

## Study visit to Belarus

According to the project goals and objectives that, among others, envisage transfer of experience in economically viable and multifunctional farming that supports rural landscapes and biodiversity, a study tour to Belarus took place from June 28th - July 1st of 2010.

When attending project meeting, Mr. Evgeny Shirokov from Minsk Division of International Association of Ecologists in his presentation introduced with agriculture for biodiversity in Belarus. It was discussed during the meeting that it is important to co-operate in order to share experience with farmers from other countries. During the discussions meeting participants also pointed the need to learn more from best practice in farming for biodiversity. Questions on nature conservation and on economical solutions should be included as topics in study tours.

Participants of study trip learned Belarusian experience in countryside permaculture land management, straw-bale and reed construction technologies, and its importance for improvement of countryside local economy, agro-ecotourism and biodiversity management. Program of study visit was prepared by Belarusian partner of project, head of Minsk Division of International Association of Ecologists Dr. Evgeny Shirokov in co-operation with Irina Sukhy, head of Ecodom (both NGOs).

As Minsk Division of International Association of Ecologists and EcoDom work intensively with construction by using ecological materials (straw, reed, clay and hay), program had many good examples of that kind of housing. Using these materials could revive the rural economy, would increase and diversify the sources of income for the local community and consequently would contribute to the sustainable development of rural areas. It is assumed that Belarusians' experience could be valuable and interesting for other partners too.

Participants arrived on 28.06.2010 and accommodated in hotel located in countryside, 40 km from Minsk. On 29.06.2010 study group visited eco-village "Drujnaya" (140 km from Minsk). This eco-village was founded in 1994 for refugees from Chernobyl zone and was sponsored by German NGO in co-operation with local NGOs and anti-nuclear activists. This eco-village is a demo-site of eco-construction technologies. There were 23 eco-houses built from local renewable materials (reeds roofs and walls, straw-bale, straw-clay and wood chips-clay houses). Study tour participants learned about history of this place, events during World War 1 and modern co-operation between Belarusians and Germans in eco-construction houses for Chernobyl victims.

Study tour participants learned about some construction technologies, usage of local renewable construction materials (straw, reeds, hay, wood chips, and clay) and its effect on improvement of economy of local community.

Construction is a major social and economic development priority for the government. The government's housing construction and rural development policy

aims to improve the quality of life for rural inhabitants, to attract young professionals to rural areas, to improve the level of comfort of rural housing to match that of urban, to provide socially acceptable standards of living in rural areas by 2010 through upgrading of housing facilities and development of engineering infrastructure.

The government's ultimate objective in housing construction is to provide all Belarusians with comfortable, energy efficient, reasonably priced housing, alongside with improvement of utilities services. In view of government's budgetary limitations, investments in housing construction are going to be mostly targeting extra-budgetary sources. At the same time, budgetary funds are going to be used for infrastructure development, construction of social housing for lower-income, disabled and other in-need groups.

Straw-bale housing construction stretches back to the 1890's when settlers in Nebraska USA, a treeless landscape, had no other convenient materials than straw to build their home. Although there are many design options, two of the most common (in the US) are the 'post and beam', and 'Nebraska style' designs. With the first a wood, steel, or concrete framework is erected and bales are placed in the walls as insulation. With the second, a top-plate is laid above the bale wall and secured to the foundation by metal rods and/or strapping. The roof is then attached to the top of plate. In either system, the bale courses are stacked in a "running bond," and pinned with rebar, wood, or bamboo stakes. For added strength, chicken wire is commonly wrapped inside and out, and sewn tight to the bales. Then a soil plaster or cement stucco is applied as a finish. However, bales also can hold plaster without wire mesh. They are quick to build and the skills and equipment needed to build them are not sophisticated. In addition, in comparison with conventional brick and wood houses, they have better insulation quality, noise insulation also is better; and as non-toxic product itself, bales allow a gradual transfer of air through the wall, bringing fresh air into the living environment, especially when combined with a natural plaster.

Most frequent questions about straw-bale homes include concerns about fire, moisture, and insects. While individual stalks of straw can be burnt, but when compressed together into bales, due to lack of oxygen, they actually resist combustion. At a certified laboratory in New Mexico, a plastered straw bale wall system easily passed a two-hour fire test, which is required for commercial construction. Liquid moisture is a problem in bale walls, as it is in any wall system. But with a proper foundation, roof, and finishing plaster, straw bale buildings can last indefinitely, as nearly century-old homes in Nebraska prove.

In Belarus, three NGO's, American, German and Belarusian, built 18 straw-bale houses in the Village of Zanaroch in 1996. Through seminars and the dissemination of the Russian translation of the US publication 'Build it with Bales', they attracted the interest of over 100 small construction companies and NGO's. Following these demonstrations the MAC built 12 more demonstration straw-bale houses (2 in each region). However there is still widespread scepticism among government decision-

makers, the construction sector and public regarding the viability of this concept. Straw-bale houses owners, their neighbours, friends, the technicians and government officials involved in the construction of the houses, have seen the energy savings and aesthetic results, but they have no evidence of long term durability of the houses yet.

Overall the level of public awareness about the idea of straw-bale housing is fairly moderate, though clearly insufficient for large-scale replication of the technology. A number of newspaper articles, TV newscasts and web pages have been devoted to the subject annually.

The amount of straw collected across Belarus in 2004 were approximately 3.8 million tons, with Minsk Oblast harvesting some 948,000 tons, followed by Grodno Oblast at 870,000 tons, Brest Oblast at 700,000 tons, Gomel Oblast at 552,000 tons, Mogilev Oblast at 386,000 tons and Vitebsk Oblast at 356,000 tons. Some 60-80% of the straw harvested is used for forage, bedding and other agricultural applications. The remaining 0.8-1.5 million tons can be used for other purposes including housing construction.

Building of one house (90-100 m<sup>2</sup>) requires some 5-8 tons of straw, which means that 100,000 tons of straw would enable one to build 12,000-20,000 houses. It is very important to have building codes and standards for straw-bale housing and trained construction-inspectors. In Belarus there are currently no construction codes or standards for straw-bale housing. Thus, straw-bale buildings legally can be built only for demonstrational purposes i.e., not for commercial enterprises.



*Demo Model and description of one of construction technology: wood-chips-clay wall with reed mesh.*

Participants also studied reed-roof construction process. It was done by visiting Belarus-German team during their seminar of knowledge transfer 'Know-How' in eco-village. Other possible ways to improve local economy by using reeds also had been demonstrated: reed fences, reed mats, and reeds stucco nets.

This is a good example of win-win strategy for Nature and Local Community: use reeds in housing can stop eutrophication in big and clean Naroch Lake on one hand and improve local economy and generate 20-30 new working places on the other hand.

Lessons Learned: it is very important to get information and know-how about clean production from local natural renewable materials, find market for local production and find win-win strategy for Nature and Local Community. In particular case study tour participants saw examples how environmental conditions in the lake and its biodiversity were improved by removing biomass of old reeds. This also improves economy of local community and re-makes traditional sustainable eco- technologies. It is very important for our project idea.



*Study tour participants visiting reed-roof construction in eco-village.*

On the way back participants visited 0-Energy straw-bale eco-house of round shape with green roof, solar panels, etc., constructed in 2008 by Evgeny Shirokov as a Demo Eco-house of Sustainable Life Style and ecotourism.



*0-Energy straw-bale round eco-house covered by clay in Belaruchi.*

Participants were informed on economy, energy, health advantages of straw-bale or hay-bale houses, natural design and sustainability. Also they got knowledge on sustainable eco-technology for potato producing under straw or hay without chemistry fertilizers.



*Interior of straw-bale eco-house.*

Participants took part in round table discussion with presentation of 15-years of Belarusian experience in straw-bale social housing and watched a movie on process of straw-bale construction.



*Permaculture technology of potato production under straw or hay.*

On June 30 participants visited Shemetovo village to see project of sustainable management of 50 hectares of meadows with permaculture design. After that we visited private agro-eco-tourism enterprise (owner – A.Luchenok) and studied some good examples of lake/meadows management with improvement of local economy and creation of new working places. Mr. Luchenok has plans to start production of organic food and to connect this farming with socio-cultural activities.



*Eco-tourism development of meadows/lake system near Shemetovo.*

Different multifunctional grassland farming practices were observed in visited farms. In small rural enterprise managed by Mr. Luchenok development of new products and services such as agro-eco-tourism based on marketing of local products were discussed. There were examples and ideas how to use local resources (e.g. lake for fish farming, angling and boating; agricultural land for crops, grazing and attractive traditional landscapes; lake shore for visitor facilities) sustainably, with care for environment, but in the same time with profit that makes business viable.

Project of sustainable grassland management with permaculture design was discussed in Shemetovo village. Its main objectives are safer food and rural development, but traditional farming and nature-friendly planning programs are also included into the development strategy. This project can be used as example how to tackle with the problem of agricultural land abandonment as abandonment is significant threat for grassland biodiversity for most of project countries. However, because Belarus is not an EU country, it should be taken into account that there are considerable differences in national policies.

These examples fit well with nature-oriented grassland farming supported by the project and would be a good starting point to develop further cooperation and exchange of experience at farm level.

It was concluded that it is very important to pay greater attention on permaculture, agro-eco-tourism for development economical models acceptable for sustainable management of grasslands and conservation of biodiversity.



In the evening participants had discussions on experience seen during the study tour, possible future co-operation, and differences in project countries.