Study tour to best practice examples for paludiculture in Germany

The study tour to paludiculture sites and companies dealing with paludi-biomass in Northern Germany has been carried out in the framework of the project “DESIRE” (Interreg Baltic Sea Programme 2014 – 2020) within the actions “Dialogue of multidisciplinary working group on paludiculture implementation (Activity 2.3)” and “Cross-sectoral dialogue on paludiculture biomass utilisation” (Activity 4.3).

The outcomes from this evaluation based on the answers and recommendations of participants of the study tour, are expected to be usable to give some input to the Strategy for paludiculture in the Neman basin (2.3).The intention of the study trip to Germany was to give an overview on best practice experience on paludiculture: excursion with selected stakeholders for knowledge exchange with land users and enterprises of exisiting paludiculture pilots in Germany. Meetings with local and regional authorities will be held to discuss advances and perspectives of paludicultures for nutrient retention and inclusion into water and agricultural policies and arising opportunities, overall goal is institutional exchange and learning and technical capacity building (4.3). The programme and the aims of the study trip to paludiculture sites is well described in a handout which can be downloaded here.

Photo: the participants of the excursion at the last program site in Hankhausen

2. Programme

The DESIRE study tour to best practice examples for peatland rewetting and paludiculture in Lower Saxony and Mecklenburg Vorpommern, Northern Germany was carried out between Monday, 21.10. and Thursday, 24.10.2019. In between, a workshop in Dummerstorf at Mecklenburg Vorpommern Research Centre for agriculture and fisheries (LfA) resp. : Leibniz Institute for Farm Animal Biology (FBN) has taken place. The folllowing table (1) shows the main excursion destinations and agenda items.

Table: Main excursion destinations and agenda items within the study tour on paludiculture in Germany, reduced by organizational points, accomodation details and travel times

date	Location or event	Remarks
21.10.	**Polder Kamp, Peene river estuary**	
16:00 – 17:30	Typha cultivation test site polder, harvesting techniques, products from Typha	Kamp, Aldert van Weeren
19:45	Kick off, getting to know each other	Restaurant Kolping Salem
22.10.	**Neukalen & Malchin and Dummerstorf**	
8:15 – 8:30	Lake Kummerow wet meadows (drive through) Hay making sites in wet peatlands	near Neukalen
8:45 – 9:30	Heating plant thermal utilisation of hay bales Neukalen	Malchin: Ludwig Bork
9:30 – 11:30	Typha plantation field site from PRIMA project	Tractor transport to the field site, Henning Voigt
14:00 - 17:30	Workshop on paludiculture strategies for implementation, potential inclusion of paludiculture in agricultural policies	Dummerstorf: MV research Centre for agriculture and fisheries (LfA)
23.10.	**Gut Darss, Mecklenburg Vorpommern, Bad Oldeslohe, Schleswig-Holstein, Germany**	
8:30 – 11:00	Coastal peatland management with water buffaloes, production and marketing of waterbuffaloe meat for regional market	Gut Darss, Born, Herr Thomas Möhring
15:30 - 17:00	Hiss Reet - construction materials from reed	Bad Oldeslohe: Tom Hiss
20:00	Dinner with paludiculture round table, discussion of open questions	Restaurant in Oldenburg.
24.10.	**Hankhausen sphagnum farming, Lower Saxony, Germany**	
8:30 - 11:00	Sphagnum farming pilot site of Greifswald University / Moor Kultur Ramsloh (MoKuRa – peat substrate producer)	Hankhausen: Greta Gaudig und Anja Prager

3. Study Tour notes and questions discussed (21.-24.10.2019)

Polder Kamp and Anklamer Fähre: Presentation of reed harvesting special machinery and Typha cultivation sites

At this site, Aldert van Weeren from Wetlands products foundation, lead the excursion and gave inspiring information on different aspects of paludiculture. He showed examples for machines for harvesting which are adaptations by different companies for harvesting reeds. The potential soil destruction by these machines is at a minimum, as soil pressure is rather low.

For production of construction plates, biomass from Cattail is mixed with magnesite which on one hand makes burning more difficult and on the other hand is stabilizing the material. A wall can be built from such plates. It is also possible to form plates only from milled biomass from Typha just by pressure and the heat which develops by pressure, no glue is needed. These Typha products are 100% degradable, but adding minerals can enhance quality/stability.

The Polder Bargischow in direct neighbourhood of Kamp will be used as an ecological compensation for North Stream pipeline: northern part – flooded/shallow lake; southern part – partly flooded- will be brought to paludiculture. The Polder Anklam West, some kilometers upstream had been fully rewetted some years before: now it is a shallow lake – important for birds, but no emergent plants are growing at water tables of about 1 meter above ground.

Wet meadows, Lake Kummerow

The meadows of Neukalen at the Lake Kummerow have been rewetted within a large scale restoration project by the federal agency for nature protection (Peene-Haff Valley and Peatlands; in total ca. 20,000 ha, costs 31,27 Million Euro) in the beginning 2000s (1992 – 2009). As they have not been drained very deeply before, these meadows did not degrade as much and today their water tables are leveled out with the adjacent lake Kummerow. These meadows are used for hay making when water tables are low due to strong evapotranspiration in summer and the hay is delivered to the heating plant in Malchin.

Malchin Heating Plant

Within the above mentioned large scale restoration project the farmer negotiated long term management contracts with the nature protection agency. As fertilizer could not be used and the quality of fodder decreased from year to year, the suckler cows almost starved and he had to find any alternative for the utilization of the hay produced from his ~300 ha wet peatlands. Hence, the heating plant had been constructed, to utilize the biomass sensibly by Ludwig Bork who gave explanations. More information: https://www.moorwissen.de/de/paludikultur/projekte/bonamoor/index.php

About 500 households are provided with heat energy and warm water within a 10 year contract for heat supply with fixed prices. The plant is run mainly with round bales of hay which are mechanically disintigrated before it is transported to the boier by a conveyor. 1m³ ash per day is produced at full performance of the boiler. The ash is a rather fine powder which must be dumped in a landfill. Alternatively this could be a valuable fertilizer after having been manufactured to pellets. The daily amount of 1m³ is too low for building up a fertilizer production chain being economic. Biomass material with less nutrients and lower ash contents) can be obtained if harvesting takes place later in the season.

Typha plantation (PRIMA project site)

The Typha plantation just had been realized within a project from GMC supported by the Federal Ministry for Agriculture (https://www.moorwissen.de/en/paludikultur/projekte/prima/index.php). The PRIMA project manager Josephine Neubert led the excursion to the pilot site, supported by Nora Köhn and the farmer Henning Voigt. By turning to paludiculture, the farmer losees EU-subsidy

payments with this project as Typha spec. is not eligible as agricultural products. Greifswald Mire Centre (GMC) is working on changing this on EU and regional level. The site was planted with pregrown Typha plants. The plants were bought in Germany (30cents/plant – 40,000) and have been planted with a forest planting machine.

Figure: members of the excursion group standing on the levee surrounding the new Typha-polder

Gut Darss

The Gut Darss (https://gut-darss.de/start.html) is a large organic farm in the village Born on Fischland/Darss/Zingst peninsula mainly producing meat by keeping suckler cows - most of it is Fleckvieh and Charolais cattle - on drained and on restored peatland sites. The manager responsible for the herd of cattle, Thomas Möhring, led the group across the farm and into the peatland pastures. Today, about 30 employees look after 4,700 cattle (2,100 suckler cows) as well over 4,000 ha of land (including leased land) another 30 employees are working in the tourist sector. The land use intensity is very low at 0.8 Cattle Units per ha of main forage area. The breeds Deutsch Angus, Charolais, Gelbvieh, white-blue Belgians and Fleckvieh belong to the bull stock. A part of the calves is given to conventional fatteners. Additionally, more than 300 Water Buffaloes graze on pastures of Gut Darss.

The little island within the Saaler Lagoon, Schmidtbülten, has been grazed since about 10 years by Water Buffaloes. Just some days before we visited this site, the Buffaloes have been taken away from this island for grazing the the surrounding, stronger degraded peatlands. Before Schmidtbülten has been covered by a dense reed stand. Grazing with Scottish Highland Cattle has not been successful. But Water Buffaloes turned it back to some kind of original coastal flooded peatland again.

Photo: Water buffaloes on some degraded peatlands managed by Gut Darss

Hiss Reet

Hiss Reet is a company in Bad Oldeslohe, federal state Schleswig-Holstein, mainly trading with products from Common Reed https://www.hiss-reet.de/?L=1 The company mainly imports it from Turkey and Romania. The reed must contain < 18% moisture to be stored. The reed is sold to be used for very different purposes like insulation material, acoustic absorbers in rooms, plaster material, thatch, decoration, fences etc. Products from Hiss Reet are certified. Roofs covered with reed should have a slope of 25-45% in order to assure longevity of the reed. The whole reed-sector is very much under pressure as raw materials are replaced by imports from China. There are tax disadvantages for European producers compared to imports from overseas. 20-25% of reed for thatch in Germany originates from China, in NL it is even more.

Photo: various products stored at the main warehouse of Hiss Reet company- Tom Hiss giving explanations

Hankhauser Moor: Sphagnum farming

Sphagnum farming is the cultivation of peat mosses (Sphagnum) for the production and harvest of peat moss biomass. In Hankhausen, federal state of Lower Saxony, there is a 16 ha experimental site set up by GMC and partner organisations within different projects for testing large scale cultivation of sphagnum mosses. As too high nutrients in irrigation water may be a problem its envisaged to try to extract nutrients with an upstream Typha-field in order to reduce nutrient contents. Phosphorus is filtered out by sphagnum, content decreases with distance to ditch.

(https://www.moorwissen.de/en/paludikultur/imdetail/torfmooskultivierung.php)

Photo: Harvesting device for peat mosses in Hankhausen

6. Evaluation of the comments and recommendations of the participants of excursion

The evaluation of the questionnaire is a contribution to our multidisciplinary stakeholder dialogue on implementation of paludiculture and utilization of biomass from wet peatlands. The participants of the study tour have been asked that when preparing their answers, they should keep in mind the showcases they have seen during the excursion and the outcomes from the Dummerstorf workshop and discussions. They were asked about their take away messages, lessons learned and to give recommendations to the project.

Answers to the questions above have been provided by most of the participants of the study tour to the organizers during the following weeks after they came back home. Their answers have been compiled to the main messages.

1. Lessons learned and Key take away messages

    - Peatlands must be wet
    - Paludiculture as a new approach for sustainible peatland management
    - Importance of paludiculture for the climate
    - GHG emissons reduction by peatland rewetting
    - Great potential of new raw materials for industry
    - Try to consider experiences from study tour in own work
    - Paludiculture is recognised as an option for sustainable farming

2. Recommendations from participants

    - Show economy of Paludiculture
    - Install pilots in Neman catchment
    - Inform on benefits (Ecosystem Services)
    - Strong involvement of farmers and capacity building is essential
    - Intensify contacts to companies dealing with construction materials
    - Share experiences with project countries, e.g. on AES for Aquatic Warbler

3. What did you learn from the project members?

    - new insights on potential possibilities to use biomass from wet peatlands in the industry
    - Strong Global concern for environment/climate change
    - Dependency of the peatland issue on policy actions