



## IMCG Bulletin: October 2016

### Word from the Secretary-General



[www.imcg.net](http://www.imcg.net)

Dear mire friends

Again a well-filled bulletin, thanks to the many contributions of our members from all over the world. Please continue in this way and share your experiences and ideas with your fellow members!

This Bulletin again contains spin-off of the peatland events in Borneo and Malaysia in August 2016, including a short protocol of the IMCG General Assembly in the Cameron Highlands, Malaysia, August 27. Following the discussion on mountain peatlands at the General Assembly, the World Mountain Forum took place from 17-20 October 2016 in Mbale, Uganda, on which this bulletin reports.

Importantly, the high-level scientific journal *Science* published last week, 3 November, a “Letter” under the title “Time for responsible peatland agriculture” (<http://science.sciencemag.org/content/354/6312/562.1>). This paper summarizes the concerns of an overwhelming number of tropical peatland scientists on the misleading reports on sustainability of oil palm plantation and other business-as-usual peatland agriculture, which were published after the 15th International Peat Congress in Kuching (Sarawak, August 2016). The scientists stress that this claimed sustainability is contrary to the vast majority of science published over the past two decades. The Paris Agreement has entered into force on 4 November 2016, after having been ratified by 55 UNFCCC parties responsible for 55% of the world’s emissions. Until this moment 103 UNFCCC Parties responsible for 68% of the emissions have ratified the Agreement ([http://unfccc.int/paris\\_agreement/items/9444.php](http://unfccc.int/paris_agreement/items/9444.php), [https://dl.dropboxusercontent.com/u/33616175/PA\\_Ratification\\_Taka.xlsx](https://dl.dropboxusercontent.com/u/33616175/PA_Ratification_Taka.xlsx)). With this un-anticipated early ratifications and effectuation, the first session of the Paris Agreement is being held in conjunction with UNFCCC COP22 in Marrakesh 7-18 November.

This Bulletin also includes the first detailed information on the 2017 IMCG Field symposium in (sub)arctic Russia. Read carefully and register in time!

Please send your news messages, discussion items, relevant photographs and other November contributions (incl. your new papers to be included in the list) by 30 November 2016 to Hans Joosten at [joosten@uni-greifswald.de](mailto:joosten@uni-greifswald.de).

### IMCG News

#### **Minutes of the IMCG General Assembly, August, 27, 2016, Cameron Highland, Malaysia.**

Alexandra Barthelmes was designated to make the minutes, Ab Grootjans was elected as chairperson of the meeting.

#### 1. Report of the executive committee

A report on the IMCG organisation since the last General Assembly (2014) was presented on behalf of Hans Joosten, secretary-general:

- During the reporting period IMCG Chairman was Piet-Louis Grundling. Piet-Louis resigned in July 2016, and a new chair will soon be elected by the Main Board.
- The IMCG Executive Committee (EC) further consisted of four additional members: Hans Joosten (secr.-gen.), Francis Muller (treasurer), Ab Grootjans, and Rodolfo Iturraspe.
- Next to these EC members, the IMCG Main Board (MB) consisted of: Olivia Bragg, Beverly Clarkson, Eduardo Garcia-Rodeja, Tatiana Minaeva, Tapio Lindholm, Eric Munzhedzi, Faizal Parish, Line Rochefort, Jan Sliva, and Leslaw Wotejko.

- The MB has decided not to organize new elections this year to allow continuation. The IMCG constitution (art. 9.7) allows keeping MB members appointed in office for 6 consecutive years. Associated with the election of a new chairperson, the Main Board will evaluate its functioning over the past years and organize new MB elections (via internet) in due time (within max. 2 years).
- The Website [www.imcg.net](http://www.imcg.net) has been regularly updated and maintained by Michael Trepel.
- The IMCG Bulletin has been produced monthly by Piet-Louis Grundling, Bev Clarkson and Hans Joosten (contributions always needed!).
- The biennial IMCG Field Symposium (28 participants), Conference and General Assembly were successfully held in Belarus in 2014.
- The IMCG European Mires Book has finally been finished (after 26 years!). Publication is expected for February 2017 (cf. Report Asbjørn Moen on IMCG Symposium before)
- IMCG was represented in the European Habitat Forum EHF by Rudy van Diggelen.
- The free-for-all online scientific journal 'Mires & Peat', published by IMCG and IPS, was led by Editor-in-Chief Olivia Bragg with as IMCG Assistant Editors: Dicky Clymo, Stephan Glatzel, Ab Grootjans, and Peter Jones, and as Website Administrator Michael Trepel. Many IMCG members function as Associate Editors (see [www.mires-and-peat.net](http://www.mires-and-peat.net)), authors and peer reviewers of the journal. The Web of Science Impact Factor (IF) was 0.806 (first time value) since 2014 and rose to 1.095 in 2015. The increasing number of manuscript submissions promises a good future for the journal. A new financial arrangement involving longer term financial commitment was agreed between IMCG and IPS in August 2016.

A report on IMCG finances was presented on behalf of Francis Muller:

- On 31-12-2013 the IMCG account held € 2963.37, on 31-12-2015 € 1762.91, meaning that the IMCG budget over 2014 + 2015 has decreased with € 1200.46 and that like in previous years IMCG expenses are larger than its income. Substantial finance flow related to IMCG, however, goes via self-financing of members and via (bilateral) donations outside the IMCG administration.
- The decision of the General Assembly of 2014 to install a membership fee of 25 € (incl. exemption on request) has not been implemented.

A report on IMCG membership was presented on behalf of Jan Sliva:

- On 01 August 2016 IMCG had 658 Ordinary Members and Supporters, incl. 52 without valid email address (update your addresses!!), meaning that 606 members (in 63 countries) receive our regular electronic messages. Membership includes 73 members in Africa (11 countries), 23 members in Asia (7 countries), 29 members in Australia/Oceania (2 countries), 1 member in Central America / Caribbean, 400 members in Europe (34 countries), 23 members in Russian Federation (Europe + Asia), and 12 members in South America (5 countries). In comparison: in 2002 IMCG had 276 members in 47 countries.

## 2. Honorary membership

According to IMCG Constitution article 4.7, "Honorary members shall be those individuals who have been nominated as such by the Main Board by reason of their exceptional merits to the objects of the Society, and who have been granted the status of honorary member by the General Assembly, and who have accepted this status."

The IMCG Main Board nominated Nikolay Bambalov and Olivia Bragg as honorary members. Appreciations were presented on behalf of Merten Minke, Vyacheslav Rakovich and Nina Tanovitskaya for Nikolay, and of Richard Lindsay for Olivia (both appreciations published in IMCG Bulletin August 2016).

The General Assembly decided to grant both nominated members the status of IMCGF honorary member.

## 3. Global Mountain Peatland Initiative

- In an introductory presentation Faizal Parish noted that mountain peatlands are facing many problems including drainage, overgrazing, mining, infrastructure development, and climate change. There are several constraints to resolve these problems including lack of knowledge on nature and extent of mountain peatlands especially in developing regions, insufficient protection, insufficient capacity for management, and inadequate resources. He proposed to establish a Mountain Peatland Initiative, an issue already discussed at the IMCG Field Symposium in Ecuador/Colombia in 2012. Tasks of such Initiative would be: facilitating capacity building for management of mountain peatlands in key regions, site linkages/twinning,

exchanges between regions, Best Management Practise manuals, training materials, targeted visits and research, and specific projects. Topics could be: mountain peatlands and climate change, water supply/management, land management, grazing, carbon storage, rehabilitation, community development, and assessment. Priority areas would be: Andean paramos and puna wetlands, Southern African highlands, Eastern Africa (Bale Mountains/ Ethiopia, Southern Highlands/ Tanzania, Rwanda/Burundi), Hindu Kush Himalayan/ Tibetan Plateau, European Uplands- UK/ Alps, Southeast Asia. Implementation would primarily focus on networking and exchange primarily on a voluntary basis, e.g. on a directory of montane peatlands areas, directory/ network of groups, compilation of studies, linking up and exchange between existing projects and groups. Subsequently specific projects can be developed for funding to support the overall initiative or work in specific regions and countries. The Initiative proposed can be implemented through a multi-partner approach under the umbrella of IMCG.

- In the following discussion Izolda Matchutadze proposed to include the Caucasus in the initiative. Samantha Grover suggested partnerships between the Australia Alps and Tibet. Ab Grootjans stressed the impact of climate change on mountain areas and that overgrazing destroys mountain peatlands in the same way all over the World. Asbjørn Moen emphasized the need for a definition of 'mountain peatlands'.. Rob Stoneman reminded that UK restoration expertise might be applicable to other areas. Faizal noted that no suitable funding source so far exists, so that the initiative at the beginning has to be interest-based.
- The General Assembly applauded the initiative and agreed that conceptional issues will be worked out later and that the focus will be on developing countries.

#### 4. Resolutions

- Rob Stoneman presented a powerpoint with a wrap up of the observations of last week's field trips as a basis for a resolution for Malaysia and Brunei. These include the strong governmental commitments to peatland conservation and restoration, the gazetting of remaining peatlands with near-natural forest cover as National Parks or Forest Reserves, the lack of capacity on the ground to deliver the National Action Plans, the negative effects of land subsidence, fire, and pollution, and the necessity to install adequate bufferzones, to restore fire damaged peatland, and to implement best-practise management on peatlands under oil palm.
- After discussion of these and additional issues and following the request of Malaysian and Bruneian governmental agencies for detailed advice, it was decided to prepare a short summarizing resolution supported by a detailed report. Rob and the Global Environment Centre will coordinate its production in consultation of the other participants.

#### 5. Any other business

After concluding that no other issues were on the table, the chairman closed the General Assembly.

#### **Mires and Peat**

Thomson Reuters has increased the Impact Factor of Mires and Peat to 1.095, so there is nothing anymore that should withhold you from submitting your next high-quality paper to your own scientific journal. Find the journal online at <http://mires-and-peat.net/>. Send your new manuscripts on any topic relating to mires, peatlands and peat to the Editor-in-Chief Olivia Bragg: [o.m.bragg@dundee.ac.uk](mailto:o.m.bragg@dundee.ac.uk)

In October 2016 Mires and Peat has published the following articles:

- Scientific basis of a new method for hydrophobic modification of mineral binders using peat products. (O. Misnikov) Volume 18: Article 22.
- The effect of long-term forestry drainage on the current state of peatland soils: A case study from the Central Sudetes, SW Poland (B. Glina, A. Bogacz, M. Gulyás, B. Zawieja, P. Gajewski & Z. Kaczmarek) Volume 18: Article 21.

**IMCG field symposium 'Mires of the Northern Part of European Russia' (22 July – 4 August 2017)**

Tatiana Minajewa ([tania.minajewa@gmail.com](mailto:tania.minajewa@gmail.com))

Nadezhda Goncharova ([goncharova\\_n@ib.komisc.ru](mailto:goncharova_n@ib.komisc.ru))

The field symposium will be organised in three slots:

1. Polar Urals mires, Inta, 22 – 26 July
2. Taiga zone peatlands and Symposium 'Mires of the Eastern European Arctic and Subarctic' with field visit, Syktyvkar, 27-30 July
3. Tundra zone peatlands and workshop 'Northern ecosystem restoration' in Naryan Mar, 30 July – 4 August.

Participants may take part in all or in only some slots. Each slot capacity is limited to 22 foreign guests.

You may arrive to all three starting points (Inta, Syktyvkar, and Naryan-Mar) from Moscow or Sankt Petersburg. The earlier you book your flights, the cheaper they will be.

Excursion costs are not cheap. On top of your flights to Moscow and transportation to and from your chosen starting and ending points, we expect average costs of 80 EUR per day for food and transportation. This fee will include accommodation for slot 1. Accommodation during slots 2 and 3 requires additional payment from the participants. In Syktyvkar there is possibility to hire apartments via Booking.com which are 3 times cheaper than a hotel: 20-30 euro a day for a 2-3 bed apartment. In Naryan-Mar hotel business is monopolised and there is no chance to make it cheaper than 80 euro a night on top of the daily fee for food and transportation.

The logistics include visiting federal protected areas and the security zone of the Russian external border on the Arctic Sea shore. For both a special permission is needed, meaning that registration should take place before March 31st. Please send your application to Tatiana Minajewa ([tania.minajewa@gmail.com](mailto:tania.minajewa@gmail.com)).

Tips for transportation: Inta is the largest head ache. You get there from Moscow by train in two days, or by plain to Usinsk in 2 hours followed by 2 trains (5 hours); or by plain to Vorkuta (2 hours) followed by train (4 hours). Syktyvkar and Naryan-Mar have regular air connection with Moscow and St Petersburg.

On the next page is a description of the field excursion as it looks now.



*The excursion area. Photo: Tatiana Minajewa*

date	event	content
July, 22	Arrival to Inta, stay in hotel	Travel and setting up day
July, 23	Early morning – leaving for Yugyd Va national park. On the way: visiting the peatland. Set up in the touristic complex “Zhelannoye”, stay there for 3 nights	Palsa mire and monitoring plot Kulitsanyur 65°54'10"N, 60°26'40"E on the watershed of Blak and Great Inta rivers
July, 24	Visiting mires, staying in Zhelannoye	Barkova mountain (depending on weather) High elevation peatlands and old mine.
July, 25	Visiting mires, staying in Zhelannoye	Mountain palsa mire, 6.5 km from the touristic centee and on the foothill of Starik mountain. Peatland in Delya-Glad`.
July, 26	Visiting mires; Leaving complex Zhelannoye Taking train from Inta 21.59 h	Travel to Inta and studying mires on the way.
July, 27	Arrival to Syktyvkar around lunch time, setting up. Arrival from Moscow and St Petersburg of those who join slot 2	Travel and setting up day
July, 28	Scientific seminar	Scientific Symposium ‘Mires of Eastern Europe Arctic and Subarctic’ at the Institute of Biology Komi
July, 29	Field excursion Get together dinner	Visit to Pychymskoye (Medla Pev Nyur) experimental site. Dinner in Syktyvkar
July, 30	Flight Syktyvkar – Naryan-Mar (once a week, should be really booked in advance, otherwise one should travel via Moscow). Arrival of those, who only join slot 3	Arrival, set up, for those who arrived from Syktyvkar. Excursion to Pustozersk (4-5 hours). Evening time: Introduction to the excursion in the hotel Pechora
July, 31	Visiting of peatlands	Peatlands along the road to Krasnoye – plateau peatlands and flat palsa mires, impact of the linear infrastructure; late afternoon visit to the cultural centre of the indigenous people
August, 1	Visiting of peatlands in Bolshezemelskaya tundra and coastal area – will depend on weather which day. Only those, who obtained permission from border security service! i.m. registered before March, 31	Coastal marshes and coastal tundra, polygonal peatlands In the Bolshezemelskaya tundra – palsa mires and ecosystem restoration sites.
August, 2		
August, 3	Seminar on ecosystem restoration	In Naryan Mar
August, 4	Seminar on ecosystem restoration – meeting with stakeholders Leaving to Moscow or Sankt Petersburg	Flights from Naryan-Mar to Archangelsk, Sankt Petersburg and Moscow.

## News from the regions

### Global

#### Denial of long-term issues with agriculture on tropical peatlands will have devastating consequences

A large number of newspaper articles have taken up our protests against the false statements on sustainability of oil palm and other conventional agriculture on peatlands following the International Peat Congress (IPC) in Kuching. Find a selection below:

<http://www.straitstimes.com/singapore/environment/can-peatland-turn-into-oil-palm-fields-and-not-cause-haze>

<http://www.malaysiakini.com/letters/358077>

<https://news.mongabay.com/2016/10/139-scientists-shoot-down-misleading-reports-from-malaysia-peat-congress/>

<http://www.eco-business.com/news/139-scientists-shoot-down-misleading-reports-from-malaysia-peat-congress/>

<https://www.wetlands.org/news/denial-continues-over-long-term-impacts-of-peatland-drainage-in-southeast-asia/>



<http://www.hs.fi/paivanlehti/07102016/a1475725108971>

<http://www.pressreader.com/singapore/the-straits-times/20161004/282136405909242>

<https://www.sciencedaily.com/releases/2016/10/161006221929.htm>

<http://print.kompas.com/baca/sains/lingkungan/2016/10/03/Pakar-dari-20-Negara-Luruskan-Isi-Kongres-di-Saraw>

<https://www.pressreader.com/malaysia/the-star-malaysia/20161028/281805693476058>

<http://wildsingaporenews.blogspot.de/2016/10/malaysia-let-us-better-manage-peatlands.html#.WB-shsndl6c>

<http://www.nottingham.ac.uk/news/pressreleases/2016/october/scientists-call-for-urgent-rethink-of-tropical-peatland-palm-oil-and-drainage-based-agriculture.aspx>

<http://www.hitechdays.com/news/105030/scientists-call-for-urgent-rethink-of-tropical-peatland-palm-oil-and-drainage-based-agriculture/>

<https://yoshi.today/can-peatland-turn-into-oil-palm-fields-and-not-cause-haze/>



*IMCG members documenting a peat fire along a pipeline in Brunei during the 2016 IMCG Field Symposium.  
Photo: Hans Joosten*

### **Global Peatlands Initiative started**

In the first week of November, on the occasion of UNFCCC COP22 in Marrakesh, the Global Peatlands Initiative (GPI) was launched. The GPI is an effort by leading experts and institutions to save peatlands as the world's largest terrestrial organic carbon stock and to prevent it being emitted into the atmosphere. Partners to the GPI will work together within their respective areas of expertise to improve the conservation, restoration and sustainable management of peatlands. In this way the GPI will contribute to several Sustainable Development Goals, including by reducing greenhouse gas emissions, maintaining ecosystem services and securing lives and livelihoods through improved adaptive capacity.

Global activities will begin with a rapid global assessment of peatland extent and carbon content followed by a more detailed analysis of sustainable peatland management options, South-South-North cooperation, and private sector engagement. Within the three initial partner countries Indonesia, Peru and the Republic of Congo activities will focus on supporting a shift in management practices towards inclusive, sustainable approaches which maximize the contribution of peatlands management to efforts to address climate change and natural resource use. The pilot projects will also support the transition to a Green Economy.

Founding members of the Initiative include FAO, UNEP, Wetlands International, GRID Arendal, European Space Agency, World Resources Institute, Greifswald Mire Centre, World Conservation Monitoring Centre. IMCG will soon follow. More information: <http://www.globalpeatlands.org>

### **IPCC agrees outlines of new reports and prepares for more**

The Intergovernmental Panel on Climate Change (IPCC) has agreed the outlines of two new reports that will help governments implement the Paris Climate Change Agreement. The Panel approved the outlines of **Global Warming of 1.5°C**, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, to be delivered in 2018, and the **2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories**, to be finalized in 2019. The decision on the outlines clears the way for the IPCC to launch the call for nominations for authors for both reports at the beginning of November. Relevant will be to include sufficient peatland expertise in the authorship to guarantee adequate consideration of the large and growing peatland greenhouse gas emissions.

[http://ipcc.ch/news\\_and\\_events/pdf/press/161020\\_P44\\_PR.pdf](http://ipcc.ch/news_and_events/pdf/press/161020_P44_PR.pdf)

<http://www.iisd.ca/vol12/enb12677e.html>

At its 43rd Session (Nairobi, Kenya, 11 – 13 April 2016), the IPCC Panel decided to prepare a **special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems**. A call was issued to Governments, Observer Organizations and IPCC Bureau members, requesting them to submit expert nominations for the Scoping Meeting before Monday, 3 October 2016 (<http://ipcc.ch/report/sr2/>).

A call for nominations was furthermore issued to Governments and Observer Organizations to submit expert nominations for writing the **Sixth Assessment Report** via their [focal points](#) before Monday, 14 November 2016 (midnight CEST): <http://ipcc.ch/apps/nominations/scoping/ar6/public/>.

## **Africa**

### **Uganda**

#### **World Mountain Forum and Africa Mountains Event**

The 2016 World Mountain Forum (WMF) took place from 17-20 October 2016 in Mbale, Uganda. Gathering over 250 participants under the theme “Mountains for our Future,” the Forum provided a platform to discuss sustainable mountain development (SMD) in the context of the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). The Forum convened sessions on four key themes: mountains and climate change; mountain communities and livelihoods; mountain ecosystem services; and sustainable mountain agriculture. The WMF 2016 resulted in a Mbale Call for Scaling Up Action, themed “Don’t leave the mountains behind,” which is expected to galvanize work on the ground and guide mountain-related interventions in ongoing international policy processes.

A **Special Africa Mountains Event** took place on 17 October and highlighted key issues affecting mountain ecosystems and communities in Africa, including poverty, climate change, food insecurity and land degradation. The event was facilitated by Jesca Eriyo, Deputy Secretary General of the East African Community (EAC), Uganda. Paul Mafabi, Director of Environment Affairs, Ministry of Water and Environment, Uganda, welcomed participants to the Mount Elgon region. Sam Kanyamibwa, Executive Director, the Albertine Rift Conservation Society (ARCOS), introduced the main theme of the WMF 2016, namely “Mountains for our Future”. Shilaku James, the Resident District Commissioner, Mbale, highlighted the importance of the Mount Elgon in providing water and cash crops, and called for participants to overcome obstacles in SMD and achieve results. In a keynote presentation, Musonda Mumba, UN Environment Programme (UNEP), stressed the importance of thinking globally when taking action locally with regard to sustainable mountain development (SMD) in Africa. She said that protecting biodiversity can help mountain communities adapt to the risks of climate change, and called for work on strengthening the resilience of mountain ecosystems. Jesca Eriyo presented an overview of the East African Community (EAC) mountain agenda. Noting that conflicts and wars in eastern Africa frequently occur in or near mountains, which provide hiding spots, she stressed that mountain ecosystems are especially prone to human impacts. She called for the transboundary management of mountain ecosystems in East Africa and appreciated ongoing collaboration between EAC, ARCOS and other partners. Panel presentations discussed the roles of community, public and private sector stakeholders in mountain regions.





*Carex-Dendrosenecio community in a peatland near the outer rim of the Mt Elgon caldera (3900m), Uganda.*  
 Photo: René Dommain

The WMF convened on 18 and 19 October 2016. In an opening address, Sam Kanyamibwa, ARCOS, called for a more effective framework to “give voice” to mountain ecosystems and communities in international policy settings. Francis Nkako, Kenya Water Towers Agency, underscored the importance of long-term mountain policies to ensure the ongoing contributions of mountain ecosystems to livelihoods, noting that mountain stakeholders of all sectors are at once “beneficiaries, part of the problem and part of the solution.”

Behruz Emomov, Ministry of Foreign Affairs, Tajikistan, highlighted the importance of mountains as a provider of economic resources and biodiversity. He said that if appropriate actions are not taken, mountain ranges will stop being a “source of life” and become a “threat to life.” He recommended the effective use of regional water resources to reduce poverty and ensure food, energy and ecological security. Participants watched a video on mountains and climate change (<https://www.youtube.com/watch?v=KssExEWfR2k>).

The high-level segment took place on Wednesday morning. Thomas Hofer, MP, summarized past technical discussions and the draft Mbale Call for Action, noting it addresses mountain challenges related to, inter alia, climate change, ES, poverty reduction, SDGs and financing mechanisms, especially the Green Climate Fund and the GEF SGP. Hofer highlighted the need to link science, policy and the traditional knowledge of local communities, and stressed the importance of ensuring mention of mountains in international negotiation processes, particularly the upcoming IPCC report.

On Wednesday afternoon, Paul Mafabi, Ministry of Water and Environment, Uganda, facilitated the closing session. The Forum came up with a Mbale Call for Scaling Up Action in SMD called “Don’t Leave the Mountains Behind”. The Call includes several actions at local, national, regional and global level in terms of policy, knowledge and action. Ronald Kibuule, State Minister for Water, Uganda, noted that this Forum was the first of its kind in Africa, and said it showed Uganda’s clear commitment to sustainable mountain management.

Presenting a statement on behalf of Ugandan President Yoweri Museveni, Vice-President Edward Ssekandi noted that “mountains are a cornerstone of humanity and of sustainable development,” pledged to continue supporting SMD initiatives in Uganda and called on other mountainous countries to integrate SMD into their national development agendas.

The next World Mountain Forum will convene in 2018 in a Central Asian country to be determined.

<http://www.mtnforum.org>, <http://www.iisd.ca/download/pdf/sd/enbplus194num6e.pdf>





*High mountain peatlands in the Andes: Pantano de Martos, Colombia. Photo: Hans Joosten*

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#### **A brief history of sustainable mountain development initiatives and meetings)**

Nearly half the world's countries have significant mountainous regions. These regions are home to about 850 million people, and provide more than half of the world's population with water for domestic use, agriculture, industry and power generation. Additionally, mountains are home to half of the world's biodiversity hotspots and many threatened and endangered species, which attract tourism and create recreation opportunities.

Yet many mountain regions suffer from dire poverty, widespread land degradation, inequitable land rights, and are already enduring severe negative impacts from climate change, even as demand for mountain ecosystem services rises. Mountain regions are among the most sensitive environments to climate change, warming at a faster rate than global averages, with receding glaciers as one of the most visible indicators of this change. If current trends continue, many glaciers are expected to disappear completely by the end of this century, potentially leading to catastrophic changes in water availability for large parts of the world.

The first major international decision to address the issue of mountains and mountainous regions was at the UN Conference on Environment and Development (UNCED), held from 3-14 June 1992 in Rio de Janeiro, Brazil. One of the principal

outputs of UNCED was Agenda 21, a 40-chapter programme of action. On mountains, Chapter 13 of Agenda 21 recognizes the important ecological, economic and social functions of, and services provided by, mountainous regions. It makes a number of recommendations to governments on mountains, including: promoting erosion control; promoting alternative livelihoods; developing early-warning systems and disaster-response teams for hazardous areas; and creating information centres on mountain ecosystems to build expertise on sustainable agriculture and conservation areas.

By its resolution 53/24, the UN General Assembly (UNGA) proclaimed 2002 as the **International Year of Mountains**, with the objective of raising international awareness about mountains, their global importance, the fragility of their resources, and the necessity of sustainable approaches to mountain development. During the "UN International Year of Mountains," UNGA designated 11 December, from 2003 onwards, as "International Mountain Day."

The **Mountain Partnership (MP)** was founded by the Governments of Italy and Switzerland, the Food and Agriculture Organization of the UN (FAO) and UN Environment Programme (UNEP) and launched at the World Summit for Sustainable

Development (WSSD) in Johannesburg, South Africa, in 2002. Subsequently, four meetings of the MP have been held. The first Global Meeting in Merano, Italy, 5-6 October 2003, identified common needs, priorities and concerns among mountain countries, and explored key issues related to the structure, membership and governance of the Partnership. The second meeting in Cusco, Peru, 28-29 October 2004, adopted the Cusco Framework for Action. Participants also affirmed their collective commitment to the goals of sustainable mountain development (SMD) through the Declaration of the Andes. The third Global Meeting in Rio de Janeiro, Brazil, 19 June 2012, identified strategic objectives for effectively promoting SMD; and building the future cooperative efforts of the MP on a synergistic, inclusive and committed foundation. Three paragraphs (210, 211 and 212) on mountains were included in the Rio+20 Outcome document, “The Future We Want.”

The fourth meeting in Erzurum, Turkey, 17-19 October 2013, addressed the new MP Strategy and Governance, mountains in Rio+20 and the post-2015 Social Development Goals (<https://sustainabledevelopment.un.org/?menu=1300>), the Mountain Forum knowledge platform for SMD, regional coordination mechanisms, and the selection of the Steering Committee (<http://www.iisd.ca/mountain/gmmp4/>).



*Mountain peatlands provide water to urban centres. Cotopaxi, Ecuador. Photo: Hans Joosten*

The “International Conference on the green economy and sustainable mountain development: opportunities and challenges in view of Rio+20” was hosted in Kathmandu, Nepal, 5-7 September 2011. The “Kathmandu Declaration on Green Economy and Sustainable Mountain Development” made several recommendations to governments, calling for, inter alia, the establishment of mechanisms to compensate and reward communities for mountain ecosystem services and

improvement in markets for these services and efforts to ensure access and rights for women and indigenous communities, including valuation and utilization of traditional knowledge and practices (<http://www.iisd.ca/crs/uncsd/gesmd/>)

The “Lucerne World Mountain Conference” in Lucerne, Switzerland, 11-12 October 2011, presented regional and global experiences in mountain development since UNCED and identified challenges and opportunities for the future of global SMD. Among the themes discussed were: the role of the green economy in mountains; the importance of mountains to the Rio +20 summit; and a ‘Plan of Action’ to secure renewed political commitment for SMD.



*Aberdare mountain peatlands (Kenya). Photo: Hans Joosten*

The first Mountain Day took place on 4 December 2011 during UNFCCC COP17 in Durban, South Africa. The event highlighted the critical role that mountain ecosystems play in climate adaptation and sustainable development as well as the vulnerability of mountains, and those who depend on them, to climate change (<http://www.iisd.ca/climate/cop17/md/>).

In 2012, “Mainstreaming Rio+20 outcomes in the UNFCCC processes for prosperous, resilient, and sustainable mountain ecosystems and communities,” was held in Doha, Qatar, 3 December 2012, on the sidelines of COP 18. The discussion sessions focused on: climate change stories from different mountain regions of the world; integrated management of mountain water resources; and the role of mountains in food security and livelihoods (<http://www.iisd.ca/climate/cop18/md/html/crsvo1194num2e.html>)

In 2015, “International Mountain Day: Celebrating International Cooperation on Climate Change Adaptation in Mountain Environments - from Rio to Lima to Paris,” was held 11 December 2015, on



the sidelines of UNFCCC COP19. The event considered the important role of mountains and cooperative measures in ecosystem-based approaches to climate change adaptation in mountainous regions (<http://www.iisd.ca/climate/cop21/enbots/#event-3>).

The **World Mountain Forum** (WMF) took place from 22-24 May 2014 in Cusco, Peru, provided a platform to promote SMD, and included sessions on climate change, family farming, mountain communities; and mountain cities. These sessions included a particular focus on water and food security, sustainable investment and climate change adaptation. WMF 2014 showcased and discussed available local, regional and global experience in mountain development, and identified opportunities and challenges for global SMD ([http://www.iisd.ca/mountain/wmf/2014/html/crs\\_vol194num4e.html](http://www.iisd.ca/mountain/wmf/2014/html/crs_vol194num4e.html)).

The First **African Mountains Regional Forum**, themed “Towards a Shared Mountain Agenda for Africa,” convened in Arusha, Tanzania, 22-24 October 2014 and gathered over 100 participants representing government, academia, research institutions, intergovernmental organizations and civil society. During the meeting, participants identified strategic actions to address major emerging issues, addressed the promotion of linkages and collaboration between different stakeholders for a regional framework on sustainable mountain development in Africa; and shared lessons learned and experiences in meeting the conservation and development challenges including biodiversity, water, energy, food security

and climate change in African Mountain regions. The meeting adopted the Arusha Outcomes, which many participants hoped would raise the profile of the African sustainable mountain development agenda ([http://www.iisd.ca/mountain/amrf/2014/html/crs\\_vol194num5e.html](http://www.iisd.ca/mountain/amrf/2014/html/crs_vol194num5e.html)).

The outcome document “The Future We Want” of the **2012 UN Conference on Sustainable Development**, also known as Rio+20, recognized the benefits derived from mountain ecosystems, the need for sustainable development in mountain regions, the importance of mountains as home to indigenous people and local communities and the crucial role mountains play in providing water resources to a large portion of the world’s population. The Future We Want warns about the vulnerability of fragile mountain ecosystems to the adverse impacts of climate change, deforestation and forest degradation, land use change, land degradation and natural disasters, the marginalisation of its communities, and invites States to, inter alia, adopt a long-term vision and holistic approaches to SMD, including through incorporating mountain-specific policies into national sustainable development strategies. The need to “Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” is set as Sustainable Development Goal 15 of the 2030 Agenda, and Target n.1 of SDG 15 explicitly mentions mountains among the ecosystems to be conserved, restored and sustainably used in line with international agreements.



Colombia, Laguna Verde. Photo: Hans Joosten



## Asia

### Bornean orang utan ‘upgraded to ‘critically endangered’

IUCN has raised the threat level of Bornean Orangutan to ‘critically endangered’. The two major reasons why most Bornean Orangutans populations are in sharp decline are (1) destruction, degradation and fragmentation of their habitats, and (2) hunting. Recurrent forest fires, especially in peat forests, cause additional sharp declines about once every decade. Bornean Orangutans decreased by more than 60% between 1950 and 2010, and a further 22% decline is projected to occur between 2010 and 2025. More information in the IUCN Red List fact sheet: <http://www.iucnredlist.org/details/17975/0>

See also <http://www.msn.com/en-us/news/world/plight-of-the-orangutan-inside-the-wildlife-photographer-of-the-year-winning-photo-essay/ar-AAjeUwa?li=BBnb7Kz&ocid=mailsignout&page=2&fullscreen=true#image=4>

### Naming and shaming palm-oil buyers to stop rainforest burning

Groups like Greenpeace and the Union of Concerned Scientists have taken to naming and shaming companies that they say aren’t doing enough to make suppliers stop the destruction of rainforests and peatlands. On September 21, WWF released its 2016 Palm Oil Buyers Scorecard (<http://palmoilscorecard.panda.org/>), looking at the policies of 137 companies worldwide. The good news, according to WWF, “at least half of the companies we looked at” have made “gratifying progress” toward using sustainable palm oil that meets criteria such as a ban on the destruction of primary forests.

Public pressure seems to be helping, with many companies announcing new policies or expanding on existing policies to clean up their supply chains of palm oil. To ensure their palm oil comes from sustainable sources, companies are making commitments to trace their supply back to the farm where growers harvest the fruit or the mill where producers extract the oil. “The industry is at a critical stage on the journey to sustainable palm oil,” WWF Palm Oil lead Adam Harrison said in a statement. “More major brands are now using only certified palm oil yet laggard companies continue to drag their feet.”

<http://www.themalaymailonline.com/money/article/naming-and-shaming-palm-oil-buyers-to-stop-rainforest-burning>



Oil palm mill in Sabah, Malaysia (photo: Hans Joosten)

## Georgia

### Conservation and wise use of Kolkheti peatlands – novel approaches, new opportunities – Paludiculture experience sharing visit to Germany

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In the July 2016 issue of the IMCG Bulletin, Grootjans et al. (2016) reported that Batumi State University of Georgia and the Greifswald Mire Centre are collaborating to update the protected areas management plans for Kolkheti National Park and Kobuleti Protected Areas, harbouring the largest mire areas of Georgia. Major challenges are the continued unsustainable, mire affecting drainage activities adjacent to these Ramsar sites and designated protected areas.

Within this planning framework a Georgian delegation visited Germany on 21-23 September 2016 to get to know novel sustainable and feasible solutions in managing and restoring peatland ecosystems with both ecological and economic benefit. The Georgian group was composed of the authors of this communication: Ms. Khatuna Tsiklauri, Lead Specialist of the Agency of Protected Areas of Georgia, Mr. Aleksandre Khabeishvili, Kolkheti National Park Director, Mr. Mamuka Gvilava, ICZM National Focal Point for Georgia, Ms. Izolda Matchutadze, Head of the Kolkheti Mires and Water Ecosystem Conservation Department at Batumi State University (the organizer), and lead by Mr. Lasha Moistsrapishvili, Chairman of the Agency of Protected Areas of Georgia.

The program started with an exciting visit to the Sphagnum farming site on former bog grassland in the peatland 'Hankhauser Moor'. It was indeed enlightening to see what has been achieved in public-private cooperation of the researchers from Greifswald Mire Centre and the private company MOKURA ([www.moorkultur-ramsloh.de](http://www.moorkultur-ramsloh.de)), a peat company lead by the true entrepreneurs Gunnar Koch (CEO) and Silke Kumar (lead horticultural engineer) – an excellent example how peat industry can apply innovation in an attempt to transform this extractive sector into a sustainable Sphagnum farming enterprise. German engineering sophistication was indeed required to establish the Sphagnum culture, but Georgian guests were assured, that due to its special natural conditions, the same experience could be repeated in Kolkheti with less complicated technical means, while natural Sphagnum growth rates in Kolkheti are phenomenal. Kolkheti can count on the experience and innovation of MOKURA and the Greifswald researchers when conditions for implementation in Georgia mature!



*Sphagnum farming site at Hankhauser Moor, Lower Saxony, Germany, Oct. 2016. Photo: Tobias Dahms.*



*Sphagnum farming is indeed wet and balancing business. Photo: Silke Kumar.*

In the effort to capitalise on the potential of harvesting peatmoss in Kolkheti, it is paramount to be aware of the importance of marketing and value chain analysis of Sphagnum-based substrates for the growing media industry. In this respect, it was indeed important to visit Floragard Vertriebs-GmbH, an experienced marketing company for potting soils and substrates ([www.floragard.de/en](http://www.floragard.de/en)) and to listen to the insightful introduction offered by Winfried Temming of Floragard. Thousands of substrate recipes acquired in almost 100 years of experience, its wide network of marketing links, including for recipes testing, and its comprehensive laboratory



facility can make Floragard the best partner if and when Georgia ever cultivates and harvests peatmoss biomass in Kolkheti.

The tight schedule of two days included field visits and acquaintance with the complete cycle of biomass production for heating. We visited the wet fen meadows at Lake Kummerow, where reed canary grass and sedges dominated vegetation is harvested for combustion. We continued our tour to the reed canarygrass and sedge biomass heating plant, operated by Agrotherm GmbH Schwinkendorf, which serves 540 apartments, a kindergarten, a school and several office buildings in the city of Malchin. Indeed, there is plenty of abandoned agricultural space in Kolkheti to trial similar biomass framing and harvesting, in order to heat the schools and kindergartens in poor communities around the Kolkheti peatlands. This would simultaneously save the equivalent amount of trees from being cut for firewood and employ local people in biomass cultivation and harvesting and, why not, even pellet production from wet-plant biomass. Indeed, wetland sustainability learned in Germany. We deeply appreciate the informative guidance by Tobias Dahms from Greifswald University, as well as the insights provided by Greta Gaudig of the Greifswald Mire Centre.



*Georgian guests and German hosts at a paludiculture biomass harvesting site. Photo: Tobias Dahms*

Yet another stimulating idea was offered to the Georgian visitors by Maximilian Wenzel, a young researcher of Greifswald University, who explained cattail (*Typha* sp.) cultivation potential in Rochow, near Ueckermünde. He demonstrated the guests why the wetland plant cattail offers an excellent natural building material with very good insulation properties. Also the use of reed as construction material was discussed. If Germany cares for the insulation of houses to reduce energy consumption, Georgian families would benefit from reduced heating costs certainly. With a little bit of innovation, Kolkheti could become a producer of non-synthetic insulation materials for sustainable housing in Georgia. The Head of the Agency of Protected Areas came up with the initiative to establish a small model mock-up at the Visitor Centre of Kolkheti National Park to inform local communities on green building materials. Greifswald University is committed to support Georgian partners with implementing this idea, by specifying and including this and other sustainability actions in the updated protected areas management plans for Kolkheti and Kobuleti.

The program of visits culminated with a discussion meeting on the topic of “World Natural Heritage Kolkheti wetlands and forests” in the Succow Foundation and the Peatland and Nature Conservation International Library (PeNCIL), hosted by Marianna Nitusova (Succow Foundation), and Professor Hans Joosten of Greifswald University and the Greifswald Mire Centre. Important policy discussions and exchange of ideas on potential arrangements to facilitate the UNESCO designation of Kolkheti were followed by a seminal tour through the



PeNCIL library, guided by Hans Joosten with inspirational stories about the history of this unique part of Germany and the future plans to host the 25,000 publications on mires from around the world – with a small but important corner devoted to the brainchild of Professor Joosten: the globally unique rainwater-fed percolation bogs of Kolkheti.

A pleasant surprise was awaiting the Georgian delegation in the morning of the third departure day. Hans Joosten and Matthias Krebs, who had carefully organised the entire visit program, had managed on a short notice to arrange a meeting with the founder of the Succow Foundation, the patriarch of conservation in Germany and in the vast Eurasian space, including Georgia: Michael Succow. It was inspirational to listen to the history of scientific and political persuasion, which made it possible to set aside for biodiversity conservation and future sustainability enormous spaces in this important part of the World. Particularly pleasant was to hear the deep conviction that Kolkheti mires and forests unequivocally deserve inclusion into the UNESCO heritage list and status. The future of these areas will be truly sustainable from both an ecological and economic point of view, if managed truly sustainably, and paludiculture has a special role to play in this endeavour.



*Group photo with Professor Succow in the Eurasian garden of Michael Succow Foundation HQ, Greifswald. Photo: Susanne Abel.*

The Georgian delegation was convinced: sustainable development is possible in the biosphere of the Kolkheti natural areas. Business-As-Usual does not work anymore, Nature-As-Usual is the future. It remains now to convince the communities around Kolkheti, and – importantly – Georgian and international economic stakeholders and funding agencies, to support the new paradigm in Kolkheti. The modus operandi of dry-land agriculture needs to be changed in support of paludiculture: no more drainage, but restoration of damaged ecosystems, to make them work in synchrony with nature and to achieve truly sustainable development in these UNESCO candidate environmental heritage areas, to make the vision of Professor Succow work not only inside protected areas, but in productive ecosystems upstream and downstream of the Kolkheti peatlands.

Last but not least, as 1/3rd of the Kolkheti National Park is marine area, let us use this opportunity to congratulate the readers of the IMCG Bulletin with the International Black Sea Day of October 31 – one of the main benefits of the conservation of Kolkheti peatlands is to buffer and protect the waters of this beautiful Sea, its coastal, wetland and marine habitats.

## Indonesia

### Norway must demand an end to the destruction of mire and peatland in Indonesia

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Norway has over the last decade contributed large sums of money to Indonesia to reduce deforestation and forest degradation, restoring peat swamp forests, and support local business. Regardless, 2015 was one of the worst years of forest fires in Indonesia ever, and an area of 26,000 km<sup>2</sup> (larger than the county of Nord-Trøndelag) was burnt. About half was peatlands (peat swamp forest). The smoke from the peatlands in Indonesia went halfway around the world, neighbouring countries were swept in haze for three months in a row, over half a million people got respiratory ailments, and 100,000 premature deaths are now being related to the haze (Environmental Research Letters, IOP). The fires are extensive also in 2016, especially in Sumatra and Kalimantan.

Tropical peatlands cover about 250 000 km<sup>2</sup> in Southeast-Asia, about 6% of all peatlands in the world are found here. Since the tropical peatlands are significantly deeper than the overall mean, about 10% of all peat in the world are stored in Southeast-Asia. As much as 80% of these peatlands can be found in Indonesia. In addition to being important for biodiversity, the peatlands are also important for sequestering and storing carbon. The enormous emissions of greenhouse gases in Southeast-Asia are closely linked to the burning of drained peatlands and forests.

The destruction of tropical peatlands was insignificant until the 1980s, but has escalated drastically since then. The destruction is often linked to establishment of palm oil plantations. Indonesia and Malaysia produce today about 85% of all palm oil in the world.

During a visit to Malaysia and Brunei in August 2016, we got to see some of the large national parks and nature reserves established to protect peat swamp forests. Still, large areas are affected, even within the protected areas. We observed numerous ongoing fires, but Indonesia is still considered leading in forest fires and destruction of peat swamp forest. On August 29 the sun in Kuala Lumpur disappeared behind a blanket of fire haze coming from Sumatra. As Indonesia's partner in business and conservation, we have an obligation to step in, and it has to happen now!

(Summary of an article posted in the leading newspaper of Central Norway Adresseavisen, Oct. 28, 2016).

### Vice President urges environment forestry ministry to familiarize people with peatland restoration

Vice President Muhammad Jusuf Kalla has instructed the Environment and Forestry Ministry to familiarize all sections of the society with the importance of restoring the peatland. "The vice president has urged the ministry to disseminate information about peatland restoration in all regions of Indonesia," Environment and Forestry Minister Siti Nurbaya said on Friday, October 7. The discussion on peatland restoration was led by the vice president himself. The minister remarked that mutual understanding among the central government, the local administration, and the investors was needed to avoid any problems in the future. The minister explained that several institutions and ministries such as the Environment and Forestry Ministry, the Public Works and Housing Ministry, the Agriculture Ministry, the Agrarian and Spatial Affairs Ministry, and the National Development Planning Board will be involved in the effort.

<http://www.antaraneews.com/en/news/107102/>

### A haze-free Asean region by 2020? Private financing for peatland restoration

On Sept 21, the World Economic Forum (WEF) and Peatland Restoration Agency (PRA) of Indonesia organised a Peatland Investment Dialogue to discuss a potential business opportunity for the private sector, where companies are urged to invest in the national effort to restore 2,000,000ha of degraded peatland. Peatland restoration is an important key to achieving a haze-free Asean by 2020. According to the Centre for International Forestry Research, restoration of a hectare of degraded peatland costs around US\$2,500 (RM10,500). The PRA states that around US\$11.2 billion is needed to restore 2,000,000ha of degraded peatland in the next five years. Making infrastructure development the top priority, the Government of Indonesia has to limit state budget allocation for other sectors, including for environment and forest management. This is where private financing is expected to close the gap, not only to achieve the imperative 2,000,000ha target in Indonesia but also to cover a wider landscape of degraded peatlands in Southeast Asia that in 2006 alone had reached 12,000,000ha. In addition, the call for private sector contribution is also driven by the public's desire to

hold corporations, especially plantation-based companies, responsible for causing the haze crisis. Companies' mismanagement and illegal clearing of forests and peatland by drying and burning have been identified as the primary cause of the annual haze in the region. Based on McFarland's (2015) analysis and lessons learnt from forest carbon projects in Southeast Asia, particularly in Indonesia, the private sector can participate in peatland restoration financing through four avenues. First, by developing peatland restoration projects, using the concession for ecosystem restoration (RE). The permit will give the private sector the legal right to manage and use the peatland for environmental or forest carbon project. There is, however, the concern on the complexities of obtaining the RE concession, as it is still a system ridden with rent-seeking practices by corrupt government officials. Second, the private sector can provide funds to nonprofit organisations, such as those involved in environmental issues, to develop peatland restoration projects. Third, the private sector can commit to a dedicated fund for peatland restoration and implement sustainable management practices on the concessions that they hold. And the private sector can play the role of carbon offset buyers or fund environmental services project.

The clarity over spatial planning will provide legal certainty required for the green economy investment to thrive. The next step will be to address social conflicts due to overlapping claims on land with a long history of unequal land struggles between states in the region and marginalised indigenous communities. The second biggest challenge is weak law enforcement and corruption in the forestry sector. The high rate of deforestation and peatland degradation in the region has been linked to illegal business practices facilitated by corrupt officials. A stronger effort has to be initiated at the national level to reinforce the legal system. The Indonesian government has started to introduce a multi-door approach, a platform to prevent and apprehend environmental offenders by ensuring that they are held accountable, not only for the environmental degradation caused, but also subjected to investigation based on other laws, such as on money laundering. This approach is expected to adequately punish environmental offenders and reduce the rate of deforestation and peatland fires. The Indonesian government has also imposed a moratorium on the opening of new plantations and mining sites on peatland until May next year. This will provide time to review private concessions and land disputes and resolve the political economic problems.

<http://www.nst.com.my/news/2016/10/180432/haze-free-asean-region-2020>

<https://www.rsis.edu.sg/wp-content/uploads/2016/10/CO16252.pdf>

### Indonesia receives US\$125mn to restore peatlands

A number of countries have provided Indonesia with assistance funds totalling US\$125 million to restore peatlands in several provinces for the next few years.



*Burned-over peatland in South-Sumatra. Photo: Hans Joosten*

“The funds will be used for peatland restoration endeavors for the next three years,” Peatland Restoration Agency (BRG) head Nazir Foead said in Palembang, South Sumatra, on Wednesday, October 19, 2016, after observing peatlands with Norwegian Ambassador to Indonesia Stig Traavik. Nazir revealed the assistance funds came from Norway, the United States, Japan, Germany, the United Kingdom and other European countries. In addition, the donor countries provided assistances related to technology and sent their experts. Nazir explained that Norway also helped to map peatlands and related projects worth US\$15 million. With such aids, Nazir expressed optimism that the target to restore 2.4 million hectares of peatlands in seven provinces would be achieved. Traavik pointed out that South Sumatra has almost inaccessible peatlands; making it difficult to extinguish land fires. He suggested that prevention efforts would be the best option to mitigate the peatland fire risks.



South Sumatera governor Alex Noerdin welcomed Norway's plan to provide assistance funds to restore peatlands in the region. He also said that the government would not be able to restore peatlands without help from other countries. Alex revealed that the size of damaged peatlands has reached 700,000 hectares, and restoring each hectare would cost Rp30 million (US\$2,300).

<http://en.tempco.co/read/news/2016/10/19/206813494/>

#### **Indonesia can get Rp500trillion from preserving peatland**

Indonesia may get Rp500 trillion per annum from carbon trading if it can preserve peatland from degradation and committed to pushing the use of unexploited peatlands for agriculture. Indonesian Peatland Restoration Agency (BRG) chairman Nazir Foad said that the Rp500 trillion will be achieved if Indonesia is able to preserve 6.2 million hectares of unexploited peatlands from a total of 19.4 million hectares of peatland in seven provinces. Nazir said that aside from preserving peatlands from degradation, a strong commitment from policy makers is also needed. The central government and provincial governments must focus their energy to preserve peatland area in seven provinces designated by BRG by engaging local farmers and residents.

National peatland restoration program has cleaned up 15,000 canals by blocking and backfilling. In addition, BRG has also established 1,300 deep wells for peatland rewetting, seeding, and replanting. Restoration efforts have been carried out by BRG in seven provinces, namely Riau, Jambi, South Sumatra, West Kalimantan, Central Kalimantan, South Kalimantan and Papua. "By 2020, the market will be ready, Indonesia will be able to trade carbon," Nazir said.

<http://en.tempco.co/read/news/2016/10/24/056814552/Indonesia-Can-Get-Rp500tn-from-Preserving-Peatland>

#### **High-resolution map of Indonesia's peatland**

The Indonesian government has started producing a detailed peatland map using light detection and ranging (LiDAR) technology. A lack of detailed peatland maps has led to many problems such as overlapping permits and rampant slash-and-burn practices. LiDAR is a surveying method that measures distance to a target by illuminating that target with a laser light. The laser light is shot from a small plane.

The Peatland Restoration Agency (BRG) began on October 19 mapping 170,000 hectares of peatland in South Sumatra, specifically Ogan Komering Ilir regency and Musi Banyuasin regency, which were badly ravaged by massive land and forest fires last year. Besides South Sumatra, the government will also produce maps for damaged peatland in Meranti regency in Riau and Pulang Pisau regency in Central Kalimantan this year. "This map will become the basis of our planning [to restore burned peatland]," BRG head Nazir Foad said in Palembang, before boarding a small plane to start the mapping process. "In order to make a good plan, we're not brave enough without this map." Mapping in South Sumatra, Riau and Central Kalimantan would be completed in mid-November so that the government could commence rewetting drained peatland, immediately.

The technology is capable of producing a detailed map with scale of 1:2,000, which enables to pinpoint areas that require restoration and protection, and canals that should be blocked. Indonesia currently has a national peat map with a scale of 1:250,000.

The government decided to use LiDAR as it can map up to 2,000 hectares of land in one hour, costing US\$5 per hectare.

<http://www.thejakartapost.com/news/2016/10/22/high-resolution-map-protect-nation-s-peatland.html>

For impressive photos of haze in Indonesia, see: <http://blog.cifor.org/44089/living-in-a-toxic-haze?fnl=en>

## **Malaysia**

#### **Felda launches new sustainability policy**

Felda Global Ventures (FGV) is one of the largest palm oil producers globally and a leading Malaysian grower with access to a 784,000 hectare land bank. The company is 75% owned by the Malaysian government and an important supplier to Wilmar, Musim Mas, and IOI Corporation. FGV's move toward greater transparency and attempts to mitigate environmental and social risks may also indicate changes at the Malaysian Palm Oil Council.

FGV's new policy, approved by the company's Board of Directors on August 25, 2016, commits to provide accurate, factual, and balanced information on its sustainability initiatives to shareholders and stakeholders.

The new policy includes No conversion of High Conservation Value (HCV) areas, peat soil, and / or areas with High Carbon Stock (HCS) and implementation of best management practices on existing peatland estates.

Issues remaining include

- peatland clearance still continues in West Kalimantan and has been reported to the RSPO
- FGV's new policy does not provide for restoring peatlands and biodiversity
- FGV defines peat as greater than 50 cm of depth instead of "regardless of depth".

<http://seekingalpha.com/article/4010284-chain-felda-global-ventures-launches-new-sustainability-policy>

## Russia / Siberia

### International Field Symposium “West Siberian Peatlands and Carbon Cycle: Past and Present”

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Please pay attention that the dates of the International Field Symposium “West Siberian Peatlands and Carbon Cycle: Past and Present” have been changed to 19-29 June, 2017. Preliminary timeline:

19-21 June: field excursion to Konda Lakes Nature Park (Khanty-Mansiysk Autonomous District)

22-23 June: International conference “Carbon Balance of Western Siberian Mires in the Context of Climate Change” (Khanty-Mansiysk)

24-25 June: Field Symposium “West Siberian Peatlands and Carbon Cycle: Past and Present” and excursion to the international field station Mukhrino, Khanty-Mansiysk

26-28 June: Field excursion to Noyabrsk (Yamalo-Nenets Autonomous District).

Please submit the titles of your presentations until November 30 at the latest since we are planning to apply for a grant of the Russian Foundation of Basic Research and need to compile a draft program. Please [register](#) also in case if you are planning to submit a paper without personal participation. Consult the webpage <https://mukhrinostation.com/projects/wspcc-2017/> for more details on the Symposium.

## Europe

### Peat extraction below average in Finland, Ireland and Lithuania

In **Finland**, the weather favoured peat extraction in May and until mid-June throughout the country. The start of the season was predicting to exceed the average harvesting figures. However, towards the end of June, the weather changed for more rainy with showers almost every other day. In July and August, record rainfall was measured in many important peat extraction areas. According to the Bioenergy Association of Finland ([www.bionenergia.fi](http://www.bionenergia.fi)), the total peat extraction was 10.84 mill. m<sup>3</sup> of which 1.42 mill. m<sup>3</sup> was for “environmental purposes” i.e. used as animal bedding, composting, soil improvement and growing media. The amount of energy peat, 9.42 mill. m<sup>3</sup> or roughly 3 mill. tn or 8.4 TWh consists of less than 10% sod peat, the rest being milled peat for larger CHP plants and industry. Due to the rapidly changing energy market there was no target figure for peat extraction. A high percentage of extraction fields was temporarily idle due to declining demand of energy peat during the past few years, but the peat trade is likely to recover. It is planned to reduce the rather large energy peat stocks of previous years over the coming winter. Peat demand for horticultural and bedding purposes is strong.

**Ireland**'s prime peat extraction season (otherwise known as the “summer”) was quite wet and broken from a weather point of view. There was an early start in May, but conditions suitable for extracting milled peat were very poor in June and quite patchy thereafter. Despite that, and owing in particular to the fast start, the final outturn was in the 80 - 85% range.

In **Lithuania**, the prognostic peat extraction for 2016 is estimated to be 1,935,000 m<sup>3</sup>. This is less than expected and volumes are 34 % lower than a previous year. Accordingly, the number of seasonal employees in peat industry has dropped from 830 to 745 whereas the number of permanent employees remained stable in 2016. This year season results are low due to unfavourable weather conditions. Mean precipitation was 65.3 mm per month in comparison to 46.8 mm in 2015.

<http://www.peatsociety.org/sites/default/files/snippets10-2016.pdf>

## European Union

### Austria

#### Session "Peatland Hydrology" at the EGU General Assembly 2017 in Vienna (23 – 28 April)

The session aims to bring together peatland scientists to focus on improved understanding of hydrological processes operating in all types of peatlands. Peatlands being considered may be pristine or disturbed and degraded and may also include rehabilitation and re-wetting interventions. Hydrological data may have been collected for other reasons (e.g. carbon flux calculations) but the session welcomes re-examination of such hydrological data in its own right or as supporting data for other studies. Results from research focussing on all aspects of peatland hydrology are welcome, as are field, laboratory or modelling studies on hydrological, hydrochemical or geophysical topics, including hydrological ecosystem service provision such as nutrient retention or flood protection. Our scale of interest ranges from the plot to the regional scale.

The deadline for the receipt of Abstracts is 11 January 2016 - 13:00 CET. Deadline for support applications is 1 December 2016.

Session (Co-)Conveners: Bärbel Tiemeyer, Thünen-Institute Braunschweig, Germany; Joe Holden, University of Leeds, UK; Björn Klöve, University of Oulu, Finland; Michel Bechtold, Thünen-Institute Braunschweig, Germany  
<http://meetingorganizer.copernicus.org/EGU2017/session/23027>

### Belarus

#### Rational utilization of natural resources and sustainable development of Polesie

Annett Thiele ([annettthiele@gmail.com](mailto:annettthiele@gmail.com))

The international conference 'Problems of rationale utilization of natural resources and sustainable development of Polesie region' was held in Minsk, Belarus, September 14<sup>th</sup>-17<sup>th</sup>, 2016. Around 300 participants from five countries (Russia, Belarus, Poland, Ukraine, Germany) discussed the current problems of drained peatland utilization and possible ways of sustainable use of drained and rewetted peatlands. Russian colleagues from Tver University presented results of recent reed establishment trials on rewetted peatlands in Tver Oblast. Colleagues from the international Saharov State Ecological Institute Minsk presented the results of the EU AID project 'Wetland Energy' dealing with pellet production from peatland biomass in the Grodno region.



*Prof. Nikolay Nikolayevich Bambalov showing peat loss in a Polesie fen drained in 1961 (steel gauge marks the original soil surface; left). Analysing the soil profile of a sand cover cultivation ('Sanddeckkultur') experiment (centre), where since 2012 no structural C losses seem to have taken place (right). Photos: Annett Thiele.*

One of the excursions to the 'Polesie experimental station of meliorative landuse and grassland cultures' presented the long term peat loss rates of 'sand cover cultivation' (Ge. 'Sanddeckkultur'), where shallow peat layers are covered with a sand layer in order to conserving the peat. A four-year experiment showed that peat layers of about 30 cm thickness covered with sand and used as grassland had not lost any carbon. Follow up studies on GHG emissions and carbon fluxes in water and soil will be highly appreciated by the colleagues of the Institute for Nature Use of the National Academy of Sciences Minsk.

Surprisingly during the conference no word was spend on the possible negative effects of reviving the E40 water way connecting the Baltic Sea via the Pripjat with the Black Sea (<http://udf.by/english/main-story/112885-poland-belarus-and-ukraine-to-revive-the-baltic-black-sea-water-route.html>). Already in 2014 a



joint Polish, Belarusian and Ukrainian committee had been formed to plan the water way and investigate its chances and risks. It is expected that the 2000 km long water way will have to transport 4 million tons annually. This would require the Pripjat to be straightened and equipped with seven sluices, embankments and dams. Belarusian ecologists call it the 'Death of Polesie' (<http://bahna.land/2016/10/11/e-40-smert-dlia-polesja/>). The Environmental impact Assessment from the Polish side is said to be done superficial. A Belarusian assessment will follow. Ukrainian critics remind that intensive and heavy vessels traveling along the Pripjat could mobilize the gyttja in the Kiev water reservoir, which stores huge amounts of radionuclides from the Chernobyl fallout. The Polish side has its own issues: they skipped the route along the Western Bug as Natura 2000 SPAs are covering parts of the river and search now for an alternative way. The lobbying mainly comes from the Polish side. It is crucial that the environmental impact assessment is discussed with the public but also that scientists and ecologists use their influence to spread the word and talk about the risks.

#### **A sea of cranberries: how to pick berries in Polesie**

Spectacular pictures of cranberry (*Vaccinium macrocarpon*) harvest by the Pinsk company "Poleskiye Zhuravin", Belarus, where the cranberry fields are filled with water and the berries raked to where they are collected on a trailer: <http://bahna.land/2016/10/29/more-kliukvy/>

## **Finland**

### **Viiankiaapa - a bird paradise threatened by mining**

Hanna Aho ([hanna.aho@sll.fi](mailto:hanna.aho@sll.fi))

The mining boom is threatening many protected areas in Northern Europe and Viiankiaapa is one of them. Viiankiaapa is an aapamire in Finnish Lapland, 150 kilometres south of the Arctic Circle. The mire covers 6,595 hectares and is home to 21 endangered bird species, many threatened sedge and moss species and has a diverse collection of mire habitats. A fifth of all bird species of Finland have been recorded from here. The very northern aapamires are under special protection by the European Union and Viiankiaapa is protected by Natura 2000 as well as national legislation. Finland has a global responsibility to take care of the world's mires, which makes Viiankiaapa's status even more valuable not only in Finland or Europe, but also worldwide.

The mire is characterised by vast flark fens, on which strings may extend unbroken for several kilometres. The flarks are wide, and there are also large open water pools. The mire is flanked by pine bogs, and the site also features rich birch fens, which are typical of aapa mires in Central Lapland. The protected area also contains natural forests of which half are older than 150 years.

Viiankiaapa lies within the Central Lapland Greenstone Belt, i.e. a schist area characterised by volcanic rocks. Mires in such volcanic areas are usually richer than those in acidic granite areas. Also the yearly flooding of the mire brings nutrients and enhances species diversity.

The mining company Anglo American is currently looking for platinum, nickel, copper and gold underneath Viiankiaapa. The deposit is predicted to be one of the biggest in Europe. The mineral deposit was first discovered in 2004 and soon the company started preliminary investigations. The company applied for a mineral research permit in 2011. Due to insufficient nature evaluations the search for minerals was on hold for several years, but it will likely start again during the winter of 2016-2017. In August 2016 the Finnish Safety and Chemicals Agency (Tukes) has granted the company an exploration permit to continue deep drillings after the complaints by the district organisation of the Finnish Association for Nature Conservation (FANC) had been rejected by court. The research permit is valid until 2020. The FANCs district organisation of Lapland has applied to the highest court.

To this date 165 drilling holes of 200 meters to 1 kilometer deep have been made and the company is going to drill 150 holes more. The drilling is allowed only during winter time when the mire is covered by snow. Next year Anglo American is going to start an environmental evaluation for a mine.



*Viiankiaapa mire. Photo: Timo Helle and Kaija Kiuru*

According to the European Habitat Directive (see Box above) a possible harm to the nature values of Viiankiaapa has to be compensated. The problem is that Viiankiaapa is one of the largest and richest surviving aapa mires in Lapland and compensating it fully is hardly possible because restoring several small areas is not equivalent to conserving a large one. The question remains if a mine can be built underneath the mire so that the protected area would remain intact. Only further investigation will reveal if this is possible and the evaluation of the research will be difficult and even impossible for the public. In any case a mine in the area will have environmental, social and economic impacts.

The possible establishment of a mine on a protected area has evoked local and national objection, but the project still continues. The case of Viiankiaapa is not only about saving a couple of species: it is about saving an entire conservation area with all its species and habitats, about safeguarding one of the last wildernesses and the way of life of reindeer herders, and about protecting the entire European Natura 2000 network.

More information on Viiankiaapa: <http://www.nationalparks.fi/viiankiaapa>

**Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora**

“2. Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.

3. Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.





*Dactylorhiza lapponica* in Viiankiaapa.  
Photo: Timo Helle and Kaija Kiuru

Holes after drilling at the forested area of Viiankiaapa.  
Photo: Hanna Aho

## France

### New nature reserve Grande Pile

Since July 1, 2016, the Grande Pile peatland is a 'Réserve naturelle régionale', the tiered one of the Conservatoire d'espaces naturels of Franche-Comté. The mire is especially known for its extreme depth and long palaeo-record, reaching back at least 140,000 years. More information under:

<http://www.sciencedirect.com/science/article/pii/S0033589478900790>  
<http://cen-franche-comte.org/document.php?idoc=JFjznRHrDQtG4xCp>

## Netherlands

### Field congress on wet crop cultivation

Jeroen Geurts ([j.geurts@science.ru.nl](mailto:j.geurts@science.ru.nl))

The first field congress on wet crop cultivation in the peat meadow area was held on the 30th of September 2016 at the Veenweiden Innovatiecentrum (VIC), Zegveld, The Netherlands. It was organized by the VIC, STOWA (Applied Research on Water Management), Radboud University Nijmegen, the province of Utrecht and the Louis Bolk Institute. Aim of this day was to share knowledge and to show and discuss the cultivation of wet crops in relation to soil subsidence, ecosystem services, sustainability, possible applications and economic profitability. The focus was on cattail, cranberry, peatmoss, and Azolla. These are all wet crops with enough perspectives to take sustainable agriculture to a next level, to create a solution for the high CO<sub>2</sub> emissions and soil subsidence rates, and to improve water quality and biodiversity. The more than 100 participants had different backgrounds: provinces, water authorities, municipalities, nature protection organizations, farmers, consultancies, research institutes).

Professor Leon Lamers (Radboud University) gave a scientific introduction about wet crop cultivation, paludiculture and ecosystem services in peat meadow areas. He stressed the importance of rewetting and paludiculture for the production of clean water, food and biomass, but also for providing supporting, regulating



and cultural ecosystem services. This means for example biodiversity, climate regulation, and education. Nature and production are not counteracting, but they are just on opposite sides of a gradual scale between 100% nature and 100% production. Wet crop cultivation should be somewhere on this gradual scale. Profitability calculations of wet crops should be partly based on market incomes and partly on ecosystem services.

In the afternoon people could visit stands and experimental fields with all 4 wet crop species. Besides that there was the option to visit an experimental field with wild rice, *Miscanthus* and willow. The presentations also focused on possible applications, economic profitability, and ecosystem services. Cranberry (*Vaccinium*) can be used for human consumption. The most important costs are maintenance costs for weed management. Different forms of weed management were demonstrated (mechanical, biological, chemical). The market for cranberries is quite small. The cultivation contributes to a lesser extent to ecosystem services. Cattail (*Typha*) can be used for making construction material and isolation, fodder, energy production, and even for human consumption. Ecosystem services will have important benefits from cattail cultivation, especially water storage, water purification, lower CO<sub>2</sub> emissions and land subsidence. Water fern (*Azolla*) grows very fast and can be used for protein-rich fodder, and even for human consumption in the future. *Azolla* can take up a lot of phosphorus from the surface water and a lot of nutrients can be removed by harvesting. Water storage is another important ecosystem service. Peatmoss (*Sphagnum*) can be used for decoration material and sustainable potting soil. *Sphagnum* cultivation will stop peat subsidence and lower or stop CO<sub>2</sub> emissions.

In the final discussion between stakeholders, the delegate of the farmer organization stressed that it is logical that agriculture and nature have to work together to conserve the peat meadow area. The delegate of the water authority indicated that the water level should not always follow the function. Because of climate change, we have to think the other way around more often. The delegate of the policy makers mentioned that the peat meadow area is an important economic area that has to be conserved. They all agreed to develop a joint agenda and knowledge program to introduce wet crops in the peat meadow area, focusing on substantive questions, solutions for practical constraints, and profitability calculations. The second field congress on this topic will be held in September 2017.

## Ukraine

### Amber extraction destroying peatlands in Ukraine and Belarus

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At the Polesia conference in Belarus (see above) a report was presented on amber exploitation in the Polesia region, especially in Ukraine. According to scientists the rivers coming from Ukraine are black as a result of the soil washing technique. Mass media describe an 'amber war in Ukraine', [https://www.youtube.com/watch?v=4zSe1lUkL\\_Q](https://www.youtube.com/watch?v=4zSe1lUkL_Q), and document that hundreds of hectares have been turned into moon-like landscapes (Rovenskaya Oblast 169 ha, Zhitomirskaya Oblast 220 ha, Volynskaya Oblast 200 ha). The Ukrainian government discussed illegal extraction activities in 2012 but the former president of Ukraine, Viktor Fedorovych Yanukovich, put the issue aside in the light of other urgent problems. Possibly the government will legalize the activities to gain a piece of the cake but – on the other hand – she also has to take care of the working conditions of the workers. Export is oriented to China and turnover is assumed to be more than US\$1 billion (150-300 t amber) per year. Recent publications (<http://news.tut.by/society/515891.html>) report on similar but smaller extraction activities near Kobryn in Brest Oblast, Belarus. In Brest Oblast in 2015-2016 extraction activities have been documented from five localities. However, activities in Belarus turned out not to be cost-effective due to falling amber prices and the low concentration in the soil. In 2015 illegal extraction activities in Sporova Zakaznik led to sentences of 4.5 years of jail for two amber searchers.

## United Kingdom

### BIOFUELS IN HISTORY Issues of Energy, History, Landscape & Environmental Change

17-18 November 2016, Sheffield Showroom & Workstation

<http://www.ukeconet.org/biofuelhistory.html>

Organised by the Biodiversity and Landscape History Research Institute, South Yorkshire Biodiversity Research Group, with Sheffield Hallam University, University of York, University of Stirling, JBA consulting and others.

This event is a BES Peatlands SIG two-day, multi-disciplinary workshop & seminar to explore issues for peatlands & woodlands, for energy / fuel use. This major issue has arisen as an unrecognised factor in climate change and landscape issues - from our previous conferences. The event will draw together key researchers and thinkers on the subject to identify key emerging paradigms. Please contact Ian Rotherham if you wish to submit a proposal or to support the event in other ways. All are welcome.

For more information, please email [info@hallamec.plus.com](mailto:info@hallamec.plus.com) or telephone 0114 2724227 and follow our website for updates and programmes: [www.ukeconet.org](http://www.ukeconet.org) .

### **£5million windfall for Marches Mosses**

The Marches Mosses BogLIFE Project, Natural England's largest European-funded LIFE project of its kind to date, has just been approved. From October, Britain's third largest lowland raised bog, which includes Fenn's, Whixall & Bettisfield Mosses, and Wem Moss National Nature Reserves, near Whitchurch and Wrexham, will see a step change in its rate of restoration back to being one of Europe's finest wildlife sites. The £5million package of improvements will be delivered over the next five years in a partnership led by Natural England, together with Natural Resources Wales and Shropshire Wildlife Trust. The funding will pay for the acquisition of a further 63 ha of peatland, and enable water levels to be raised over 600 ha to improve the raised bog habitat. In addition the Project also aims to restore swamp, fen, willow and alder carr wet woodland, habitats missing from the edge of the bog. More information: <http://iucn-uk-peatlandprogramme.us3.list-manage.com/track/click?u=f1bc6fee95849ff37dcbae3b4&id=4295d34fe8&e=5413830ff2>

## **South-America**

### **Chile**

#### **Mires exploitation and destruction in Chilean Patagonia as a consequence of insufficient environmental regulations**

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In Chile 3% of the national territory is covered by mires and peatlands, meaning approximately 4,600,000 ha (CONAF 1999). Of these ecosystems, almost 70% are located in Chilean Patagonia, covering the region from Los Lagos until Cape Horn in the Magallanes region. Patagonia is one of the last regions in the temperate world where natural mires still grow intact and in pristine conditions. Some international agreements signed by Chile are indirectly related to mires: the Ramsar Convention on Wetlands and the Kyoto Protocol of the United Nations Framework Convention on Climate Change. Nevertheless, ecological considerations are little of an issue in front of the productive activities in the country. Subsequently, so called "environmental catastrophes" are frequent, in 2016, for instance, the massive occurrence of *red tide* in Chiloé by eutrophication derived from salmon farms (see National Geographic 2016) or the contamination of the drinking water in the capital Santiago (see eFSNR 2016). The progressive destruction of mire ecosystems is only one point more on the list of non-awareness and neglect of the ecological consequences by politicians and institutions.

So far, due to their geographical isolation mire ecosystems in the Chilean Patagonia have remained rather protected from industrial contamination and exploitation initiatives. But this situation is changing with support and commitment of the Chilean government. Special attention lies in the Region of Magallanes, where after recent calculations app. 269,545 hectares of *Sphagnum* mires are located (Domínguez & Vega-Valdéz 2015). In this region, on the one hand, the National Institute for Agriculture and Livestock Research (INIA) investigates and researches actively the harvest and commercialization of *Sphagnum magellanicum* moss. Through workshops, bulletins and talks, this institution induces local communities and entrepreneurs to invest in the harvest, drying and product development based on this peat forming species. The growth rate of living *Sphagnum magellanicum* mosses calculated by the INIA from regeneration experiments is 2 to 5 mm year<sup>-1</sup> under outdoor conditions (Domínguez & Larraín 2013). With this rate, a sustainable management of these mosses could only be realized if the harvested areas are allowed to rest for 30 to 75 years, which is the time needed by new *Sphagnum* strings to reach 15 cm length. But living plants are not the only threatened component of mire ecosystems. Peat is defined in Chile by the Mining Code (Ministerio de Minería 1983) as a "non-metallic resource". Since mining is the most important basis of Chilean economy, potential exploitable mining resources are given special preference and are considered to be above environmental regulations. This

policy was accentuated during the dictatorial regime of Augusto Pinochet (1973-1989) who defined mining concessions as “a right in rem and immovable, separate and independent of the domain of the surface property, even if they have the same owner, enforceable against the State and any person, transferable and transmissible; susceptible to mortgage and other property rights and, in general, of all act or contract...” (Minería 1983). Currently, the Mining Ministry through its Regional Office (Secretaría Regional Ministerial SEREMI) is actively promoting research and investment in peat mining in Magallanes. This Ministry signed an agreement with the World Conservation Society (WCS) in July of 2015, which administrates the Natural Park Karukinka on the Island of Tierra del Fuego (Minería 2015). Approx. 25.000 ha, i.e. circa 10%, of Magallanes’ mires are located in Karukinka Park. The agreement specifies that mires inside Karukinka can only be impacted for research purposes and that peat mining can only be allowed under special conditions. Sadly, all other mires in Chilean Patagonia are excluded from the agreement and can be mined (Minería 2016).

In the Magallanes region mires are important for retaining fresh water in the landscape, a precious resource since the area is seriously affected by water scarcity. Some sections of these ecosystems are also covered by forests, e.g. of *Pilgerodendron uviferum* (a cypress species protected by law in Chile), allowing a mosaic of habitat niches for endangered fauna like e.g. *Strix rufipes* (Díaz-Tavié 2016). In the province of Última Esperanza, one of the Magellan provinces with the highest presence of mires (Ruiz & Doberti 2005), construction works on behalf of the Ministry of Public Works (Ministerio de Obras Públicas MOP) have begun earlier this year, for a road connecting the settlements Seno Obstrucción and Río Pérez (Figure 1), allowing an alternative connection with the regional capital Punta Arenas. The planned course of the road will cut one of the biggest mire complexes of the province in two affecting its hydrological and ecologic balance (Fig. 2). Even though the new road is primarily built to facilitate expansion of the salmon industry and coal mining, it is likely to induce peat exploitation as well, as isolation was always the best protection mires had. Consequently, the road will facilitate the access to moss harvest and peat mining areas that otherwise could not be reached. The Mining Ministry is obliged by law to give information on the mining concessions to everyone who requests it. However, our request to give figures about actual peat mining concessions remains unanswered until today.



Figure 1: Planned course of the road between Seno Obstrucción and Río Pérez (red line). Areas with red-brown colour are mainly mires.

Destructive effects on mire ecosystems have already been registered after the completion of the Carretera Austral in the region of Aysén in Chile. Its construction affected over 6000 hectares of mires through the structural division of these ecosystems (Figure 3), the removal of peat layers for extraction of aggregates, and the drainage/flooding of the affected areas with ecologic and hydrologic unbalances for the whole mire complexes (Rodríguez 2015).





Fig. 2: a) Road currently constructed close to Seno Obstrucción with ca. 500 m through pristine forest until reaching a mire. b) Thick *Sphagnum magellanicum* cushions on the surface of the future road c) Currently not constructed but marked road course through a mire where peat thickness reaches >3 m.

These examples show that Chile is not applying serious regulations related to mire protection and that the importance of these ecosystems is still overseen by local authorities. In order to raise awareness about mire ecosystem functions, between May and July 2016 the mire experts Marvin Gabriel and Ana Carolina Rodríguez undertook an initiative to educate children and teachers of the town Puerto Natales, about the importance of the mires in the region. In coordination with the local Environmental Department of the Municipal Corporation for Education, several scientific workshops were developed about mire ecological functions and protection,



with scholars in the local schools (Figure 4).

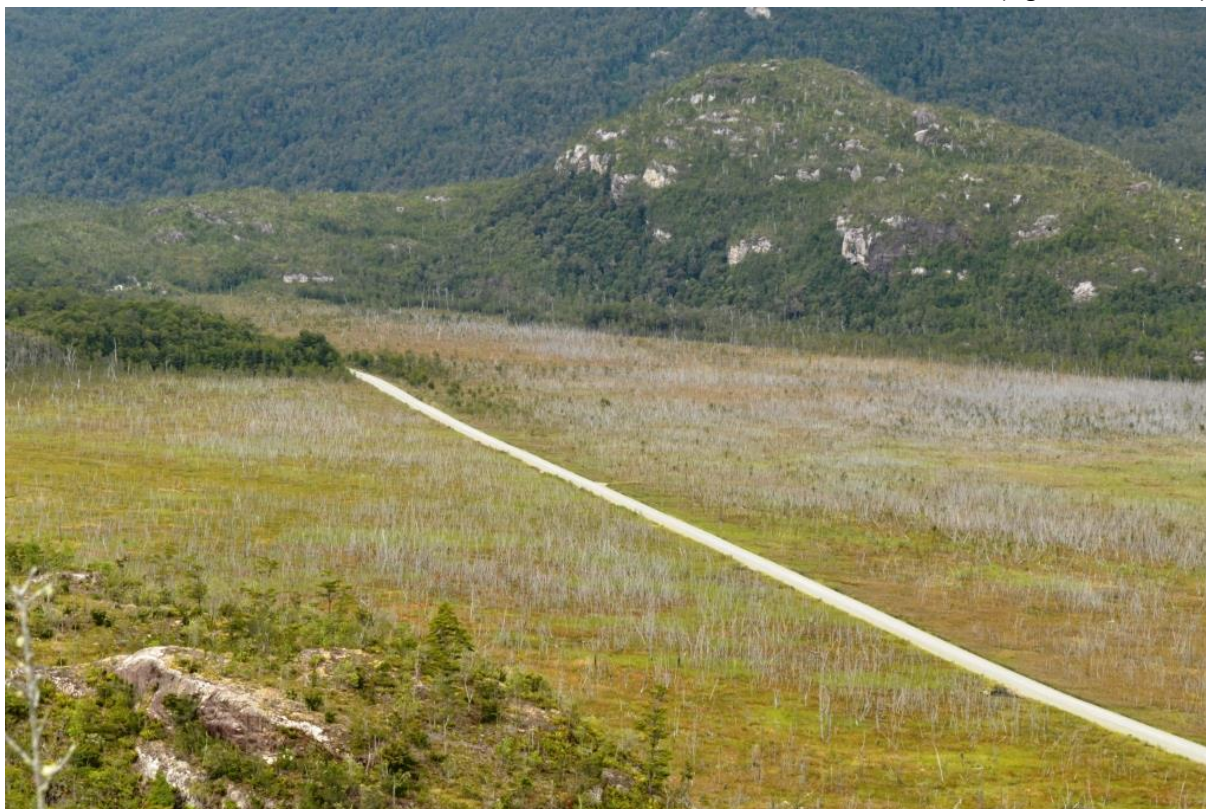


Figure 3: Mire divided by the Carretera Austral in the Low basin of the Baker River, Region of Aysén.

The children and teachers were introduced to mire plants, peat and some of their functions like water retention, water purification and ecological linkages of these ecosystems, which are very present in their province. It would be desirable if local environmental institutions repeat such initiatives and educate people from a scientific perspective, rather than from a short term productive one. Otherwise mires in Chile will be in risk and with it the chances of future generations to benefit from their ecosystem functions.



Fig. 4: Raising awareness about mires and their ecosystem functions among scholars of Puerto Natales.

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## Peatland conservation relevant papers October 2016

Collected by Hans Joosten: [joosten@uni-greifswald.de](mailto:joosten@uni-greifswald.de)

1. Quality not quantity: Organic matter composition controls of CO<sub>2</sub> and CH<sub>4</sub> fluxes in neotropical peat profiles: <http://www.sciencedirect.com/science/article/pii/S0038071716301912>
2. A database of radiocarbon dates for palaeoenvironmental research in Eastern Africa: <http://www.openquaternary.com/articles/10.5334/oq.22/>
3. Human-affected disturbances in vegetation cover and peatland development in the late Holocene recorded in shallow mountain peatlands (Central Sudetes, SW Poland): <http://onlinelibrary.wiley.com/doi/10.1111/bor.12203/abstract?campaign=wolearlyview>
4. A new soil mechanics approach to quantify and predict land subsidence by peat compression: <http://onlinelibrary.wiley.com/doi/10.1002/2016GL071116/abstract?campaign=wolacceptedarticle>
5. The role of the seed bank in recovery of temperate heath and blanket bog following wildfires: <http://onlinelibrary.wiley.com/doi/10.1111/avsc.12242/abstract?campaign=woletoc>
6. Middeleeuwse veenontginningen in het getijdenbekken van de Hunze. Een interdisciplinair landschapshistorisch onderzoek naar de paleogeografie, ontginning en waterhuishouding (ca 800 - ca 1500): [http://www.rug.nl/research/portal/files/35326469/Complete\\_thesis.pdf!null](http://www.rug.nl/research/portal/files/35326469/Complete_thesis.pdf!null) (36 mb!)
7. Effects of sulfate and sulfide on the life cycle of *Zizania palustris* in hydroponic and mesocosm experiments: <http://onlinelibrary.wiley.com/doi/10.1002/eap.1452/abstract?campaign=wolacceptedarticle>
8. The influence of habitat disturbance on genetic structure and reproductive strategies within stands of native and non-native *Phragmites australis* (common reed): <http://onlinelibrary.wiley.com/doi/10.1111/ddi.12492/abstract?campaign=wolearlyview>
9. CH<sub>4</sub> exchanges of the natural ecosystems in China during the past three decades: The role of wetland extent and its dynamics: <http://onlinelibrary.wiley.com/doi/10.1002/2016JG003418/abstract?campaign=woletoc>
10. Ultrahigh resolution mapping of peatland microform using ground-based structure from motion with multi-view stereo: <http://onlinelibrary.wiley.com/doi/10.1002/2016JG003478/abstract?campaign=wolacceptedarticle>
11. Carbon balance of rewetted and drained peat soils used for biomass production: a mesocosm study: <http://onlinelibrary.wiley.com/doi/10.1111/gcbb.12334/full>
12. Nitrous oxide uptake in rewetted wetlands with contrasting soil organic carbon contents: <http://www.sciencedirect.com/science/article/pii/S0038071716301109>
13. Greenhouse gas emissions from fen soils used for forage production in northern Germany: <http://www.biogeosciences.net/13/5221/2016/>
14. Peat porewaters have contrasting geochemical fingerprints for groundwater recharge and discharge due to matrix diffusion in a large, northern bog-fen complex: <http://www.sciencedirect.com/science/article/pii/S0022169416304802>
15. How does drainage alter the hydrology of shallow degraded peatlands across multiple spatial scales?: <http://www.sciencedirect.com/science/article/pii/S0022169416305273>
16. Sea level and ground water table depth (WTD): A biogeochemical pacemaker for glacial-interglacial cycling: <http://www.sciencedirect.com/science/article/pii/S0277379116303535>
17. The role of fire in UK peatland and moorland management: the need for informed, unbiased debate: <http://rstb.royalsocietypublishing.org/content/371/1696/20150342>
18. Moorland vegetation burning debates should avoid contextomy and anachronism: a comment on Davies et al. (2016): <http://rstb.royalsocietypublishing.org/content/371/1708/20160432>
19. The role of fire in UK upland management: the need for informed challenge to conventional wisdoms: a comment on Davies et al. (2016): <http://rstb.royalsocietypublishing.org/content/371/1708/20160433>



20. The peatland vegetation burning debate: keep scientific critique in perspective. A response to Brown et al. and Douglas et al.: <http://rstb.royalsocietypublishing.org/content/371/1708/20160434>
21. Development of a new pan-European testate amoeba transfer function for reconstructing peatland palaeohydrology: <http://www.sciencedirect.com/science/article/pii/S0277379116303742>
22. Holocene climate changes in the central Asia mountain region inferred from a peat sequence from the Altai Mountains, Xinjiang, northwestern China: <http://www.sciencedirect.com/science/article/pii/S0277379116303663>
23. Pollen-based biome reconstructions over the past 18,000 years and atmospheric CO<sub>2</sub> impacts on vegetation in equatorial mountains of Africa: <http://www.sciencedirect.com/science/article/pii/S0277379116303730>
24. Peatland plant communities under global change: negative feedback loops counteract shifts in species composition: <http://onlinelibrary.wiley.com/doi/10.1002/ecv.1627/abstract?campaign=wolacceptedarticle>
25. Hydrogeological controls of water table-land surface interactions: <http://onlinelibrary.wiley.com/doi/10.1002/2016GL070618/abstract?campaign=woletoc>
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