few additional laborers are hired for work.

35% of income come from production and 65% – from different kinds of subsidies, projects, and support payments. The owner is aware that beef cattle and grazing benefit from natural renewable resources (grass in pastures, sun energy, and water from rain). The society gets the required production, the surroundings are spruce, the rural landscape is preserved, and the farmers maintain sustainability of business.

The overall country data analysed in context of the farm Brīvnieki data allow drawing some general conclusions on current situation of extensive grazing in Latvia. One of them is that during the first decade of the 21st century there has been a general improvement in livestock farming and recovery of grazing in Latvia. Another conclusion is that there are still a lot of grasslands that can be used to expand extensive grazing and therefore secure both farm economical viability and conservation of biodiversity in grasslands. Existing legislation and availability of different support schemes (e.g. under Rural Development Programme) have a positive effect on further development of extensive grazing. However, low price and instability in meat market can be mentioned as obstacles. In order to improve farms economic situation and to ensure nature-friendly management of grasslands for long-time, it is necessary to diversify farms economy.

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Ekstensīvā ganīšana Latvijā un šī brīža attīstības tendences saimniecības „Brīvnieki” piemērā

Kopsavilkums

Latvijas laukos izsenis lopkopība un dzīvnieku ganīšana zālajos ir bijusi tradicionāla nodarbe. Latvijā ir 1 551 000 ha lauksaimniecībā izmantojamās zemes, no kuras pastāvīgās pļavas, ganības un zālāji aizņem 26 %. No kopējās 400 000 ha zālāju platībām 198 000 ha saimniecībās ir reģistrēti zālēdāji dzīvnieki (liellopi, zirgi, aitas, kazas), taču 202 000 ha pļavu platībās nav reģistrētu dzīvnieku.

Lauksaimniecības dzīvnieku zālēdāju kopumā skaits valstī no 2005.-2010.gadam bijis salīdzinoši stabils; liellopi ap 380 tūkstošiem; periodā ir pieaudzis aitu un kazu skaits, samazinājies zirgu skaits. Samazinājies arī liellopu ganāmpulku skaits, taču kopumā ganāmpulki kļuvuši lielāki. Zidītājgovju skaits sešu gadu laikā gandrīz trīskāršojies.

Ekstensīvas ganīšanas īstenotājiem ir iespēja pieteikties atbalsta maksājumiem. Tos var saņemt vienotā platībmaksājuma pieteicēji; ganāmpulku saimnieki, kuru saimniecības atrodas mazāk labvēlīgo apvidus teritorijās. Lauku attīstības programmas 2007-2013 Agrovīdes apakšpasākumā bioloģiski vērtīgu zālāju daudzveidības saglabāšana, ir noteikts īpašs atbalsts ekstensīvai ganīšanai.

Atbilstoši saimniekojot, tiek saglabāta pļavu zālāju bioloģiskā sugu daudzveidība – gan savvaļas flora, gan fauna, gan veidojas raksturīgā lauku ainava.

Zemnieku saimniecībā “Brīvnieki” Priekuļu novada Veselavas pagastā nodarbojas ar gaļas liellopu audzēšanu, aitikopību. Dzīvnieki visu gadu uzturas ganībās. Saimnieko, lietojot bioloģiskās lauksaimniecības metodes. Liellopu skaits kopš 2004. gada pieaudzis no 30 līdz 90 dzīvniekiem.

Ganāmpulks atrodas pārraudzībā. Saimniecība strādā, gūstot jaunu pieredzi, īstenojot projektus, meklējot veiksmīgākos risinājumus izaugsmei.

Dzīvnieku ganīšanai pārvietojamos aplokos izmanto no 80 līdz 100 ha, tās ir pastāvīgās pļavas un ganības. Ganību teritorijā atrodas 4 ha bioloģiski vērtīgo zālāju, daļa platību iekļaujas Gaujas Nacionālā parka teritorijā. Esošais liellopu ganāmpulks veidots no piena lopu ganāmpulka, krustojot dzīvniekus un iepērkot gaļas šķirņu dzīvniekus. Pašlaik pārsvarā ir gaļas šķirņu liellopu krustojumi. Aitikopība attīstās pamazām. Šobrīd aitas izmanto teritoriju apganīšanai, kā ainavas elementu. Zālēdājiem pastāvīgi ganoties, ganībās izzūd krūmu atvases un mainās ganību botāniskais sastāvs. Zelmenī ieviešas vairāk tauriņziežu, sastopami savvaļas pļavām raksturīgie augi. Saimniecība sadarbojas ar kooperatīviem. Liellopus realizē Zaubes kooperatīvā. Saimniekojot “Brīvniekos”, tiek uzturēta un saglabāta lauku vide un ainava, godātas Latvijas lauku vērtības.

Year-round grazing as a tool for rural landscape management and tourism development: two examples from Latvia

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Abstract

Since 1999, Ark Foundation (hereafter – Ark) is working in Latvia to promote natural grazing as a key process for maintaining meadow habitats. When this project started, free ranging herds of cattle and horses were brought from The Netherlands. At the end of year 2010, Ark is supporting natural grazing in 25 locations throughout the whole country. C.a.560 heads of year-round grazing cattle and horses are now grazing on approximately 4000 ha of grasslands. In this article, two examples are given where natural grazing has lead to more nature and income thorough tourism. Vītiņu meadows have species-rich grasslands with rapidly increasing thick layers of dead grass and bush density. The introduction of large grazers like year-round grazing cattle and horses restored the grasslands' mosaic structure, reduced layers of dead grass and stopped spread of bushes. The grazing ensured preservation of valuable grassland ecosystem with several species endangered on national and international level.

Jaun-Ieviņas is a private farm owning the herd of year-round horses supplied by Ark. Horses helped to make publicity for farm and consequentially, attracted tourists. After eight years of natural grazing farm welcomes 1500 visitors yearly. Visitors also can stay in farm's guesthouse and in small shop buy farmer's self-made products. Now tourism is a major source of income for farm. Besides economical benefits, grazing by horses also secured increase of biodiversity in grasslands – during eight years of natural grazing the area of Biologically Valuable Grasslands increased from one hectare in 2002 to 19.5 ha in 2010.

Background

Ark Foundation is an innovative non-governmental nature organisation with a wish to show how societal changes lead to new chances for nature and the landscape. Ark encourages people to accept philosophy that more space for nature will improve the quality of life as for man, so as for nature.

Unaltered nature is essential for plant and animal preservation as well as for the economy and well-being of people. Unaltered and dynamic nature areas where natural processes occur: this is what Ark stands for. To restore natural processes in areas where they have been affected by human activities, Ark became specialized on themes like river renaturalization and natural grazing.

Millions of people live and work or recreate in and around nature areas and are aware of the economic and societal value of nature. Ark stands for the development of spontaneous, accessible nature in the conviction that this will enhance the quality of life for many of us, especially for those living close to the urban areas.

Natural grazing in Latvia

Like in other European countries, Latvian semi natural grasslands are in need of grazers. After the collapse of the Soviet Union, many extensive farmlands become unmanaged, were abandoned and became overgrown by trees and shrubs. In 1999, Ark, on the invitation of the PDF (WWF's partner-organization in Latvia), started the first natural grazing project on the shores of the Lake Pape. In 2005, the Dutch National Postcode Lottery granted Ark the project "Letlands". About one million Euros were given to enable Ark to give a strong impulse to natural grazing in combination with ecotourism in Latvia. Free ranging herds of cattle and horses were brought over from The Netherlands. These herds are well adapted to survive also in the northeastern European conditions and are ready to resume the ecological function that they have had for thousands of years. Another significant effect is that the herds seem to attract tourists, which can give a boost to the economy of the Latvian rural area. In 2010, natural grazing occurred in 25 locations throughout the country on around 4000 ha of natural meadows. In this article, two examples are given where grazing have brought changes to nature and people around it.

Vītiņu meadows

The eastern shores of the former lagoon of Lake Liepāja have long been recognized as botanically valuable, but in the late 90-ies, they were rapidly

losing their value. The meadows had not been grazed for a long time, bush growth was taking over, and thick layers of dead grass were suffocating the once rich vegetation. In 2002, the municipality of Grobiņa and Ark started the grazing project on the Vītiņu meadows: first, with cattle and, second, in year 2004 a herd of horses was introduced in the area. By slow grazing, the rich vegetation is recovering to its historical state of biodiversity: the first sign was the increase of Bird's-eye Primrose *Primula farinosa*. Year after year, the area slowly has become more cleaned up and the vegetation has been recovering. The cattle opened the reed fields and created many openings in the previously thick line of reed along shoreline of the lake. Consequently, this attracts wading birds that look for food in the soft broken soil. After the horses have been introduced, the layers of old grass are quickly disappearing, giving place to many smaller plant species. During the winter season, huge amounts of bark and small branches are browsed away opening up the dense blocks of bushes. In early spring the meadows are now grazed to the maximum. This is exactly what is necessary to prevent overgrowth and to preserve the richness of species in the Vītiņu floodplain meadows.



Figure 1. The browsing of branches and bark in winter is a very essential process for maintaining the open structure of the area. Photo: Jan van der Veen.

Jaun-Ieviņas

Jaun-Ieviņas is a farm in the municipality of Rauna, where the Rudzītis family was the first private initiative in Latvia to start a year-round grazing project. The Rudzītis planned to build a guesthouse and wanted to add more attraction to that by highlighting the natural (ecological) style of their business. Ark and the Rudzītis decided to develop a way to introduce nature management as a logical and economically attractive combination for their business. In the summer of 2002, a herd of seven Konik horses arrived to the estate Jaun-Ieviņas. This rather unusual step for a private enterprise attracted attention of the media and gained publicity in the national news. As a result, tourists started to come already in the first year reaching about 700 people. Mrs. Rudzīte has prepared exciting stories about her herds, and due to that, people did not lose their interest and kept coming. During the following year (2003), the number of visitors reached a thousand. Nowadays, the number of tourists has stabilized at around 2000 per year. The biggest part of the farms' income now comes from tourists: the guesthouse, from selling the farms' products and organizing excursions. Moreover, due to natural grazing, the area of certified Biologically Valuable Grasslands has increased from one ha in 2002 to 19.5 ha in 2009.

Why natural grazing? Co-evolution of plants and animals

Originally, tens of thousands of plant and animal species belong to the varied landscapes of Europe. Much of this rich variety is the result of grazing, as large herbivores are fundamental to structure-rich grasslands, rough herbage and transition areas of brushwood and forests. Nowadays, almost all naturally grazed landscapes have disappeared. Many large herbivores have been extirpated, domesticated, or driven away from their historical range. The ecological communities that established themselves due to natural grazing have originally created the current landscape that includes pastures and other grasslands as well as the production forests. However, the ecological process, related to the food and migration behavior of the large grazers has been lost.

Large grazers belong to the European nature. A large part of indigenous flora and fauna owes its existence to these herbivores. Due to this, Ark is dedicated to returning these animals back in the Latvian landscape and has already reintroduced herds of year-round grazing cattle and horses in 25 different places throughout Latvia. In 2010, a total of 227 cattle and 326 horses were grazing on ca 4000 ha of restored grasslands.

Even though the concept of natural grazing seems very new, people from all over the country generally supported the idea. Society took this as a very understandable and natural concept for managing natural meadows. Unlike in the western part of Europe, the old pastoral landscapes with

domestic grazers and herdsmen have only relatively recently disappeared from the countryside, and there are still people who have experienced it so they have their own memories. Thus, the idea of returning large grazers as a part of the Latvian nature was accepted relatively easy by the Latvian public. Gradually year-round grazing cattle herds spread over the Latvian countryside, starting with one location at Lake Pape in 1999. In 2002 additional grazing areas established: two – near the coastline at Liepāja and at Engure and two – also in the north near Rauna and Alūksne where winters are much harsher.



Figure 2. Grazed and abandoned grasslands. Photo: Jan van der Veen.

Step by step

The first project, where grazers were brought over from the Netherlands to Latvia, was at Lake Pape in the south west of Latvia. Here the climate is relatively mild. Under the influence of the Baltic Sea, the winters are warmer and the snow coverage normally comes and goes in small layers that melt away again when the weather changes. The project provides an opportunity to experience how animals cope with the climatic circumstances that are still much harder than they experienced in the Netherlands. To do that, we started to bring animals to the north and east of Latvia where the climate is much more continental. The winters mostly are snowy, and the snow layer of more than 50 cm in late winter is common. Under such circumstances, the main food basis (grass) becomes unreachable for the grazers and, even though animals naturally start feeding on branches and bark, additional hay feeding is usually necessary.

In this article, two examples where grazing changed the local environment as well as the people around it are described in detail.

Vītiņu meadows

The background information of the project in Vītiņu meadows:

- Owner – Grobiņa municipality.
- Partners – Grobiņa municipality, Lake Liepāja Society, National Postcode Lottery, Ark.
- Management – Valdis Ķede (private farmer) in consultation with Ark.
- Area – 150 ha, grazed by 31 Koniks and 22 cattle (number of animals as on January 1, 2010).
- Status of the territory – Natura 2000.

Vītiņu meadows are characterized by high biodiversity. During Soviet times this area already had a status of protected territory due to its floristic values. Nowadays, it is a Natura 2000 site. Species such as *Stachys officinalis*, *Inula salicina*, *Sanguisorba officinalis* and *Gladiolus imbricatus* grow in the meadows. The meadows also have rich fauna of invertebrates and high density of amphibians. These natural grasslands are located just a few kilometers from Liepāja, the third largest city of Latvia. On the other side of the lake, one can see the silhouette of the Liepāja old city center.

Vītiņu meadows have never been drained or used for any form of modern intensive agriculture, so the vegetation has been preserved in its almost original state. Being a part of the lagoon-like lake Liepāja hydrological system, the area gets flooded regularly – not only by freshwater, but also by salty water, which is pushed into the lake from the sea during every storm coming from the west. This is unique for Latvia. Additionally, there are groundwater streams flowing out on surface in the area; also, because of a clay (dolomite) soil layer, rainwater is collected on the lower parts of the area, forming shallow temporary pools that slowly dry out in summer. All these abiotic conditions influence a variety of biotopes, each of them containing characteristic vegetation, amphibians, invertebrates and other taxons. More than 100 bird species have been listed as nesting in the area.

Vascular plants

There are species typical for grasslands influenced by brackish water, for instance *Triglochin palustris* and *Tripolium vulgare*. There are some plant species typical for clean mesotrophic water, like *Iris sibirica* and *Schorzoneria humilis*. There are also eight Orchid species: among them *Dactylorhiza incarnata*, *Orchis mascula*, *Gymnadenia conopsea* and

Platanthera bifolia, species like *Betonica officinalis*, *Stachys officinalis* and *Sanguisorba officinalis* that are very abundant. A rare eye catcher is *Pinguicula vulgaris*.

Butterflies

Vītiņu meadows hold vital populations of four species of day butterflies listed in Annex II of Habitats Directive (Anon. 1992): *Lycaena dispar*, *Coenonympha hero*, *Euphydryas aurinia* and *Maculinea teleius*. All four species are abundant here, for *Maculinea teleius*, this is the only registered place in the Baltic countries where it occurs.

Snails

In Vītiņu meadows, live three protected species of Vertiginidae, namely *Vertigo geyeri*, *Vertigo genesii* and *Vertigo angustior*. Vītiņu meadows are the only place in Latvia where all three species have been found together. The biggest population is of *Vertigo angustior*, exceeding the number of 100 million individuals.

Grazers reveal the beauty of Vītiņu meadows

The first ideas about the management of Vītiņu meadows came from the Grobiņa municipality in the year 2000. As Ark and WWF, Latvia, had successfully started natural grazing with Konik horses the year before on the shores of Lake Pape, the municipality decided that this could be a good method to save and restore the rich biodiversity in the Vītiņu meadows as well.

The meadows had already been abandoned for 15 years by that time, and they were rapidly losing their value. Thick layers of dead grass covered most of the area and bush growth increased rapidly, covering already about ¼ of the area. Its unique vegetation was in decline, and several of the endangered species were getting more and more rare or even had gone extinct locally. After the traditional summer grazing and hay cutting had disappeared from the area, the species' diversity of these grasslands started diminishing because of the accumulation of old grass and expansion of bushes. Grazing by cattle and horses had always played an important role in this area, for hundreds of years people had brought their cattle to graze Vītiņu meadows' floodplains, and even earlier, large herbivores such as aurochs possibly have been grazing here, for it is known, that they are specially attracted to salt-water floodplains. (van Vuure 2003) On floodplain meadows, grazing is one of the most influential natural processes and

essential for its existence. Thus, reestablishment of grazing with cattle and horses seemed to be good solution for restoration of open landscape and habitats in Vītiņu meadows. Still, there were some hesitations, because the climate conditions in this area can be severe: autumn floods can almost fully cover the area and, during winter, snow and ice can make food resources almost unavailable.

The decision in favor of year-round grazing was made based on the assumption that under close supervision it is possible to overcome most of the problems. The plan was to start with a herd of cattle, because they are better than horses adapted to wet marshy conditions. The municipality found funds for fencing of 100 ha of the area, and Ark provided a herd of cattle. In the summer of 2002, the fence was ready and, on September 16, the first eight cattle were released in the area.

Animals used for grazing

The herds of cattle living in Vītiņu meadows are part of a dedomestication program carried out by Ark. By crossbreeding the Latvian brown with old self-supporting breeds, like Hungarian grey and Scottish Highlander, the type of cattle will be selected that is strong enough to stay on pastures throughout the year. A great variety of genetic qualities is brought together in this herd. The next generations will show which crossbreeds are best adapted for year-round grazing.

The horses introduced here are Konik polski – the breed with reconstructed phenotype of the Tarpan, now extinct, and that is the most likely ancestor of the domestic horse. Their shaped and well-adapted body makes them well equipped to live under natural conditions.

The cattle seemed to cope very well with the natural circumstances of the area; and, in 2004, it was decided to start grazing also with horses. In August, a herd of 11 Konik horses was introduced in Vītiņu meadows. The animals bred and their numbers increased so quickly, that, in 2006, there were already more than 40 animals grazing in the area. The herds in the Vītiņu meadows are very shy, probably, because of the remoteness of the area and the small number of visitors that they actually encounter. The cattle can hardly be seen, especially in summer. They live a hidden life in the brushwood or on the reed-fringed shores of the lake.

Number of animals that can live in this area depends on the amount of food that the area can provide in winter. In summer, vegetation is growing much faster than the herds can eat it, the grazing activities are then shaping the landscape into a mosaic with short grazed patches, blooming tall vegetation, bush- and tree- formations. During autumn and winter, the grazers eat most of the vegetation that was left over in summer. Grazers like horses and cattle are capable of digesting very hard vegetation; therefore, even a considerable amount of small branches and bark from trees is eaten.

Thus, winter grazing is an essential process in maintaining the semi-open structure of the area.

During the winter of 2006, the area was heavily grazed. This cleaning provided suitable conditions for the renewal of the vegetation that previously has been suppressed under layers of old grass. However, overgrazing also was a signal that the size of the herd reached its maximum. To avoid starvation of animals next winter, the herd was reduced and the area of available pasture increased by adding additional 50 ha of fenced area. The work was carried out by Ark with the help from National Postcode Lottery that provided the funds for the fencing material. In autumn 2006 the enlargement of the grazing area was completed.

In spring 2010, the herd included 31 horses and 22 cows, and foals and calves are born every week, so this number is increasing.

Restoration of grazed habitats

Already after the first year of grazing, in 2003, there were some results achieved. The structure of the animals' path appeared in the fenced area, some places were cleaned from old vegetation, and bark and small branches of Willow *Salix sp.* bushes were eaten. Along the path of the cattle, *Primula farinosa* begun to grow again in places, where the hooves broke and open the soil.

Year after year, the area slowly is cleaning up. The cattle opened the reed fields and created many openings in the previously thick line of reed alongside the shores of the lake. It attracts wading birds, which are looking for food in the soft, broken soil. After the horses were introduced, the layer of old grass is quickly disappearing and giving space to many smaller plant species like *Schorzoneria humilis* and *Primula farinose*. The intensity of cattle grazing is unevenly distributed during different seasons: during summer, the cattle eat more reeds, and during winter, more bushes. During the winter season, considerable amounts of bark and small branches are browsed away making openings in dense blocks of bushes. Thus a diverse and constantly shifting mosaic of the landscape is created. Now, every year during early spring, Vītiņū meadows are grazed to the maximum. This is exactly what is needed to prevent overgrowing and to preserve the richness of species in Vītiņū floodplain meadows.

Management and sources of income

Grobiņa municipality contracted a private farmer for the daily management of the herds. The farmer Valdis Ķede is not directly paid by the municipality, but is renting the area for a symbolic price and is, therefore, able to apply for subsidies available under Rural Development Programme (Anon.

2007). In addition, he yearly takes out the surplus of cattle and horses to sell them for slaughter. As his farm is a certified organic farm, the meat can be sold as ecological and, therefore, has a higher price. Currently, the meat is sold directly to slowly increasing number of customers. The taste and structure of the meat is more like game, and most people buy it because of these qualities.

The location close to the city Liepāja has additional advantages for attracting tourists to the area. The area is open for public, the wild living herds of horses and cattle attract many tourists. To make the area even more attractive, the municipality organized a picnic place together with the information stands and built a watching tower in the center of the grazing area. Valdis Ķede organizes excursions in the grazing area, which provides additional income for the farm.

Education

In the area of Vītiņu meadows, well-trained teachers every year take local primary school children for adventurous field lesson in the grazed areas. During these lessons, every child gets his own assignment book to keep. There is a lot of equipment for the children, like binoculars, loops, nets, etc., to work with. Teaching and teaching materials are provided by Ark. Lessons are based on the materials similar as used by Ark in the Netherlands. Unfortunately, due to the current economic conditions, it is getting harder for schools to organize transportation to the area.

Jaun-Ieviņas

The background information of the project in Jaun-Ieviņas:

- Owner – Family Rudzītis.
- Partners – Family Rudzītis, National Postcode Lottery, Ark.
- Management – Family Rudzītis (private farmer) in consultation with Ark.
- Area – 50 hectares, grazed by 21 Koniks and 4 cattle (number of animals on January 1, 2010).
- Status of the territory – EU Eco-label, 19.5 ha. of the grazing area is certified as “*biologically valuable grassland*”.

Jaun-Ieviņas is a farm in the Rauna municipality (northeast of Latvia), where the family Rudzītis was the first private initiative taker in Latvia, who became involved in year-round grazing project. Besides their affection to nature and, especially, to wild horses, the family understood, that having a natural area with herds of horses and cattle is a good way to attract tourists to their estate. The Rudzītis planned to build a guest house and wanted to

add to its attraction something that would eventually tell about the natural (ecological) style of their business. Inspired by the grazing project with Konik horses at Lake Pape, in the summer of 2000, they contacted Ark to consult about the possibilities for their private business to work with a similar concept. For Ark this seemed to be a good opportunity to develop a way of organizing nature management as a logical and economically attractive addition for a business, like the guesthouse of the family Rudzītis.

Ark and the Rudzītis family started the grazing project; it was agreed that after 5 years half of the herd would be returned to a herd fund (set up by Ark). From that fund, animals could be given repeatedly for similar purposes to other people. In the summer of 2002, a herd of seven Konik horses from the Netherlands arrived on the estate of Jaun-Ieviņas. This rather unusual step for a private enterprise attracted the attention of the media and the farm Jaun-Ieviņas gained publicity in the national news. Due to this, tourists started to come, and already in the first summer about 700 people visited the farm. Mrs. Rudzīte was able to tell a passionate story about her herds that she considered as a part of her own family. As a result, people did not lose their interest and kept coming. The following year, the number of visitors reached a thousand, and this was even before the guesthouse could offer its services. The excursions alone do not bring in a lot of money, but, at least, they covered the costs for building a fence. In 2010, the farm was also certified as an organic farm. In 2005, they opened the doors of their new guesthouse. The number of visitors grew to 1500, and they were offered not only a nice excursion, but also a stay for a night, thus, producing more income for the owners. In 2007, they received the EU Ecolabel for their farm and guesthouse. The number of visitors kept growing reaching 2000 people in 2007. Rudzītis understood that they had to offer more and cheaper facilities that would bring in money. In 2008, they built a kiosk near the entrance of the grazing area. Here, visitors can buy products from the farm Jaun-Ieviņas, as well as other local ecological products such as self-made charcoal, honey, herbal tea, juice, jams and dried fruits, and ecological ice cream. The number of tourists has stabilized around 2000 people per year by now. Today tourists bring in the biggest part of the farm's income. Nevertheless, the Jaun-Ieviņas farm has other sources of income to rely on and, if one of the businesses is not going so well, then they concentrate on the others. For example, in 2010 they concentrated more on farming than in previous years.

There was rapid increase of grasslands biodiversity in grazed areas. In 2002, the botanists surveyed the whole grazing area. They recognised only one hectare as biologically valuable grassland. For Biologically Valuable Grasslands additional payments are available through the Rural Development Programme to encourage their management. In 2009, the same area was surveyed again and 19.5 ha were recognised as biologically valuable. The increase most likely had taken place due

to natural grazing. However, within the grazed area, there are a lot of semi-open woodland pastures with as rare or even more rare plant species than in the certificated biologically valuable grasslands. However, due to existing restrictions the woodland pastures are not eligible for receiving the management subsidies as they are not recognized as grasslands or pastures.

A small herd of year-round grazing cattle was introduced in the grazing area in 2006, because cattle have a different grazing strategy. For example, they prefer grazing in marshy conditions or browse dense bush formations. The herds of Konik were also doing well and their numbers increased. Many horses from Jaun-Ieviņas were brought to other farms in the region, where people are starting to apply similar methods of nature and landscape management and ecotourism.

The experience of the farm Jaun-Ieviņas allows concluding that subsidies from the Rural Development Programme may be an important part of farms' income, but as the Rudzītis showed, diversification of the sources of income allows better adapting to the changing market situation and to the uncertainties caused by changes in the subsidy policy.

Problems and opportunities

Natural grazing is a new concept in Latvia as well as in big parts of the European Union. Nevertheless, concept of year-round grazing was accepted by involved farmers, especially for using in marginal and abandoned agricultural lands. By contrast, for the public especially close to large cities it took longer time to accept the idea that the animals are outdoor all the winter. However, the most important problem for those who are working with this concept is compliance with the requirements under Rural Development Programme. Year-round grazing would be much more attractive for landowners if the Ministry of Agriculture would recognize it as farming practice with its own specific set of rules. Now, landowners using year-round grazing have to comply with the same rules as seasonal grazing but this can lead to serious contradictions. For instance, in seasonal grazing meadows have to be grazed at the end of summer, while for year-round grazing the animals still have to find their food there until early spring. The area will be still grazed of only at a later date! The majority of year-round grazing sites are within Natura 2000 sites and majority of them are found to be Biologically Valuable Grasslands. This means that the main goal for these areas is nature conservation. However, farming here has to comply with rules based on agricultural production. This leads to frequent contradictions and consequently, inefficient nature management.

Three major problems make it hard to fit year-round concept in to the current regulations:

- procedures applied to control quality of grassland management are carried out in inappropriate season. In a year-round grazing scheme the areas are well grazed at the end of winter or start of spring;
- when year-round grazing is used for nature conservation, grazed areas can be (or even aimed to be) a mosaic where meadows are interspersed with bushes or even are wooded meadows. However, these heterogeneous and highly biodiverse types of landscape are not eligible to receive support under Agri-environmental schemes. For instance, the vegetation can be well-managed Biologically Valuable Grasslands, but it cannot be included in support schemes because according to the regulations there are too many trees. Allowing almost none trees on grasslands to be eligible for support under Agri-environmental schemes significantly reduces farmers' interest to manage mosaic grasslands;
- since large areas (more than 1000 ha) can be managed by natural grazing the herds living under these conditions become shy and it becomes almost impossible to catch animals for ear tagging and for blood sampling. This requires special regulations; for instance, animals could be administrated as "wild animals in captivity". That approach could ensure that herds have status similar to the status of game instead of domestic animals. Thus, individual animal registration would not be needed.

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Dabiskā ganīšana kā lauku ainavas uzturēšanas un tūrisma attīstības instruments: divi Latvijas piemēri

Kopsavilkums

Kopš 1999. gada Ark fonds strādā pie tā, lai veicinātu dabisko ganīšanu kā vienu no galvenajiem pļavu biotopu uzturēšanas procesiem Latvijā. Sākot šo projektu, no Nīderlandes tika atvesti pussavvaļas liellopu un zirgu ganāmpulki. 2010. gada nogalē Ark fonds atbalstīja dabisko ganīšanu jau 25 dažādās vietās visā valsts teritorijā. Šobrīd aptuveni 560 liellopu un zirgu nogana apmēram 4000 hektāru zālāju. Šajā rakstā sniegti divi piemēri, kur dabiskā ganīšana veicinājusi dabas saglabāšanu un ienākumu pieaugumu tūrisma attīstības rezultātā. Vītiņu pļavās ir sugām bagāti zālāji, kuros notiek strauja krūmu blīvuma un kūlas slāņa palielināšanās. Lielo zālēdāju ieviešana atjaunoja zālāju mozaikveida struktūru, apturēja tālāku krūmu izplatīšanos un mazināja kūlas uzkrāšanos. Ganīšana nodrošināja vērtīgas zālāju ekosistēmas, kurā satopamas valsts un starptautiskā līmenī apdraudētas sugas, saglabāšanu.

Jaun-Ieviņas ir zemnieku saimniecība, kurai pieder Ark fonda piegādāts pussavvaļas zirgu ganāmpulks. Zirgi veicināja saimniecības plašāku atpazīstamību un piesaistīja tūristus. Astoņus gadus pēc dabiskās ganīšanas uzsākšanas saimniecība katru gadu uzņem ap 1500 viesu.

Viesiem ir iespēja palikt saimniecības viesu namā un iegādāties saimnieka gatavotus produktus. Šobrīd tūrisms ir galvenais saimniecības ienākumu avots. Zirgu ganības sniedz ne tikai ekonomisku ieguvumu, tās nodrošina arī bioloģiskās daudzveidības palielināšanos zālājos – astoņu dabiskās ganīšanas gadu laikā Bioloģiski vērtīgo zālāju (BVZ) platība palielinājusies no viena hektāra 2002. gadā līdz 19,5 hektāriem 2010. gadā.

Goat farming for landscape and wool

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Abstract

The agropastoral landscape of Hjartdal-Svartdal in Telemark county is of high conservation value. Even though land use changes have caused landscape changes also here in recent decades, it still contains a mosaic of semi-natural habitats and a lot of cultural monuments. Maintenance of such a valuable landscape requires interested farmers and other locals as well as local and regional authorities willing to support necessary management. Fortunately, many locals here are interested in their unique landscape and want to maintain it. One of them is Bjørg Minnesjord Solheim. She is a goat farmer focusing on the connections between farming system, landscape and biodiversity as well as the quality of the products. She has developed a value-adding chain from soil to mohair wool products and in this way also contributed to the rural development.

Introduction

The valleys of Hjartdal and Svartdal are situated in the inland, mountainous part of Telemark county. There are of high conservation value due to the natural and cultural heritage created here by centuries of traditional farming. The Hjartdal-Svartdal area has been given priority in different national inventories as an especially valuable rural landscape. Continued agricultural management is necessary to maintain the landscape qualities

The rural landscape

The geology, soils, climate, and topography of the area have been of decisive importance for the way its natural resources have been used. Land use is and has been based on husbandry. The farms are situated in the valley bottom and on the mountain slopes from about 200 meters to 600 meters above sea level, while the old summer farms are found at 600-

900 meters a.s.l. The infields are small but the outlying land is extensive. Traditionally the outlying land was used for grazing and summer farming. In addition most of the winter fodder i.e. hay and leaf fodder, was harvested here. Outlying land is still used for sheep grazing during the summers but most of the traditional use of the extensive outlying areas has ceased and some of the small farms are abandoned. In addition agriculture has been intensified. This process has caused landscape changes.



Figure 1. The Midt-Svartdal farm. Photo: Håkon Minnesjord Solheim, 2005.

A valuable cultural landscape

Even though the forest is gaining ground and the landscape in the Hjartdal-Svartdal area has changed in recent decades due to land use changes, it still contains a mosaic of semi-natural habitats and a lot of cultural monuments making it possible to read the history in the landscape. The climate in the area is relatively dry, allowing wooden buildings to have a long life. The area is therefore characterized by the existence of a lot of historical buildings. Many of them are protected, especially medieval buildings and buildings from the eighteenth century. A unique feature of the Hjartdal-Svartdal area is the many species-rich hay meadows. They are of high importance for biodiversity and may be identified in plant-sociological terms as the Mat Grass *Nardus stricta*, Wood Cranesbill *Geranium sylvaticum*, or Meadow Oat-grass *Avenula pubescens* meadow types. Many pastures are also species-rich and contain red listed species.

Maintenance of landscape qualities

Maintenance of such a valuable landscape as the Hjordal-Svartdal area requires interested farmers and other locals as well as local and regional authorities willing to support necessary management. Fortunately, many locals are interested in their unique landscape and have established a limited company to act jointly and maintain the landscape qualities. The local and regional authorities support them. Several of the farmers and locals have also discovered the possibilities the landscape offers for rural development as tourism and labeled products. One of them is Bjørg Minnesjord Solheim.

Goat farming for landscape and wool

Bjørg Minnesjord Solheim lives at one of the old farms in Svartdal. In 2002 she started with mohair goat farming. For her the connections between farming system, landscape and biodiversity as well as the quality of the products are of substantial importance. She wants a value-adding chain from soil to product. Bjørg therefore uses her goats for a well planned management of the landscape and semi-natural pastures to maintain the biodiversity. In this landscape she can find plant species which she can use to produce plant dye for the wool. The goat wool is cut twice a year.



Figure 2. Mohair goat. Photo: Håkon Minnesjord Solheim, 2006.

The first years Bjørg had to send the wool to Denmark since there was no spinning factory in Norway. However, in 2008 she established her own little spinning “factory” at the farm, and the intention is to make the whole production ecological. Several types of wool yarn are produced and used for production of lots of different products as clothes, shawls and plaids, designed by Bjørg and her collaborators. Her wool production is a contribution to the rural development. Five women are now working with the spinning process and seven knit, weave and sew. In this way she is not just farming for biodiversity but also maintains traditions and craft culture. In addition the little “factory” spins wool for others and contributes to similar rural development in other areas.

Geitehold for ull og landskapspleie

Sammendrag

Kulturlandskapet i Hjartdal-Svartdal-bygdene i indre Telemark har mange kvaliteter og er høyt verdisatt i kulturlandskapsregistreringer. Selv om landbruksdriften er forandret og modernisert også her siden 1960-årene, er dette fortsatt et landskap med en mosaikk av seminaturlige habitater og mange kulturminner. Hvis et slikt landskap skal kunne ivaretas trengs det en interessert lokalbefolkning som får støtte av landbruks- og miljøvernmyndigheter på ulike nivåer. Heldigvis har mange i Hjartdal-Svartdal-bygdene blitt interesserte i sitt unike landskap og ønsker å ivareta landskapskvalitetene. En av dem er Bjørg Minnesjord Solheim. Hun er en geitebonde som er opptatt av sammenhengene mellom driftsmetoder, landskap og biologisk mangfold og i tillegg av kvaliteten på sine produkter. Hun har derfor utviklet en verdiskapings-kjede fra jord til mohairullprodukter og på denne måten også bidradd til bygdeutviklingen i Hjartdal-Svartdal.

A successful concept for farming for biodiversity

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Abstract

Norwegian semi-natural habitats of high importance for biodiversity are threatened especially by abandonment and encroachment by trees and bushes. A project called "Our semi-natural heritage" was therefore initiated in 2006. The project emphasizes to create good tools for developing management plans for different kinds of valuable, semi-natural habitats and to create links between farmers and local and regional agricultural and environmental authorities as well as NGOs. The project follows each chosen habitat and farmer closely to inspire him and to ensure that the management gives the desired results and that the farmer gets the support he needs with regard to knowledge and economy. The project also builds up local and regional knowledge on maintenance of the valuable, culture-dependent biodiversity. The project experience of acting as a catalyst for a "starting management process" is good and the project concept is now used by the Directorate for nature management in a new national action plan for hay meadows.

Introduction

As in most European countries the semi-natural habitats in Norway are threatened by intensified agricultural management and, most of all, by abandonment and encroachment by trees and bushes. The environmental and agricultural authorities have taken different measures to counteract the negative development and to preserve valuable areas.

The Directorate for Nature Management has during the last decades mapped valuable semi-natural habitats (the results of the mapping projects are presented on their website www.naturbase.no) and the Directorate for Agriculture has developed economical measure programs to promote management of these areas and maintain biodiversity. However, evaluations of the measures and of the state of biodiversity have shown that they so far have not been successful enough with regard to biodiversity connected to the semi-natural habitats. On this background a project with a new concept was initiated in 2006.

A new project

In 2006 a new project was therefore initiated with the intention to act as a catalyst for a “starting management process”. The goal for the project called “Our semi-natural heritage” is to initiate and start proper management in as many of the most valuable, mapped semi-natural habitats as possible. The target group for the project is farmers, local agricultural and environmental authorities as well as agricultural advisors and NGOs. Also schools, local history groups and museums are sometimes involved.

The project started in Aust-Agder and Vest-Agder counties i.e. the two southernmost counties in Norway. In 2010 the project had expanded to three new counties (Hordaland, Rogaland and Telemark). In short, the concept for the project is to identify valuable semi-natural habitats (from “naturbase”) owned by farmers who want to maintain them. The project then helps the farmers to make management plans, to create links and cooperation with the local and regional agricultural and environmental authorities and to find economic supporting measures for management. Economic measures exist on both the local, regional and national level and differ from county to county. The project follows each chosen habitat and farmer closely to ensure that the management gives the desired results and that the farmer gets the support he needs with regard to knowledge and economy.

The project has revealed several things that should be taken into account if the desire to maintain most of the especially valuable semi-natural habitats should be fulfilled:

- *The farmers get more interested and enthusiastic for management of valuable habitats if “biodiversity” and the benefit it represents are concretized* i.e. if it is explained how these sustainable and species-rich habitats can be of importance for future agricultural development. The semi-natural habitats are for instance gene banks for important grassland species and of high importance for pollinators. Agriculture to a large extent depends on pollination, and by maintaining the species-rich semi-natural habitats, this ecosystem service may be sustained.

- *It is of high importance to help the farmers with management plans to secure good professional quality.* Traditional management knowledge has partly been forgotten due to the agricultural “modernization process” during the 20th century. “Wrong” management initiatives may cause irreversible loss of biodiversity and must be avoided. If valuable semi-natural habitats need to be restored it is also of high importance that the restoration immediately is followed up by yearly management. The restoration may otherwise result in a situation for the biodiversity worse than the situation before restoration.
- *“Starting help” and continued help to the farmer during the first management years are of high importance to secure a successful process.* To feel sure that he takes the correct management measures, the farmer needs help to identify the valuable semi-natural habitat and to get better knowledge of semi-natural habitat management. Helping him to get a good cooperation with the authorities and to find economic support measures, saves time for him and can help him to get “over the threshold” and start management. Most farmers have far too much to do and if the starting process is too complicated and time consuming, they often leave it off.
- *It is of importance to “award” the farmers who manage valuable semi-natural habitats in accordance with good management plans.* This can be inspiring and in addition be of importance for the farmer if he wants to use the valuable habitats and cultural landscape in connection with rural tourism or “niche product” (labeled article) production. As a consequence other farmers can get aware of the possibilities and perhaps also start to manage their valuable semi-natural habitats.
- *Monitoring to secure good management of the habitats also in the future is important.* It is of importance for instance to secure that a new farmer gets the knowledge he needs to manage the habitat in a proper way. It is also important with monitoring to be sure that the management gives the desired results in the long run.

The project has also revealed that it is of high importance to build up local and regional competence and cooperation within this field. Management of semi-natural habitats can be complicated and sometimes you need knowledge from different subject areas to secure a proper management. By linking the different authorities at different levels better and in addition secure good cooperation with professionals and NGOs, the management within a region will function much better. An example of this is the management of one of the project habitats, Haugestranda in Farsund municipality. Haugestranda is a seashore pasture used for cattle grazing

through centuries. Several red listed plant species are found in this habitat, among others Sea-holly *Eryngium maritimum*. Traditionally the pasture was not fertilized, but to improve the production, local agricultural advisers some years ago recommended the farmer to fertilize the pasture. This has caused loss of about one fourth of the population of *Eryngium maritimum*. The project “Our semi-natural heritage” therefore got in contact with the farmer as well as the local agricultural advisers to discuss the problem. The result is a management plan for the habitat focusing on maintenance of the biodiversity. In addition the agricultural advisors have calculated the loss of production caused by consideration for biodiversity so that the farmer can get economic compensation for this.



Figure 1. The trees in this wooded pasture have not been pollarded for about 50 years. Now the area is successfully restored and managed by the project “Our semi-natural heritage”, Øvre Ramse, the municipality of Åmli in Aust-Agder county. Photo: Ellen Svalheim, 2009.

Important experience

The project “Our semi-natural heritage” has resulted in important experience. This is now used by the Directorate for nature management which is responsible for the management of biodiversity in Norway. In 2009 the project concept with regard to cooperation between local and regional environmental and agricultural authorities and farmers was incorporated in The National Action Plan for Hay Meadows (“Nasjonal handlingsplan for slåttemark” according to DN report 2009-6). This action

plan is now implemented step by step by starting management of the most important hay meadows (cf. "naturbase") in one county after the other. The hay meadows are prioritized by taking into consideration such aspects as their value, representativeness and possibility for good management. The project concept has now been used in the National Action Plan process in seven counties and will be implemented in the other counties during 2011 and 2012. So far the project concept has been used to start management of 100 hay meadows in accordance with good management plans.

Some of the sites of the "Our semi-natural heritage" project are also used by the Directorate for nature management as study sites in connection with the development of a national monitoring program for semi-natural habitats.

Acknowledgement

The project is financed by the Norwegian Genetic Resource Centre and the environmental and agricultural county authorities in the counties which are involved in the project.

Landbruk og biologisk mangfold – et vellykket konsept

Sammendrag

I Norge trues de verdifulle, semi-naturlige habitatene og deres biologiske mangfold av gjengroing. I 2006 ble derfor et nytt prosjekt, "Arvesølyprosjektet", igangsatt. Prosjektet har som målsetting å fungere som en katalysator for å få i gang skjøtsel av de mest verdifulle semi-naturlige habitatene (A- og B-lokaliteter i Naturbase; www.naturbase.no). Prosjektet prøver å få bønder som har verdifulle habitater til å bli interessert i å skjøtte dem gjennom å konkretisere nytteaspektet ved biologisk mangfold. Prosjektet hjelper også bonden med faglig funderte skjøtelsesplaner og med å etablere god kontakt med landbruks- og miljøvernmyndigheter på kommune- og fylkesnivå. Også landbruksrådgivingen, skoler, frivillige organisasjoner m.v. kan bli involverte. Prosjektet følger hver enkelt lokalitet og bonde over tid for å sikre at skjøtelsen gir ønsket resultat og at bonden får den økonomiske støtten og kunnskapen som trengs. Erfaringene fra prosjektet er meget positive. Prosjektkonseptet brukes derfor nå av Direktoratet for naturforvaltning i arbeidet for å gjennomføre Handlingsplanen for slåttemark som ble utarbeidet i 2010.

Traditional and modern eco-technologies in applying reed and straw as ecologically clean building materials for sustainable development of local economies and for safety of biological diversity: Belarusian experience

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Abstract

It is important to have and to improve environmentally friendly technologies, traditional and new, aimed to save biodiversity and local sustainable development in rural areas. Reed technologies in construction sector can save local lakes, produce new working places and improve local economy. Belorussian NGOs show some good examples in this field, including international cooperation and non-profit knowledge and know-how transfer.

Introduction

Proceeding with sustainable development in Belarus rural territories, dramatic rise of fossil fuel prices and pollution of the environment, climate change, need for development of local economies, and a growing demand for reasonable ecologically clean housing – all these issues will force the present generation to turn to the experience of former generations based on harmony with Nature. In Belarus, there is a group of nongovernmental ecological organizations, Belarusian and foreign, that revives and develops these technologies. This group is famous also outside Belarus because they

work in the field of building ecological houses from straw, hay, and reed and due to development of organic agriculture. These technologies allow not only developing local economies and getting reasonable dwelling and products of high ecological quality, but also preserving biological diversity in the sites where these products are applied. For example, annual harvesting of reed in the area of Lake Naroch prevents this area from becoming a swamp due to large quantity of annually rotting reed biomass. The aim of this article is to introduce with these technologies and their current application in Belarus.



Figure 1. Reed roofing of clay and straw house insulated with reed mats in Zanaroch, June 2010. Photo: E. Shirokov, 2010.

Roofs made of reed or straw are traditional and closely connected with Belarusian culture. In fact, two and more generations ago the majority of our families lived and grew up in wooden houses under the straw roofs. Last generation completely forgot the art and traditional technology of making the latter; and generations before the last made those types of roofs in too simplified manner which resulted in a decreased fireproof ability of straw and reed roofs during the last war (this fact is well-known from the military newsreel). A straw or reed roof, made in a proper way, is incombustible, but this requires following the ancient technology of soaking a roof in a thin clay grout, which is ecological, durable and cheap in comparison with modern chemical fire-prevention remedies that are sometimes used in recently invented technologies. A straw roof is almost absent on the market because of the lack of manually harvested straw. It is considered that a reed roof is very expensive (from 50\$ per square meter in Belarus, from 80\$ per square meter in Moscow suburbs) and exotic, though if one carefully

calculates a whole “pie” of metal roofing or indulines with drain system installed, the reed roof is just 10% more expensive. Moreover, a reed roof is an insulator at the same time. Finally, if one adds a period of service and an ecological component – the air quality in the attic floor without chemical insulation and finishing materials – then it appears that traditional roof is, in fact, more beautiful and cheaper.

A roof made of clay and straw

This roof is cheap, not complicated in construction, fire-resistant but quite heavy that is why it needs a slope from 40 to 50 degrees. The period of service of this roof is 25 – 30 years and even more, if timely maintenance is provided.

Straw and clay are the initial materials for such roof. Manually threshed (handmade) rye straw will be especially suitable; crushed or grinded by a machine threshed straw will be slightly worse. One can use wheat and barley straw instead of rye straw. Straw should be cleaned from grass and rot.

Only rich clay can be used, with sand content of 15% at the most. It is better to prepare clay in advance before winter based on one cubic meter for 30 – 35 square meters of the roof. Frozen clay becomes more friable and easier to soak.

Technology Bind sheaves using manually threshed rye straw (sheaves should not be very tight in order to soak them easily with clay grout), the diameter of a sheaf should be 15 – 20 cm, its length 70 – 100 cm, ears should be chopped off. If one uses machine threshed straw, then the diameter of a sheaf should be 8 – 10 cm with the length of 50 cm.

Then, one should dig two or three pits. One of them (a lime pit) will be used for soaking clay and the rest will be used for soaking sheaves in clay grout. The pit is 100 cm in depth, the length is 150 – 200 cm, the width is 120 – 140 cm. To avoid crumbling of the pit walls, it would be better to strengthen them with boards. The bottom of the pit should be covered with boards or a straw layer (3 or 4 centimeters thick). It is necessary to do it in order for the clay grout not to be mixed with soil while pouring.

Clay should be mashed with spade before it is soaked. Scatter friable clay into the lime pit layer by layer, each 10-15 cm thick, pour water (one part clay to two parts water), keep it for 5-6 hours or more. Then mix it with oars or mash with pestles until you get homogeneous and swampy mass. Clay thickness is determined with the help of straw. If the straw is put into the clay, stalk stays vertical for some time and pasted clay grout does not drip then the clay is ready for use. If the straw stalk falls and the clay grout drips then more clay should be added to the grout (too thick grout should be diluted with water). Ready grout may contain clods that's why it needs filtering through a sieve with 1x1 cm meshes or through woven basket.

Sheaves are soaked in the following way. Fill 5-10 cm of the pit with clay grout. The first pair of sheaves is placed along wide side of the pit; ends are directed to the pit center, the second pair vice versa. After the first row is finished, clay grout is poured over, so that its level is 3-5 cm above trampled sheaves. Trample sheaves until they are soaked in grout. Then put the second row across the first one in the same order.

Clay grout is poured over sheaves in the second row and trampled, then the third row is placed on them and so on. Put rows one by one, but leave 20-25 cm of the pit free. After trampling the last row, pour the pit with clay grout until it covers the last sheaves row for 3-5 cm. Then, cover sheaves with slabs or plates and press them with stones and leave the sheaves for 2-3 days to soak properly. This will make sheaves soft and flexible. Then pull them out (by hands or with pitchfork), lay sheaves on the ground so that the grout can drain into the lime pit. As soon as clay stops dripping, the sheaves are ready to use. Sheaves covered with straw can be kept for two days at the most, otherwise they get spoiled.

Timber for clay and straw roof should be strengthened with lathing of dressed straight poles 5-7 cm thick each. Poles are fastened to roof timber with hard treenails, which are put in holes bored in the timbers (diameter 2 cm, depth 6-7 cm). Nail pole ends to prevent them from falling. Distance between poles under manually threshed straw should be 30 cm; and 20 cm under machine threshed.

Wet clay and straw roof is quite heavy. Therefore, props are installed in the loft to prevent roof timber from bending. Remove props only after the roof is dry. The best time for roofing is the end of spring or the beginning of summer (roof gets dry quickly). Rains wash out wet clay; frosts crack it.

To provide straight roof overhang, a prop board is fastened to lower lathing supported by poles or sticks.

The roof is 10-15 cm thick. Sheaves are placed in horizontal rows, beginning from overhang proceeding gradually to the ridge. Two slopes should be covered simultaneously, covering one slope with 1-2 rows, then covering next one the same way, so that the roof timber is not overloaded.

The first row of a roof should be covered with sheaves with neatly chopped ends, which are placed downwards and cuddled to prop boards. After placing sheaf on purlin it should be untied and leveled. Sheaves are placed one by one overlapped. After the first sheaf row is finished, its thickness is checked using the board with nail of needed length (10-15 cm) in the middle of it. The check should be made above lathing because, when reaching it, a nail does not go through and so it indicates only the thickness of roofing.

The first row of sheaves is covered with the second one the same way-following ends of rows.

In both cases, sheaf ends are bent over the purlin for 5-10 cm as if making a hook, which holds the straw. When 3-4 rows are placed, the straw is combed with metal rake and clay grout is poured over. Then, the grout

is rapped and smoothed with spade (better wooden) until the roof is made even.

If one works with brakes, the edges of already placed sheaves usually get dry. So before placing a new row, it is highly recommended to water those with clay grout.

Poles should be nailed at 10 cm distance from each side of the ridge, which is necessary for cohesion of the last row sheaves. These sheaves are placed in a way to form a gutter, which is needed to make a ridge. A formed gutter is covered with untied sheaves until the gap between roof and placed sheaves is filled with bunches of clayed straw to level the roof in this section. After leveling, the ridge is covered with locks of clayed straw bending it obliquely from one slope of the roof to another. Such roofing provides firm and leveled layer.

A chimney is covered in the following way. First, the space between the bottom of a chimney and the surface of the roof should be half-filled using mixture of 10 cm long straw stalks and clay. Second, from the right side, i.e. from the top of roof, the chimney is plastered with clay mixed with chopped straw (2-3 cm long). Then, this is covered with clay straw sheaves to form a slope ensuring efficient water drainage.

Valleys are covered in the following way. A sheaves row is placed along the ends of valley. To keep sheaves flat, they are squashed and placed 3-5 pieces per row tied. The first row is covered with the second (ends up as well), this time untied. This is made to thicken valley covering in 1.5 times compared with the main roof. The roofing should be made as good as possible, as valleys are the most vulnerable to leakages.

Hips are roofed in the following way. At first, cover slopes with a row of sheaves. Afterwards, place one more layer of clayed straw along the top of the hip that so that it overlaps the junction of placed on the hip rows. The layer should be 10-15 cm lower than hip rows.

Slopes entirely covered with sheaves are combed with a rake, hollows are smoothed, plates of clayed straw are placed and plastered with clay. Then, the roof is combed once again and thick clay grout is poured over, squashed and smoothed with spade. If a slope is leveled, its hollows will collect water which will quickly destroy the roof.

A roof should be dried evenly. Therefore, dormers are made in the pediments that provide transparent airing.

Roof maintenance is as following. In hot and windy days, a roof should be watered or covered with wet cloth or wet straw mats. In early spring, a roof should be cleaned from snow. Small cracks that have appeared should be plastered with clay, then tamped and smoothed. Big cracks are firstly filled with mix of clay and straw, then plastered with clay.

Clay and reed roof

Reed should be prepared in advance in autumn-winter period, rotten stalks and panicles should be removed, then reed is tied in bunches.

Grout for clay and reed is prepared in the same way as for clay and straw sheaves. Dig pits, place in them the bunches of reed and pour over clay grout. In 5 days take bunches from pits and leave reed to dry for 3 days.

Clay and reed roof should be made with 30-60 degree slope with lathing made of dressed poles 8-10 cm thick. Poles are placed beyond timber treenails, at each 30-40 cm. If the roof is not dry, it is too heavy and timber should be supported with temporary props.

A roof layer should be 10 cm thick, smoothed, covered with sifted ground for 3-4 cm, which is leveled and compacted as well. Ground is covered with 2 cm rough clay layer, then plastered with mix of clay and chopped straw for 5-7 cm, then the surface is well leveled, compacted and smoothed. This work should be done on a slightly dry roof in dry season.



Figure. 2. Reed roof on timber house, Minsk region. Photo: E.Shirokov, 2007.

Modern technology of making reed roof is as following. Place reed on prepared roof timber (with entire or periodic lathing each 40 cm), level it with special spade, and then fix it with a galvanized wire (diameter 4-6 mm). Wiring is lined in horizontal rows on each lath and is fastened to roof timber with stainless steel wire, which is screwed to lathing. A binding wire is covered with layer of reed, each layer watered with thin clay grout.

A ridge is covered with a mixture made of moss, heather and clay grout, or green elastic reed, or ridge tins of proper colour, or copper plates. Unlike today, old technology recommended to fasten reed to roof timber with elastic pine-roots, spruce or hazel wickers which were used instead of thick metal wiring.



Figure. 3. Reed roofing according to modern technology, Zanaroch, June 2010.
Photo: E. Shirokov, 2010.

To resist climate conditions in Belarus, a reed roof should not be thinner than 30 cm, then only upper 5 cm layer will become wet (and dry). The lifetime of a correctly made reed roof is more than 50 years; near London the author has witnessed a reed roof that has been enduring 200 years without repairs. That roof is well- covered with moss, but still able to drain water and keep warmth. The roof is more than 50 cm thick.

Another important line of development is production of reed mats, which are used for clay and straw, cob and woodchips houses insulation. Construction of frame reed houses is also possible, but such houses turn out to be too expensive. Reed mats production is quite profitable (a 5 cm thick reed mat costs four EUR/m² in Germany), provides new workplaces for rural economies, especially, during the off-season. Ecological houses made of straw or hay bales with clayed reed tied in sheaves are much cheaper; besides, latter ones were spread on the territory of Belarus in 17-19 centuries.

New NGO's activities planned for transfer of eco-technologies

Minsk Division of International Association of Ecologists (MD IAE) sees the task to create in the nearest future a centre for eco-technologies transfer. This centre will apply the principles of sustainable development and will serve for restoration of the culture of reasonable and ecological house construction. Wood, as a material, will undoubtedly take a significant place in it. From our point of view, a rational application of wood means using it in load-bearing frame structures insulated with the most available, the cheapest and the most ecological warmth-keeping material, which is grain crop straw. Our NGO have already worked out such a successful experience in Belarus during the last decade; and this experience indicates that even insoluble tasks can be solved. For example, it became possible to reduce housing prices by 30-40%, to cut heating expenses in 4 times, and also to achieve high ecological quality with saving energy of building process in 150-200 times. Moreover, straw compared with wood is used only after passing its lifecycle. Some people believe that so it possesses special energy; in old times and nowadays, some people use straw to protect from geopathogenic influences.

Availability and inexpensiveness of this warmth-keeping material, which is considered to be a waste product of farming industry, influenced the choice to use extruded straw blocks for building instead of many other building eco-technologies. These technologies were developed by our NGO (MD IAE) in cooperation with the Belarusian-German charitable organization "Houses instead of Chernobyl" for building ecological houses for people from the Chernobyl area. Private German donations were involved in the project. The goal set by MD IAE 16 years ago was to achieve high ecological quality of dwelling and energy efficiency with minimal investments, and this goal was achieved: ecological houses made of straw ensure four times better isolation effect than required by the current Construction Code and, at the same time, the expenses for a building process are reduced by 30-40%. Several years were spent on proving a high fireproof ability of plastered straw walls, and on getting engineering specifications for straw blocks as a building material. MD IAE managed to work out and fulfill original projects of straw ecological houses for a village, energy passive ecological houses projects for a city, bathhouses with pools, vegetable storages, roadside service establishments, hotels, and others. A number of floors varied from one to four. MD IAE is the first NGO from Commonwealth of Independent States (CIS) to be awarded a prize for work – a prestigious international award in the sphere of energy efficiency and sustainable energy "Energy Globe" in the nomination "Housing" in 2000 (in Austria). MD IAE was a laureate and a finalist of the World Habitat Awards in 1999 and 2006. The organization is doing its best to

share gained knowledge with colleagues from foreign countries – Russia, Ukraine, and the Baltic States. To serve this purpose, the annual seminar was arranged where MD IAE shares its knowledge on eco-technologies of sustainable development. In 2010, it took place from 23-25 of July (already 10th time).

Conclusion

Radical change in the prices of energy recourses and, consequently, building materials, along with increasing costs of municipal services, will stimulate people to use this technology in Belarus and Russia. In Germany and the Baltic states, this technology will have future as a tool for climate and sustainability – not only in rural areas.



Figure 5. Participants of the annual International Association of Ecologists seminar for sharing knowledge on eco-technologies in front of the ecological house made of straw blocks, near Minsk 2010. Photo: E. Shirokov, 2010.

Традиционные и современные экотехнологии использования тростника и соломы как экологически чистого строительного материала и устойчивого развития местной экономики: опыт Беларуси

Резюме

Для успешного устойчивого развития сельских регионов необходимы дружественные природе экотехнологии, сохраняющие биоразнообразие и улучшающие местную экономику. Важно сохранить традиционные и развить новые энергосберегающие экотехнологии и ноу-хау для строительной отрасли. Технологии, использующие тростник для производства и строительства крыши, матов и т.д. могут сохранить озера, создать рабочие места и улучшить местную экономику. НПО Беларуси показывают несколько хороших примеров этой области, включая международную кооперацию и некоммерческую передачу знаний и ноу-хау.

Green Social Housing in Belarus as a tool for sustainable development in rural areas

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Abstract

Belarusian NGOs have taken responsibility for adaptation and development of the straw-bale construction technology and have been successful so far. This environmentally friendly technology is less expensive and more sustainable than conventional house construction and can improve local economy. Straw-bale housing is Zero-Carbon or Carbon+. NGOs are trying to spread knowledge through mass media and public activities, such as seminars, exhibitions, etc.

Development since 1996

In Belarus, a coalition of local and international NGOs is proving that straw-bale houses are cost effective and sustainable. Being environmentally friendly and energy efficient, these houses, on one hand, are a sound way to provide affordable housing in rural areas, and, on other hand, stimulate sustainable development of economy in the countryside settlements and provide possible solution of climate problems. The Belarusian economy and construction sector will be soon in a state of crisis because of Russia-Belarus tension due to fossil fuel. Therefore, cheap and well-insulated healthy houses are in high demand.

In August 1996, three organizations – the NGO Solar Energy International, the Belarusian Division of the International Academy of Ecology (former name of Minsk Division of International Association of Ecologists; hereafter abbreviated as BD IAE) and German- Belarusian NGO “Houses for Chernobyl settlers” – conducted a straw-bale house-raising seminar in Zanaroch, an experimental eco-village for Chernobyl refugees. The participants of 14 seminars included representatives of NGOs

and government construction companies from Ukraine, Russia, Belarus, and Uzbekistan. Zanaroch was chosen because BD IAE was a partner of a German-Belarusian organization, called “Houses instead of Chernobyl“, which worked there to build an eco-village for Chernobyl refugees using clay-straw technology. In 2010, the village already includes 23 buildings and is becoming a testing ground for environmentally sound technologies for sustainable development.

More than 70 percent of the radiation that came from the Chernobyl Nuclear Power Station explosion fell on the territory of Belarus - an amount equal to 90 nuclear bombs dropped on Hiroshima. People, who are still displaced from the contaminated area, need environmentally safe, energy efficient and inexpensive housing. The straw-bale technology meets these requirements, as well as requirements of sustainable development.

It is also important that the international community is collaborating in a country that experienced the fiercest European and World wars. Now, people from different countries are coming together to support the international movement for sustainable development, which promotes nature-friendly construction technologies.

The project “Transfer straw-bale technology” itself did not have an easy start. The initial budget was several times too low and there were no state support available. Fortunately, it was agreed with the German partners to provide the basic construction materials at no cost, so the project was saved.

The weather was the second serious obstacle. The gram crop in Belarus in the summer of 1996 was running three weeks late, and the project had to make use of the previous year’s straw, which was ray straw (90% of straw in Belarus is ray). What could have been a disaster ended up proving the feasibility of forming bales from piles of old straw, which is common in the Belarus. The bales were prepared in two days, and the house itself was built in just a week. Final house finishing works had to be done after the seminar, in September 1996, by the BD IAE staff.

Several attempts to interest government agencies in this technology proved unsuccessful, until an appeal was made directly to the Ministry of Construction and Architecture (hereafter – MAC). Representatives of the Ministry of Construction and Architecture visited the site in October 1996. Their impression being in presence in Zanaroch significantly changed their ideas about existing and proposed construction technologies for the countryside. As a result, the National Straw-Bale Building program was developed for the construction of 12 straw-bale and straw-clay demonstration houses in Belarus, two in each region of the country. In 1998, the Ministry paid for Belarus straw-bale (hereafter – SB) Code-document about technical conditions for production of straw-bales and house construction. However, until now, BD IAE has problems with building SB houses in towns: professional construction companies are not satisfied, because SB houses are 2-3 times cheaper in Belarus than convenient brick houses, and “they can lose the market”.

Nevertheless, more than 100 small building companies and NGOs in Belarus and more than 50 in Russia and Ukraine have requested copies of the Russian version of *Build It With Bales*, an instructional book by MacDonald S.O. and Matts Myhrman (1994), which had been translated during the project. Distribution of the book is ongoing at conferences and gatherings, and there is an intention to distribute the book into other countries, involving workshops' participants who volunteer to promote the book. Visitors, both private citizens and representatives of professional construction companies, continue to travel to Zanaroch to tour the eco-village and the straw-bale structure and become acquainted with eco-friendly building technologies.

Having made successful use of the straw-bale technology in Belarus, the project plans to outfit straw-bale houses with alternative energy systems, such as inexpensive solar collectors and small windmills. Calculations show that these types of houses could have zero energy requirements (self-sufficient electricity, hot water, and heat), which is also very important for agro-ecotourism. The International Academy of Ecology published small booklets (Широков 2002, Широков 2010) comparing the footprints and economics of a straw-bale home with a typical home of the same size built from conventional materials. This book is a resource of great value aimed to assure government officials and private citizens on the benefits of straw-bale construction in terms of local economy, climate, and sustainability.

1998-2010: new straw-bale houses, technologies and research

Some Belarusian building organizations such as Petrikov Construction Company and Minskgrajdanproekt are involved in National SB program with an assistance of Deputy Minister Mr. Anatoly Nichcasov. He is an architect by profession and fond of SB houses. The Ministry of Construction and Architecture pays for some SB projects and research, invites BD IAE to participate at the National Habitat Center and State Commission on Sustainable Development of Human Settlements. Some results of the cooperation between Ministry, BD IAE, local firms and building organizations in the National Program (АНОН. 2010) are summarized below.

New constructions and technologies: summer and winter

On the photo, two equal size SB houses (1997-98) in Michedovichi, Gomel region are presented: left – built in 1998, the project completed official testing of the SB house in Michedovichi. There were no problems identified with moisture in the walls, R-value was four times more than officially recommended (national code in metric system recommended $R=2.5$,

test values R of SB walls were seven for “winter” and ten for “summer” respectively). Health of people, including children, living in the SB house had improved – all of inhabitants agreed with this statement.

The SB’s house inhabitants spent 4-5 times less fuel, than in the conventional brick houses. The amount of energy necessary for SB houses and brick houses in our climate was calculated: the relation was 1:150, price relation – 1:3. Since 1998, each SB house has also a 2-8 m² solar collector for heating water in April-September. Obviously, this success would not be possible without dissemination of information. First, the book on new technologies (MacDonald, Myhrman 1994) was translated (by Evgeny Shirokov, 1996) and published in Belarus

In 1997-2000, BD IAE published about 50 articles in daily and special newspapers and magazines. The station *Radio of Russia* that has about 80 million Russian-speaking people audience prepared a 30 minutes interview with the author on the SB technology and activities in Belarus. Consequently, about 5000 letters from people who wanted to obtain SB technology were received only from Russia. The main reason of that was low price and good heat insulation, but they were less concerned about sustainability of this technology. The special issue in the magazine “*Architecture and construction of Russia*” (No 5, 1998, 5000 copies) was prepared about the SB technology and activities in Belarus. TV programs, such as NTV and Channel 1 also broadcasted information on SB activities. In 2010 the project will prepare a special Training Program for construction workers’ schools and universities. Co-operation with Russia, Ukraine, Moldavia, the Czech Republic and other East and West Europe countries will also begin in 2010.



Figure 1. Round 0-Energy straw-bale house in Belaruchi, near Minsk Photo: E.Shirokov, 2010.



Figure 2. Construction of Round 0-energy straw-bale house Photo: E. Shirokov, 2008.

Housing construction as a social priority for the Government

Housing construction is a major social and economical development priority for the Government of Belarus. As set out in the National Strategy for Sustainable Development (2005 – 2020), the Government housing policy focuses on improving of the housing supply, the development of housing construction with long-term loan schemes, further development of housing market and services.

The Government's main objective in housing construction is to provide all Belarusians with comfortable, energy efficient housing with improved utilities for reasonable price. The Government is planning substantial budgetary allocations for infrastructure development, construction of social housing for people with low income, disabled, and other disadvantaged groups.

Rural areas: the social focus of the Government

In rural areas across Belarus, social, economic and demographic, and consequently housing, problems are most critical. The Government is concerned about the current levels of rural depopulation, and the Belarusian President has expressed his concern about the disproportionate construction level around Minsk, the capital, while houses in agricultural villages are old, of poor quality and expensive compared to rural salary levels. Therefore,

the President approved the *National Rural Development Program 2005-2010* (Анон. 2005) to upgrade the facilities of agricultural communities, with a total budget of around US\$ 32 billion. Out of the total budget, US\$ 1.3 billion will be devoted to the construction of at least 50,000 (average housing size 70m²) new houses and apartments, with bank loans expected to total around US\$ 1.2 billion, agricultural enterprises' investments of US\$ 65 million, and local budgets allocations of US\$ 57 million.

Existing construction methods and materials offer little opportunity for the Government to meet the targets set by the National Rural Development Program regarding construction costs, quality, and maintenance costs. In 2000, the International Energy Agency estimated the average consumption in Belarusian houses at 183 kWh/m² ⁴. In comparison, this is higher than the average energy consumption in EU-15 estimated to be 140 kWh/m². The Ministry of Architecture and Construction have been discussing technologies, financing and policy options to make housing affordable and energy efficient. One of the ideas is to use straw-bales for insulation and construction in rural houses. Houses built of straw are extremely energy efficient, compared to conventional houses made of brick or wood, and comfort levels are improved. Straw can provide four times better insulation than wood and seven times better than brick. The research undertaken for the USA Department of Energy by Lawrence Berkley Laboratories proved that 20% of energy could be saved just by changing the wall material from wood to straw. When passive solar designs are included, from 40% to 60% of energy efficiency could be saved.

However, straw is not a widely accepted building material in Belarus today. In overall, the level of awareness of straw-bale housing is moderate, thus, clearly insufficient for large-scale replication of the technology. A substantial number of newspaper articles, TV newscasts and web pages have been devoted to the subject annually, but there are obvious information and awareness barriers that need to be overcome. There are 23 straw-clay and one straw-bale demonstration houses in Belarus. However, there are no standards of model designs for using the material, the construction and financial sectors do not have experience in using the material, and policy makers and the public have yet to be convinced of its merits. The project will work on removing these barriers by developing the necessary standards and norms and designing plans in cooperation with Ministry of Architecture and Construction.

⁴ National experts estimated the actual average annual energy consumption on heating and ventilation of houses in Belarus at 195-203 kWh/m².

In line with the new programming priorities (АНОН. 2010), the proposed technology focuses on the strategic objective of energy efficiency in buildings, as it promotes the adoption of energy-efficient technologies and practices in construction, including the energy-related systems used in buildings.

Straw-bale housing is mainly applicable in rural areas, because of local availability of straw production and reduced production costs. Mostly small buildings' design has been tested and small buildings are more common in rural areas. In 2009, Belarus aimed to construct about 4.2 million m² of new housing in the nearest future. Out of this about 30%, or 1.26 million m², will be built in rural areas (АНОН. 2010). The National Rural Development Program 2005-2010 plans construction of new buildings of 580,000m² annually, 46% of them will be in rural areas.

The National Rural Development Program

In September 2005, the President introduced a number of amendments to the procedures of housing construction and financing within the National Rural Development Program 2005-2010. The new regulation stipulates that housing construction for employees of agricultural enterprises and social organizations is to be carried out based on an annual plan considering labor requirements and development prospects of these organizations. In case the agricultural enterprise is not capable of financing housing construction for their workers using their own capital (which is the most common case), it can use support mechanisms envisaged under the Program. An enterprise has to develop a plan of housing for their workers, where volumes of construction and costs must be adjusted to the level of inflation. Standard duration of construction of a one-family farmhouse (except for wooden houses) should not exceed four months. Agricultural cooperatives are expected to realize about 44% of construction under the Rural Development Program, while state and private construction companies will construct the rest. It is important for the project success to work with all stakeholders in both planning phase by raising their awareness in the benefits of straw in construction, as well as during the construction phase to share the risk of not being able to sell or rent unfamiliar housing stock.

Outside of the National Rural Development Program, 90% of all construction is undertaken by the private sector. Private construction companies use their own capital and, to a lesser extent, loans to start construction⁵. In case of the Government orders, such as social housing

⁵ Some big companies have relatively large operational capital. They started using soft loans and privatization money in the immediate post-Soviet times. They invested in their first large constructions, which were paid back by individuals relatively quickly with good profits and, consequently, this has created good operational capital for further re-investment in even bigger constructions. Thus, bank loans are used less frequently and largely by newcomers in the market.

programs, they use money available from the national or local budget. Shortly after the foundation of a house is constructed, they start a campaign to draw private individuals to buy future apartments (if it is an apartment block) or houses in the future village. The pace of the construction depends on how successful a construction company is in attracting consumers, who usually borrow capital to buy their future housing. Since the demand for housing is high, in most cases construction companies do not have any problems to get consumers and do not deviate significantly from their business plan and construction plan.

Conclusion

Economical and financial crisis has favored the straw-bale business development in Belarus, because government and private persons are forced to look for more sustainable and less expensive construction solutions. This technology will provide housing sector with “climate” Zero-Carbon and Carbon+ houses, improve countryside economy and reduce energy consumption at national level.

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Строительство экологического социального жилья как инструмент устойчивого развития в сельских регионах

Резюме

Белорусские НПО адаптировали и развивают экотехнологию строительства из соломенных блоков, достигая на этом пути заметных успехов. Эта дружественная природе строительная технология может решить ряд сложных задач в сельскохозяйственных территориях: климат, доступное недорогое экологически чистое социальное жилье, сохранение биоразнообразия, устойчивости, улучшения местной экономики и т.д. В настоящее время НПО Международная ассоциация экологов пытается широко распространить знания и ноу-хау через средства массовой информации и семинары по передаче экотехнологий.

Organic and conventional agriculture in Belarus: a current state and trends

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Abstract

Agriculture plays an important role in the economics of Belarus, but organic agriculture is not the focus of the Government's attention. Intensive agricultural production is the major direction of agriculture development in Belarus today. It demands significant expenses and provides negative consequences on environment. Social problems in the rural areas include extremely low birth rate and movement of young people to cities. Salaries are low in agriculture, and significant funds are needed to start an own farming business. Farmers can receive up to 100 ha of land for use, but not in their possession.

The Government does not create favorable conditions for development of private farms in Belarus. The development of organic agriculture in Belarus is hindered by the absence of normative legal basis, insufficient state support, low awareness among customers and potential producers and lack of information or false information. The most active actors in the field of development of organic agriculture in Belarus are NGOs and scientific establishments. It is necessary to conduct wide awareness raising campaign to inform the potential customers about organic production and educate the agricultural producers. It is necessary to introduce certification and labeling system for organic products. For the effective cooperation in development of organic agriculture in Belarus, it is necessary to combine efforts of all stakeholders.

Introduction

Today, agriculture is one of the main pollution sources of environment as about one third of the total pollution comes from the agrarian sector of economy. Therefore, improvement of the agricultural practices is of crucial

importance to sustain cleaner environment. Agriculture pays an important role in the economy of Belarus, with significant part of population living in rural areas and employed in agricultural sector.

The state of agriculture in Belarus: harvests at any price

Although professionals assess the natural conditions in Belarus as average and many of them state that the climate is not sufficiently favorable for farming, agriculture plays an important role in the economy of Belarus. Agriculture provides about 8.4 % of the GDP (АНОН. 2009), about one third of the population lives in rural areas and 9.4 % of the employed population worked in the agriculture in 2005. The availability of arable lands in Belarus is the highest in Europe: 0.47 ha (according to other sources even 0.6 ha) per each resident. The availability of agricultural land per resident is even higher, 0.9 ha, that is twice as many as in Germany, France, and England.

There are four main groups of agricultural land-users in Belarus: collective farms (SPK – agricultural production cooperatives), private farms, owners of homesteads with land up to one ha and owners of small summerhouse gardens (“*datcha*”) farming on approximately 0.05 ha small plots – members of horticultural associations. In total, there is 8227.7 thousand ha of agricultural land in Belarus, including 87.0% managed by collective farms, 1.2% managed by private farmers, 8.6% managed as homesteads lands and 0.7% managed by summerhouse gardens owners (“*datcha*”) (АНОН. 2010a).

Nowadays, intensive agricultural production is the major direction of agriculture development in Belarus. It demands significant expenses for labor force and machinery, as well as for fuel; for example, power costs to produce one production unit are 3 to 4 times higher than in the USA. Examples of negative consequences of intensive agriculture in Belarus include:

- *Pollution of lands, water, and atmosphere with mineral fertilizers, pesticides, heavy metals*

The share of agriculture as regards CO₂ pollution in the atmosphere comprises about 23%. About 6% of agricultural grounds are polluted with biogenic elements in the concentrations exceeding the maximum permissible rates (Тарасенко 2001). The situation is aggravated with the fact that about 23% of the territory underwent radioactive contamination because of Chernobyl accident.

- *Chemical, physical and biological degradation of soils*

In Belarus, degraded and erosion exposed soils cover 4 million ha or 19% of the overall territory of the country, including 2.6 million ha of arable lands (АНОН. 2007). This situation is a consequence of

agricultural use of ecologically unstable soils, including peat soils of drained bogs. To date, 1.45 million ha of peat bogs have been drained, including 1.1 million ha for agricultural needs.

- *Thickening of arable lands*

Excessive usage of machinery for processing of soils led to their thickening and damage to their structure, which enforces the processes of erosion of lands.

- *Accumulation of toxic substances, including heavy metals, in foodstuffs*

Study of mothers' milk in Belarus (1999-2001) detected contamination with residues of organochlorine compound pesticides in all studied samples (Голубовская 2006).

- *Appearance of persistent races of vermin and pathogenic agents*

Persistent and pathogenic agents appear because of broad application of pesticides, this led to the appearance of a “catch 22”. Wide application of pesticides cause persistence among vermin, and thus the dosage shall be increased or new means of protection shall be developed, to which vermin and pathogenic agents adapt again, thus requiring even higher dosage of pesticides that is even more damaging to the environment.

- *Increase of contamination of fields with weeds*

This happens due to long-term application of herbicides with a narrow scope.

- *Decrease of yield and increase of costs of agricultural production*

All the above-mentioned factors influence the productivity, decrease yield and thus increase the costs of agricultural production.

Social problems in the country villages are as serious as the ecological ones. The demographic situation is very unfavorable – the birth rate is extremely low and young people move to towns and cities. Despite the high level of unemployment, there is insufficient amount of qualified labor force in villages. Salaries are low in this field of economy, and significant funds are needed to start an own farming business.

Land reform has not taken place in Belarus. All lands of agricultural purpose were assigned to the state property with the new *Land Code* adopted in 1999, this act prescribes that private property is considered only possible for a land plot with a house (no more than 0.15 ha) and for homestead land up to one hectare. Citizens have the right to rent up to two ha of lands for personal farming purposes and own a land up to one hectare. Farmers can receive up to 100 ha of land for use, but not in their possession.

The Government does not create favorable conditions for development of private farms in Belarus. The *Law on Farming Economics* (АНОН. 2005) was adopted on February 18, 1991 (revised on July 19, 2005). The Law provoked serious critics from farmers as equal rights of farmers with other agricultural producers were not provided for and private property for land was not provided for either, and the procedure of allocation of lands was not established. The Law did not provide a possibility to establish farming cooperatives and associations.

In accordance with *the Decree of the President No.193* of April 1, 1998, farmers have to sign agreements with local authorities, stating the conditions of land use, a structure of production, types and volumes of goods, and production resources that will be produced and purchased. Governmental authorities prepare draft of this agreement. Not all farmers sign the agreements, but unless they sign them, they cannot count on state financial support.

According to assessments, farmers receive 7 to 10 times less state support if compared to other agricultural enterprises in Belarus. The state program of support for private farms has almost been terminated. The most common reason for farmers to terminate their business is the lack of financing. Farmers can take loans with interest 12% per annum, but taking surcharges into account (credit insurance, rate of increase of prices), it results in 20 to 30% per annum.

According to the assessments of the World Bank experts (АНОН. 2005), contemporary macro-economical policy in Belarus is not favorable for efficient agriculture development. Agricultural markets are under control of the state and local authorities. The price regulation is combined with administrative limitations (licensing, etc.). As a whole, taxation does not favor the development of agricultural production, though agricultural producers have taxation benefits. At the same time, agriculture is taxed with indirect taxes through the price regulation. Due to the existing policy, revenues of producers are limited to 2% monthly, while expenses are not limited. The Ministry of Agriculture and Food and local authorities set extreme prices for agricultural production. The export of foodstuffs is monopolized by the state. Available information and statistical data are not sufficient for conducting a deep economic analysis; moreover experts, particular those of the World Bank, doubt the validity of statistical data.

Agricultural Science in Belarus

Although terms “ecologization”, “ecological” and some others are mentioned in science policy programs, studies in the field of organic agriculture are not considered prospective. Nevertheless, some practical applications in organic agriculture can be found among different scientific works: for example, for the development of biological methods of plant

protection (Institute of Plant Protection, Institute of Fruit Growing, Institute of Vegetable Growing of the National Academy of Science of Belarus).

The leading science and education establishments in the field of organic agriculture in Belarus are Belarusian State Agricultural Academy and Grodno State Agricultural University. There is the Department of Entomology and Biological Plant Protection, where the methodological recommendations *The Principles and Rules of Ecologic Farming* were developed (Anon. 2008). Agricultural Department offers a course “The Production of Pollution-Free Agricultural Products” and students do practical work on organic farms in Europe. There is a master level course “Agricultural Ecology” offered by the Agricultural Ecological Department in the Belarusian State Agricultural Academy. However, the majority of scientific works and publications in the country are devoted to the intensive methods of the production of agricultural products.

The demand for “ecologization” of agriculture and application of “ecological methods” is often expressed in the publications of leading Belarusian scientists. However, these publications do not address specifically the issue of organic agriculture as they focus on attempts to improve the existing agricultural practice and to decrease its negative impact on the environment. It is often acknowledged in publications that “ecologization” of agricultural production in Belarus has good prospects and that it is preferable in comparison with further intensification because of the comparatively low density of population and better provision with agricultural holdings per head in comparison with other European countries. When examining current agricultural problems, the authors take into an account the social factor. For example, Gusakov V.G. (Гусаков 2005) describes the pro-ecological and systemic approach to the development of agriculture. He lists several activities as the “most important and prospective activities in the context of new agricultural policy”. Among them he recommends the official introduction of State Eco-labelling system for the marking of foodstuff, creation of large areas specially for the production of ecologically clean products with the use of extensive inferior techniques in the country, improvement of management system by refusing the centralized administration methods, transition to the economic and legal control methods and provision of stable socio-economic development of agriculture. The author outlines that it is necessary to adopt the “ecological agriculture” state program.

The publications devoted to the practical methods of organic agriculture as a system are few. Among them, the book *“Practical Recommendations for the Ecologically Clean Agricultural Production in the Republic of Belarus”* (Тарасенко & Свиридов 2002) published by Belarusian-German joint venture “Nadezhda-XXI Century” should be mentioned. It contains the recommendations on how to grow ecologically clean vegetable products, the summary of the rules and norms for organic agriculture.

Overall, there is no sufficient scientific research in the field of the organic agriculture and there is no holistic approach to it in Belarus, however, there is a scientific potential to adopt the international experience and create own methodology, which will be adapted to the country conditions. Unfortunately, the scientific research on the alternative agricultural methods are financed and supported by the state to less extent.

Practice of organic agriculture in Belarus

It is difficult to evaluate the total number of farm holdings that conduct the organic agriculture, or use some of its elements and variations, such as bioorganic agriculture or permaculture. The Ministry of Agriculture and Food Supply of Belarus has no data about the number of holdings that use organic methods of agricultural production and about the amount of produced organic production (bio-output). Belarusian organizations that unite the farmers also do not have the information on the methods of organic agriculture.

However, the interest in organic agriculture is high. The farmers consider that the main obstacle to promote organic agricultural system in Belarus is the absence of special certification establishments and the insufficient price policy. Nevertheless, Belarusian farmers are interested in organic methods, and many of them begin to apply organic practices. Public Association "Ecohome" has established a label "In Harmony with Nature", criteria of this label are developed in accordance with the main principles of organic farming. In 2009, 13 producers received this label; three Belarusian farmers are entering into a contract with certification bodies and start the organic transition period.

The production of foodstuffs at summerhouse gardens and homesteads is significant in Belarus: the production value is 4844 billion Belarusian rubles. It comprises almost 40% of production value of the country's agriculture (Anon. 2006). At the same time, the area used for this type of agricultural production does not exceed 10.47% of the total area of agricultural lands (homesteads cover 9.8% and summerhouse gardens – 0.66%). There was ten times more potatoes produced in homesteads and "dachas" in 2006, than in collective farms. The production of vegetables in homesteads and summerhouse gardens exceeds this production of the other producers for 8 and 30 times respectively (Anon. 2009).

The production of agricultural products at many summerhouse gardens and homesteads is close to organic production. The interest in the methods of organic agriculture is high among small garden holders – they invite the lecturers from the scientific and public service institutions, and related materials are often published in special publications.

The "Nadezhda plus", the subdivision of "Nadezhda XXI century", is only one company that produces ecologically clean products in Belarus,

although the standards of IFOAM for the growing, storage and treatment are not fully observed during the production. Because of high cost and peculiarities of the Belarusian legislation in the pricing policy, the foodstuff production at this enterprise is supported by grants. This enterprise provides 95% of ecologically clean products to the children center “Nadezhda” of the joint Belarusian-German non-profit organization “Nadezhda -XXI century”.

Legislation, norms, standards, and certification in agriculture and adjacent fields

There is no law on the organic/ecological agriculture in Belarus, but there is an intention to pass the Law “*On the Alternative Methods of Agricultural Production*” (National Assembly plans for Laws Development, year 2010). Despite of the absence of the legislative basis for the organic agriculture, Belarus signed and ratified a number of international documents (for example, the legislation in the field of sustainable development) that are treated as laws, according to the Belarusian legislation. Those documents can form the basis for the practical activities in introduction of organic agriculture methods in Belarus.

Disregarding the fact that the paradigm of nature management in the country remains the same, there are some changes, although insignificant, towards better “ecologization” of the agricultural field. Some documents that provide evidence towards this trend are reviewed below

- The organic agriculture answers the purposes determined in the National Strategy of Stable Socio-Economic Development of the Republic of Belarus for the period till 2020 (National strategy of Sustainable Development (NSSD) year 2002). This strategy includes the goals for the agricultural sector in the long-term perspective, for example “the formation of the effective competitive stable and ecologically safe agricultural production, which conforms to the international standard and provides food safety of the country”. In section 4.2.6 of the “The Introduction of Modern Ecologically Safe Techniques” it is recommended to use biological plant protection facilities, subsurface tillage, apply the principles of permaculture, i.e. methods of organic agriculture, extensively.
- The Code on Land of the Republic of Belarus of January 4, 1999 No 226-3 (version of the Law of the Republic of Belarus of 05.08.2002 No.99-3) regulates the land ownership and directs the rational use and protection of land; equitable development of different economic forms on the land; the preservation and

improvement of the environment; and the protection of the land entitlement of the subjects of the land relationship.

- Document “Main Trends of the Socio-Economic Development of the Republic of Belarus for the period till 2010” sets the goals to preserve the natural resources for the needs of future generations, to restore the soil fertility, to preserve plant and animal life and to achieve an ecological balance.

Currently, 12 state programs are implemented in the field of agricultural sector. When considering these documents, it becomes obvious that organic agriculture on a state level is not considered an essential element of the agricultural sector of economy.

“The State Program of the Revival and Development of the Village for 2005-2010” was adopted by President Decree No.150 on 03.25.2005 (2005a). It provided for development of intensive agriculture and the administrative methods of management, the emphasis was placed on receiving the highest possible harvest. Only in paragraph 2.3 “The Increase of the Soil Fertility” the introduction of the “ecological land ownership” methods is mentioned as one of the measures. This is the only mentioning of the term “ecology” in the document.

The State Principal Program of the Fruit Growing Development for 2004-2010 “Fruit Growing”, adopted by the Council of Ministers of the Republic of Belarus on May 31, 2004, has its aim to increase the fruit and berry production by further intensification of agricultural production. It foresees the use of economic, agricultural, and biological management methods as desirable methods for plant protection from diseases and pests, contrary to use of the chemical methods.

Currently, there is no definition of the terms “ecological (organic) agriculture”, “pollution-free product” in the legislation, agricultural practice, and public opinion. In spite of the broad use of the term “pollution-free product”, the meaning of this term is perceived by different people and organizations in different ways. Even in scientific publications connected with organic agriculture, the terms are not determined or are determined not in accordance with the international standards, for instance, IFOAM standards. Therefore, it is impossible to identify an organic product as labeling of it is not regulated by legislation and depends on the producer’s conscience. In some cases, the substitution of terms takes place. Very often, the products containing permissible radionuclide concentration are called pollution-free (ecologically clean) products.

There are no certification establishments for the organic agriculture in Belarus; therefore, some experts (Тарасенко & Свиридов 2002) recommended employing the services of foreign certification centers from other countries.

In answer to the inquiry, the Ministry of Agriculture and Food Supply (No.10-3/13858 on 11.10.2006) provided information that there is no differential organic production marking in Belarus, as well as there is no state certification system for the holdings which produce organic foodstuff and there is no normative legal acts for the pollution-free production. The absence of the organic product labeling in Belarus means the absence of the instrument to encourage producers, on one hand, and to increase opportunities to inform customers about the qualities of products, on the other.

Role of NGOs in organic agriculture

The public association “Ecohome” began to popularize the permaculture in Belarus, including the ecological design, approaches and methods in agriculture and construction by the middle of 90s. The main aim is to create ecosystems that are constructed and function according to the principals of natural ecosystems. The team of certified trainers has been working in “Ecohome”, conducting seminars in permaculture in the non-formal education system since 2000. The book *The Introduction to Permaculture* by Bill Mollison (1997) was translated and issued to public. This NGO established its own certification label “In Harmony with Nature”. “Ecohome” together with Centre of Environmental Solutions implements projects in the field of organic agriculture. Their activities include seminars for farmers and consumers, presentations and publications of books and periodical issue. In 2010, Belarusian NGOs, working in the field of organic agriculture, started to develop a system of eco-friendly model of food retailing system in cooperation with entrepreneurs.

International Association of Ecologists plays a significant role in dissemination of information about permaculture (Fig. 1.) and organic agriculture by publishing special books and organizing seminars on these issues.

The public association “Women for Revival of the Naroch Region” (the village Komarovo, the Myadel district, the Minsk region) implemented the project “Development of Pollution-Free Agriculture in the “Naroch National Park”. Within the project, the organization elaborated a model of organic farm on the area of 20 ha, developed methodological recommendations and trained specialists in the field of organic farming.

Sources of information

There are few sources in libraries (articles and books), where ecological or organic agriculture is mentioned, publications providing some practical



Figure 1. Production of permaculture potatoes on the experimental site of International Association of Ecologists, Belaruchi. Photo: E. Shirokov, 2010.

information about this method are practically absent. The book search system found 39 sources in the Agricultural library, and 9 sources in the National library. The articles describing the methods of organic agriculture often appear in press, usually in editions aimed for summerhouses residents, farmland owners, and farmers. The Internet is the main source of information about organic agriculture, but Belarusian online resources are practically nonexistent.

Recommendations for future work

The development of organic agriculture in Belarus is restricted by the absence of normative legal basis, insufficient state support, low awareness among customers and potential producers and lack of information or false information.

For the development of organic agriculture in Belarus it is, first of all, necessary to conduct wide awareness raising campaign to inform the potential customers about organic production. The marketing research is necessary, too. The study was performed by Center of business technologies «SATIO» on order of Public Association “Ecohome”. The main results show that 95.4% of respondents would like to buy organic products. Purchasing power of Belarusians is not very high, however, more than a half of our respondents (55,8%) expressed the willingness to pay for organic products. A survey showed that market of organic products exists in Belarus, and consumers are waiting for organic products (АНОН. 2010 b).

The work with agricultural producers is also very important. Not only farmers, but also summerhouse garden and homestead owners should be addressed, as they produce the major proportion of food in country, especially vegetables and fruit. Nowadays, the interest in the production of pollution-free and organic products is high, but there is the lack of information about the methods of organic agriculture adapted to the country conditions and about the economic aspects of organic production.

One of the main obstacles for the development of organic agriculture is the absence of certification and labeling system for ecologically clean products. If no steps are taken in this direction at the national level, there might be a possibility to introduce private standards (e.g. the standards of one of the ecological NGOs), which are based on the IFOAM standards, or to use the services of international certification institutions. It is important to encourage customers and producers to develop the organic labeling in the country.

For the effective cooperation in development of organic agriculture in Belarus, it is necessary to combine efforts of all interested parties. It can be a working team or partnership, combining NGOs, agricultural producers and, possibly, the representatives of scientific institutions and authorities.

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Органическое и конвенциональное сельское хозяйство в Беларуси: современные тенденции

Резюме

Сельское хозяйство играет важную роль в экономике Беларуси, однако органическое сельское хозяйство не является приоритетным для правительства. Основное направление — интенсивное сельское хозяйство, затрачивающее много ресурсов и негативно воздействующее на окружающую среду.

Правительство не поддерживает развитие частных фермерских хозяйств в Беларуси. Развитие органического сельского хозяйства сдерживается отсутствием законодательства, недостаточной поддержкой со стороны государства, низко информированностью потребителей и потенциальных производителей, а также отсутствием информации или ее искажением. Наиболее активны в развитии органического сельского хозяйства в Беларуси — общественные объединения (НГО) и научные учреждения. Для развития органического сельского хозяйства в Беларуси нужна широкая информационная кампания для потенциальных потребителей и обучение сельскохозяйственных производителей. Необходимо ввести сертификацию для органических продуктов

Для эффективного сотрудничества необходимо объединить усилия всех заинтересованных сторон.

Nordic - Baltic - Belarus solutions in farming for biodiversity

