Independent Peatland Expert Working Group

IPEWG

IPEWG Meeting 9

Overview

This was the first on-site meeting for Phase 2 of IPEWG with a strong focus on using the outcomes from the scientific work to inform management planning. The meeting was organized as a series of field visits and workshops to allow IPEWG members to work closely with APRIL staff to review progress, provide suggestions and input and plan next steps. This overview highlights some of the main strands of work with further information provided in the detailed meeting summary that follows.

Understanding interactions: The role of IPEWG is to help APRIL to use science to underpin peatland management. However, this does not mean that there will be a single 'right answer' about what should be done. All landscapes involve multiple interactions between various environmental, social and economic factors, and peatlands are particularly complex because in addition to these, there are also interactions between water table depth, subsidence, carbon emissions, fire and production. Thus, fundamental to responsible management of peat landscapes is a holistic understanding of the interactions between these different factors.

During phase 2 IPEWG will work with APRIL to better understand key interactions so they can inform planning and management, ultimately allowing development of different scenarios to understand how to best deliver the long-term vision for responsible peatland management. Key aspects are controlling fire; minimizing subsidence and greenhouse gas emissions; producing fiber; protecting, conserving and restoring forest; and economic development. The outputs of phase 1 have greatly improved our understanding of many of the interactions, for example, the impact of raising the water table on subsidence and CO_2 emissions, but further questions remain, as discussed below.

Controlling fire: Minimizing fire on peat is a major objective of the Indonesian government, crucial to the health and welfare of Indonesians and a long-term focus of APRIL. Yet surprisingly there is relatively little published data or research on the causes, extent and control of fire in the Indonesian landscape. APRIL is very proactive in fire management through its Fire Free Village Program, with very limited incidence of fire even during 2015. APRIL has data on fire occurrence and extent within and adjacent to its own concessions, which can be linked to other data such as water table depth in nearby plantations, the age and type of vegetation and response time of fire crews. This suggests that there are a number of factors which are important in controlling fire including ignition and control as well as peat dryness. Building a better understanding of the different factors involved and how they interact is essential to underpin an effective fire management strategy.

During the meeting, IPEWG had the opportunity to visit one of the villages in the Fire Free Village Programme and to discuss directly with local people why they use fire, the impacts of haze from fires on health and how they are collaborating with APRIL to find alternatives to burning.

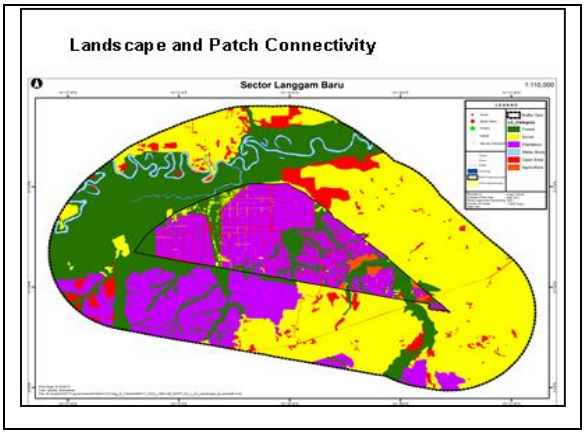
The next step for IPEWG is to review all the existing published information on fire (focusing on the drivers of ignition and spread) and combine this with APRIL's data to understand better what is known about the key factors in minimizing the extent and impact of fire on peat, and whether there are gaps in understanding which require more work.

Producing fiber on wetter peat: Economic viability is an essential aspect of responsible management and for APRIL this requires a secure fiber supply for the mill. Therefore, during phase 2, IPEWG and APRIL will continue to focus on growing

Acacia with a 40cm water table. This is using a combination of analysis of existing data on Acacia performance at high water tables, a breeding programme, setting up and monitoring water table experiments in the field, and using models. Modelling is particularly useful for thinking about the implications of different options as it allows a number of different possibilities to be considered quickly and at low cost. One of the IPEWG members has developed a model for peatland plantations which is now allowing key questions and uncertainties about raising water tables to 40 cm to be examined. For example, what is the implication of high water tables for nutrient availability, and how can any nutrient deficiency be addressed? What will happen to subsidence and to GHG emissions and how can these be minimized? At the same time, APRIL have purchased a landscape level hydrology model (MIKE SHE) which allows modelling of the impacts of different water management regimes over the whole landscape. Combining these two models will allow APRIL and IPEWG to build a much better understanding of how to optimize management of plantations within the landscape.

Growing native species: APRIL has made rapid progress in developing a program for producing and planting native species on peat. During phase 1, IPEWG and APRIL reviewed a series of trials already carried out and APRIL expanded their team working on the production of native species plants to allow a major scale up. A recent move of the native seedling production to an operational nursery has allowed rapid scale-up of production to hundreds of thousands of young trees, and planting at scale is already underway. Plans for the coming year are for over 200 ha of planting within areas identified as restoration under the recent government regulation. While ensuring all planting meets the new regulation, APRIL staff will also work with IPEWG to implement planting designs that maximise use as replicated trials with detailed information maintained on species planted, survival and growth. This data can then provide information for APRIL to improve its planting techniques and contribute to the wider understanding of large-scale restoration of peatland in Indonesia. An important part of the next steps will be to involve Indonesian academics and specialists in the program to maximize the opportunities for learning and collaboration.

Protection and conservation: APRIL has a long-standing commitment to a 1:1 ratio between protection and production across the landscapes they manage. The protection area is divided between the large Ecosystem Restoration Concessions on Kampar and Pulau Padang – both of which are solely peatland forests - and smaller conservation forests within their concession areas which include forests on both mineral and peat soils. During phase 1, IPEWG discussed the importance of improving the management of the conservation forest areas within the concession areas and APRIL now has an ongoing conservation program that has been implemented for each of its own concessions, and is currently being extended to supply partners. The Restoration Concessions have their own management (RER Progress Report 2017 http://www.rekoforest.org/multimedia/rer-progress-report-2017), but during Phase 2 IPEWG will increase ongoing discussions on the interactions between these large protection areas and the rest of APRIL's concessions as well as sharing information and learning on peatland landscape management.



Independent Peatland Expert Working Group

IPEWG

Summary Report

Time/Location: Jun 5 – 8, 2018 – Pangkalan Kerinci, Indonesia

Participants

IPEWG: Prof. Dr. Supiandi Sabiham, Prof. Ari Lauren, Prof. Susan Page, Prof. Chris Evans, Prof. Vincent Gauci, Dr. Ruth Nussbaum, and Joe Lawson (SAC Chair)

APRIL: Praveen Singhavi, Lucita Jasmin, Dr. Ibrahim Hasan, Rob Pallett, Mark Werren, Dr. John Bathgate, Craig Tribolet, Sailal Arimi, Sabar Siregar, Dr. Chandra Deshmukh, Dr. Chandra Ghimire, Rudi Fajar, Taufan Chrisna, Yogi Suardiwerianto, Brad Sanders, Dadang Setiawan, Dr. Sofyan Kurnianto, Amit Haldar, Riyadin Hendratno

Secretariat: Tim Fenton & Addriyanus Tantra (APRIL)

Objectives:

- Confirm role and remit for IPEWG phase 2
- Initiate development of a strategy for long-term peatland management
- Present updates on ongoing work streams - data collection, analysis and resource mapping with a strong focus on applying the results to the field.

IPEWG Update: presentation on the importance of understanding methane (CH_4) pathways through vegetation in wetlands, as information gaps currently being filled indicate CH_4 could be a noteworthy contributor to GHG in our atmosphere.

Field Visits Undertaken: Fire Free Village, Pelalawan and Native Species Production Nursery, Pelalawan

Progress with the IPEWG Work plan

Topic	Discussion Overview Notes	Workplan Ref.
Component 1 – Building Science-based Understanding and Minimizing Impacts		
D1. Subsidence and carbon balance	**Action D1.1a, b, c - Analysis of existing subsidence data:** The final draft paper has been completed, reviewed and approved for submission by all parties. Target submission date is end of June 2018. The second paper has already started by means of excerpts from paper 1. Its focus will include temporal variations in subsidence in greater detail. Target draft review is November, 2018.	**Output D1.1** Analysis of patterns of subsidence in APRIL plantations on peat for internal discussion and subsequently for further dissemination
D1. Subsidence and carbon balance	**Action D1.3 a, b, c - GHG flux data:** Dr. Sofyan Kurnianto was introduced as the newest member of the Peatland GHG Monitoring team, and will be contributing to APRIL's peatland modelling team. Professor Ankur Desai of the University of Wisconsin-Madison was contracted to review the methodology for monitoring of GHG Emissions by APRIL's Eddy Covariance Flux Towers, including evaluation of experimental design, instrumentation setup, data processing algorithms, sampling protocols and staff training in early 2018. His report with recommendations was submitted to APRIL in February, and was subsequently shared with the IPEWG for their review and feedback. GHG flux data trends for CO_2 and CH_4 exchange comparing native forest to Acacia	**Output D1.3** Support for optimal data collection and analysis from APRIL's 3 Flux Towers

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	plantations on peat soils was presented for different rotations. The 14 month old plantation flux indicated a neutral CO_2 condition after being positive from time of planting until point of canopy closure, while the native forest acts as a small source during the dry season and a sink during the wet season. Methane release was less from plantation than from native forest. CO_2 emission levels from soil heterotrophic respiration are lower in 4th rotation peatland plantation than 2nd rotation plantation. Further data collection, analysis is and discussion is required before any conclusions can be drawn. In response to IPEWG's previous recommendation, APRIL has developed a schedule for publication submissions starting in December 2018 through to 2020.	
D2. Water table management and hydrology	**Action D2.2a:** The high water table (WT) trial site was relocated in 2018 to a more suitable area. Discussions included extending an invitation to the Peatland Restoration Agency (BRG) or Ministry of Environment and Forestry (MoEF) collaborating research parties to jointly study the impacts of high water table on plantation crop yield, in addition to testing a hypothesis regarding the requirement for additional surface fertilizers. The site is in the last stages of preparation for maintaining the required water tables, and the IPEWG now need to confirm the experimental design.	**Output D2.2** Improved understanding of options for and impacts of managing water tables
D2. Water table management and hydrology	**Action 2.3:** Lysimeter trial update – the site description has been completed and establishment of the subsurface boundary is in-process. The experiment will be conducted in two bounded and sealed plots (30 x 20 x 4 m). Planned data measurements include water input, water output, Ground Water Table level, soil moisture content, water use by *Acacia crassicarpa* and water stress, growth rate, and soil oxygen content.	**Output D2.3** Improved understanding of Ground Water Table on tree water use and growth rates
D3. Growing Trees on Wetter Peat	**Action D3.1:** Fungsi Lindung Ekosistem Gambut **(FLEG)** – are peatland protection areas in production concessions that are no longer allowed to be planted following harvest of fiber plantations. There are 4 actions permitted for management of these areas following harvest – re-planting with native species, natural succession without planting, rehabilitation (of the peatland hydrology), or other approaches in accordance with the development of science or technology. There are opportunities for APRIL to collect data to study the natural regeneration and succession following harvest; and to start to understand the silviculture requirements in FLEG areas. In addition, APRIL R&D have started a breeding program for more high water table tolerant Acacia. **Action D3.2:** IPEWG presented on the importance of understanding methane (CH_4) pathways through vegetation in wetlands. New research findings indicate CH_4 emissions through trees and other vegetation can make a significant contribution to GHG emissions in some environments. APRIL generated a discussion by presenting some data on plantation growth at higher water table (WT) levels. Stocking is a key driver of productivity and WT level can impact stocking at different stages of growth. Early growth may be	**Output D3.1** Development of a program to optimize use of acacia on wetter peat **Output D3.2** Plan for establishment of a large R&D program on water-tolerant species

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	impacted negatively by WTs that are either too shallow or too deep. Toppling can occur when trees are nearing harvest age in areas of high WT. Extended periods of flooding will cause mortality within the plantation. IPEWG will allocate time to jointly analyze the data with APRIL to see what else can be learned from the information and its implications for growing Acacia at higher WTs. In response to the new regulations and the IPEWG Roadmap towards Responsible Peatland Management, APRIL has recently completed the conversion of an Acacia seedling nursery to a Native Species production-level nursery. The peatland based nursery has started operations with the establishment of 300,000 mother plants in both uncovered and covered greenhouse beds. The current focus is on an initial four species for production, but R&D continues its work on the full list of 32 species. Propagation methods include seeds, cuttings and transplant of wildings. Native species collections are taking place locally and as far away as Oki, South Sumatera Research Center and Kalimantan. APRIL is targeting 230ha to be planted operationally to native species in 2018.	
D6. Natural forest condition and management	**Activity D6.2a,b** The goal of APRIL's Conservation Forest management framework is to be an inclusive and sustainable process that effectively protects, restores and enhances identified values and addresses its Conservation commitments. The program is now rolled out to all PT. RAPP sectors (operating areas) and will be introduced to all APRIL Supply Partners in the second half of 2018. A key to the program is engaging with local communities to discuss identified conservation values and how communities may continue to utilize forested areas in a more responsible manner. Community engagement is a continuing process. R&D is continuing its program of testing different native species growth on peatlands with the establishment of a 3.1 ha trial in the field.	**Output D6.2** Effective management of remaining natural forest
1.2 Resource Mapping	**1.2.2a – Review of LiDAR outputs** Product development from the 2017 LiDAR data collection includes: • A Digital Terrain Model (DTM) extracted in different resolutions (1m, 5m, 10m) • Contour generation, Slope assessments, Detection of drainage networks in plantation and natural forests, and watershed assessment • Object based Image classification for Land Cover assessment • Height profiles from classified LiDAR point cloud • Canopy height model created from above ground point cloud (both Discrete and Full Waveform point cloud); and, • Direct LiDAR output used as the input for hydrological modeling using DHI applications and algorithms. No further LiDAR surveys or development of tools from existing LiDAR data have taken place in 2018. Learnings from the project include purchase of data from other sources (I.e. WorldDem) which is of sufficient detail for most imaging work; and where more stringent detail is required, APRIL is considering the new and developing technology for mini-LiDAR systems mounted on UAVs.	**Output 1.2.1** Build understanding of peat and forest resources **Output 1.2.2** Develop greater capacity among practitioners and users of resource mapping information

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1.4 Clear Communication	**1.4.1 –** IPEWG has been working on a communications release for Phase I - a report on the progress for the first 2 years of IPEWG. In its final stage of review, the report will be released in early July. Internally, both IPEWG and APRIL staff have committed to more frequent calls and video-links in order to manage ongoing joint projects.	**Output 1.4.1** Communication on the Roadmap; challenges of peatland; and science-based approaches.
Component 2 - Responsible Peatland Operations		
2.2 Modeling plantations and landscapes	**2.2.1–** Develop, test and refine models which will allow predictions to be made of the impacts of different management strategies for (a) responsible management and (b) a new vision for peat landscape management. Using the LiDAR collection from 2017, APRIL is learning how to apply the MIKE SHE modeling system to its peatland management processes. A total of 6 training courses have been completed with the science team since late 2017, and the first model of an operational area illustrating the water budget, including canals, is under review. IPEWG has committed to support this hydrological work and is seeking ways in which to link the spatial modeling of MIKE SHE outputs into the Plantation Simulator process model.	**2.2.1** Model which can be used to predict the implications of different management strategies
2.2 Modeling plantations and landscapes	**2.2.2 – Drainability and flood risk assessment / mapping** This work stream will be further developed in 2018 with modeling capabilities improved by quarter 4. A briefing paper to be developed by IPEWG, will be discussed at the November, 2018 meeting.	**Output 2.2.2** An understanding of the areas of peat at greatest risk from subsidence and the timeframe for changes
Component 3 – Developing a Vision for Peatland Landscapes		
Senior Management Discussions		
3.1 Development of a strategic vision	APRIL's Peatland Vision was reviewed by the IPEWG in 2017. Although there are changes currently underway across all Indonesian peatland landscapes, the core of the Vision remains the same. IPEWG's work going forward remains on the main factors affecting peatland operational management – Fire, Subsidence and Emissions, Conservation & Biodiversity, Fiber Supply and Socio-economics.	**Output 3.1.1** Understanding the views and aspirations of local, national and international stakeholders with respect to peatland mgmt.
Next IPEWG Meeting Dates		
Meetings	The next scheduled IPEWG meeting is by video-link Sept 18, 2018 The next on-site meeting for IPEWG is proposed for Nov 6-9, 2018.	-