17 March 2021

Peatlands International

issue 1.2021

International Peatland Society

Just Transition and Hybrid Substrates

16th International Peatland Congress

Editorial

Just Transition?

This edition of Peatlands International has an emphasis on Just Transition, a concept which provides for assistance to be given to redundant workers and communities when economic entities are closed for environmental reasons. Many of the actions involve rebuilding social and economic capacity in the affected regions.

A principal motivation for ceasing peat extraction in some areas has been to reduce greenhouse gas emissions from drained peatlands. This reduction will only be effective if action is taken to restore or rehabilitate the decommissioned peatlands.

The Wise Use book stated that agriculture and forestry account for 80% of man-made losses of non-tropical mires. To these areas can be added drained or otherwise damaged tropical peatlands and large areas of abandoned peatlands in Ireland, the former Soviet Union and other areas. If Just Transition is to result in environmental as well as social justice, someone somewhere should seek to mitigate emissions from these areas.

The approach of the IPS to uses of peatlands is based on the Strategy for Responsible Peatland Management (SRPM). This respects the environmental, social and economic values of peatlands. As well as climate functions, rehabilitated peatlands have recreation and aesthetic functions. But, where appropriate, peatlands also have a wide range of economic functions which enhance the quality of life on the planet.

One of these which is receiving a lot of attention at present is the use of peat in horticulture. A number of countries are seeking to seriously reduce or eliminate the use of peat in horticulture. The Wise Use book found that 'peat has emerged as the foremost constituent of growing media.'

Peatlands International is the global magazine of the International Peatland Society (IPS). It provides the more than 1,700 individual, institute and corporate members of the Society with up-to-date information on peat and peatland matters, reports and photos of conferences and workshops, background reports and publication reviews. To serve all of our members, we provide always a good balance between economic, social and environmental points of view. Opinions are those of the authors. To receive Peatlands International in your email every three months, visit www.peatlands.org/join-us and sign up as a member - or easily subscribe for € 59/year via our online shop.

Impressum

Peatlands International
ISSN: 1455-8491

Publisher:
International Peatland Society
Nisulankatu 78 B, 40720 Jyväskylä, Finland
phone: +358 40 418 4075
email: ips@peatlands.org

Editor-in-Chief & Layout:
Susann Warnecke, Acting Secretary General, Head of Communications and Finance Administration

Editorial Board
Lydia Cole, United Kingdom
Marie-Claire LaBlanc, Canada
Jean-Charles Michel, France
Juhani Päivänen, Finland
Jack Rieley, United Kingdom
Jos Schouwenaars, the Netherlands

Are you interested? Contact susann.warnecke@peatlands.org.

Cover: Windfarm on rewetted peatlands, Mountlucas, Ireland, by Susann Warnecke

www.peatlands.org/publications

It further found that 'there is not at present any alternative material available in large enough quantities and equally risk-free which could replace peat in horticultural crop production.'

A 2012 report prepared for EPAGMA on the life-cycle impacts of the various constituents used in growing media found that all constituents have some impacts. Simply substituting other constituents for peat (where this is technically possible) would not eliminate impacts.

Some of the discussions around removing peat from horticulture production make no reference to what would happen to the abandoned drained peatlands. Simply walking away from drained peatlands makes no sense. Much better would be to continue to use some of them, putting in place a plan for rehabilitation.

Where it is put in place, Just Transition takes some of the emotion out of discussions on the future uses of peatlands, and this is to be welcomed. It is hoped that this edition of Peatlands International will help in these discussions.

Donal Clarke

Executive Board Member
donalcla@eircom.net

Photo: S.B von Lanten

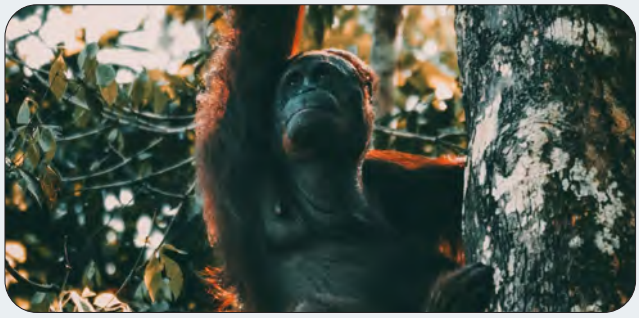
Contents

Follow us also at ---> linkedin.com/company/peatlands :)

IPS Secretariat
Nisulankatu 78 B
40720 Jyväskylä
Finland
peatlands.org

Peatlands and Just Transition in Ireland
pages 6-9

Hybrid Substrates
pages 18-25



Round the world in eight peatlands
pages 30-35

Peatlands and Just Transition in Ireland

The cessation of peat extraction by Ireland's largest peat company, Bord na Móna, and the closure of two peat-fired power stations have led to substantial job losses in Ireland's midlands region. These decisions have led the Irish Government to appoint a Just Transition Commissioner and establish a Just Transition Fund.

Just Transition is a concept developed by trade unions to protect workers when economies are changing due to environmental protection policies that result in job losses. The concept has been endorsed by the International Labour Organisation and the European Bank for Reconstruction and Development, among others.

Traditional peat cutting demonstration during the IPS Symposium in 2015, Boora Works, Killaranny Bog, Co. Offaly. Photo: Susann Warnecke

Background

The midland areas of Ireland had traditionally been less economically developed than some other parts of the country. Beginning in the 1930s the industrial development of peat extraction brought a level of economic prosperity to the area. At various times there were three turf-fired power stations, four milled peat electricity stations, three horticultural peat processing plants and four briquette factories.

Throughout the 1960s and 1970s employment in Bord na Móna varied between 7400 and 5400: in addition, hundreds more were employed in the electricity stations. Seasonal employment enabled small farmers earn a viable income. This heavy dependence of the area on a peatland-based economy formed a background to the introduction of Just Transition projects beginning in 2019.

Planning Regulations

Since the introduction of the 1963 Planning Act peat extraction has been stated in law to be exempt from planning regulations. Irish law became subject to the Environmental Impact Assessment Directives of 1985, 1997, 2003 and 2009. Irish law continued to exempt peat extraction from the need for planning permission, and by extension, from the need to complete Environmental Impact Assessments. This interpretation of European law was challenged by environmental NGOs.

In December 2018 the Irish High Court found that peat extraction by two private companies, where the areas involved were over 30 hectares, was not exempt from planning permission.

In January 2019 the Government introduced Statutory Planning Regulations which allowed peat extraction to continue without planning permission for a transitional period. These regulations were challenged in the High Court. In September 2019 the High Court set aside these State regulations. It ruled that peat could not be extracted from areas above 30 hectares without an Environment Impact Assessment and planning permission.

Peat-fired power stations

In the early part of the 21st century there were three power stations which burned milled peat supplied by Bord na Móna, at Edenderry (owned by Bord na Móna), Lanesboro and Shannonbridge (both owned by the Electricity Supply Board). Each had planning permission for specified periods, and as each of these periods ended, planning permission had to be renewed. The station at Edenderry had been combining peat with biomass since 2008. By the end of 2020 that station was burning 42% biomass, and the aim is to transition to 100% biomass consumption.

The planning permission for the Electricity Supply Board power station in Shannonbridge (100MW) was due to expire on 31 December 2020. Prior to that it sought a new planning permission allowing it to transition to solely using biomass by 2027. In July 2019 this application was refused. In November 2019 the ESB announced that its two peat-fired power stations, at Lanesboro (135MW) and Shannonbridge, would close with the loss of 100 jobs. The closure of the two stations took place in late December 2020.

Cessation of peat extraction by Bord na Móna

In October 2018 Bord na Móna announced that it would cease peat extraction on 17 out of the 62 bogs which were then active. Some 430 redundancies were expected as a result. It also announced that peat harvesting on a further 45 bogs would end within seven years. The reason given for these moves was ‘because of the need to decarbonise energy sources in response to climate change.’

In January 2021 Bord na Móna formally announced the end of all peat harvesting on its lands. The last full peat harvest had been in 2018, there had been a partial harvest in 2019, and none in 2020. This decision followed the closure of the two peat-fired power stations, and the decision

Milled peat extraction at Derrinboy, Ireland. Photo: Hannu Salo

regarding the need for planning permission for peat harvesting. The company stated that the decision was a key milestone in its 'brown to green' strategy to become a leading climate solutions company.

Just Transition

In November 2019 the Irish government appointed Mr Kieran Mulvey as Just Transition Commissioner for the Irish Midlands. His role was to advise on the development of opportunities for the midlands workers directly affected by the closures and the wider midlands community.

In June 2020 the Government established a Just Transition Fund for the midlands. Its objective was to invest in innovative projects which would contribute to creating a green and sustainable economy in the midlands region. Since then the Fund has disbursed financing in two tranches: the first a sum of €1.2 million to 16 applicants; the second a sum of €27.8 million to 47 projects.

In November 2020 the Government announced the creation of a €108 million fund for the rehabilitation of 33,000 hectares of cutaway peatland. Bord na Móna will invest a further €18 million in this project. In briefing the press on its plans for rehabilitating these peatlands a Bord na Móna representative said that, ideally, the restoration measures would improve peatland hydrology so as to support Sphagnum moss communities. He said that, to date, it had restored 3,000 hectares to this level. Where this level of restoration was not possible, the aim would be 'enhanced rehabilitation'. This will involve re-profiling topography to maximise groundwater levels. The purposes of the rehabilitation include addressing both climate and biodiversity issues.

In the same month the EU announced a Just Transition Fund for communities moving to a low carbon emissions economy. It is directed at regions facing difficulties from the phasing out of peat and coal. Ireland is expected to receive some €77 million from this fund between 2021 and 2027.

In February 2021 an EU fund of €10 million was announced to finance a Peatlands Knowledge Centre of Excellence, a Just Transition Accelerator and a People's Discovery Attraction.

Shortage of Peat for the Irish Horticulture Industry

In September 2020 the Government published a report on a review of the use of peat moss in the horticulture industry. It found that 'there are significant positives and negatives arising from the ending the use of peat moss in the horticultural industry. There are difficult choices to be made …'


Rewetted cutover peatland at Ballycon. Photo: Susann Warnecke

The relevant Minister of State then established a working group to examine the issues identified by the review, including eliminating the use of peat moss in amateur gardening and the elimination of the use of peat moss in the horticulture industry over an agreed period of

Small scale extraction demo at Boora Works. Photo: Susann Warnecke

years. The working group begins meeting in early March 2021.

In January 2021 sources in the horticulture industry said that Bord na Móna had informed them that peat supplies could run out as early as March 2021. Newspaper reports at the time quoted these sources as saying that thousands of jobs could be lost in the Irish horticulture industry due to a shortage of peat.

The shortage was 'a huge source of concern' to the horticulture industry as 'peat is the base material that most businesses in the Irish horticulture sector relies on'. Peat, the industry said is 'an essential raw material for plant growth'.

In addition to the decision of Bord na Móna to cease peat harvesting, the High Court decision of September 2019 had prevented many Irish companies producing horticultural quality peat (including Bulrush, Westland, Harte Peat, Klasmann-Deilmann and Erin) from continuing production.

At a meeting of a Parliamentary Committee on Agriculture on 16 February 2021 it was claimed that the shortage of peat would wipe out the mushroom, vegetable and nursery sectors, leading to job losses of 17,600 people.

It was further stated that the horticulture industry had begun importing peat from the Baltics, and, it was said, from Scotland.

Briquettes

Bord na Móna has announced that its peat briquette factory at Derrinlough will continue production to 2024 using existing peat stocks.

The eventual cessation of production will have implications for households in the midlands, which are heavily dependent on briquettes for both heating and cooking. In partial response, the Government has introduced a Midlands Retrofit Project to upgrade the energy ratings of domestic houses.

In February 2021 the Government stated that it will introduce legislation governing the use of solid fuels for domestic heating. This will involve stopping the sale of sod turf, but the use of briquettes will continue as they comply with existing clean air regulations.

Conclusion

Bord na Móna's peat extraction and the generation of electricity exclusively from peat were coming to an end. Recent decisions have simply brought these decisions forward.

It is heartening that the Government's action to mitigate the effects of these decisions has been to finance the restoration and rehabilitation of drained peatlands. It is a clear example of turning a problem into an opportunity. Also, if Bord na Móna had not pursued its 'brown to green' strategy in recent years it is a fair guess that it would now be closing down. The remaining issue to be addressed is sourcing the specialist peat needed for the horticulture industry.

Donal Clarke

IPS Executive Board member
donalcla@eircom.net

Ireland's Just Transition Process: The Implications of Tying the Just Transition Concept to Human Rights Law

The failure to carry out inclusive and timely just transition processes, as called for by the United Nations (UN), may jeopardize future initiatives aimed at reducing greenhouse gas (GHG) emissions.

Countries phasing out GHG emitting industries, without providing appropriate supports for those whose livelihoods depend on them, may even be in violation of international and regional human rights mechanisms.

Peat extraction has long been a source of employment in the Irish Midlands, largely via the semi-state run company, Bord na Móna. While it was initially announced that the company would stop extracting peat for energy production by 2030, redundancies were in place as of 2019.

The fast-tracked closures are raising questions regarding the future of workers and their communities. Interestingly, it was the State that for many years encouraged workers to relocate or

Photos on these pages of the Garryduff Cutaway, Co. Galway and Co. Offaly border, near Shannonbridge.

All pictures by Stephen Monteverde, a PhD researcher on NUIG's EPA and JPI funded WaterPeat project.

IPS' Allan Robertson Grants (€500) are awarded to:

a) young peatland and peat researchers carrying out research or practical work or
b) young professionals in early stages of their career in managing peatlands or peat industry.

Further reports of 2020 will be published in the June-December issues this year. More info: peatlands.org/about-us/honoursgrants. Next deadline 31 January 2022.

remain in the Midlands to work in the industry. The speed at which the closures took place shows a sharp departure from past policy and illustrates the government's role in failing to prevent legal employment in un-environmental practice.

A number of alternative areas of employment have been proposed to date; however, some of these proposals raise concerns regarding ecological and structural stress to the bogs and the continued release of GHG. Although some re-training and up-skilling initiatives have been implemented, it appears that no comprehensive process has been undertaken to determine the plausibility of these suggestions and the preferences of the workers themselves.

As some jobs and industries disappear and change it is important to consider what protection the law might provide to workers and communities. In other words, how might law contribute to ensuring a just transition, where workers and communities are not left to shoulder the burden of the State's changed policies alone?

Human rights law may prove to be a useful tool for encouraging the State to address gaps in its approach to implement a proper just transition. By doing so, it may serve to build public trust in the State's ability and willingness to protect its residents from financial hardship, thus building

Data derived from personalised tables provided by the Central Statistics Office regarding those engaged in "the extraction of peat" in the Irish Midlands in 2016

All Ages	15 - 19 years	20 - 24 years	25 - 29 years	30 - 34 years	35 - 49 years	50 - 64 years	55 years and over
656	<6	21	62	72	168	323	<10

No formal education	Primary	Lower secondary	Upper secondary	Technical/ vocational	Advanced certificate/completed apprenticeship	Higher certificate	Ordinary bachelor degree/professional qualification or both	Honours bachelor degree/professional qualification or both	Postgraduate diploma or degree
11	**60**	**171**	**125**	**42**	**88**	**26**	**29**	**45**	**25**
On foot	Bicycle	Bus, minibus or coach	Train, DART or Luas	Motor cycle or scooter	Driving a car	Passenger in a car	Van	Other, including lorry	Work mainly at or from home
7	**8**	**0**	**<6**	**<6**	**483**	**13**	**117**	**10**	**<6**


Photo: Stephen Monteverde

compliance with future carbon reducing policies in other sectors.

My research included a limited number of interviews with local actors and resulted in a 2019 report for the Irish Green Party, as well as submission to the UN Special Rapporteur on Extreme Poverty and Human Rights in June 2020. The latter is available via the Rapporteur's webpages, and looks closer at the possible human rights implications of the just transition concept, namely under article 8 of the European Convention on Human Rights (ECHR).

In conclusion, it would appear that more action is needed in the Midlands to facilitate the inclusion of workers and communities in the just transition process; perhaps via the use of deliberative research methodologies in collaboration with local organizations, a process which is currently underway in other European regions.

Clare Profous

profousc@tcd.ie

Finnish energy peat entrepreneurs request direct financial support from EU Just Transition Mechanism

The reduction in the use of energy peat has been under discussion in Finland. The energy peat sector has undergone an unprecedented decline, due to both political decisions and market collapse, emissions trading and recent tax solutions.

At the same time, there has been some debate to establish the European Union's (EU) Just Transition Mechanism (JTM), which seeks to support the sectors most affected by reducing climate emissions. In Finland, it has been decided that the JTM will be targeted at supporting the reduction of energy peat use, while elsewhere in the EU, the support is being allocated to coal-intensive areas.

The JTM includes both loan- and fund-based support. From the perspective of the peat industry, it is very important that the views of entrepreneurs are taken into account in the planning of just transition.

The use of peatlands is discussed in Finland. Photo: Risto Lauhanen

Seinäjoki University of Applied Sciences (SeAMK) has studied just transition in the South Ostrobothnia region in the autumn of 2020, using a questionnaire.

South Ostrobothnia is the most intensive peat extraction area in Finland and ca. 150 companies are working in the peat industry in this region.

The purpose of the questionnaire was to highlight the companies' own voice, which can be used to strengthen the just transition. The questionnaire was sent to 140 companies and the response rate was over 26%. The study was the first quantitative research concerning just transition in the Finnish peat industry.

It was notable that 57% of respondents were under the age of 50 and had over 50 ha of peat extraction areas under their control. In this age group, the just transition is especially important as these entrepreneurs have several working years remaining. Most of the respondents were also working in several industries (peat accounted for 10-100% of net sales).

According to the preliminary results of the survey, most of the entrepreneurs wanted direct financial support. More than 80% of the respondents highlighted direct financial support to compensate for job losses among energy peat entrepreneurs and the unnecessary purchases of machinery and equipment. In addition, more than half of the respondents requested direct financial investment support for new purchases and activities, as well as for the after-use of peat extraction areas (e.g., afforestation, restoration, wetlands).

It was notable that less than 10% of energy peat entrepreneurs favoured lifelong learning and retraining support. Direct financial support would solve the financial uncertainty faced by many entrepreneurs. The selling of special equipment would be difficult, at least to domestic buyers, as the whole industry is declining in Finland.

It is generally known that Just Transition Funds (JTF) cannot be used for direct financial support to cover the revenue losses. Currently, there is a risk that poorly planned support mechanisms will not be used, even if the funds are available. Therefore, the question arises, how well does the JTM match the demands of the energy peat entrepreneurs? More accurate results of the study will be reported in a scientific article in 2021.

The study was conducted as part of the project "HYBE - Hybrid solutions for decentralized energy production in the rural areas of South-Ostrobothnia landscape" and financed by the European Agricultural Fund for Rural Development, the Foundation of the Central Union of Agricultural Producers and Forest Owners (MTK Säätiö), Töysän Säästöpankkisäätiö, Seinäjoen Energia Ltd and EPV Energy Ltd (EPV).

Kari Laasasenaho &
Risto Lauhanen

School of Food and Agriculture
Seinäjoki University of Applied Sciences
Seinäjoki, Finland
kari.laasasenaho@seamk.fi
risto.lauhanen@seamk.fi

Entrepreneurs are worried about their future. Photo: Hannu Salo

Peat Hackathon - Steps towards a Carbon Neutral Business

Peat raises emotions and conversation. Giving up the use of peat as a source of energy and preventing the opening of new extraction areas is part of the EU strategy, aimed at decreasing the impact on climate and nature. The EU is committed to carbon neutrality by 2050, Finland already by 2035. In addition, the Ministry of Employment and the Economy of Finland has established a working committee to support the transformation of the use of peat from a source of energy to high quality, innovative products.

Berner Ltd and Tikalan Ltd are Finnish companies, which currently use peat for growing media. They wish to find new, biobased solutions to replace peat in horticulture, and asked JAMK University of Applied Sciences, in conjunction with the bioeconomy accelerator, BioPaavo, to organize a hackathon - an innovation competition - to find a solution to develop a sustainable, environmentally friendly business.

Replacing peat has been researched in several projects. Now it is time to combine innovations, ideas and knowledge. BioPaavo, together with Kasvu Open, a Finnish sparring programme for growing companies, organized the hackathon. The competition was open to everyone: companies, research institutes, students, etc. Fourteen teams enrolled and 10 of them were chosen to participate in the hackathon.

The hackathon process consisted of three phases. During the kick-off event, teams received a more precise assignment from Berner and Tikalan, and were able to ask for more details. The second phase involved individual preparation for the Hackathon event, including product sample delivery, networking and cooperation. Due to Covid-19, no live meeting was arranged; all actions were organized using remote tools - in this case, Zoom and Howspace.

Project Manager Merja Rehn and Minna Lappalainen (on screen), Director of the Institute of Bioeconomy. Photo: JAMK

The hackathon reached a conclusion on 18th February 2021, when all teams presented their solutions to the

hackathon jury and the other teams.

The winner was Valio's team, with a concept of processing dry, hygienic and nutritious material from cows' silt faeces, separated as dry fraction. The process uses the heat of the composting process to dry and purify the mass.


Project Manager Merja Rehn. The hackathon was held as virtual event. Photo: JAMK

The concept, developed by Valio Ltd and JAMK, was considered from all perspectives. The development process is already advanced, the solution is scalable and the price is at target level, said Product Manager, Arja Laivonen, from Berner Ltd. Valio Ltd is a Finnish dairy and food company, owned by 4,300 milk producers via cooperative societies.

The method, developed by Valio and JAMK University of Applied Sciences, has a lot of potential and it is encouraging that there seems to be demand for this kind of product. The method can be used to align the nutrient burden, reduce the use of peat and optimize the use of nutrients - and it is useful for the whole value chain, maintains researcher, Robert Harmoinen, from Valio. The team's win shows that the circular economy is developing and new innovations are emerging, says Juha Nousiainen, director of Valio's carbon neutral milk chain.

Hackathons, organized by BioPaavo, continue: in collaboration with Siparila Ltd, a hackathon seeking environmentally friendly solutions for the industrial surface treatment of wood is now open. The hackathon is targeted towards Finnish actors, but at the same time, a call for innovation has been announced internationally, to source more sustainable packaging solutions, in addition to surface treatment.


Peat is the most popular raw material for growing media. Alternatives are being sought. Photo: Mutia Rahmah

Merja Rehn

Project Manager
merja.rehn@jamk.fi

Annemari Sinikorpi

Communication Coordinator
annemari.sinikorpi@jamk.fi

BioPaavo - Bioeconomy Business Accelerator
Institute of Bioeconomy
JAMK University of Applied Sciences
Saarijärvi, Finland
www.biotalouskampus.fi

Hybrid Substrates

The international substrate industry faces the challenge of abandoning its focus on peat in favour of alternative constituents. However, implementation is not as easy as politicians and NGOs imagine. In subsequent years, this will not work without hybrid growing media.

The large-scale use of peat-based growing media began in the 1960s. For more than half a century, more and more nurseries around the world have placed their trust in a sophisticated product, that is available in large quantities and ensures crop security and high yields. In Europe and North America in particular, commercial horticulture has almost completely adapted to growing media - and in many sectors, raised bog peat is still the most important raw material.

Phase-out of peat harvesting and use

The Lower Saxony Peatland Protection Act came into force in 1981. Since then, politics and environmental activists - not only in Germany - have been engaged in a discourse with the substrate industry, regarding the pros and cons of using peat in growing media.

Growing media are essential for the international food industry. All photos: Klasmann-Deilmann

Around fifteen years ago, the climate protection debate also reached the substrate producers and has dominated the controversy ever since.

The goal on the part of governments and NGOs is the same for environmental protection and climate protection: the substrate industry should rapidly phase out the harvesting and use of peat and henceforth, manufacture its products from alternative constituents.

Initiatives to this end have been launched primarily in Germany, the United Kingdom, Austria and Switzerland, but phase-out scenarios are also being discussed in other countries.

The German government is currently working hard on regulations that will essentially or even completely eliminate the use of peat in growing media by 2030. The aim is to extend this initiative across the entire EU.

In Ireland, for the time being, peat harvesting is no longer allowed because the substrate industry became embroiled in confusion between EU requirements and national implementation.

Experts know that this development affects the livelihood of the substrate industry, as well as that of commercial horticulture. An equivalent example would be to threaten the automotive industry with turning off the oil tap before electric cars constitute an adequate replacement.

Peat is by far the most suitable raw material for a crop-safe substrate, due to its unique physical, chemical and biological characteristics. Alternative constituents also have specific advantages, but ultimately it is raised bog peat that combines a hybrid substrate mix into a homogeneous whole and ensures the functionality and crop safety desired by the grower (see pages 23-25).

Nurseries all around the world have placed their trust in growing media.

Extended transition phase

Despite ongoing criticism, the substrate industry continued to rely on peat for decades. It tapped additional resources and developed true, high-performance products, that set a challenging benchmark for hybrid substrate blends. In parallel, however, the industry began using alternative constituents. The producers' self-image was not a universe separated from the rest of the world, but rather followed society's increasing awareness of environmental and climate protection.

Wood fibre, green compost, coir, perlite and bark have long become firmly established in the general raw material mix and can be used in ever greater proportions; hybrid substrate mixtures are steadily approaching the bar set by pure peat products. Although substrate producers and nurseries continue to drive this development forward in close cooperation, politicians and NGOs have demonstrated impatience and have increased the pressure.

Since the adoption of the European Union's Green Deal, the general mood in the substrate industry has changed. The target of climate neutrality by 2050 is a requirement that also places an obligation on substrate producers. Even the last peat enthusiast is aware that the development towards less and less peat, and more and more alternative constituents, cannot be stopped. Peat is no longer “the answer,” peat is now “part of the answer.” The industry is changing at full speed.

Crop safety first

However, an uneasy feeling remains. Some people will remember the market launch of the first flat screen TVs to replace the tube TVs they were used to. The new, slim sets could be placed on the shelf, but the picture was poorer, and the operation of these new sets was sometimes more difficult.

Unlike the TVs, which were enthusiastically received by consumers despite the temporary setbacks, many growers remained reserved with regard to using alternative substrate mixes. In a shortened formula, these require more attention to crop management, need more water and must be re-fertilized. In many places, real persuasion is still needed here.

In the ornamental plant and nursery sector, this development is now well advanced. Alternative constituents can be safely used with up to 50% by volume. Substrates for organic cultivation and soft fruits also contain high proportions of renewable raw materials. It is particularly the young plant

www.klasmann-deilmann.com

We grow with our tasks

As the world's leading supplier of growing media, sustainability is more than just an important issue for us. It is a concrete task. To preserve what needs our protection. And out of respect for the generations that will follow us. This is why we are already acting today by providing renewable raw materials, restoring former extraction areas, developing alternative constituents and reducing emissions.

Find out all the facts in our current sustainability report.

1913

we make it grow

Klasmann-Deilmann

segment and also the sector of horticulture that produces for the food industry, in which the preferred black peat is much more difficult to replace. Until the conversion from 100% peat to a reduced portion is successfully completed, the grower and the technical advisor of the substrate manufacturer must work closely together.


Growing media ensure crop security and high yields.

In view of the response from the markets, the substrate industry finds itself in a quandary. Irrespective of the progress that politicians and NGOs wish to see, crop safety must be maintained at all costs. It is existential for the success of nurseries.

This is particularly true for vegetable seedlings, the availability of which has a direct impact on the security of supply of healthy food. The switch to alternative raw materials in growing media can only succeed by making careful steps and must be defined separately for each horticultural sector.

The quantities needed are not available

In this context, the German substrate producers agreed to a voluntary commitment in 2020. They brought together their responsibility for climate protection and their will to supply nurseries reliably and with high-quality substrates only, and presented a viable compromise:

- in substrates for commercial horticulture, a total peat reduction of 20% will be achieved by 2025, and 30% by 2030.
- in potting soils for gardeners, the total peat reduction will increase to 50% by 2025, and to 70% by 2030.

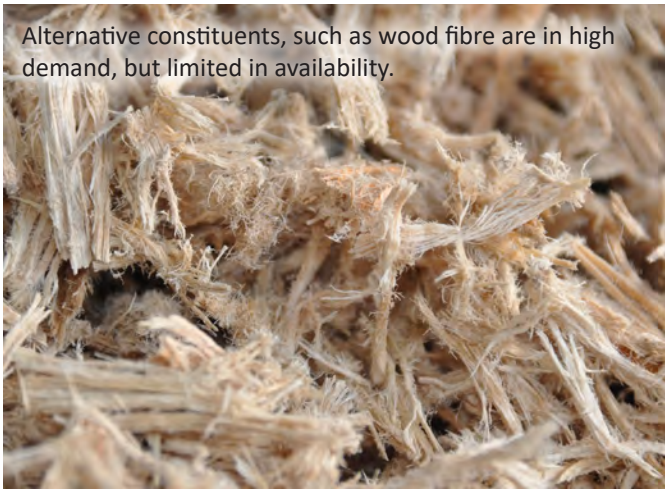
The German Federal Ministry of Food and Agriculture (BMEL) was appreciative but stated that this regulation was not sufficient. Since then, the discourse between politicians and the substrate industry is no longer focussed solely on quality, but has increasingly been extended to the question of availability. Behind every additional percentage point of voluntary commitment or political requirement, lies an increasing demand for alternative constituents.

The implementation of the peat substitutes required for the hobby sector alone, will lead to a rush for wood, green residues and coir, and will tie up volumes that will place even tighter limits on further development in commercial horticulture.

Even if research and development will soon facilitate significantly higher proportions of alternative constituents in the individual substrate segments, the limited availability of the raw materials required for this purpose remains an unsolved problem.

With regard to wood and green residues, the substrate industry is in direct competition with the energy sector and other industries. In the wood industry, substrate manufacturers have long been perceived as a player to be taken seriously.


Young plant producers, in particular, rely on peat-based growing media.


Alternative constituents, such as wood fibre are in high demand, but limited in availability.

It is already clear that increasing demand and limited resources will lead to higher price levels for alternative raw materials, which cannot be established in the price-sensitive structure of the horticultural industry. It also cannot be ruled out that wood and coco raw materials, that no longer originate from sustainably managed sources, will increasingly be offered and used.

Sustainability - between climate protection and security of product quality and supply

In any case, the substrate industry will make a significant contribution to greater sustainability by using less peat. Whether the positive effect on the climate will be as great as anticipated, remains to be seen. The limited availability of renewable raw materials stands in the way. In addition, even alternative constituents have a carbon footprint - emissions from production and transport also cannot be completely avoided.

The European industry association, Growing Media Europe AISBL (GME), based in Brussels, is currently working on a programme that will calculate detailed LCAs of individual growing media from next year. This will provide the discussion on the impact of products on the climate with a more compelling argument.

In fact, the peat harvest contributes a maximum of 0.2% to the overall emissions in Germany, so the positive effect of phasing out peat might not be as significant as expected and politicians may have adopted the wrong focus.

In addition, efforts are continuing at industry level to free the discourse with politicians from the all-valid dogma of climate protection. Security of supply in the food industry and well-being, supported by ornamental plants and reforestation with the help of nursery plants, are valid criteria that contribute directly to greater sustainability, even if they do not necessarily improve the climate balance.

All in all, the substrate industry, like many other industries, faces the challenge of adapting to the new requirements of sustainable development. The producers are on the right track. They understand the function of their product and in what quantities it is needed. They are driving the move to more and more alternative constituents in the substrate.


Vacuum harvester in Lithuania. Peat is still the most important raw material for growing media.

At the same time, they remain committed to commercial horticulture and continue to offer their customers reliable products. Therefore, the discourse on the future of peat in substrates remains important. For the time being, commercial horticulture will have to rely on hybrid substrates. Without peat, it will not work yet.

Following peat harvesting, the areas are rewetted.

Why peat?

Peat-based substrates deliver unique reliability in crop cultivation. They can be continuously produced and supplied to a consistently high quality. After processing, the different types of peat have physical, chemical and biological properties that make them ideal for horticulture and which, overall, are unmatched by any other raw material.

Physical properties

- High structural stability
- Optimum ratio between air and water capacity

Chemical properties

- pH value can be adjusted specifically for each crop
- Optimum nutrient content adjustable for each crop
- Good nutrient buffering
- Free from harmful substances

Biological properties

- Largely free from weed seeds
- Free from pathogens

Economic properties

- Long-term availability
- Uniform characteristics
- Quality that meets the horticultural requirements of a wide range of plants

The following must be taken into account when using peat:

- capability for higher water storage, must be irrigated less often than other constituents
- different sieving of peat allows a substrate composition that can be specifically tailored to the needs of each crop
- addition of wetting agent ensures rapid water absorption during cultivation
- peat has a low pH value, so by adding lime the pH value can be precisely adjusted
- peat has a low nutrient content, so any nutrient ratio required by a specific crop, can be adjusted precisely

Cotton grass is re-establishing on rewetted areas.

Why green compost?

Green compost as a constituent

- is biologically active
- suppresses root diseases
- ensures potted herbs live longer
- acts as a slow-release nutrient source
- has a high buffering capacity
- improves re-wettability
- promotes the conversion of organic fertiliser into plant-available nutrients
- is suitable for growing media in terms of organic growing

The following must be taken into account when using green compost:

- high salt content
- high pH value
- high weight with an influence on logistics
- consistent testing is necessary to obtain a high-quality compost from the beginning; only green residues should be used
- a necessity for quality assurance is essential to exclude residues and growth-inhibiting effects on the cultivated plants
- can be used in substrates at a maximum of 25% to 30% by volume if the quality is appropriate; ideally, compost should be combined with peat to obtain sufficient, plant-growing properties of the substrate
- ideally, RHP, RAL or PAS100 certified compost should be used in substrates

Rewetted area.

Why wood fibre?

The use of wood fibre as a constituent:

- supports healthy, rapid root development
- ensures optimum drainage
- increases air capacity and ensures long-term structural stability
- reduces transport costs due to the substrate‘s low overall weight
- is suitable for growing media in terms of organic growing

The following must be taken into account when using wood fibre:

- limited ability to store water
- use of quality-tested wood fibre only (e.g., RHP)
- tendency to N-fixation, a nitrogen fertilizer is ideally added to the substrate

Why perlite?

Perlite as a constituent for growing media:

- a mineral constituent made from expanded volcanic rock
- supports the structural stability of a substrate
- optimizes air capacity and drainage
- chemically neutral (inert) and has no influence on the fertilization of crops
- ideal for blocking substrates for the sowing and propagation of cuttings
- reduces substrate weight and optimizes transport

The following must be taken into account when using perlite:

- does not buffer or provide nutrients
- no water storage capacity
- dust content should be avoided
- use of quality-controlled material is advisable
- high energy input required for production
- cost-intensive constituent

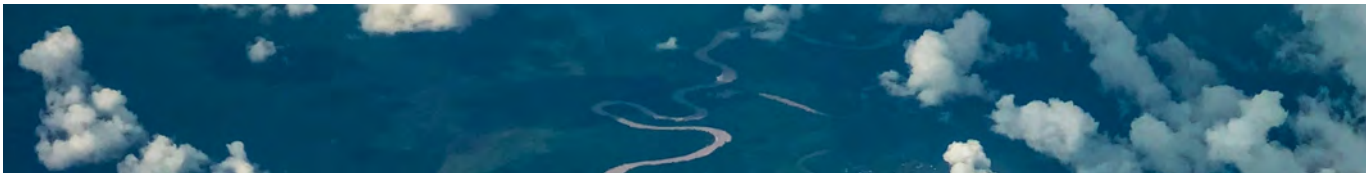
Why coir?

Coir as a constituent for growing media:

- coir pith and coco fibre can be used in growing media
- coir pith supports water absorption in substrates
- coir pith can be used as an alternative to peat to a certain extent
- coco fibre optimizes water transport in the root zone and increases structural stability and air capacity in the substrate
- both can be used for organic cultivation, if obtained from organic cultivation themselves
- coco fibre can be used as a substrate only in combination with other raw materials

The following must be taken into account when using coir:

- pH values in the raw material are usually high and often fluctuate
- need for pre-treatment, such as washing and buffering with a nitrogen solution
- intensive water consumption during production in the countries of origin
- addition of lime in pure coir pith is only possible to a limited extent
- sole use of quality-assured material in order to ensure a good washing and buffering process
- long transport routes to Europe



Emissions from peat harvesting

Until a few years ago, scientific knowledge on the impact of peat harvesting and use on the climate, only existed to a limited extent. In view of this, Klasmann-Deilmann initiated a study and, between February 2015 and February 2017, conducted greenhouse gas (GHG) measurements on white peat and black peat harvesting areas.

The mean emission levels, determined for the black peat harvesting area, used for monitoring in Germany, were 3.13 t CO_2e ha^{-1} a^{-1}. On the white peat harvesting site in Lithuania, monitoring revealed average emissions of 8.05 t CO_2e ha^{-1} a^{-1}.

The table below shows the results, based on 24 months of direct GHG measurements.

Dirk Röse

Corporate Communications
dirk.roese@klasmann-deilmann.com

Klasmann-Deilmann Group
info@klasmann-deilmann.com
www.klasmann-deilmann.com

Trace gas	Black peat, Germany	White peat, Lithuania
CH_4	0.00054 t CO_2e ha^{-1} a^{-1}	0.0606 t CO_2e ha^{-1} a^{-1}
N_2O	0.28 t CO_2e ha^{-1} a^{-1}	0.79 t CO_2e ha^{-1} a^{-1}
CO_2	2.85 t CO_2e ha^{-1} a^{-1}	7.20 t CO_2e ha^{-1} a^{-1}
Ø	3.13 t CO_2e ha^{-1} a^{-1}	8.05 t CO_2e ha^{-1} a^{-1}

Table: Greenhouse gas (GHG) emissions on white peat and black peat harvesting areas in Germany and Lithuania.

A Miniature Bog at the SLU Campus in Uppsala

In June 2020, a small bog was created at the Knowledge Garden of SLU in Uppsala. To investigate whether moss (*Sphagnum spp*.) pits are suitable elements for landscape architecture in urban, nemoral areas of Sweden, we will examine the establishment of the used oligo- to mesotrophic peat mosses on a gradient from hollow to hummock.

Key words: Sphagnum spp., hollow - hummock gradient, landscape architecture, Knowledge Garden SLU

The Ultuna Knowledge Garden is designed to support teaching and research at the Swedish University of Agricultural Sciences (Sveriges lantbruksuniversitet, SLU) in Uppsala, but is also intended to serve recreation and inspiration.

In contrast to botanical gardens, which typically, are organized systematically, according to the species and families of the plant kingdom, the Knowledge Garden is an educational garden, which is constructed according to aspects of landscape architecture. Here, a multitude of attractive and

Figure 1: Uppsala (Sweden), location of SLU Campus Ultuna and Knowledge Garden.

diverse areas, which are created by combining plants with other materials and landscape elements (e.g., stones and ponds) as well as furniture (e.g., benches and espaliers), invite visitors to come for a stroll (Figure 1).

In June 2020, a small bog was constructed at the Knowledge Garden of SLU. In an area of around 4 m^2 we wish to represent the beauty of mires to provide an incentive to use this element in landscape gardening. It is situated in the oldest part of the Knowledge Garden, the Ullbo Woodland Garden, which is representative of water and shade loving plant species (Figure 2).

Further information relating to the Knowledge Garden and the Ullbo Woodland Garden can be found on SLU's website: www.slu.se/om-slu/orter/uppsala/ultuna-kunskapspark.

Water and many elements of wetlands are frequently used in landscape gardening (Dreiseitl & Grau 2006). Nevertheless, to our knowledge, few attempts have been made to create mires and peatlands (however, see Koenig et al. 2018). Therefore, this experiment serves as a pilot-project to construct such an ecosystem in an urban context.

Nr.	Latinskt namn	Nr.	Latinskt namn	Nr.	Latinskt namn
1	*Betula ermanii*	12	*Magnolia kobus*	31	*Rhododendron* 'Satomi'
2	*Betula utilis* var. *jacquemontii*	13	*Mahonia aquifolium* 'Apollo'	32	*Rhododendron* 'White Lights'
3	*Euonymus alatus*	14	*Ostrya carpinifolia*	33	*Rhododendron* Lights-serien
4	*Fagus sylvatica*	15	*Picea glauca* 'Conica'	34	*Rhododendron schlippenbachii*
5	*Ginkgo biloba*	16	*Pinus nigra*	35	*Rhododendron* sp.
6	*Hamamelis* × *intermedia* 'Arnold Promise'	17	*Prunus sargentii* 'Rosensky'	36	*Sorbus* 'Chinese Lace'
7	*Hamamelis* × *intermedia* 'Pallida'	18	*Prunus serrula*	37	*Sorbus* 'Signalman'
8	*Hedera helix*	19	*Rhododendron* (Knap Hill-Gruppen) 'Persil'	38	*Taxus* × *media* 'Adams'
9	*Ilex* × *meserveae* 'Blue Princess'	20	*Rhododendron* (Knap Hill-Gruppen) 'Satan'	39	*Taxus* × *media* 'Hicksii'
10	*Juniperus* × *pfitzeriana* 'Mint Julep'	21	*Rhododendron* (Knap Hill-Gruppen) 'Silver Slipper'	40	*Taxus baccata* 'Columna Suecica'
11	*Lonicera henryi*	22	*Rhododendron* (Minus-Gruppen) 'Peter John Mezitt'	41	*Taxus baccata* 'Repandens'
		23	*Rhododendron* (Minus-Gruppen) 'PJM Elite'	42	*Taxus cuspidata* var. *nana*
		24	*Rhododendron* (Mollis-Gruppen) 'Adriaan Koster'	43	*Thuja occidentalis* 'Brabant'
		25	*Rhododendron* (Mollis-Gruppen) 'Apple Blossom'	44	*Thuja plicata* 'Excelsa'
		26	*Rhododendron* (Mollis-Gruppen) 'Lemonora'	45	*Sphagnum* spp. (Bog)
		27	*Rhododendron* (Mollis-Gruppen) 'Radiant'		
		28	*Rhododendron* 'Arneson Gem'		
		29	*Rhododendron* (Mollis-Gruppen) 'HH'		
		30	*Rhododendron* 'Nabucco'		

Figure 2: Plantation plan and species list of the Ullbo Woodland Garden with the location of the moss pit (no. 45).

Raised bogs are fed by precipitation and consist of a complex of hollows and hummocks. To mimic this environment, we dug the ground to different depths, sealed it with water-impermeable foil and filled it with peat and rainwater (Figure 3).

The following peat mosses were introduced according to their habitat, along the micro-topographical gradient from hollow to hummock (Laine et al. 2011): *S. cuspidatum* and *S. riparium*, *S. fallax*, *S. rubellum*, *S. magellanicum* and *S. papillosum*, *S. fuscum*, as well as *S. capillifolium* (see experimental set-up, Figure 4).

These mosses prefer oligo- to mesotrophic nutrient conditions, although some of them have rather flexible requirements

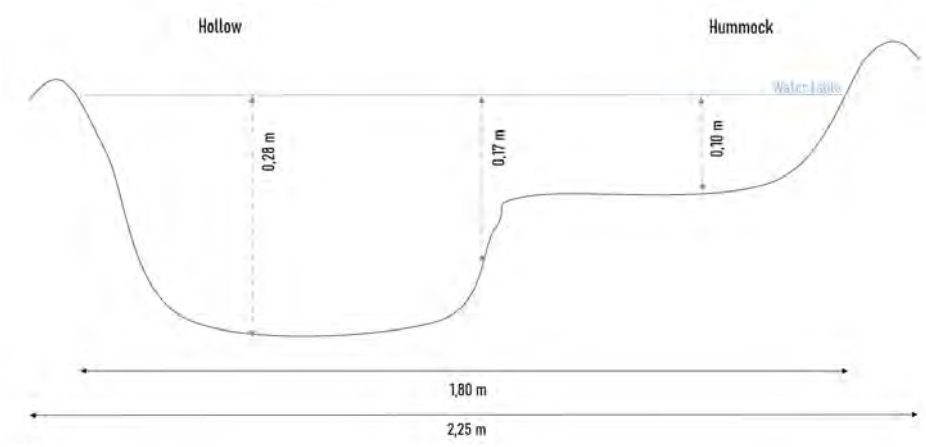


Figure 3: Cross-section of the moss pit (not to scale)

and are, therefore, distributed world-wide in the boreal and temperate zone.

In the future, the selected peat mosses will be examined regarding their success in establishment, growth and competitiveness in an urban Swedish surrounding.

Furthermore, the greenhouse gas emissions of the different species in relation to various weather conditions will be documented, to indicate whether they are sources or sinks of carbon dioxide and methane. Measurements of pH and electrical conductivity are used to describe the status of the ecosystem in the long-term.

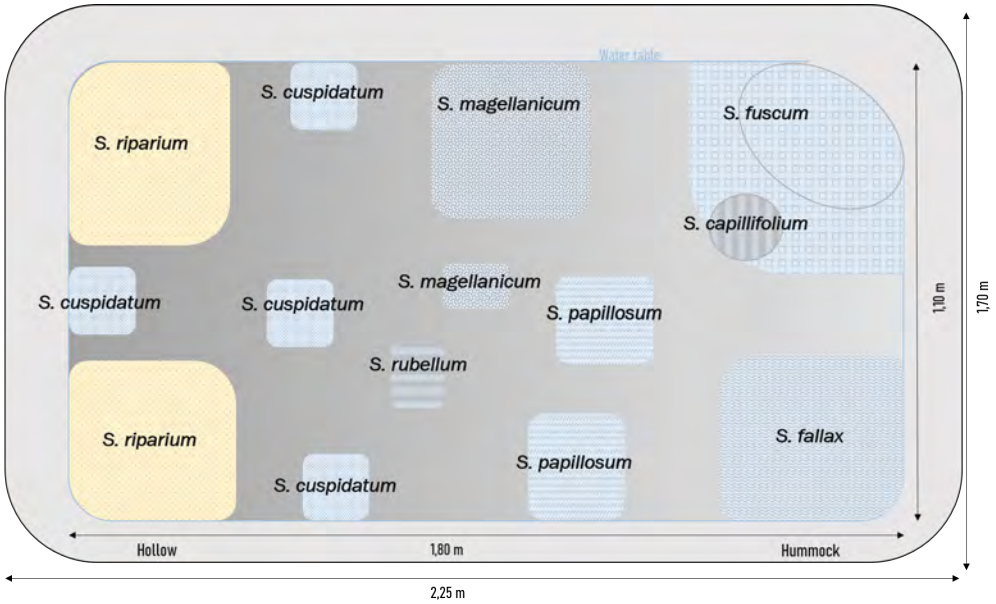


Figure 4: Experimental set-up and preferred trophic environment of the *Sphagnum* species (blue: oligotrophic, yellow: oligo- to mesotrophic)

The target water table of the pit was adjusted with rainwater just once during the exceptionally hot and dry month of August, 2020. Besides this, precipitation was sufficient to compensate for the losses caused by evapotranspiration. All species indicate an increase in biomass.

It will be exciting to observe how this little bog will develop over subsequent years, and whether moss pits can contribute to sensitizing the broad population for this habitat, while constituting a cost-efficient element in landscape architecture.

Eva Weber

Freising, Germany
eva.marie.weber@hotmail.de

Sabine Jordan

Uppsala, Sweden
sabine.jordan@slu.se

Literature

Dreiseitl H. & Grau D. (Publ.) (2006). Wasserlandschaften. Planen, Bauen und Gestalten mit Wasser - 176 S.; Basel (Birkhäuser-Verlag).

Koenig I., Christinat K., D'Inverno M. & Mitchell, E.A.D. (2018). Impact of two hot and dry summers on the community structure and functional diversity of testate amoebae in an artificial bog, illustrating their use as bioindicators of peatland health - Mires and Peat 21 (8): 1-24.

Laine J., Harju P., Timonen T., Laine A., Tuittila E.-S., Minkkinen K. & Vasander H. (2011; 2. Aufl.). The Intricate Beauty of Sphagnum Mosses - a Finnish Guide to Identification. University of Helsinki, Department of Forest Sciences Publications 2: 1-191.

New Members of the IPS

New members (or new contact persons for corporate and institute members, and industry partners) are mainly approved by our National Committees.

For all other countries, the approval is made by the Executive Board of the IPS. Each National Committee is asked to compare their membership list to that of the IPS at least once a year (status below as of 15 March 2021).

Welcome to the peatland family :)

Student members:
The Netherlands: N.H.B. Md Zain

Individual members:

China: Yuanchun Zou
Finland (Suoseura): Teemu Juselius, Samuli Koivistoinen
Ireland: Ronan Casey, John Connolly, Monica de Bath, David Fallon, Larry Fullam, Melinda Lyons, Jack McGauley
The Netherlands: Jurn Buisman, Bas Tinhout, Roelof Westerhof, Dennis Worst
Sweden: Järvi Järveoja
United Kingdom: Guaduneth Chico

Corporate & institutional members:

Germany (DGMT): Erika Schomburg (Torf-u. Humuswerk Uchte GmbH)
Ireland: Mark McCorry (Bord na Móna), Suzanne Nally and Shane Regan (National Parks and Wildlife Service)
The Netherlands: Paul Offerman (MPS-ECAS B.V.)
Norway: Thorleif Hals (Jiffy International AS)

You can ask for, change or delete your membership information any time by contacting susann.warnecke@peatlands.org.

More info, membership benefits and membership form: www. peatlands.org/join-us

Round the world in eight peatlands

On 18th December 2020, a group of peat experts gathered in a Zoom-room to share their tales of peatlands from across the world. They were all invited to take part in the British Ecological Society's Annual Meeting, in a Thematic Session focusing on the climatic, ecological and societal importance of peatlands.

Each of the eight speakers had significant knowledge and experience to share on a particular geography of peatlands and/or thematic area of research, from investigating burning in the peat swamp forests of Borneo to exploring research gaps in the Sphagnum-dominated bogs of Wales. Here we summarize some of the key points raised by each of our esteemed speakers.

The session was opened by **Susan Page** with an excellent summary of the key roles that peatlands play in societies across the world, and of the key challenges they face. Despite the multiple services they provide (as illustrated by Fig. 1), peatlands are being subjected to many different drivers of change (Loisel et al., 2020), which are degrading the peat carbon store at a rate that is incompatible with recovery over human timescales (Goldstein et al., 2020).

Sue reminded us of the importance of addressing the world's drained peatlands, a huge and increasing source of carbon emissions that will continue to emit until the peat is depleted. Within decades, the use of this finite resource for extractive and agricultural purposes will no longer be possible.

Agriculture is one of the dominant ways in which people interact with peatlands across the world. In the peatlands of Southeast Asia, and notably

Fig. 1: The multiple ways that peatlands support livelihoods, presented by Sue Page.

Indonesia, smallholder farms and industrial plantations growing oil palm on peat are common. This has led to the generation of emissions from peatlands across Southeast Asia over the last 25 years, approx. 2,500 Mt C, equivalent to half of the complete stock of carbon held in the UK's peatlands, approx. 5,500 Mt C.

These UK-based stocks are also rapidly dwindling, as many organic soils are exploited for commercial agriculture and horticulture. In the year 2000, it is thought that peatlands worldwide changed from a net sink to a net source of carbon. In addition to emissions, peat subsidence is a significant issue, and one that will prevent use of peatlands in the future, especially with sea-level rise in coastal areas.

How then can peatlands continue to support the many livelihoods that depend on this wetland ecosystem and its resources?

Balancing livelihood and climate security is a key challenge. One of the solutions is to think more strategically about where to produce food. Carlson et al. (2016) demonstrated that those peatland areas that produce some of the highest greenhouse gas (GHG) emissions from drainage-based agriculture, also produce some of the lowest returns when it comes to nutritional calories.

Sue reminded the audience that there is no such thing as truly sustainable management of drained peat soils; 'responsible' use is the only option. The essential first step in responsible use and in addressing the livelihood and climate challenge is raising water tables, leading to reduced emissions and increasing the lifetime of peat. Further research is needed and trials performed to explore viable ways of producing food using wet agriculture, or paludiculture (as named in the areas with the highest water table).

There will be constraints to what can be produced and where, and inevitable trade-offs, but dryland agriculture is not a sustainable option for peatlands. Some of the key challenges that still need to be overcome include knowledge gaps, selecting appropriate types of crops, and balancing the needs of food security and livelihoods.

Sue concluded by emphasising that there are significant compromises, constraints and inadequacies in education that need addressing to promote responsible peatland management. But as peat-based emissions continue to use up our national carbon budgets under the Paris Agreement, coupled with the continuing loss of agricultural land, the global community needs to act NOW.

Mark Harrison continued the discussion on emissions, but with reference to fire. The now frequent burning of peatlands in Southeast Asia is causing huge carbon, health and economic losses.

What we know less about is the impact that fires are having on biodiversity. When forests burn, the canopy cover is greatly reduced, causing significant reductions in habitat and creating exposed ground that further dries. Studies

Orangutans in Central Kalimantan. Photo by Dimitry B.

have shown that, for example, there are lower abundances of butterflies in peatland areas impacted by burning. Aside from understanding more about the consequences of the fires for wildlife, another important, and often complex knowledge gap is around why the fires occur. Proximate causes include peat drainage, land use change and the use of fire in peatlands by people, whether purposefully or accidentally, creating ignition sources that are inadequately controlled. Once the reasons for peatland fires have been identified, solutions for managing and restoring them can be trialled (Harrison et al., 2020a). Mark emphasised that before any restoration work is even conceived, it is vital to ask what goal of that intervention is; restoration for what, and for whom?

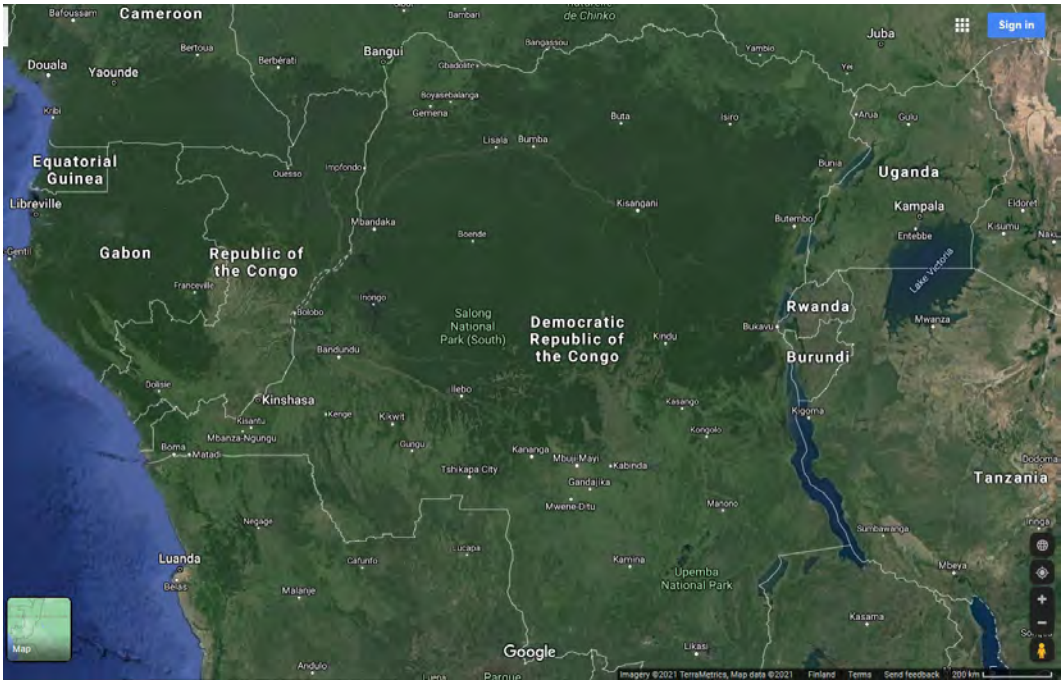
The Kalimantan Lestari project (translating to Sustainable Kalimantan), encompassing a multi-institutional interdisciplinary research team, will aim to ask these questions, along with many others. Coordinated by the University of Exeter, it will address the challenge of fire in the peatlands of Indonesian Borneo, with a focus on: (i) drivers of fire; (ii) impacts of fire; and (iii) ways of reducing the risk of and to increase resilience to fire, with the central goal of working holistically with and supporting local communities. As a final note, Mark brought our attention to some of the challenges that the Covid-19 pandemic has brought to tropical peatlands (Harrison et al., 2020b).

From Southeast Asia's largely degraded, fire-prone peatlands, the focus switched to the intact peat-forming forests of the Cuvette Central in Central Africa. A huge area of peatland was mapped by **Greta Dargie** in 2017 (Dargie et al., 2017), lying within the Democratic Republic of Congo and the Republic of Congo. Although the geospatial boundaries of the peatland are now known, there remain huge uncertainties in the carbon stocks held within the peat complex; a stock of great international interest.

Greta reminded us to think beyond carbon though, to appreciate that these areas also hold spiritual value to local communities, along with many of the ecosystem services mentioned by our host of speakers. In acknowledgement of this important resource, the two Congolese Governments signed the Brazzaville Declaration in March 2018, which aims to improve cooperation and conservation activities between these two peat-rich nations. There are already some protective structures in place on the ground, e.g. Ramsar Sites, National Protected Areas, but with the pressures of developing economies and increasing interest in hydrocarbon extraction from the region, there is a need to enhance protection and the accountability of the Government.

The international community must provide financial and other forms of support to help avoid dangerous land use change, and to ensure the peatlands are in the most favourable condition to withstand the unknown consequences of ongoing climate change in the region.

New maps suggest that large areas of the Cuvette Central are made up of hydrologically isolated domed peatlands (Davenport et al., 2020), which are more vulnerable to the predicted warmer and drier conditions to come.



Map of the Republic of Congo and the Democratic Republic of the Congo. Source: Google Maps

There is currently a huge research effort underway, CongoPeat, to explore the past and present dynamics of these important tropical peatlands, and to better predict how they might respond to future climate change. The project aims to provide the two Congolese Governments with best information possible, to enable them to make wise decisions for the climate, livelihoods and biodiversity.

The Congo is not the only region with largely intact but relatively threatened tropical peatlands. The peatlands of the Peruvian Amazon contain huge volumes of carbon, stored under a large diversity of wetland forest types and open areas. Despite the peatlands being relatively intact, due to no or limited drainage activities within the flooding basin of the Amazon river, they are various notable uses of these ecosystems. **Euridice Honorio** described the harvesting of *aguaje* fruit from *Mauritia flexuosa* palm swamps, often found growing on peat. This harvesting is important for local livelihoods, providing them with a natural resource to sell at local markets.

It is also predominantly sustainable a practice, and as such, an example of the importance of incorporating local knowledge and practices into landscape conservation and management plans. There is concern, however, that the degradation of these peatlands is an imminent possibility, as rice cultivation, mining, oil palm plantations and associated new infrastructure creep geographically closer (Fig. 2).

Euridice emphasised the need for more protected areas, strengthened territorial management strategies and the use of scientific knowledge in policy making. But the first step is for greater recognition of the peatlands themselves. Euridice is currently working with Peru's Ministry of Environment to create a definition for the nation's peatlands, followed by a strategy for protecting them.

From the tropical latitudes, the discussion moved to the temperate zone, and in particular, Ireland. With the third greatest area of peat in Europe, Ireland is a nation with an extensive history of peat extraction for fuel. This practice has resulted in 82% of its peatlands undergoing drainage-based use, with the closest to a natural state being those under restoration. **Catherine Pschenyckyj** illustrated this point with the fact that 90% of Ireland's soils are now carbon sources, rather the sinks they would previously have been as intact peatlands.

In addition to carbon emissions, peat slides are an emergent property of these degraded landscapes, with impacts on the quality of water supplies, on communities of aquatic biota and on local people.

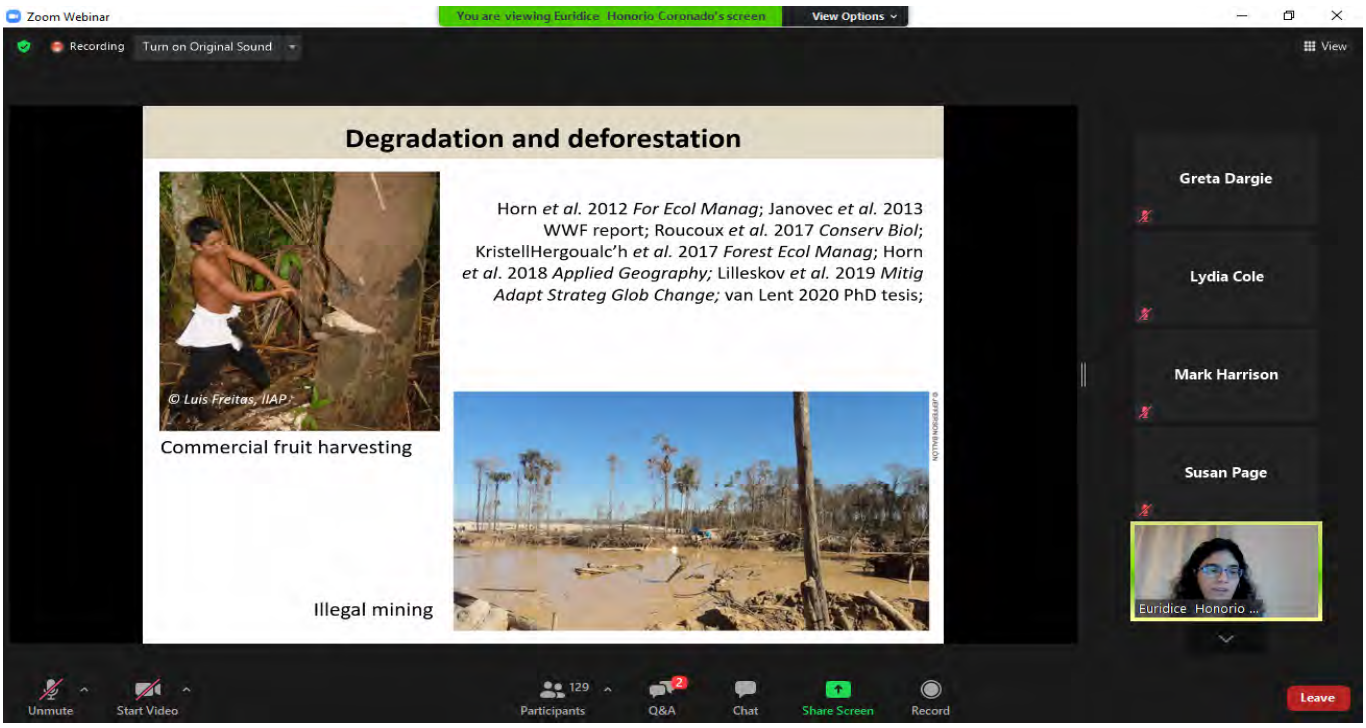


Fig. 2: Euridice Honorio discussing the current threats to the conservation of Peru's lowland peatlands.

However, Catherine provided encouraging news on the changes that are on the horizon: peat-fuelled power stations are closing; peatland rehabilitation projects are underway, with Bord na Móna, one of the largest energy generation companies in Ireland, investing money in restoring the sites from which they have harvested peat for many years; and projects monitoring restoration success being resourced in parallel. However, peat extraction has not halted yet, with still significant plans in place, driven in part by the horticulture industry. Catherine ended by emphasising the need to find solutions that benefit the environment and businesses.

Crossing back over the Irish Sea, **Jon Walker** spoke about Welsh peatlands, and namely a project he is working on to identify key gaps in the evidence base that is available for developing policy around peatland management in Wales. Through a literature review, he identified a dearth of research on forestry practices in Welsh peatlands, and a bias towards certain areas or topics, such as greenhouse gas emissions. Results from this important study, highlighting themes that require greater research focus, will feed into the Welsh Peatland Research Network, and in turn, direct the generation of robust science to fill evidence gaps for the National Peatland Action Programme of the country.

Moving to the north of the UK, **Rebekka Artz** described the work she has been involved in to map Scotland's peatlands. There has been an increasing interest in, and need to map peatlands all over the world, but in particular in those places where there is money to invest in restoration. In Scotland, £250 million has been devoted to peatland restoration; the nation where the greatest area of peatlands is being restored across the world. The Scottish Government now has to decide where they can make the most effective and efficient investment of those funds. The first step is to locate the peatlands in an unfavourable condition, using models that predict how intact a peatland is from a range of remotely sensed cues, such as surface moisture.

High resolution satellite data, i.e. from the European Space Agency's Sentinel 1 and 2, along with training data, primarily obtained through ground surveys, are key to making the modelling more accurate in depicting the situation on the ground (e.g. Williamson et al., 2020).

Once the condition of the peatlands has been assessed, priority areas identified and restoration work commenced, the progress of interventions needs to be monitored. Variables such as change in vegetation and water table dynamics can be measured remotely, to give an indication of the resilience of peatlands to drought conditions.

With this information, Rebekka and colleagues are working to develop an online decision support tool to assist stakeholders in choosing the most appropriate management options for a particular peatland in a given condition. Restoration tools developed in Scotland may prove useful in other regions, such as Canada, where vast areas of peatlands are ripe for restoration after the damaging activities of past decades.

Snowdon, Caernarfon, Gwynedd, Wales, United Kingdom. Photo: Jack B.

Finally, **Sarah Proctor**, of the IUCN UK Peatland Programme, provided food for thought to close the session: "we need business unusual". The recognition by UK society of the great importance of peatlands has been slow, but does appear to have now occurred and at a critical time.

Fig. 3: The UK's first collaborative Peatland Strategy was developed by the IUCN UK Peatland Programme Partnership back in 2018 to capture and embed, for the long term, a shared vision for our peatlands, helping to maintain a focus across a broad partnership and allowing progress to be monitored.

This is exemplified by the publication of the UK Peatland Strategy (Fig. 3) in 2018. This document details solutions for managing peatlands across the UK and its overseas territories, with a vision and targets for a healthier peatland nation by 2040.

The specific goals of the strategy include:

- (i) Conservation, of blanket bogs (globally rare), raised bogs, fens;
- (ii) Restoration of heavily degraded peatland to functioning ecosystems, e.g. of Blackhill in the Peak District;
- (iii) Adaptive Management, moving away from our established culture of drainage-based dryland agriculture, which is a huge source of GHG emissions;
- (iv) Sustainable Management, considering the truly sustainable options for peatland use;
- (v) Coordination, via instruments such as the UK Peatland Code and the Eyes on the Bog Initiative; and, vitally
- (vi) Communication, producing a wide variety of resources for different stakeholders.

Sarah ended by emphasising that healthy peatlands are central to so many of the other goals we are striving for at a national and international level and which will be discussed next year in Glasgow at the 26th Conference of the Parties of the UN Framework Convention on Climate Change (COP26).

The talks provided an overview of some the unique and many shared challenges that peatlands and their associated communities face across the world. Awareness of the importance of these ecosystems is rising, but there is still a lack of integrated thinking and sustainable actions at national to international levels.

Research into peatland functioning and management has perhaps never been as pressing as it is now. And until we have the answers, panellists reminded the audience of the central rule of peatland management: to keep these wetlands wet.

Lydia Cole

IPS Expert Group
Peatlands and Biodiversity
lydcole@googlemail.com

How to promote the sustainability of silviculture on drained peatland forests?

Significance of peatland forestry

Globally, ca. 15 M ha of mires have been drained for forestry purposes, one third of which are in Finland - it is 'the most drained' country in the world. The remainder of the drained peatlands are mainly in Sweden, Norway, the Baltic countries, north-western Russia and in the British Islands.

Extensive forestry in the boreal zone is also practiced in Canada, but only a small proportion of this has been drained for forestry. If the drainage networks have been maintained, the stand yield may have multiplied from its pristine state before drainage. For example, in Finland, the estimated value of the wood reserve on peatlands is around 13.1 billion euros (16 billion USD), of which the proportion of drained peatlands is more than 80%.

Thus, the peatland forests are a significant wood reserve and the possibilities for commercial harvestings are constantly increasing. This is not only the case in Finland, but also in many other countries, especially in northern Europe (incl. Britain and Ireland). Of course, in many countries, the relative importance of peatland forests, in terms of both land area and wood reserve, is small.

Although the wood resources of drained peatlands are significant and largely underutilized almost everywhere, peatland forestry is associated with technical (bearing capacity, suitable harvesting technology), economic (small harvesting volumes and small average volume of the harvested trunks), as well as various environmental challenges.

As a solution, several measures have been presented, such as increasing restoration and new technologies. However, new alternative forest management methods to decrease the environmental impacts of forestry on peatland, have also emerged.

Forestry drainage and the environmental effects

Ditch network maintenance (DNM), final felling by clear cutting or by using natural regeneration methods are 'key elements' of the conventional forest management chains. DNM prevents excessive waterlogging of the site following the degradation of the ditch network, which otherwise may impair the growth and vitality of the tree stand (Päivänen & Hånell 2012). Appropriate selection of the target areas and properly timed

and implemented DNM, ensure the undisturbed stand development and can be a highly profitable treatment (Hökkä et al. 2017).

On average, DNM has been carried out in Finland every 20-40 years. In Finland, DNM has been subsidized by the state for decades, while in many other countries, the implementation of DNM has been regulated strictly and may even require specific permission.

However, despite water protection measures, DNM increases the export of nutrients and suspended solids to water courses temporarily (Nieminen et al. 2017). On the other hand, the decreasing water level increases the thickness of the aerated peat layer and enhances peat decomposition, thus increasing carbon emissions (Ojanen et al. 2013).

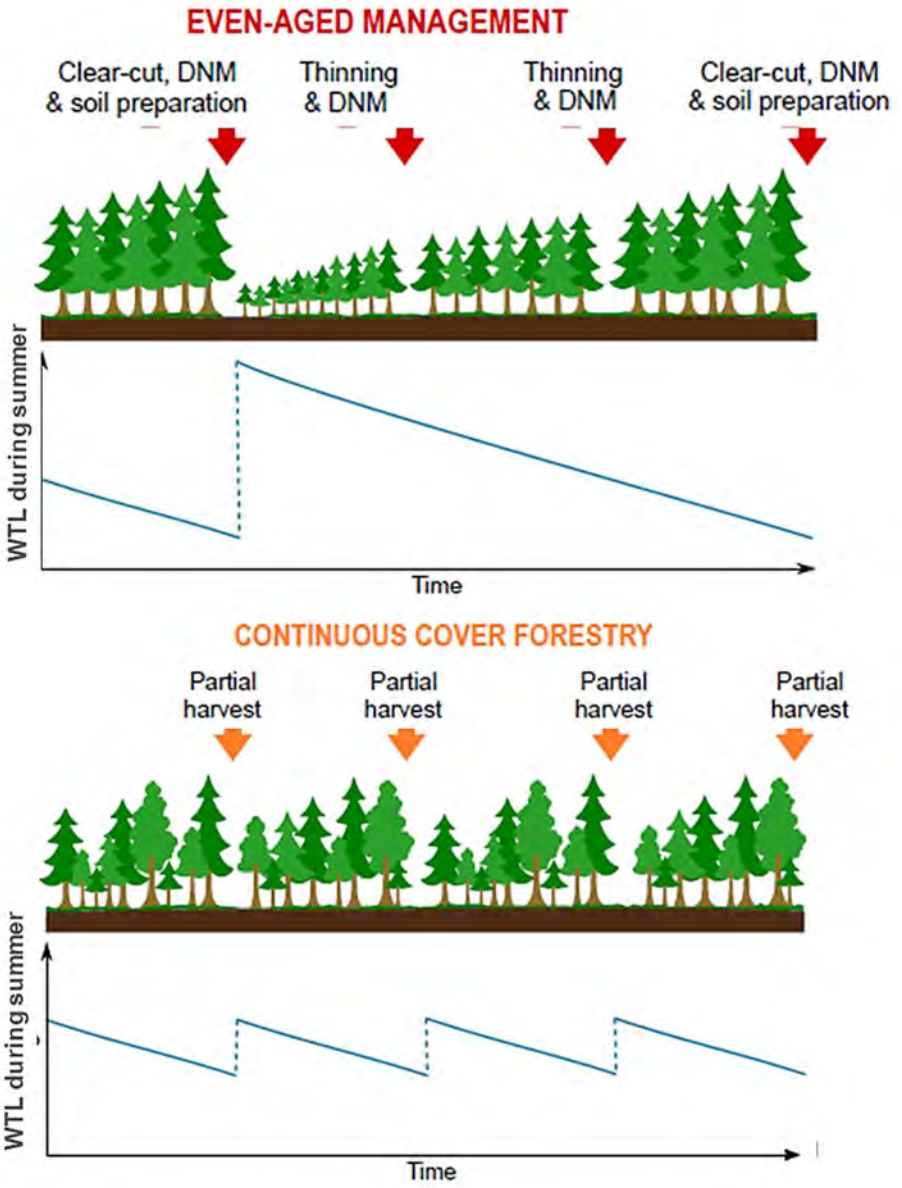


Figure 1. Schematic figure of the principles of rotation forestry and continuous cover forestry in peatlands and their impact on the median water table level (blue line). The time span of the images is one growing period of a stand in the rotation forestry.

In drained, nitrogen-rich peatland sites, in particular, the decomposing peat layer is found to be the net source of carbon (Ojanen et al. 2013). However, the rate of the carbon emissions from northern, drained peatlands are far from the highest level, for example, in the tropical peatlands. In the nutrient-poor, northern drained sites, carbon can even be accumulated in the ecosystem, despite being managed for forestry.

The evapotranspiration (EVT) of tree stands has a significant impact on the water balance in peatlands (Sarkkola et al. 2010), and in Finland, the volume of tree stands, indicating the EVT capacity, is also an important criterion for assessing the need for DNM. When the stand stocking is sufficiently large, the EVT of trees is sufficient to keep the water level below a depth of 35 cm during the late summer, which is generally appropriate for good tree growth (Sarkkola et al. 2012).

The increase in water level observed after final felling is a direct result of the decreased stand of EVT. A water level rise of 20-30 cm has been found (Päivänen & Hånell 2012; Korkiakoski et al. 2019), and on many occasions, the water level may rise to the surface peat layer during the growing season. Moist surface peat with the increasing Sphagnum moss vegetation, promotes the germination of the seeds of forest trees, but concurrently, the excessive moisture impedes the later development of the seedling stands and increases seedling mortality (Saarinen et al. 2000, 2013).

The post-treatment rise in water level, combined with the decreased nutrient uptake of the tree stand, can result in an increase in the nutrient loads to the water bodies over a few years. The loads can be many times larger from peatlands than from mineral soil sites. Phosphorus and nitrogen are released, but also organic carbon and iron, which cause water eutrophication and brownification (Kaila et al. 2014, 2015; Nieminen et al. 2015). Phosphorus and carbon are also leached from nutrient-poor sites (Kaila et al. 2014; Nieminen et al. 2015). Site preparation, such as ploughing and harrowing, as well as drainage, in turn, increase the leaching of particulate nutrients, bound in the suspended solids. Nutrients are also leached from cutting residues, but on the other hand, their removal can hardly reduce the leaching (Kaila et al. 2014, 2015).

As a result of rising water levels, increasing nutrient and carbon exports have also been observed after restoration (Koskinen et al. 2017).

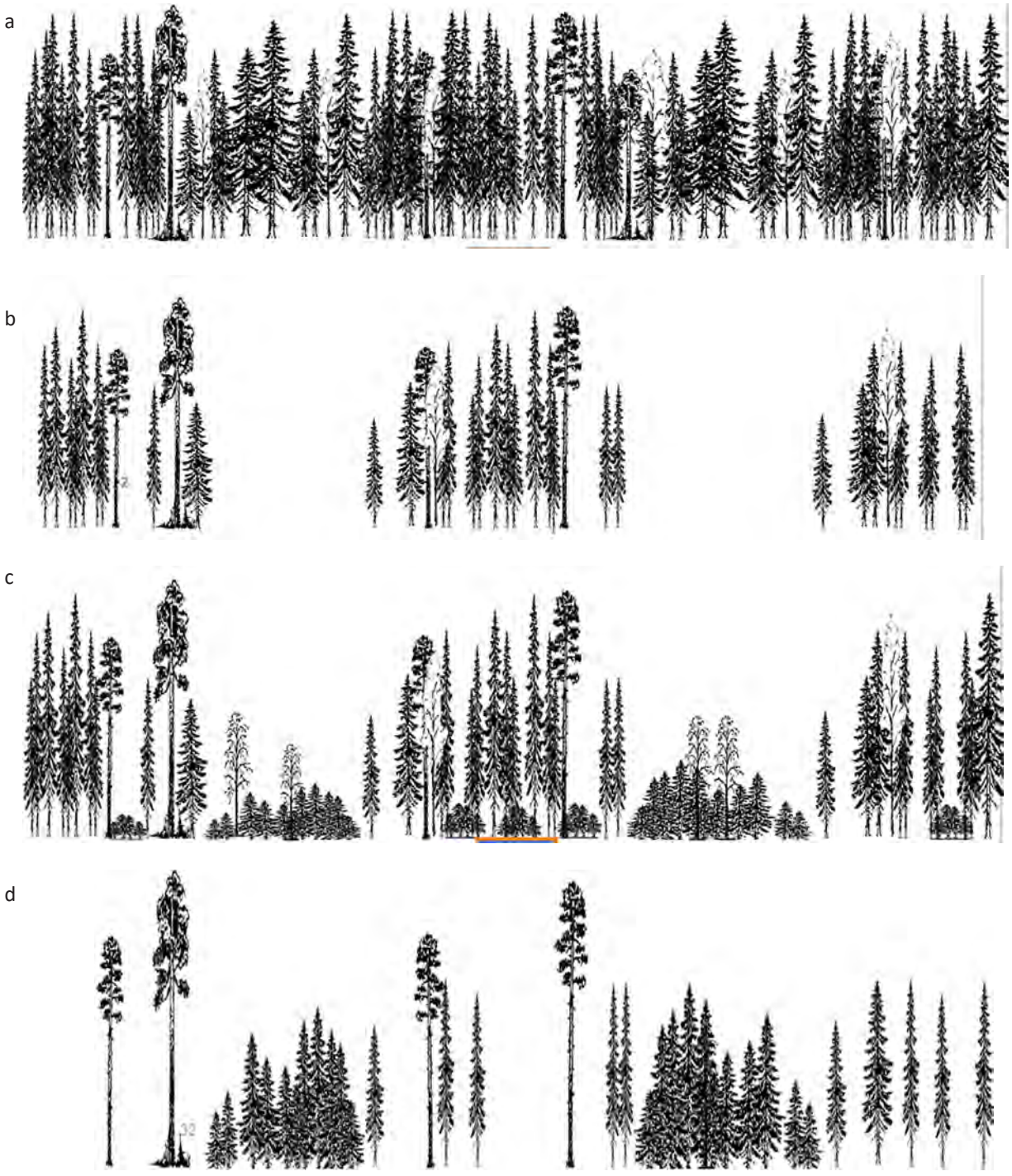


Figure 2. Principles of gap cuttings in a boreal Norway spruce stand on a peatland site before cutting (a), immediately after first harvesting (b), around 10-20 years after cutting (c) and following the second harvesting (d), 25-35 years after the first cutting.

Moreover, methane (CH_4) emissions increase at pace with the rising water table, particularly if the water table level rises above a depth of 20-30 cm (Korkiakoski et al. 2019).

The profitability of peatland forestry is lower than that of forests on mineral soil sites. Conventional rotation forestry requires specific investments, such as DNM operations and remedial fertilizations, which are not usually needed in uplands. Artificial regeneration also incurs costs that are high in relation to the forthcoming economic return, and its profitability decreases the harsher the site and the climatic conditions.

To tackle the environmental and economic challenges and to improve the ecological sustainability of peatland forest management, so-called continuous cover forestry (CCF) has been proposed as an alternative to conventional rotation forestry (Nieminen et al. 2018). There are many positive expectations associated with CCF, but also risks, of which there is very little knowledge. In the following, we present a brief overview of CCF in peatlands.

What is continuous cover forestry on peatlands?

The basic idea of CCF on peatlands is to maintain the continuous, 'sufficient' biological drainage effect of a tree stand on a site. It could reduce the need for DNM and regulate the water level to such a level that would decrease greenhouse gas emissions from the peat, as well as nutrient loading, caused by management operations (e.g., regeneration).

Thus, with a 'suitable' forest cover, the water level would not draw down too deep (lower peat decomposition rate and thus lower CO_2 emissions) or would not rise too high (lower loads and methane emissions). Since the method is based on the fact that only part of the tree stand is harvested in a single cutting, and regeneration is more or less 'continuous', the long-term target of silviculture is usually to grow the stand as uneven-aged.

However, compared to CCF on mineral soil sites, special attention needs to be paid to the number and health of stands after harvesting, in order to maintain sufficient EVT capacity to maintain drainage, either without DNM or at least to elongate the intervals of the successive DNM treatments. Recent Finnish studies show that it is possible to maintain the water table level mostly at a 'sufficient' level after CCF-harvestings, if the basal area in Norway spruce stands does not decrease any lower than 12-15 m^2 (Leppä et al. 2020).

Practical methods of CCF

The basic hypotheses regarding the suitability of CCF for peatlands are based on the fact that at least those peatland stands, which represent the so-called first post-drainage generation (Päivänen and Hånell 2012), often already have significant structural variation, due to the specific features of stand succession, as well as the local mosaic-like variation of site characteristics, such as soil moisture and nutrient resources (Sarkkola et al. 2008; Laiho et al. 2008). Secondly, many peatland forests naturally regenerate more easily than upland sites. The exceptions are poor

Figure 3. A Norway spruce stand growing on a drained peatland site in eastern Finland after selection cutting. Photo: Sakari Sarkkola

Figure 4. A spruce-birch stand after a CCF-cutting on a drained peatland site in Finland. The dominant Scots pines as well as part of the big Downy birches have been removed, and the undergrowth of Norway spruces has been left to grow. Photo: Sakari Sarkkola

pine peatlands, where a weakly decomposed 'raw humus layer' may effectively prevent seed germination and reduce seedling survival, due to extreme dry conditions in the topsoil (Saarinen 2013). On the other hand, *Sphagnum* moss, which serves as a good germination substrate, is also common in drained peatland sites (Saarinen 2000).

Selection cutting is the most traditional CCF method and it suits for spruce mires. Using this method, dominant sawn timber-sized stems are mainly felled and smaller trees, but the medium-sized trees and undergrowth are retained. Regeneration is based on natural seedling material, established and developed in the gaps formed in the cuttings (Leemans 1991).

Natural disturbance dynamics of the boreal, old-growth forests will also be mimicked by gap and strip cuttings, where small gaps/openings or relatively narrow (15-30 m) strips are cut within a stand. Either all the mature trees are harvested from the openings, or single retained trees or tree groups are left in the cutting area. The edge and the stands retained between the harvested gaps or strips can be thinned, and new gaps can be made after the previously harvested patches have regenerated and the new seedlings stand has developed. This method would be suitable for both pioneer and secondary species.

There are several ecological reasons that may limit the application of CCF on peatlands. For example, if the root rot pathogens (such as *Heterobasidion sp*.) are already present in the stand (especially spruce species), the fungus will be easily transferred to the seedlings via root connections (Piri & Valkonen 2013).

Concerning CCF, this is an important issue, because it relies heavily on natural regeneration and it is not possible to change tree species after cuttings. Another factor, depending on the geographical location, is the greater susceptibility of the thinned stands to storm damage, which can limit the use of CCF, especially in windy areas, such as maritime regions.

Since the establishment of new stand generation in spruce mires is largely based on the recovery of already existing seedling material or seed bank, site preparation has almost no benefits (Hökkä et al. 2012). In pine peatlands, light site preparation methods may significantly promote seed germination and improve the success of regeneration (Saarinen 2013).

Site preparation and planting may be necessary to secure the establishment of a seedling stand, when the strip cutting of Scots pine is applied. This increases costs, but also shortens the cutting cycle and enables the use of genetically improved material in management. This can be regarded as a kind of 'hybrid' method of CCF and a rotation-based silvicultural system.

In productive mires, Norway spruce advance growth may establish naturally below the dominant Scots pine or Downy birch stands. Advance growth may be released by the cutting of hold-overs. The greater harvesting costs, due to caring for the advance growth, may be balanced by the establishment of the spruce seedling stand with no regeneration costs.

Future prospects

Although CCF has many justified environmental and economic benefits in peatlands, there are also many uncertainties associated with it. The risks of successful regeneration and further development of seedlings are higher than in conventional forestry, although this may be partly compensated for by lower silvicultural costs. However, should sufficient natural regeneration not exist, or other restrictions, such as excessive root rot occur, the site may need to be artificially regenerated.

Tending of the seedling stand is also possible and is often a necessary measure, especially in nutrient-rich sites, depending on the owner's specific goals for forest management. DNM may have to be carried out if the condition of the growing stands deteriorates due, for example, to fungal diseases, storm damage or cuttings which are too heavy, so that evapotranspiration of the remaining stand is not sufficient to maintain adequate drainage.

The harvest outturns are lower than in the conventional regeneration fellings in rotation forestry, and they have a direct effect on harvesting costs. These may negatively affect the demand for the raw wood, as well as the incomes of forest owners. On the other hand, a scenario in which the alternative forest management practices are being set as a condition of timber sales agreements with wood buyers, is also possible in future, due to continuously increasing environmental requirements and pressures to increase the sustainability of peatland forestry.

Despite the promising research results of certain field experiments and modelling studies related to water table control in the CCF harvest (Leppä et al. 2020) and financial performance (Juutinen et al. 2021), long-term monitoring of the experimental areas, e.g., in terms of ecosystem-level greenhouse gas emissions, element loadings, forest regeneration success and the growth and dynamics of the seedlings and saplings, is still needed.

The decision-makers require more accurate financial information relating to the different options, which should be based on versatile and detailed economic research.

References

Hökkä H., Repola J., Moilanen M., Saarinen M. (2012). Seedling establishment on small cutting areas with or without site preparation in a drained spruce mire - a case study in northern Finland. Silva Fennica 46(5): 695-705. https://doi.org/10.14214/sf.920.

Hökkä H., Salminen H., Ahtikoski A., Kojola S., Launiainen S., Lehtonen M. (2017). Long-term impact of ditch network

Figure 5. A Scots pine stand on a nutrient-poor peatland site, managed by strip cutting. Photo: Sakari Sarkkola

maintenance on timber production, profitability and environmental loads at regional level in Finland: a simulation study. Forestry 90: 234-246
Kaila A., Sarkkola S., Laurén A., Ukonmaanaho L., Koivusalo H., Xiao L., O'Driscoll C., Asam Z., Tervahauta A., Nieminen M. (2014). Phosphorus export from drained Scots pine mires after clear-felling and bioenergy harvesting. Forest Ecology and Management 325: 99-107. doi:10.1016/j.foreco.2014.03.025
Kaila A., Laurén A., Sarkkola S., Koivusalo H., Ukonmaanaho L., Xiao L., Asam Z., Nieminen M. (2015). The effect of clear-felling and harvest residue removal on nitrogen and phosphorus export from drained Norway spruce mires in southern Finland. Bor. Env. Res. 20: 693-706
Korkiakoski M., Tuovinen J.-P., Penttilä T., Sarkkola S., Ojanen P., Minkkinen K., Rainne J., Laurila T., Lohila A. (2019). Greenhouse gas and energy fluxes in a boreal peatland forest after clear-cutting, Biogeosciences 16: 3703-3723. https://doi.org/10.5194/bg-16-3703-2019
Koskinen M., Tahvanainen T., Sarkkola S., Menberu M. W., Lauren A., Sallantaus T., Marttila H., Ronkanen A-K., Parviainen M., Tolvanen A., Koivusalo H. & Nieminen M. (2017). Restoration of nutrient-rich forestry-drained peatlands poses a risk for high exports of dissolved organic carbon, nitrogen, and phosphorus. Science of the Total Environment. 586, s. 858-869.
Laiho R., Sarkkola S., Kaunisto S., Laine J., Minkkinen K. (2008). Macroscale variation in peat element concentrations in drained boreal peatland forests. Silva Fennica vol. 42 no. 4 article id 233. https://doi.org/10.14214/sf.233
Leemans R. (1991). Canopy gaps and establishment patterns of spruce (Picea abies (L.) Karst.) in two old-growth coniferous forests in central Sweden. Vegetatio 93: 157-165.
Leppä K., Hökkä H., Laiho R., Launiainen S., Lehtonen A., Mäkipää R., Peltoniemi M., Saarinen M., Sarkkola S. & Nieminen M. (2020). Selection Cuttings as a Tool to Control Water Table Level in Boreal Drained Peatland Forests. Frontiers in Earth Science 8:
Nieminen M., Koskinen M., Sarkkola S., Laurén A., Kaila A., Kiikkilä O., Nieminen T. M., Ukonmaanaho L. (2015). Dissolved organic carbon export from harvested peatland forests with differing site characteristics. Water, Air, and Soil Pollution 226 6: 12 s.
Nieminen M., Palviainen M., Sarkkola S., Laurén A., Marttila H., Finér L. (2017). A synthesis of the impacts of ditch network maintenance on the quantity and quality of runoff from drained boreal peatland forests. Ambio 47: 532-534. https://doi.org/10.1007/s13280-017-0966-y.
Nieminen M., Hökkä H., Laiho R., Juutinen A., Ahtikoski A., Pearson M., Kojola S., Sarkkola S., Launiainen S., Valkonen S., Penttilä T., Lohila A., Saarinen M., Haahti K., Mäkipää R., Miettinen J. & Ollikainen M. (2018). Could continuous cover forestry be an economically and environmentally feasible management option on drained boreal peatlands? Forest Ecology and Management 424: 78-84.
Ojanen P., Minkkinen K., Penttilä T. (2013). The current greenhouse gas impact of forestry-drained boreal peatlands. For. Ecol. Manage. 289: 201-208.
Piri T., Valkonen S. (2013). Incidence and spread of Heterobasidion root rot in uneven-aged Norway spruce stands. Canadian Journal of Forest Research 43(9): 872-877.
Päivänen J., Hånell B. (2012). Peatland ecology and forestry - a sound approach. University of Helsinki Department of Forest Sciences Publications 3, 267 pp.
Saarinen M. (2002). Kasvillisuuden ja maanmuokkauksen vaikutus männyn ja koivun taimettumiseen varpu- ja puolukkaturvekankailla. (Summary: Effect of vegetation and site preparation on the restocking of Scots pine and birch in dwarf-shrub and Vaccinium vitis-idaea type peatland forests). Suo - Mires and Peat 53(2): 41-60.
Saarinen M. (2013). Männyn kylvö ja luontainen taimettuminen vanhoilla ojitusalueilla - turvemaiden uudistamisen erityispiirteitä. Dissertationes Forestales 164. 64 s.
Sarkkola S., Hökkä H., Penttilä T. (2008). Microsite variation and climate result in stand dynamics variation in pristine Pinus sylvestris mires: Evidence from a stand structure study. Journal of Vegetation Science 19: 465-474.
Sarkkola S., Hökkä H., Koivusalo H., Nieminen M., Ahti E., Päivänen J. & Laine J. (2010). Role of tree stand evapotranspiration in maintaining satisfactory drainage conditions in drained peatlands. Canadian Journal of Forest Research 40: 1485-1496.
Sarkkola S., Hökkä H., Ahti E., Nieminen M., Koivusalo H. (2012). Depth of water table prior to ditch network maintenance is a key factor for tree growth response. Scandinavian Journal of Forest Research 27. 10 s.
Sikström U., Hökkä H. (2016). Puuston ja kasvupaikan väliset vuorovaikutukset ja niiden merkitys kunnostusojituksissa - kirjallisuuskatsaus. Metsätieteen aikakauskirja vuosikerta 2016 numero 2 artikkeli id 5961. https://doi.org/10.14214/ma.5961 (in Finnish)

Sakari Sarkkola, Markku Saarinen & Hannu Hökkä

Natural Resources Institute Finland (Luke)
sakari.sarkkola@luke.fi

Peatlands

International

Media Kit 2021

Media Description

Peatlands International is the global magazine of the International Peatland Society.

It is read at companies in the horticultural and energy sector, universities, research institutes, scientific organisations and other institutions as well as by private persons interested in peat and peatlands in more than 33 countries of the world.

Distribution

By email (PDF)

1700 members ->
2,000 - 3,000 readers
Pages: 40-64
Frequency: 4 issues / year, March / June / Sept / Dec

Deadlines: 28 February, 30 May, 30 August and 30 November

International Peatland Society

Advertisement sizes and prices per issue

Size A, full page A4, colour
portrait 210 x 297 mm
520 €

Size B, half page A5, colour
landscape 210 x 148 mm
310 €

Size C, 108 x 128 mm
colour 210 €

Size D, 108 x 64 mm
colour 160 €

Size E, 51 x 64 mm
colour 110 €

Size F, 51 x 32 mm, e.g. logo
color 85 €

Size G, 51 x 32 mm, e.g. logo
black+white 55 €

5% discount for 6 month and 10% discount for 12 month contracts

plus 10% for special page number reservations

VAT 0%. IPS is not VAT registered, therefore no VAT can be added or deducted.

Technical details

Format: A 4, 210 x 297 mm
+ 5 mm bleed, 4-colour
Rastering: 300 dpi

Please submit your advertisement as PDF, jpg or InDesign file to susann.warnecke@peatlands.org.

Publisher

International Peatland Society
Nisulankatu 78 B
40100 Jyväskylä, Finland
mobile: +358 40 418 4075
email: ips@peatlands.org
web: www.peatlands.org

Payments

We will send you an invoice with payment instructions by email or post.

You can pay by bank transfer (IBAN/BIC/SWIFT), PayPal, Visa and Master Card. No cheques, please.

Thank you very much for your booking!

Results of the IPS member survey 2020

Part I – What can we improve?

The IPS Secretariat carried out a member survey between 29 September and 30 October 2020. Altogether, about 1500 members were asked to participate and 75 responded (5%). We were curious to know what you think about the IPS, which things can be improved and what we are already good at. We will publish the questions and answers to the survey in a new series, starting with this issue.

Perhaps the most important question was 'What can be improved at the IPS?' As this was a qualitative and not a quantitative survey, the most significant replies are chosen below. Due to the diverse background of the IPS membership, these replies sometimes oppose each other.

In addition, some activities are difficult for the IPS to carry out, given its limited resources, as we are mostly operating on a voluntary commitment. Many requests are not new, but nevertheless, they are good to hear and to keep in mind.

The order of the answers below was originally mainly alphabetical. They are thus not ordered by importance, but grouped together in loose themes.

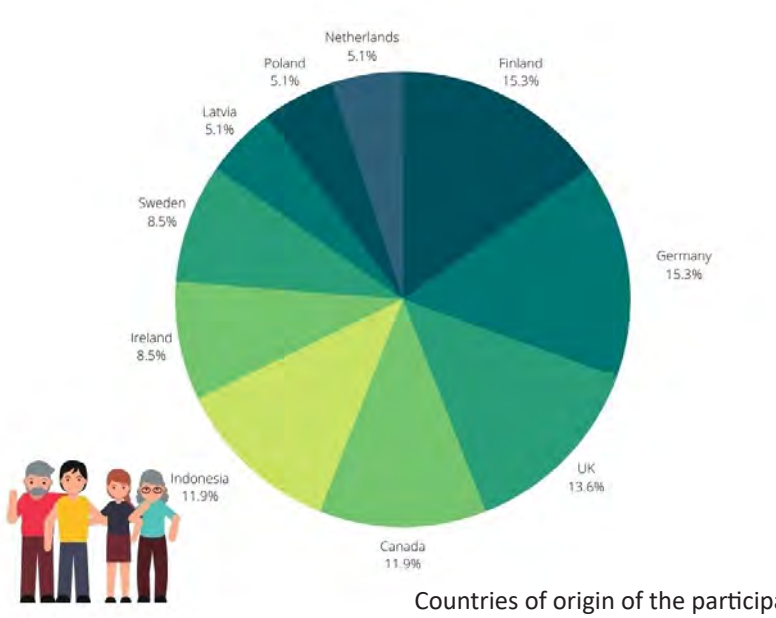
So, what has been on the wish list?

Participants asked us to 'activate the work of the Commissions, find more active and creative people who want to work and cooperate with the peatland community'. More bottom-up initiatives are needed. 'National Committees need to be activated and motivation is needed for young people to participate'. Expert groups and some National Committees should be more balanced.

Others would like to see more activity in South America. Also, job advertisements and scientific articles are demanded, as well as statistics and country-specific compilations of information, including articles in other languages.

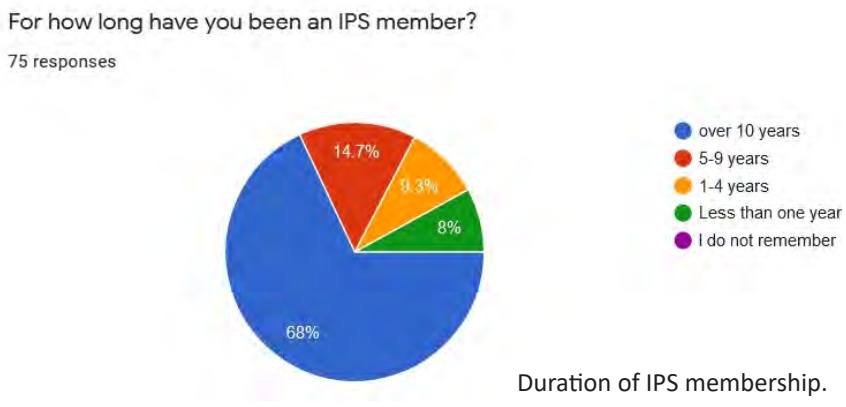
Communication between the peat industry and scientists was perceived as very important. Some asked that emphasis

Which country are you from?



Countries of origin of the participants.

must ‘concentrate on utilizing peatlands as carbon sinks’. Others suggested that the ‘IPS should bring science, conservation, industry and politics to the table for finding common solutions’. It would be nice to ‘read more good examples from all over the world about how land use is managed to meet sustainability goals (atmospheric, biodiversity, land use interests and so on), especially if there is some economic activity that is also part of the process’. According to some, the IPS should take ‘an active role in funding projects promoting sustainable use of peatlands’.



Duration of IPS membership.

Members also want to be ‘informed through various channels on all the work that goes on’ and more frequently. They liked the Peatland Snippets. It was also suggested that we should 'engage more people and have a louder voice in peatland management'. The IPS should ‘respond even more proactively to incorrect reports about peat & peatlands in the media, and come up with research and publications from the IPS itself’. 'More basic facts on peat’s unique properties’ and a ‘success story for peatland management for agroforestry’ were also on the wish list. Some emphasize ‘an impact on politics, a clearer focus on achievements’. On the other hand, 'framing and greenwashing' should be avoided. In general, member activity and visibility could be improved.

Quite realistically, members also noted that ‘funding will be a serious issue as traditional peat industries cease operation. It will be necessary to adopt a viable funding stream for the future’ and ‘financing needs to be more transparent and fair’.

With regard to events, it was added that ‘online conferencing will be necessary for the immediate future’, which we have already implemented quite well, at least for Board meetings and the coming Congress. We were asked to ‘implement equality issues for speakers at panels, keynotes, etc. (gender, race, disability, religion, nationality, sexual orientation, age, career stage, etc.)’. Some members asked for ‘cheaper fees for the conferences’ and sometimes for the events to be 'pitched at a higher academic level'. Finally, it was felt that ‘the IPS meetings are excellent’. However, 'greater outreach should be made to student groups through sponsorship, links for research and training, award schemes, etc'. These are all excellent suggestions, but need resources. Thanks to all participants for sharing their views!

Statistics

You can find some statistics in the graphics. Most members who answered had long-term experience with the IPS. That means they know a lot about us, but it also might be that some perceptions originate from other times. Of those who answered, 68% were members for more than 10 years and 15% for five to nine years. What can we do to attract and retain new members to the ‘peat family’?

Members that answered were fairly representative of the IPS membership, at least from a geographical point of view (countries with at least three participants are shown in the pie chart, left page). Nine Finns and Germans, eight Brits, seven Canadians and Indonesians, and five Irish and Swedish citizens were among those who participated, plus many members from other countries.

The results were presented to the Executive Board in December. They will be considered when implementing our new Strategy. You can download the document at www.peatlands.org/document/ips-strategic-plan-2020-2024, and of course you are very welcome to help us to implement our ambitious goals e.g. via our Expert Groups.

Susann Warnecke

Acting Secretary General
susann.warnecke@peatlands.org

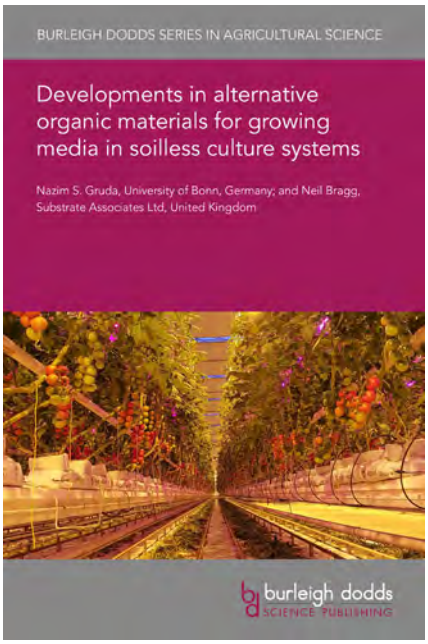
New book: Advances in horticultural soilless culture

Burleigh Dodds Science Publishing are delighted to announce the publication of their exciting new title, Advances in horticultural soilless culture, edited by Professor Nazim S. Gruda, University of Bonn, Germany.

The book includes a comprehensive chapter on the **Developments in alternative organic materials for growing media in soilless culture systems**, written by Professor **Nazim S. Gruda**, University of Bonn, Germany and **Neil Bragg**, Substrate Associates Ltd, United Kingdom.

The chapter distils down the available information on alternative organic materials which have emerged as the major contenders for peat dilution or replacement.

It discusses materials coming from residues of manufacturing processes, for instance, wood, tree bark and coconut fibres and coir; waste and composted materials, for instance, green compost; and materials specially cultivated for use as growing media components, for instance, *Sphagnum* and *Miscanthus*.



Special offer: Benefit from 10% off the purchase of this chapter if purchased via the Burleigh Dodds website. Enter **code IPS10** at checkout to receive this discount. Valid until 5 April 2021.

Peat and Peatland Events

Cancellations or changes of dates due to Covid-19 threat possible. Check the event websites for updates!

114th IPS Executive Board Meeting
19 March 2021, online

Finnish Peatland Society
Spring Seminar and Meeting
29 March 2021, Zoom
13:00 Spring Seminar
16:00 Annual Meeting
www.suoseura.fi

4th IPS Expert Meeting
6 April 2021, online

European Geosciences Union
General Assembly 2021
Virtual event
19 - 30 April 2021
www.egu21.eu

16th International Peatland Congress
3 - 5 May 2021, online
www.peatlandcongress2021.com

2nd Global Peatland and Peat Industry Summit
4 May 2021, online
www.peatlandcongress2021.com/industry-summit

IPS Annual Assembly & General Assembly
6 May 2021, online

10th International Symposium on
Land Subsidence (TISOLS)
Delft-Gouda, the Netherlands
17 - 21 May 2021
www.tisols2021.org

2nd World Peatlands Day
2 June 2021, online
www.peatlands.org/event/world-peatlands-day

9th SER World Conference on Ecological Restoration
A New Global Trajectory: Catalyzing Change
Through the UN Decade on Ecosystem Restoration
Virtual event
19 - 24 June 2021
www.re3-quebec2021.org

ISHS-IPS II International Symposium on Growing Media, Soilless Cultivation, and Compost Utilisation in Horticulture
Ghent, Belgium
22 - 27 August 2021
www.ishs.org/symposium/712

SER Europe: 2021 Conference
Alicante, Spain
31 August - 4 September 2021
https://sere2020.org

IUCN World Conservation Congress
Marseille, France
3 - 11 September 2021
www.iucn.org

AsiaFlux Conference 2020
Kuching, Sarawak, Malaysia
21 - 23 September 2021
www.asiaflux.net

UNFCCC COP 26 CMP 16 CMA 3
Glasgow, Scotland, United Kingdom
1 - 12 November 2021
https://unfccc.int

German Peat and Humus Day 2021
Bad Zwischenahn, Germany
4 November 2021
www.ivg.org/veranstaltungen/deutscher-torf-und-humustag

More at: www.peatlands.org/events

Next issue...

You are welcome to write!

Please send your manuscript (500-2000 words, A4, Arial, no full cap lines, with author contact details, language proofread if possible, e.g. **www.englishproofread.com**), photos and illustrations (separate jpg files with the names of the photographers, you need to have copyrights and persons' consent) and advertisements (pdf files, prices according to Media Kit) to susann.warnecke@peatlands.org.

Submission deadline: PI 2.2021: **30 May**

IPS is also blogging for you. Click here to read!

Annual Meetings 2021 - what has been decided for the future of the IPS?

International Peatland Congress 2021 - our first virtual large-scale conference - what have we learned?

Your article here: Write about your projects and passions!