

**THE ENERGY-FOOD-WATER LAND USE NEXUS:
POSSIBLE EQUILIBRIUMS FOR THE LOW CARBON
TRANSITION**

SMART LAND USE FOR LOW CARBON ECONOMY

SUMMARY

THEMATIC WORKSHOP LATVIA

13 - 14 JUNE 2017

INTRODUCTION

To support the achievement of the BIO4ECO objective of transition to a low carbon economy while bridging sometimes conflicting energy and land use policies, a three-day international **THEMATIC WORKSHOP “The Energy-Food-Water land use nexus: possible equilibriums for the low carbon transition”** was held in Latvia on 13th – 15th June 2017.

Thematic workshop in Latvia was organized by the Ministry of Agriculture of Latvia and Latvian Forest Owners’ Association.

Project partners and stakeholders were encouraged to exchange views, experiences and good practices **in relation to functional land management planning solutions and climate smart forestry aspects.**

The thematic workshop was organized in a form of **workshop presentations and discussions** as well as **field visits** to get regional practical experience on the discussed themes. Workshop was attended by over 45 participants from BIO4ECO partner countries/regions, including a guest speaker who represented the European Research Project LANDMARK 2020.

Local stakeholders from farmers’ and forestry organizations actively participated at the workshop and got possibility to learn from foreign experiences and compare local challenges and solutions to those crucial in partner countries.

The thematic workshop brought interest of **the local media** and thematic articles are going to be published in Latvian written agriculture and forestry media.

WORKSHOP DISCUSSIONS

Workshop discussions on 13th June were organized in two thematic blocks, both underlying issue of the development of sustainable biomass production and usage through:

- Functional land management
- Climate smart forestry

Themes of the workshop were agreed and pre-discussed between project partners before the event. Each project partner was asked to analyze the proposed themes through national/regional perspective.

Under **functional land management** theme, it was discussed how to address diverse land functions by bridging controversial policies to get most of forest and farmland (based on regional examples and scientific knowledge).

Representative from the European Research Project LANDMARK 2020 gave a presentation on Functional Land Management as a framework for the supply and demand governance of the bioeconomy sectors. Holistic management of competing targets was emphasized. Latvian University of Agriculture presented an ongoing research (under BIO4ECO project) on organic soils as land use hot-spots in relation to biomass gathering and climate change mitigation targets. Latvia State Forest Research Institute “Silava” (LSFRI “Silava”) informed about the Latvian experience on the management of extracted peatlands. Successful reclamation measures require clear management goals and sufficient consideration of the site-specific conditions and landscape-scale planning.

BIO4ECO partners presented their views on land use functionality and planning in locally adapted ways. Project partners from Catalonia, North Karelia, Romania and Slovenia presented their views on new planning tools to support forest land management decisions, regional land use planning aspects, including ecosystem services, approach of local forest and agriculture biomass usage for local heating, work on land use planning multi-functionality.

Under **climate smart forestry** theme it was emphasized that forest sector plays a significant role in the greenhouse gas balance. Appropriate climate, land resources and scientifically-based knowledge are prerequisites for sustainable and productive forest management.

Potential of wood use can be enhanced by stabilizing carbon storage, but long-run solutions are needed. LSFRI “Silava” and Ministry of Agriculture of Latvia shared Latvian experience and knowledge on active and sustainable forest management solutions and informed about EU level policy planning perspectives and its possible impacts on forest biomass production in long-run.

Project partners from France, North Karelia, Bulgaria, and Slovenia shared knowledge-based experiences with involvement of municipalities in forest resources management, small private forest owners’ role in sustainable biomass production, solutions and bottlenecks for e-services, forest biomass production and mobilization from woodlands outside forest territories.



FIELD VISITS

During the second day (14th June) of the thematic workshop, four field visits were organized to illustrate the workshop themes (presented and discussed on 13th of June) in practice.

Project partners and local stakeholders visited:

- 1) Climate house of the Latvian State Forest Research Institute (LSFRI) SILAVA;
- 2) experimental forest site to demonstrate circularity by usage of wood ash as fertilizer;
- 3) forest tree seed orchard in Suntaži to demonstrate how forest tree breeding and genetics can support active and climate smart forestry;
- 4) Skrīveri experimental field to demonstrate short rotation biomass, perennial herbaceous plants and agroforestry practices experiments in marginal agricultural land.

Climate house of LSFRI “Silava” – complex of laboratories with climate control options

Climate house laboratories are equipped with climate control options to support tree breeding and by thus improved forest reproductive material. LSFRI “Silava” researchers informed on the developed practices and on how forest tree breeding and genetic can support effective climate smart forest management and adaptability of forest stands to climate change. Relatively minor changes introduced through tree breeding and obtaining of genetically improved reproductive material affect forest management in wide.



Wood ash as forest fertilizer

Large amount of biomass residues result from biomass burning. Currently most of wood ash is being deposited as waste although it can be brought back into the nutrient cycle as a resource (fertilizer) in agriculture and forestry.

LSFRI “Silava” demonstrated research object (forest site where wood ash is recently dispersed) and explained the first research results obtained within the project “Forest tree growth enhancement program 2016-2021” (project funded by the Joint Stock Company “Latvia’s State Forests” (LVM)).

The research results show significant positive response effect of forest stand growth and vitality in case of wood ash fertilizer application (source of phosphorus and potassium). Necessity to eliminate increasing soil acidity is a typical problem in Northern Europe and wood ash can be applied also as an effective liming material.



LSFRI “Silava” researchers demonstrated several wood ash samples, coming from different wood biomass heat plants in Latvia, explained how different in chemical content and physical characteristics wood ash can be and informed on respective application solutions developed by the institute. Aspects of mutually beneficial collaboration between foresters and biomass heat stations were also discussed during this field visit.

Forest tree seed orchard in Suntaži – importance of tree breeding and genetic in elaboration of climate smart forestry practices

At one of the forest tree seed orchards LSFRI “Silava” researchers demonstrated the work done in Latvia on tree breeding and genetics. Genetic diversity has a fundamental role in species evolution and its capacity to adapt to climate change in long term. It can be considered as an insurance for species survival under pressure of different and changing abiotic (e.g. wind storms) and biotic (e.g. insects, fungi) influences.

Based on practical examples, LSFRI “Silava” explained how wrong choices made in selection of forest reproductive material can result in long lasting, cumulative negative effect on forest production later.



Ministry of Agriculture
Republic of Latvia



By using scientifically sound knowledge forest owners and forest managers have the opportunity to improve forest management practices, enable the increase of wood resource potential, produce more biomass for renewable materials and stabilize carbon balance in long run.

Skrīveri experimental site - short rotation biomass, perennial herbaceous plants and agroforestry practices in marginal agricultural land

LSFRI “Silava” in collaboration with Skrīveri Research Institute of Agriculture have established an experimental site to study growing of short rotation crops, varieties of perennial herbaceous plants and different agroforestry systems in agriculture land that for different reasons is not or cannot be effectively used for traditional agriculture. In the particular experimental site the limiting factor is high groundwater level.



Scientists showed how interaction between forestry and agriculture practices can help use land (especially low quality land) more effectively.



Different crop systems (hybrid aspen, poplar, grey alder, black alder, willows, wild cherry and perennial energy grasses) and results of different fertilizers applied (waste water sludge and wood ash) were shown during the visit. Different clone and density hybrid aspen plantations and different poplar clones were compared and practical lessons shared. Poplar clone difference was clearly visible and explained and gave an insight in proper planting material choice.



MAIN EXPERIENCES AND CONCLUSIONS

Functional land management

- ✓ Land functionality analysis can help to get most of our land
- ✓ Presence of peatlands and organic soils make them land use management hot spots
- ✓ Links between regional land use management planning and bioeconomy strategies are important
- ✓ Bioenergy development should be integral part and important support tool for development of rural territories
- ✓ Site-specific land use objectives can be tackled by forest stand management planning
- ✓ Soils are crucially important. Soil response should be modelled in a light of bioeconomy development
- ✓ Attraction of different actors` attention to soil organic carbon issues is a challenge
- ✓ Integrative approach of agriculture and forestry needs to be developed when working towards climate change targets and particularly on soil organic carbon

Climate smart forestry

- ✓ Justified and locally adapted forest management solutions are essential for climate smart forestry development
- ✓ Climate smart forestry is a wide concept and there is no common understanding yet, further work and experience exchange is needed
- ✓ Good “traditional” forestry helps mitigate and adapt to climate change even without the title “climate”
- ✓ Active forest management can contribute to climate change mitigation in three ways: carbon sequestration, fossil fuel substitution and substitution in materials
- ✓ Local planning is important part of successful forest biomass mobilization
- ✓ Information reaches forest owners better if it is processed and adapted to particular needs
- ✓ Forest owners are motivated to share their information if information security is guaranteed

- ✓ Small property forest owners are the target auditory for bioeconomy development
- ✓ Focus should be brought on ecosystem services in forest management plans
- ✓ Possibilities to use private forest owners' data (e.g. from e-service systems) in GHG inventories are worth to be explored
- ✓ E-service models should be used more widely, but one model cannot be applied everywhere in an uniform way, local solutions are needed
- ✓ GHG accounting challenges in LULUCF sector (land use, land use change and forestry) are increasing and can impact biomass mobilization future a lot

