

Minutes of Meeting

Subject : 3rd Peatlands Working Group 2 (PLWG-2) Meeting
 Date : September 7 & 8, 2017
 Venue : Aloft, KL Sentral, Kuala Lumpur

Name	Organisation	Status
Faizal Parish	GEC	Substantive
Joshua Matthews	Bumitama Gunajaya Agro	Substantive
Shahrakbah Yacob	Sime Darby	Substantive
Jason Foong	KLK	Substantive
Chin Kai Xiang	IOI Loders Croklaan	Substantive
Gotz Martin	GAR	Substantive
Richard Kan	GAR	Alternate
Serena (representing Julia Lo, only attended on second day)	GEC	Alternate
Arina Schrier	Wetlands International	Alternate
Lim Sian Choo	Bumitama Gunajaya Agro	Alternate
Tey Seng Heng	KLK	Alternate
Javin Tan	RSPO Secretariat	Secretariat
Devaladevi Sivaceyon	RSPO Secretariat	Secretariat
Aizat Affendi	RSPO Secretariat	Secretariat
Fiona Jane Francis (only attended on second day)	RSPO Secretariat	Secretariat
Absent with apologies:		
Jason Hon	WWF	Substantive
Dickens Mambu	IOI Loders Croklaan	Alternate

No.	Item Descriptions	Main Discussion Points	Action Points	Progress Update
September 7, 2017 (Thursday)				
1.	Introduction of new member	Chair begun the meeting with a round of introduction for new members and a quick run through of the agenda.		
2.	Review of previous meeting minutes	Secretariat mentioned that the efforts to get a representative from Sarawak Oil Palm Plantation Owners Association, SOPPOA has not been successful, although an acknowledgement from the top management was received by the Secretariat. Secretariat has also reached out to WWF		

		<p>Malaysia to suggest an alternate member for the WG, but it was also unsuccessful.</p> <p>Secretariat said that the Outreach and Engagement department has tracked 2 media reports on peat in palm oil plantations in the past 12 months that has reached a negative sentiment. Chair clarified that there is a deficiency in the media tracking given that there should be hundreds of articles with regards to the peat issue in the palm oil plantations. Perhaps the tracking was done for a different purpose. Chair added that within the Indonesian media reports, there would be at least 5 reports on peat every week. Suggest that RSPO have an FAQ with regards to peat to help the stakeholders if there are any media enquiries about the peat fires.</p> <p>On online BMP module, CoChair asked if Arina has done training on the online module. Secretariat clarified that she has not done it, as it has not been finalised.</p> <p>On site visit, the Secretariat said that United Plantation has actually declined for a visit due to lack of resources. Secretariat has also reached out to other companies but the response was negative. CoChair said that the time set was in November which is a peak harvest season and hence will not be a favourable time for grower if we do a site visit. GAR volunteered to offer their field for site visit with a caution that the traveling will take close to 2 days from airport. Secretariat mentioned that given only a small group of people that will be participating the site visit, it shouldn't be a hurdle for the logistics. Chair proposed to have the site visit along with the meeting that way it cuts down the need for double trip.</p>	<p>Secretariat to check with O&E if there have been any media enquiries or common questions with regards to peat or peat fires that would be useful for the preparation of an FAQ. Also what are the other communication materials that would be helpful for peat related matters.</p> <p>Secretariat to set another site visit at an appropriate time.</p>	<p>Site visit planned along with next WG meeting</p>
3.	Global peat definition	<p>Chair urges that there should be a separate definition of organic soil and peat soil and not a sole definition for organic (peat) soil. Organic soil carries a broader meaning which may not be close to peat soil.</p> <p>WG suggested to fall back to local definitions, Chair mentioned that the objective is to get a global definition as the current definition is applicable</p>	<p>Secretariat to recirculate the definition and ask the other members of the WG to come back within one week, should they have any comments and suggestions.</p>	<p>WG will re-look into the definition in the next meeting.</p>

		<p>for Malaysia and Indonesia thus not be favouring peatland at Latin America and Africa.</p> <p>The WG agreed that the FAO definition is the same as the definition set by the USDA, so the definition set is in line with both FAO and USDA interpretations. Decision made that the definition set will come into effect on the 1st of November 2017 (Annex 3).</p> <p>Chair asked if there would be any issue if the definition says 40 cm of 80 cm, rather than 50cm out of 100cm, CoChair clarified there shouldn't be any issues with that.</p>		
4.	RT15 topics and speakers	<p>Gotz said that the initial title for the prep cluster session does not sound too exciting as a practitioner. Suggested that the topics should include water table management, rehabilitation of degraded areas (conversion of these areas from plantation back to forest) and replanting guidance.</p> <p>Chair said that there shouldn't be any session on the definition of peat as the definition is already set and some stakeholders may not agree to it and that it would then need to be redefined.</p> <p>Proposed topics for the Prep Cluster 2:</p> <ul style="list-style-type: none"> a) Updating of the peat Best Management Practice (BMP) manual for existing cultivation & management and rehabilitation b) Peatlands and Government Initiative in Indonesia, BRG c) Drainability Assessment and Rewetting (Speaker: Wetlands International) d) Landscape Approach and Supply Chain <ul style="list-style-type: none"> • What to do with the peat land post oil palm – i.e. what plants to be planted, the legal requirements • Proposed speaker: AidEnvironment e) Peat Distribution and Management Issues in LatAm/Africa <ul style="list-style-type: none"> • Proposed speaker: Dr Sue Page, University of Leicester 		Updates on RT15 will be provided in next WG meeting

WG agreed to a new title for Prep Cluster 2, "Trends and Challenges in Peatland Management".

Side Meeting on the 27th November 2017,

- a) Theme: Challenges in Implementing Peat BMP Manual on Existing Cultivation & Rehabilitation and Management)
- b) Agenda: Whole-day meeting
- c) Session: Facilitated by GEC
 - Introductory presentation on the manual from the PLWG (Speaker: GEC)
 - 3 or 4 Case Studies (GAR on rehabilitation in Ketapang West Kalimantan, Sime Darby/Minamas on water management, Bumitama on Agronomic Management – Speaker: Dr Joshua Matthews, MusimMas (potentially), SIPEF on Rewetting and Paludiculture at Tengawang, Speaker: Olivier, GEC on Restoration for Malaysian and Indonesian projects)
 - Smallholder Issues (Yayasan Elang, Procter and Gamble – from their experience in Johor with the smallholders planting in the peat areas, AsianAgri, WildAsia)
 - Supply Chain Issues (Wilmar, IOI Loders, Cargill)
 - Discussion and Q&A
 - Translator might be needed

Session 4: RSPO delivering NDPE

- a) Impacts of GHG Reporting/ Assessment: ERWG Co-chair
- b) Grower's NDPE Commitments, Efforts and Challenges
 - Case study: How the companies include NDP into 7.8
 - Speaker: Bumitama, OLAM, Sime Darby on the challenges in Liberia)
- c) Consumer Goods Manufacturers' NDPE Commitments, Efforts and Challenges
 - Speaker: Unilever/Nestle/MARS)

		<ul style="list-style-type: none"> • Alternate: Financiers' NDPE Commitments Perspective on NDPE Commitments <p>d) Processor and Traders</p> <ul style="list-style-type: none"> • To integrate NDPE into the supply chain • Speaker: IOI Lodgers <p>Discussion paper attached as Annex 4.</p>		
5.	Peat-related issues in the P&C Review	Comments from WG on the 1 st draft of P&C for public consultation are annexed in Annex 5. Comments are bolded in green.		Update will be provided in next WG meeting
6.	Online module for BMP on Existing Oil Palm Cultivation on Peat and Management & Rehabilitation by Wetlands International	<p>The targeted timeframe to produce the module was before RT, but Arina said the timeframe might not be met as everyone(WG) is not responding.</p> <p>Secretariat cited that there was an internal delay within the Secretariat as the ownership of the Sustainability College just shifted from the Strategic Projects Division to the Outreach and Engagement Division. As of now, only the first module is done and the WG could just approved the wordings used in it. Rinus Bot (a Dutch Designer Company) engaged by Arina mentioned that once the blueprint is done, it could be out before November.</p> <p>Arina requested for photos relevant and required to finish Module 1, especially on chapters concerning diseases and pests.</p> <p>On the length of the module, Secretariat said that it should be about an hour and a half, consisting of 10 short videos. WG suggested that the module to be release by parts (by chapters), to which the Arina agreed that it would be a good idea.</p> <p>Secretariat asked Arina if the designer could finish the videos for all the chapters in BMP for existing cultivation with the current budget by RSPO and Wetlands International. Arina clarified that it would only cover the blueprint for one chapter of the 13 chapters for BMP for existing cultivation.</p> <p>Arina said the chapters from BMP on existing cultivation will be circulated to all members of PLWG and to comeback with comments and suggestions</p>	Respective WG members to provide comments as per agreed chapter to Arina (Refer Item 10).	Update will be provided in next WG meeting

		<p>by the 22nd of September. Comments from the relevant stakeholders within the Secretariat, meanwhile, should be compiled before the end of October for the designer to proceed.</p> <p>Chair asked what is the backup plan should there be a fallout between RSPO and the designer (the concept of the videos, etc.), Arina said that Wetlands would use their own concept.</p> <p>Chair asked Secretariat is there a budget ceiling set by the Secretariat. Secretariat clarified that she is only in charge of the content of the modules, but the decision on the designer and budget lies with Pak Yohanes (Director for Strategic Project, RSPO). Arina clarified that from their communication, Pak Yohanes said to go ahead with the Dutch designer with no mention of budget.</p> <p>WG asked if there is an urgency in launching it by RT. Arina mentioned that ideally it (or at least a section of the Module) would be launched by then. The blueprint will tentatively be out on the 22nd September, so it should be ready for it to be shown during RT.</p> <p>WG agreed to continue with the development of the blueprint for the water management chapter and communicate it out during RT, then decide on whether to continue with the rest of the chapters.</p> <p>Arina to map out the whole process with timeline and send it to the Secretariat (Pak Yo and Javin, the latter will pass it to the O&E division given that there is no point of contact within that division just yet).</p>		
7.	<p>Progress on Drainability Assessment (original document was sent separately to all WG members)</p>	<p>WG changed the title to “An RSPO Guideline on Drainability Assessment for Oil Palm Plantations on Peat”</p> <p>Arina said that testers are needed to continue with the drainability assessment smoothly. CoChair expressed his concern that WG has not come out with the accurate assessment method in the first place.</p> <p>WG asked how detailed should the data be, as in if there is a minimum accuracy that was set. The main possible reason why companies have not</p>	<p>Arina to provide update on revised guideline to WG</p>	<p>Update will be provided in next WG meeting</p>

		<p>been responding is the notion that LiDAR is required. Arina to confirm with Dipa regarding this requirement if LiDAR is the only option to be used. Chair said that instead of DEM data, the assessment should be using DTM data. Arina clarified that it should not matter as the DTM is only topographic. Chair argued that the major problem with DEM data is that it will take the elevation of the oil palm as the ground level point.</p> <p>Technical related issues raised for clarification will need Dipa's advise, Arina and Dipa will be having a meeting and informing WG for solution within 2 weeks.</p> <p>The draft version of the Guideline attached as Annex 6.</p>		
No.	Item Descriptions	Main Discussion Points		Progress Update
September 8, 2017 (Friday)				
8.	Plan for review and updates of RSPO Manuals, by GEC	<p>WG have agreed that GEC to review and update the RSPO manuals. WG explained that they might be a potential conflict of interest. Secretariat clarified that during the deliberation process, none of the GEC members were included in the e-mails.</p> <p>On the timeline, WG suggested that the new manual be launched during the RT, instead of December. Chair answered said that the soft copy may be launched then but there would not be enough time for the stakeholders to feedback. Chair also suggested that there is a simplified flowchart with illustrations, to aid the smallholders.</p> <p>CoChair said that the process with smallholders will be longer as such that there will be a lot of interviews that will be required to gauge their wants and needs.</p> <p>WG suggested to have a small group within PLWG-2 to look into preparation of simplified guidance for smallholders that will run in parallel with the general BMP document. WG mentioned that the project should not involve the active involvement of Smallholders WG as it is better to ask entities like WildAsia or Proforest who will have better perspective on the smallholders. WG should still have the higher power to oversee the whole project, but just subcontract to external parties.</p>	Secretariat to proceed with engaging GEC as facilitator for the review and update of RSPO Peat BMPs.	<p>GEC is engaged and started with the first peat BMP consultation workshop at RT15, Bali, Indonesia.</p> <p>Proposal received from GEC as attached in Annex 7.</p>

		WG agreed to the suggestion by Secretariat to include members of the Smallholders WG to attend the 'SH Linking and Learning Session, RT-15 side meeting on the 27 th of November for the slot focusing on peat management for smallholders.		
9.	Progress Update on Peatlands Mapping	<p>WG expressed their concern on the proposal by FRIM as there will be huge budget needed required just to map out peatland in Malaysia and Indonesia alone (Annex 8).</p> <p>CoChair asked WG to clarify what is the problem with the submissions done by the growers, issue was that the set aside areas are not detailed.</p> <p>WG suggested having 2 permanent staff within RSPO Secretariat to work on solely on the project, rather than paying consultant to verify and consolidate all the data received. Secretariat clarified that the scope is too big in this context, such that it covers plantations owned by both members and non-members.</p> <p>Secretariat seek to clarify which focus areas does the WG want the consultant to do. WG decided that the focus area only covers RSPO members, Planted and Set Aside, Indonesia and Malaysia (and potentially Papua New Guinea).</p> <p>Non-RSPO members and Trend of LUC on peatland will be done in the second phase of the mapping.</p> <p>Secretariat seek to clarify if WG wants WRI to do this project. WG decided that the WRI to be consulted to do the mapping, on the basis that they have more expertise to do it compared to TFT.</p>	<p>Secretariat to work out the way ahead on peat mapping work, covering mainly RSPO members' concession areas.</p> <p>Secretariat to consider approaching WRI and an external party to look into the digitalising works.</p>	Updates will be provided in next WG meeting.
10.	Updates on Peat Communication Materials/Training	<p>On poster series, Chair said there are still grammatical errors in the posters. WG decided that the WG members to come back with feedbacks within a week, by the 11th of September.</p> <p>Chair suggested that one be printed in A2 and displayed in the hall during RT and A4 ones to be distributed out.</p> <p>On practical guidance, WG asked to clarify the relevance of the document since the WG is looking into updating the BMP modules, Summary of the</p>		The hardcopy posters were distributed to all participants over Peat Workshop at RT15.

		<p>BMP and in future simplified BMP for smallholder. Arina said that the document is a simplified version of the P&C. WG said that it is still irrelevant given that the new P&C will be rolled out soon.</p> <p>WG decided that the practical guidance will be shelved first and be updated to be in line with the new P&C, once it is rolled out.</p> <p>Meanwhile, WG discussed for each member to take up one chapter in the module and revert with comments including identifying gaps. Pictures are to be provided to Arina as well.</p> <table border="1" data-bbox="555 507 1391 994"> <thead> <tr> <th>Section</th> <th>Person-in-Charge (PIC)</th> </tr> </thead> <tbody> <tr> <td>1.1 & 1.2</td> <td>Sian Choo</td> </tr> <tr> <td>2.1</td> <td>Dr Shah / Julia Lo</td> </tr> <tr> <td>2.2</td> <td>Jason Foong / Tey</td> </tr> <tr> <td>3.1</td> <td>Jason Foong / Tey/ Faizal</td> </tr> <tr> <td>3.2</td> <td>All Members</td> </tr> <tr> <td>3.3</td> <td>Dr Joshua</td> </tr> <tr> <td>3.4</td> <td>Dr Joshua</td> </tr> <tr> <td>3.5</td> <td>Dr Joshua</td> </tr> <tr> <td>3.6</td> <td>Dr Shah / Dr Gotz/Richard</td> </tr> <tr> <td>3.7</td> <td>Dr Gotz/Richard</td> </tr> <tr> <td>3.8</td> <td>Faizal / Jason Hon</td> </tr> <tr> <td>3.9</td> <td>Faizal / Kai Xiang / Sian Choo</td> </tr> </tbody> </table>	Section	Person-in-Charge (PIC)	1.1 & 1.2	Sian Choo	2.1	Dr Shah / Julia Lo	2.2	Jason Foong / Tey	3.1	Jason Foong / Tey/ Faizal	3.2	All Members	3.3	Dr Joshua	3.4	Dr Joshua	3.5	Dr Joshua	3.6	Dr Shah / Dr Gotz/Richard	3.7	Dr Gotz/Richard	3.8	Faizal / Jason Hon	3.9	Faizal / Kai Xiang / Sian Choo	<p>Arina will be circulating the documents and timeline to all WG members for comments.</p>	<p>Done.</p>
Section	Person-in-Charge (PIC)																													
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3.8	Faizal / Jason Hon																													
3.9	Faizal / Kai Xiang / Sian Choo																													
11.	Next Meeting	<p>WG as targeted for next meeting to see a further progress on the BMP. Potentially to have it back-to-back site visit or during the workshop.</p> <p>Meeting adjourned at 1 pm.</p>	<p>Secretariat to send out information for the next meeting.</p>																											

Annex 1: Agenda and attendance signing sheet

3rd PLWG meeting

Date: 7th & 8th September 2017 (Thursday and Friday)

Venue: Aloft Hotel, Kuala Lumpur Sentral

Meeting Agenda

7th September 2017 (Thursday)

Time	Agenda
9.00am – 9.45am	1. Review of previous meeting's minutes and progress on actions
9.45am – 10.30am	2. RT-15: Topics and Speakers
10.30am – 11.00am	Tea Break
11.00am – 12.30pm	3. Peat related issues in the 2017&2018 P&C Review
12.30pm – 1.30pm	Lunch
1.30pm – 3.00pm	4. Online Module-Peat Scripts (Existing Planting and Rehabilitation), by Wetlands International
3.00pm – 3.30pm	Break
3.30pm – 5.00pm	5. Progress update on Drainability Assessment, by Wetlands International

8th September 2017 (Friday)

Time	Agenda
9.00am – 11.00am	6. Plan for review and updates of RSPO Manuals, by GEC 7. Progress update on peatlands mapping
11.00am – 11.30am	Tea Break
11.30am – 11.45am	8. Updates on Peat Communication Materials/training <ul style="list-style-type: none">• Poster series• Practical Guidance for implement RSPO P&C in relation to peatlands• Other communication material, FAQ on Peat?• Training on peatland BMPs
11.45am – 12.30pm	9. AOB <ul style="list-style-type: none">• Date for next meeting
12.30pm	Lunch (end of meeting)






Annex 2. Attendance signing sheet

3rd PLWG Meeting











7th – 8th September 2017

Tactic 1, Level 2, Aloft, Kuala Lumpur

1st Day – 7th September 2017

No.	Name	Signature
1.	Lim Siau Ono	
2.	Joshua Matthews	
3.	Chin KaiXiang	
4.	Goetz Martin	
5.	RICHARD KWAN	
6.	TEY SENG HENG	
7.	JASON FOONG HUEY YUAN	
8.	SHAHRAKBAN YACOB	
9.	AIZAT AFFENDI	
10.	JAVIN TAN	
11.	Devaladi	
12.	FAIZAL PARLISH	
13.		
14.		
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2nd Day – 8th September 2017

No.	Name	Signature
1.	Lim Heng Choo	
2.	John Mathews	
3.	Jason Tan	
4.	Low Siew Yan (Selena)	
5.	Richard Lee	
6.	Chin Kai Xiang	
7.	Shahrakhan Yacob	
8.	Fauzal Parali, GEC	
9.	Pey Seng Hong	
10.	Desaladev	
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Annex 3. WG Discussion Paper: Proposed wording for definition of peat for use in all oil palm producing countries globally

RSPO Organic (Peat) Soil Classification

For the purpose of the RSPO, peat is defined as an

‘organic soil where more than half (50cm) of the upper 100cm of soil is organic material containing 35% or more organic matter by dry weight (~18% or more organic carbon)’.

This classification has been derived from the global definition of Food and Agriculture Organisation of the United Nations (FAO) and is in line with the United States Department of Agriculture (USDA) definition. In countries which have a RSPO National Interpretation (NI) process it may adopt a nationally accepted definition.

The implementation of this definition of peat will come into force on the **1st November 2017**.

Annex 4. Proposed programme for RT15, Grand Hyatt, Bali, Indonesia

Monday, 27th November 2017

Side meeting: Challenges in Implementing Peat BMP Manual Existing Cultivation & Rehabilitation and Management

Time: Whole day

Agenda:

Session: Facilitated by Co-chairs for PLWG

- Introductory presentation on the manual (Speaker: by the fasilitator)
- Drainability assessment (Wetlands International)
- Case studies (GAR on peat rehabilitation at Ketapang (West Kalimantan), Sime Darby/Minamas on water management, Bumitama on Agronomic management (Speaker: Dr.Joshua), MusimMas on , SIPEF on Rewetting and paludiculture (Speaker: Olivier), GEC on Restoration for Malaysian and Indonesian Project)
- Smallholder issues (Yayasan Elang, P&G, AsianAgri, WildAsia)
- Supply chain issues (Wilmar, IOI Loders, Cargill)
- Q&A and discussions

Date: 28th November 2017 (Tuesday)

Time: 9.00am to 10.30am (1.5 hour)

Preparatory Cluster 2: Trends and challenges in peatland management

Development and management of Oil palm plantations on peatlands remains one of the most significant contributors of GHG emissions from the oil palm sector. It also leads to long term impacts related to land subsidence and flooding and contributes to increased risk of fires and associated smoke haze.

This session on 'Peat to RSPO' aims to provide insight on RSPO on-going efforts on management, conservation and rehabilitation of peatlands; and distribution and management challenges of peatlands across palm oil producing countries of RSPO.

Moderator: Dato' Paduka Ir. (Dr.) Hj. Keizrul bin Abdullah, Wetlands International

Topics:

1. Tasks and Initiative of RSPO Peatland Working Group 2 (PLWG-2)
Speaker: Mr. Faizal Parish, Co-chair of PLWG-2
2. Peatlands and Government Initiative in Indonesia
Speaker: Mr. Nazir Foad, the Head of the Peatland Restoration Agency (BRG), Indonesia
3. Landscape Approach for Peat Protection
Speaker: Christopher Wiggs, AidEnvironment Asia
4. Peat Distribution and Management Issues in Latin America
Speaker: Dennis del Castillo, Director of Forest Management and Environmental Service Program at the Peruvian Amazon Research Institute (IIAP)

Date: 29th November 2017 (Wednesday)

Time: 4.00pm to 5.30pm (1.5 hour)

Plenary Session 4: RSPO delivering No Deforestation, No Peat, No Exploitation

RSPO through its Principle and Criteria, has been and is continuing driving and delivering sustainable practices through No Deforestation, No Peat, and No Exploitation. Despite increasing RSPO efforts and number of companies embracing sustainability, there is no shortage of media coverage and/or other publications that laud or criticize efforts by the RSPO to achieve its commitments to transform towards sustainability.

No Deforestation, No Peat, and No Exploitation, a commitment to drive sustainable practices and accelerate transformation in the palm oil industry, will require cooperation and coordination of multiple stakeholders with diverse interests; to stand together, be part of the solution and moving in the same direction.

Moderator: *Mr. Rod Taylor, Global Director of Forest Program, WRI*

Topics:

1. Impacts of GHG Assessment and Reporting
Speaker: Dr. Gan Lian Tiong, Co-chair of ERWG
2. Grower's Commitments, Efforts and Challenges
Speaker: Dr. Simon Lord, Group Chief Sustainability Officer, Sime Darby
3. Consumer Goods Manufacturer's Commitments, Efforts and Challenges (executing and implementing NDPE -commercially)
Speaker: Miss Lisa Li, Global Fats & Oil Category Director, MARS
4. Processor and Trader's Commitments, Efforts and Challenges (to integrate NDPE into the supply chain)
Speaker: Mr. Ben Vreeburg, Director Sustainability, IOI Loders Croklaan

Annex 5. Comments (bolded in green) for P&C Review

2013 Criteria, Indicators and Guidance Proposed changes shown in red		Proposed revised criteria, indicators and guidance (without changes highlighted)	Task Force Notes
4.3a Practices minimise and control erosion and degradation of soils.	<p>Indicators:</p> <p>4.3.1 (M) Maps identifying marginal and of any fragile soils, including excessive gradients, shall be available.</p> <p>4.3.2 A management plan shall be developed and implemented to minimize and control erosion and degradation of soil, with specific attention to slopes strategy shall be in place for plantings on slopes above a certain limit (this needs to be soil and climate specific).</p> <p>4.3.3 Where marginal soils are present a management plan is developed and implemented to improve marginal soils (e.g. sandy, low organic matter, acid sulphate soils).</p> <p>4.3.3 A road maintenance programme shall be in place.</p> <p>4.3.4 (M) Subsidence of peat soils shall be minimised and monitored. A documented water and ground cover management programme shall be in place.</p> <p>4.3.5 Drainability assessments shall be required prior to replanting on peat to determine the long-term viability of the necessary drainage for oil palm growing.</p> <p>4.3.6 A management strategy shall be in place for other fragile and problem soils (e.g. sandy, low organic matter, acid sulphate soils).</p>	<p>Indicators:</p> <p>4.3.1 (M) Maps identifying marginal and fragile soils, including excessive gradients, shall be available.</p> <p>4.3.2 A management plan shall be developed and implemented to minimize and control erosion and degradation of soil, with specific attention to slopes.</p> <p>4.3.3 Where marginal soils are present a management plan is developed and implemented to improve marginal soils (e.g. sandy, low organic matter, acid sulphate soils).</p> <p>Guidance:</p> <p>Techniques that minimise soil erosion are well known and should be adopted, where appropriate. These should include practices such as ground cover management, biomass recycling, terracing, and natural regeneration or restoration instead of replanting.</p> <p>For National Interpretation:</p> <p>National Interpretation (or an RSPO recognised parallel means) will refer to national guidance, and identify the best management practices and appropriate techniques for maintaining soil quality in local conditions, including guidance on soil types, and any appropriate performance thresholds such as maximum acceptable slope gradient for planting.</p>	<p>Notes:</p> <p>4.3 is split into 2 criteria (4.3a and 4.3b) to separate out management of peat from other fragile soils.</p> <p>Define:</p> <ul style="list-style-type: none"> • Fragile and marginal soils (4.3.1) • Excessive gradient (4.3.1) • Slope, soil and climate conditions (4.3.2)

	<p>Specific Guidance:</p> <p>For 4.3.4: For existing plantings on peat, the water table should be maintained at an average of 50cm (between 40–60cm) below ground surface measured with groundwater piezometer readings, or an average of 60cm (between 50–70cm) below ground surface as measured in water collection drains, through a network of appropriate water control structures e.g. weirs, sandbags, etc. in fields, and watergates at the discharge points of main drains (Criteria 4.4 and 7.4).</p> <p>For 4.3.5: Where drainability assessments have identified areas unsuitable for oil palm replanting, plans should be in place for appropriate rehabilitation or alternative use of such areas. If the assessment indicates high risk of serious flooding and/or salt water intrusion within two crop cycles, growers and planters should consider ceasing replanting and implementing rehabilitation.</p> <p>Guidance:</p> <p>Plantations on peat should be managed at least to the standard set out in the <i>‘RSPO Manual on Best Management Practices (BMPs) for existing oil palm cultivation on peat’</i>, June 2012 (especially water management, fire avoidance, fertiliser use, subsidence and vegetation cover).</p> <p>Techniques that minimise soil erosion are well known and should be adopted, where appropriate. These should include practices such</p>		
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	<p>as ground cover management, biomass recycling, terracing, and natural regeneration or restoration instead of replanting.</p> <p>For National Interpretation: National Interpretation (or an RSPO recognised parallel means) will refer to national guidance, and identify the best management practices and appropriate techniques for maintaining soil quality in local conditions, including guidance on soil types, and any appropriate performance thresholds such as maximum acceptable slope gradient for planting.</p>		
<p>4.3b Existing planting on peatlands are managed responsibly.</p>	<p>4.3b.1 Peat soils within the managed areas are documented and reported.</p> <p>4.3b.2 (M) Subsidence of peat soils shall be minimised and monitored. A documented water and ground cover management programme shall be in place.</p> <p>4.3b.3 Drainability assessments shall be required prior to replanting on peat to determine the long-term viability of the necessary drainage for oil palm growing.</p> <p>4.3b.4 All existing planting on peat must follow best practice guidelines.</p> <p>Specific guidance: For 4.3b.2: For existing plantings on peat, the water table should be maintained at an average of 50cm (between 40 – 60cm) below ground surface measured with groundwater piezometer readings, or an average of 60cm (between 50 – 70cm) below ground surface as measured in water collection drains, through a network of</p>	<p>4.3b.1 Peat soils within the managed areas are documented and reported.</p> <p>4.3b.2 (M) Subsidence of peat soils shall be minimised and monitored. A documented water and ground cover management programme shall be in place.</p> <p>4.3b.3 Drainability assessments shall be required prior to replanting on peat to determine the long-term viability of the necessary drainage for oil palm growing.</p> <p>4.3b.4 All existing planting on peat must follow best practice guidelines.</p> <p>Specific guidance: For 4.3b.2: For existing plantings on peat, the water table should be maintained at an average of 50cm (between 40 – 60cm) below ground surface measured with groundwater piezometer readings, or an average of 60cm (between 50 – 70cm) below ground surface as measured in water collection drains, through a network of appropriate water control structures e.g. weirs, sandbags, etc. in fields, and 27atergates at the discharge points of main drains (Criteria 4.4 and 7.4).</p>	<p>Notes: Indicators for replanting on peat will be discussed at TF3 based on studies being undertaken by PLWG-2. Guidance on drainability assessment is under preparation and will be available before the standard is finalized. Guidance needed on smallholder drainability assessments.</p> <p>Define peat within P&C</p>

	<p>appropriate water control structures e.g. weirs, sandbags, etc. in fields, and 27atergates at the discharge points of main drains (Criteria 4.4 and 7.4).</p> <p>For 4.3b.3: Where drainability assessments have identified areas unsuitable for oil palm replanting, plans should be in place for appropriate rehabilitation or alternative use of such areas. If the assessment indicates high risk of serious flooding and/or salt water intrusion within two crop cycles, growers and planters should consider ceasing replanting and implementing rehabilitation.</p> <p>Guidance: Plantations on peat should be managed at least to the standard set out in the <i>'RSPO Manual on Best Management Practices (BMPs) for existing oil palm cultivation on peat'</i>, June 2012 <i>[to be updated 2018]</i> (especially water management, fire avoidance, fertiliser use, subsidence and vegetation cover).</p> <p>This guidance to be moved to specific guidance for 4.3b.4. Time is needed to finetune this paragraph after the review of the manual</p>	<p>For 4.3b.3: Where drainability assessments have identified areas unsuitable for oil palm replanting, plans should be in place for appropriate rehabilitation or alternative use of such areas. If the assessment indicates high risk of serious flooding and/or salt water intrusion within two crop cycles, growers and planters should consider ceasing replanting and implementing rehabilitation.</p> <p>Guidance: Plantations on peat should be managed at least to the standard set out in the <i>'RSPO Manual on Best Management Practices (BMPs) for existing oil palm cultivation on peat'</i>, June 2012 <i>[to be updated 2018]</i> (especially water management, fire avoidance, fertiliser use, subsidence and vegetation cover).</p>	
<p>5.5 Use of fire Fire is prevented and is not used for preparing</p>	<p>Indicators:</p>	<p>Revised criterion: 5.5 Fire is prevented and is not used for preparing land.</p>	<p>Notes: Clarify: For smallholder areas:</p>

<p>land or replanting is avoided, except in specific situations as identified in the ASEAN guidelines or other regional best practice.</p>	<p>5.5.1 (M) There shall be no land preparation by burning, other than in specific situations as identified in the 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.</p> <p>5.2.2 Measures are put in place to prevent open fires in managed areas.</p> <p>5.5.2 Where fire has been used for preparing land for replanting, there shall be evidence of prior approval of the controlled burning as specified in 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.</p> <p>Specific guidance For 5.2.1: in specific cases, like control of pest and diseases, as per regulations there shall be evidence of prior approval of the controlled burning as specified in 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines or regulations in other regions.</p> <p>Guidance: Growers should establish fire prevention and control plans to involve the managed area and cooperation with adjacent stakeholders. Fire should be used only where an assessment has demonstrated that it is the most effective and least environmentally damaging option for minimising the risk of severe pest and disease outbreaks, and exceptional levels of caution should be required for use of fire on peat. This</p>	<p>Indicators: 5.5.1 (M) There shall be no land preparation by burning. 5.2.2 Measures are put in place to prevent open fires in managed areas. Error in numbering, it should be 5.5.2. Open fire to be replaced with prevent fire.</p> <p>Specific guidance For 5.2.1: in specific cases, like control of pest and diseases, as per regulations there shall be evidence of prior approval of the controlled burning as specified in 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines or regulations in other regions.</p> <p>Limited controlled burning can only be permitted in non-peat area in exceptional circumstances (validated by due-diligence process) such as field sanitation for severe Ganoderma infestation. Such controlled burning must have prior written permission from the appropriate authorities. (delete the rest in '5.2.1')</p> <p>Guidance: Growers should establish fire prevention and control plans to involve the managed area and cooperation with adjacent stakeholders. Extension/training programmes for associated smallholders may be necessary.</p>	<ul style="list-style-type: none"> • what degree of involvement does the company have in training, equipment, etc. • how to manage the use of fire by smallholders in the past (retrospectively)? <p>Consider creating new indicator for 1st sentence of Guidance and including a landscape element eg. 5.2.3: Growers should establish fire prevention and control plans to involve the managed area and cooperation with adjacent stakeholders</p> <p>Guidance The fire prevention and control plans are to be developed in collaboration with other stakeholders active in that landscape before and during the project implementation. Evidence of attempted collaboration efforts shall be documented and available.</p>
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	<p>should be subject to regulatory provisions under respective national environmental legislation. Extension/training programmes for associated smallholders may be necessary.</p> <p>For National Interpretation: National Interpretation will identify any specific situations where such use of fire may be acceptable, for example through reference to 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.</p> <p>Suggest to delete guidance on NI</p>	<p>To become specific guidance for 5.5.2 and specific guidance for 7.7.2</p> <p>For National Interpretation: National Interpretation will identify any specific situations where such use of fire may be acceptable, for example through reference to 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.</p>	
<p>7.4a Extensive planting on steep terrain, and/or marginal and fragile soils, including peat, is avoided.</p>	<p>Indicators: 7.4.1 Maps identifying marginal and fragile soils, including excessive gradients and peat soils, shall be available and used to identify areas to be avoided 7.4.2 (M) Where limited planting on fragile and marginal soils, including peat, is proposed, plans shall be developed and implemented to protect them without incurring adverse impacts.</p> <p>Guidance: This activity should be integrated with the social and environmental impact assessment (SEIA) required by Criterion 7.1. Planting on extensive areas of peat soils and other fragile soils should be avoided (see Criterion 4.3). Adverse impacts may include hydrological risks or significantly increased risks</p>		<p>Notes: Criterion split in to 2 (7.4a and 7.4b, to be renumbered after consultation) to emphasise importance of peat.</p>

	<p>(e.g. fire risk) in areas outside the plantation (see Criterion 5.5).</p> <p>For National Interpretation: National Interpretation will determine specific controls and thresholds, such as slope limits, listing soil types on which planting should be avoided (especially peat soils), the proportion of plantation area that can include marginal/fragile soils, and definitions of 'extensive', 'marginal', 'fragile', and 'excessive'.</p>		
<p>7.4b No new planting on peat, regardless of depth.</p>		<p>7.4b.1 All areas of peatlands in the new planting area are protected / appropriately managed.</p> <p>Add new indicator 7.4b.1 that is no new planting on peat after 1st November 2018.</p>	<p>Notes: Guidance needed on 'protected / appropriately managed'. Define: peat (to come from PLWG-2)</p> <p>Specific guidance for 7.4b.2 follow the requirement in BMP R&M Ver 2018.</p> <p>[note to PLWG to develop section on recommended bmp on protection and management of peat].</p>
<p>7.7 Fire is prevented and is not used for preparing land. No use of fire in the preparation of new plantings other than in specific situations, as identified in the</p>	<p>Indicators: 7.7.1 (M) There shall be no land preparation by burning, other than in specific situations, as identified in the 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.</p>	<p>New criterion: 7.7 Fire is prevented and is not used for preparing land. Indicator: 7.7.1 No land preparation by burning.</p>	<p>Notes: After planting and development</p>

<p>ASEAN guidelines or other regional best practice.</p>	<p>7.7.2 In exceptional cases where fire has to be used for preparing land for planting, there shall be evidence of prior approval of the controlled burning as specified in '<i>Guidelines for the Implementation of the ASEAN Policy on Zero Burning</i>' 2003, or comparable guidelines in other regions.</p> <p>Specific Guidance: For 7.7.2: This activity shall be integrated with the social and environmental impact assessment (SEIA) required by Criterion 7.1.</p> <p>Guidance: Fire should be used only where an assessment has demonstrated that it is the most effective and least environmentally damaging option for minimising the risk of severe pest and disease outbreaks, and exceptional levels of caution are required for use of fire on peat. This should be subject to regulatory provisions under respective national environmental legislation.</p> <p>Extension/training programmes for smallholders may be necessary.</p> <p>For National Interpretation: National Interpretation will identify any specific situations where such use of fire may be acceptable, for example through reference to '<i>Guidelines for the Implementation of the ASEAN Policy on Zero Burning</i>' 2003, or comparable guidelines in other regions.</p> <p>Add new indicator 7.7.2 (refer 5.5.2)</p>		
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Drainability in a plantation- how to Assess it

Dipa Rais & Arina Schrier

Wetlands International



Drainability in a plantation- how to assess it

An RSPO Guideline

This Guideline is developed by Wetlands International, commissioned by RSPO

Datum

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Introduction

There are different ways of looking at drainability. From an agronomic point of view, it is important to maintain high yields, and thus to create a good drainage system, specifically in peat, that is robust and effective in both dry and wet periods. The drainability, the ability of drainage by gravity alone, must be such that it enables to obtain high yields. In peat areas, from an environmental perspective an extra dimension comes into the picture: is this drainage long-term viable and is this drainage sustainable? Peatlands emit CO₂ if they are drained. Peatlands also subside if they are drained, and in some cases peatlands may subside to near or below the drainage limit. If a peatland subsides near to the natural drainage limit, sufficient drainage of a peatland will become a challenge specifically in wet periods. Peatland may become unproductive because drainage by gravity is no longer possible. Before this irreversible stage of land loss is reached, it is important to ask ourselves the question: What is the long-term viability of my drainage? Should I replant oil palm or not given the natural drainage limit in my plantation?

RSPO requires a drainability assessment before any replanting on peat. If the assessment identifies areas unsuitable for oil palm replanting, that means, if the assessment indicates high risks for flooding and/or salt water intrusion within two crop cycles, plans must be in place for appropriate rehabilitation or alternative use of such areas. Growers and planters should consider ceasing replanting and implementing rehabilitation. This guideline provides guidance on how to assess drainability. With a combination of field observations, mapping and calculations it is possible to determine in which drainability-status a peatland is classified, and to determine what time it takes for the peat surface to subside to about 1 meter (two crop cycles away) above this drainage limit.

Drainability

Drainability refers to drainage by gravity, thus drainage without mechanical devices such as pumps. In drained peatlands, the drainability may change over time because the peat soil subsides. At a certain point in time, the peat may subside to close to the natural drainage limit. The natural drainage limit (see figure) is defined as the level below which it is no longer possible to drain the land by gravity alone. In other words: the drainage of rainwater to the closest water body is limited or no longer possible by gravity alone.

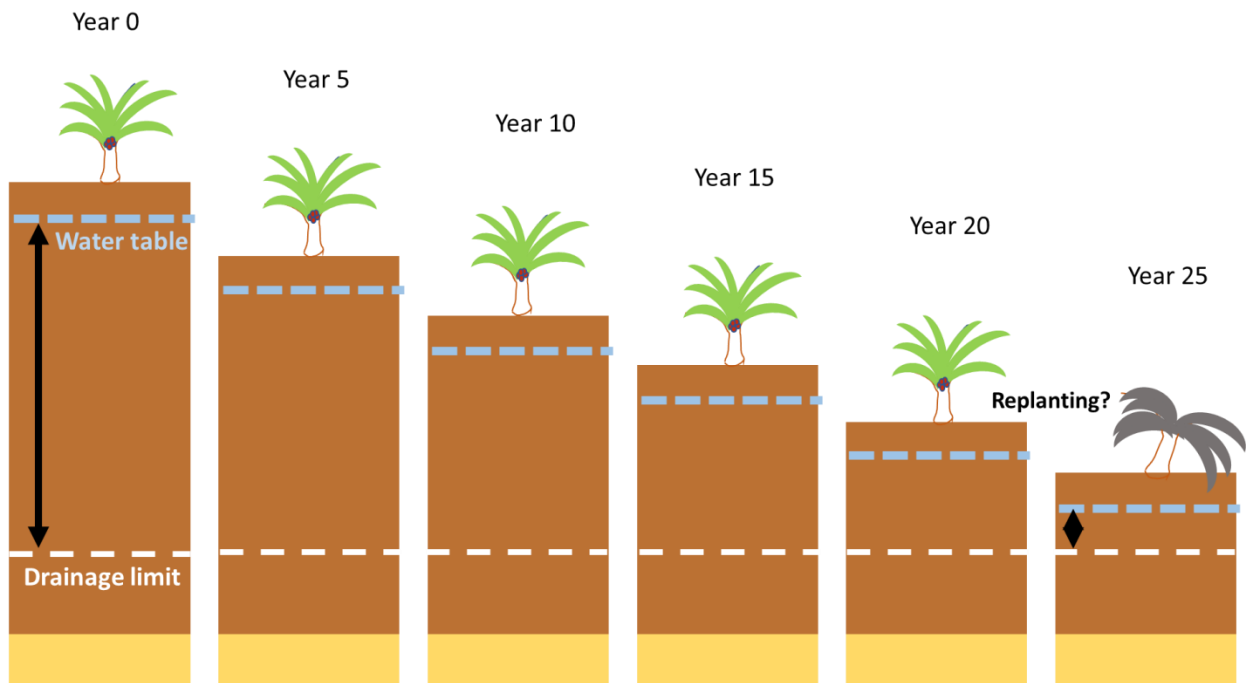


Figure 1.

The figure explains the process over time. In year zero, drainability is good, and the palms grow well. The drainage causes the peat soil to subside, and in a period of 15 years, the peat soils has subsided closer to the drainage limit, however, the drainability may still be good. Between year 20 and 25 the grower starts to consider replanting. The question is: is the area suitable for replanting of oil palms? Do I experience drainability problems already or very likely in the future? What is the thickness of the peat layer above the drainage limit? And how many years will it take before I experience real problems? This guideline provides guidance on how to assess the drainage class (based on field observations) and how to determine the time that it takes to subside to 'two rotations away' from the Natural Drainage Limit (based on a combination of field data and GIS mapping). Note that plantations will rarely be flooded by sea water, and often not by river water except for relatively narrow riparian zones of a few km. Plantation are usually flooded by rain water that cannot be drained out anymore once subsidence has reduced the surface elevation and gradient below critical levels.

The natural drainage limit

The natural drainage limit inside the plantation is in most cases based on the water level in the closest water body and on the distance to this water body. If the water body is very near, the relation between the water level in the water body and the natural drainage limit inside the plantation is strong. If the closest water body is at further distance, the natural drainage limit inside the plantation will be at higher level than the water level in the closest water body. A general rule of thumb is that for each kilometer, the drainage limit increases with 20 cm (DID Sarawak, 2001) (figure). In this guidance, we exclude (mechanical) pumping which may create a not-natural drainage limit in some areas.

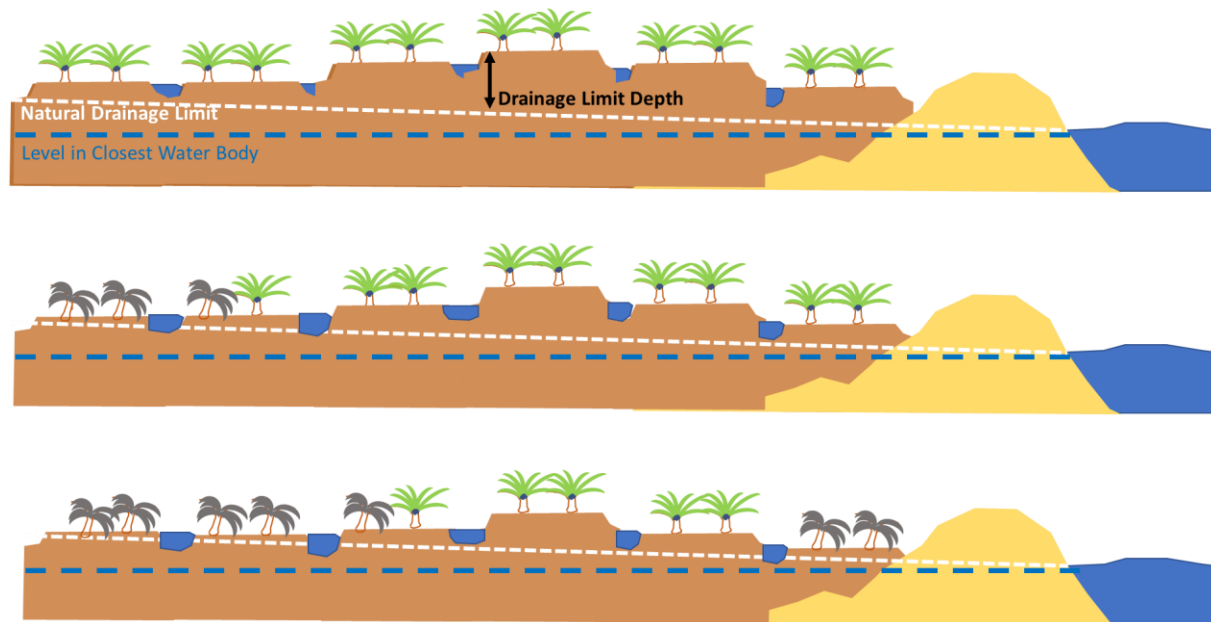


Figure 2. The impact of soil subsidence on the drainability of a peatland explained in three points in time (figures a, b and c). If the soil subsides to near the Natural Drainage Limit, the drainability will decrease and palms that have their feet in the water for too long will die. The land will become unsuitable for cultivation.

The figure explains how drainability problems may develop over time. The figure shows the Natural Drainage Limit relative to the average water level in the closest water body. How further away from the water body, the larger the difference between 'the water level in the water body' and 'the natural drainage limit'. Further away from the water body, the 'drainage limit' will be reached earlier. Although in the early stage (figure a) all palm may grow well and no drainage problems exist, later (figures b and c) problems may develop because of soil subsidence. How closer the soil will subside to the Natural Drainage Limit, how more difficult it will be to keep the water out. In figure c it can be seen that in this example more than 50% of the plantation area subsided to nearby the drainage limit and as a result the palms in these areas die because of wet feet.

Drainability Assessments

RSPO requires a drainability assessment before any replantings on peat. If the assessment identifies areas unsuitable for oil palm replanting, that means, if the assessment indicates high risks for flooding and/or salt water intrusion within two crop cycles, plans must be in place for appropriate rehabilitation or alternative use of such areas. Not only before replanting, but also in general, it is important to know the drainability status of a plantation on peat. Sometimes flood problems exist before the end of a rotation cycle or sometimes a land owner is personally interested in the long-term viability of the drainage in his/her peatland.

Two types of assessments are considered:

- (1) Field observations and measurements from which the 'current' drainage class can be determined
- (2) Assessment of the time that it takes to reach the RSPO threshold of 'two rotation cycles away from the natural drainage limit'.

The first assessment determines the current status of the peatland in terms of drainability. The second assessment estimates how long (how many years) gravity alone can still drain the peatland under existing soil subsidence. At a certain point in time, drainage by gravity may be no longer possible (Figure 2). Two rotation cycles (or 40 years) away from this point, it is recommended to stop cultivating this land with oil palm or any cultivation that needs drainage, to avoid drainage problems, floods and loss of land.

Assessment STEPS:

- Determine in which drainability class the peat area is currently from field observations (Section xx)
- Perform a Drainability Assessment:
 - Develop a map for the natural drainage limit, **or get this map from RSPO?** (Section xx)
 - Create a DEM for the area of scope (Section xx)
 - Determine subsidence inside the plantation (Section xx)
 - Create the site drainability map based on the drainage limit map, the DEM and the rate of soil subsidence (Section xx)
- Create the drainability report which includes the depth to the natural drainage limit and what time (how many years) it takes the reach the point of 'two rotations away from the natural drainage limit' (Section xx). Share the report with the RSPO secretariat (.....).

Current Drainability Class inside a plantation

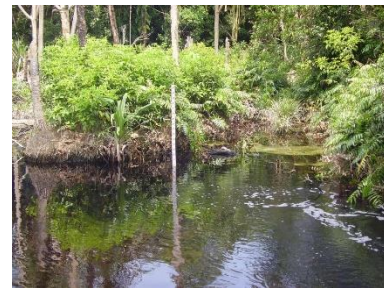
It is important to know the dynamics of the water level inside the plantation relative to the water level in the nearest water body. The nearest water body can be a river, a lake or a pond. If the plantation is relatively close to the sea, water levels during high tide and low tide should be measured inside the estate perimeter drain relative to the level of the river water outside the estate. As discussed earlier, at further distance to the water body the natural drainage limit level will be higher than the water level in the water body (Figure 2).



Highest tide in river



Lowest tide in river



Water Level Gauge

Based on observations in the field and water level measurements, the following drainability classes could be distinguished (reference to documents Dr Lim/Dr Gan/Dr Mukesh?):

Class 1 - Good Drainability - where the excess water in the field can be drained by gravity even during the highest tide and/or during the most wet periods.

Class 2 - Moderately Good - where excess water in the field can be drained by gravity > 50 % of the tidal cycle, sometimes with the help of bunds and flap-gates and/or where water in the plantation can be drained during the wet period before the palms start to suffer.

Class 3 - Poor Drainability - where excess water in the field can be drained by gravity < 50 % of the tidal cycle and/or where water in the plantation cannot sufficiently be drained during the wet period; palms start to suffer.

Class 4 - Very Poor Drainability - where excess water in the field cannot be drained by gravity even at lowest tide and/or where water in the plantation cannot sufficiently be drained during the wet period; palms start to die.

If the peat area of scope is in Drainability Class 3 or 4 it is recommended to perform a full Drainability Assessment (Section xx), it is very likely that the natural drainage limit near. Soils subsidence will

accelerate the problem of poor drainability. The detailed Drainability Assessment will determine the severity of the situation.

In the situation that the peat area of scope is in Drainability Class 1 or 2, it is likely that the drainage limit is not yet reached, but it is unsure where exactly the drainage limit is. The result of the Drainability Assessment will show the depth of the drainage limit.

In the case of replanting, it is required to perform a Drainability Assessment before replanting for all Classes (1-4) (P&C 4.3). If the drainability Assessment indicates high risks for flooding and/or salt water intrusion within two crop cycles, growers and planters should consider ceasing replanting and implementing rehabilitation.

Tidal influences in coastal areas can be partly prevented by bunds and flap-gates. Bunds are protective structures to prevent inflow of excess or saline water into the fields at high tide. Details on the construction and maintenance of bunds and flap-gates can be found in the RSPO BMP for existing plantations on peat (ref).



System with Bund and Flap Gates. The Flap Gates open automatically during high tide, preventing influx of tidal water.

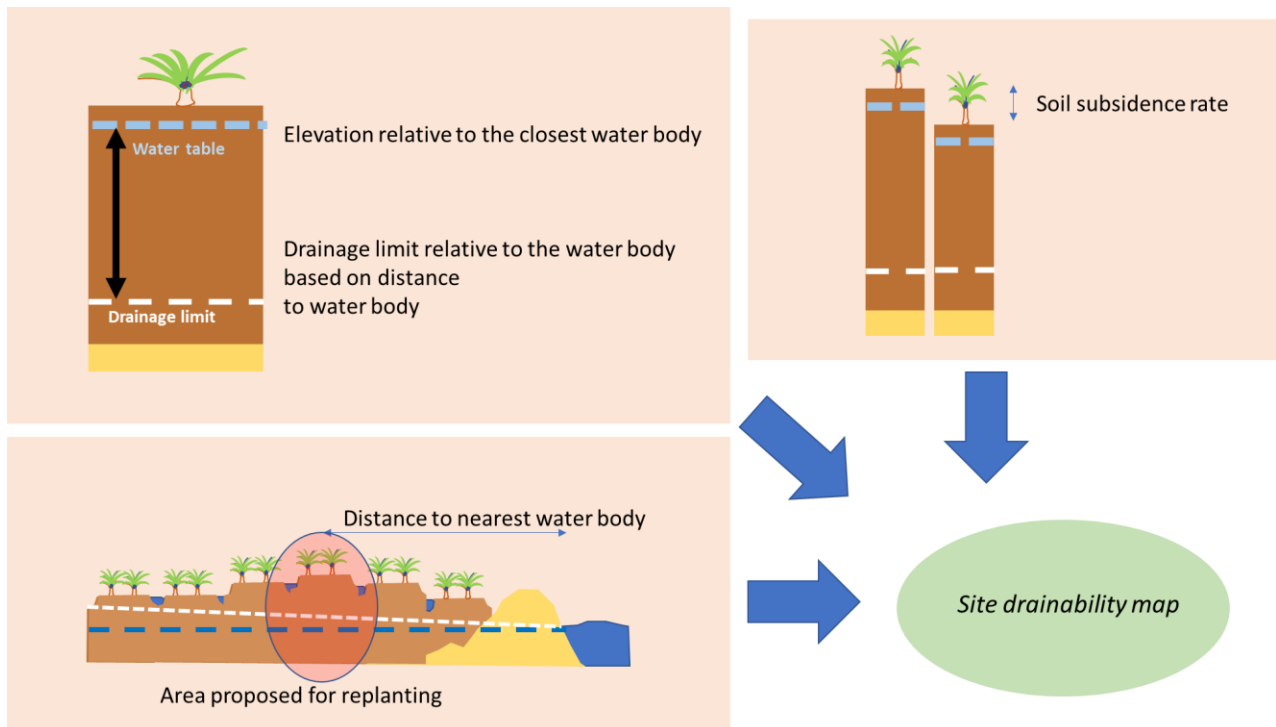


The Flap Gates open automatically during low tide, allowing drainage.

Drainability Assessment

A full drainability assessment includes:

- Development of a map of the natural drainage limit, it is based on:
 - Natural drainage network map (all natural water bodies that drain the area of scope)
 - Distance to the nearest natural water body for the peat area of scope (reference), water level elevation at the reference water body, and the head-loss slope constant of 0.0002 m/m
- Development of an elevation map (or digital elevation model (DEM)) for the peat area of scope, relative to the level of the water body (Section xx)
- Determine peat subsidence inside the area of scope (Section xx) and the peat depth (Section xx)
- Development of a *site drainability map* based on the drainage limit map, the DEM or elevation map and the rate of soil subsidence (Section xx).



<figure of ingredients for the 'site drainability map, improvements needed>

B1.2. Natural Drainage Network (this map could potentially be developed by RSPO)

Natural drainage includes all water flows on the earth surface under natural conditions. Water collects into natural drainage channels because these usually represent the lowest possible part of a landscape. Hence, water levels in natural water bodies determine the natural drainage limit in a landscape, at least most of the time. Artificial drainage can affect the natural drainage limit of any landscape. In peatlands, artificial drainage is not a long term viable option for expanding the period of time for drained cultivation. For this reason artificial drainage is excluded from the scope of the Drainability Assessment. All assessments take only natural drainage into consideration which means that only high-order streams are considered that are situated on mineral soils. For further detail see also Annex xxx.

➔ Map of high-order streams (rivers and canals) in- and around the plantation

A natural drainage network can be presented by a 'polyline feature'. The associated attribute table contains river-bed type information: peat soils or mineral soils. If the information on river bed type is not available directly, it can be estimated by retrieving indirect information from satellite images, such as Landsat 7. The detailed process is given in Annex xxx. In principle, there is a difference in water reflectance from rivers in areas well-known as peatlands (usually with darker colours) and rivers in mineral soil. Certain computer programs can distinguish this feature on the Landsat 7 image. The result is used to exclude all black-water streams from the natural drainage network polyline.

After excluding all not required parts (i.e. black-water streams and artificial drainage) the polyline is numbered based on branch. All parts that constitute the same branch must attain the same branch number. This information must be stored in a separate attribute table. See also the following illustration figure, and Annex xxx for more detail.

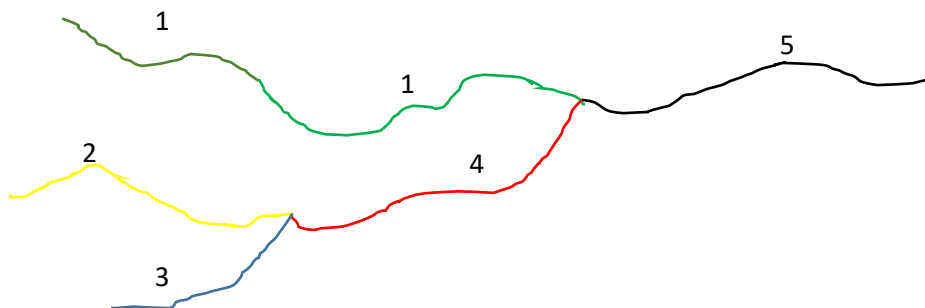


Figure xxx. Illustration of stream branch numbering: Brown and green parts of the lines attain the same number since they constitute the same branch.

Once numbered by branch, the connection between branches can be determined and stored in dedicated attribute table, namely Outlet Branch. In the above example, outlet for branch 1 is branch 5. Similarly branch 2 outlet is branch 4, and so forth. Keeping record on outlet of each branch helps to maintain consistency and tracking errors between branches later on.

The drainage network polyline is further divided into smaller segments of known lengths (eq. 100 m, 200 m, 500 m, etc.). Each segment will be used to create a sampling location of the associated river. Shorter lengths result in more samples (higher expected accuracy) at the cost of higher data load (demanding more time and resources). Depending on available time and resources one is advised to meet a good balance between the two aspects. In general, it is recommended not to have segment lengths greater than ten times the intended resolution of output raster of the Drainage Limit map. For example, if the drainage limit raster map resolution is planned to be 100 m, then the segment length should be less than 1000 m.

Once divided into smaller segments the polyline is converted into vertices (point shape) of the river segments. Coordinates of the points should be retrieved without many problems. By now, each point should consist of the following information (in attribute tables):

- (1) Point ID
- (2) Coordinate (X)
- (3) Coordinate (Y)
- (4) Branch Number
- (5) Outlet Branch

Having set all the information, the river points feature is ready to be used alongside a Digital Elevation Model for calculating the water level of natural drainage network.

B1.3. Water Level in Natural Drainage Network

Mapping the water level elevations in the natural drainage network is discussed briefly in this guidance. The vertex points of river segments have been generated in previous steps and are ready to be used to extract elevation values from SRTM 1-Arcsec. Before proceeding to the next step, vertices containing missing data from SRTM such as null or negative numbers are removed.

Since vertical resolution of SRTM is 1 meter, the profile of the extracted elevation points along river course lines would appear as a step-like feature instead of gently-sloping feature, as illustrated in figure xxx. In order to smooth the elevation profile, a Successive-Over Relaxation (SOM) could be applied as detailed more in Annex xxx. An example of a smoothing result is given in Table xxx.

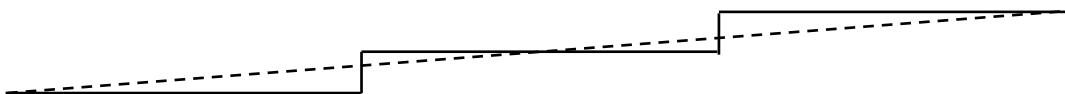


Figure xxx. An Illustration of water level elevations along a river course. Solid line: as extracted from SRTM 1-Arcsec, Dotted line: Smoothed through SOM.

Table xxx. Hypothetical example of vertex point elevations extracted from SRTM and smoothed through SOM.

Point ID	X – Coordinates (UTM)	Y – Coordinates (UTM)	SRTM Elevations (m-msl)	SOM Elevations (m-msl)
123	9,673,221	54,678	0	0.000
124	9,673,459	54,844	0	0.001
125	9,673,755	55,151	0	0.002
126	9,673,901	55,353	0	0.006
127	9,674,141	55,616	0	0.016
128	9,674,393	55,908	0	0.035
129	9,674,543	56,208	0	0.070
130	9,674,785	56,500	0	0.127
131	9,674,920	56,744	0	0.208
132	9,675,089	56,907	0	0.313
133	9,675,412	57,114	0	0.436
134	9,675,628	57,395	1	0.564
135	9,675,880	57,607	1	0.687
136	9,676,020	57,828	1	0.792
137	9,676,236	58,046	1	0.873
138	9,676,379	58,228	1	0.930
139	9,676,629	58,475	1	0.965
140	9,676,825	58,639	1	0.986
141	9,676,959	58,821	1	1.000

B1.4. Drainage Limit map generation

B1.4.1. Interpolation

The Drainage Limit map is created by interpolating drainage limit points at the area of scope. For example in the proposed area for replanting.

The drainage limit 'sampling points' cannot be physically sampled, but the drainage limit instead can be calculated based on distance to the nearest natural water body (reference), and the slope constant of 0.0002 m/m distance to water body (see also Annex xxx):

$$Z_{DB} = Z_{NWB} + 0.0002 \times \Delta X_{NWB}$$

Where

Z_{DB} : Drainage Limit elevation at a certain point in the area of scope (Drainage Limit sampling points (DLSP))

Z_{NWB} : Water level elevation at the nearest water body

ΔX_{NWB} : Distance from DLSP to the nearest water body

<simple figure on the principle of 'distance to nearest water body'>

DLSP can be generated as an array of fixed intervals (a grid) or as random points. Once generated, coordinates of DLSPs can be retrieved. Then the distances from this DLSP to the nearest water body vertices and the associated vertex IDs can be calculated (see also figure xxx and Annex xxx). By using the smoothed (Successive-Over Relaxation (SOM)) elevations of the vertices as described in B1.3 Drainage Limit elevation values of DLSPs can be calculated according to the above equation.

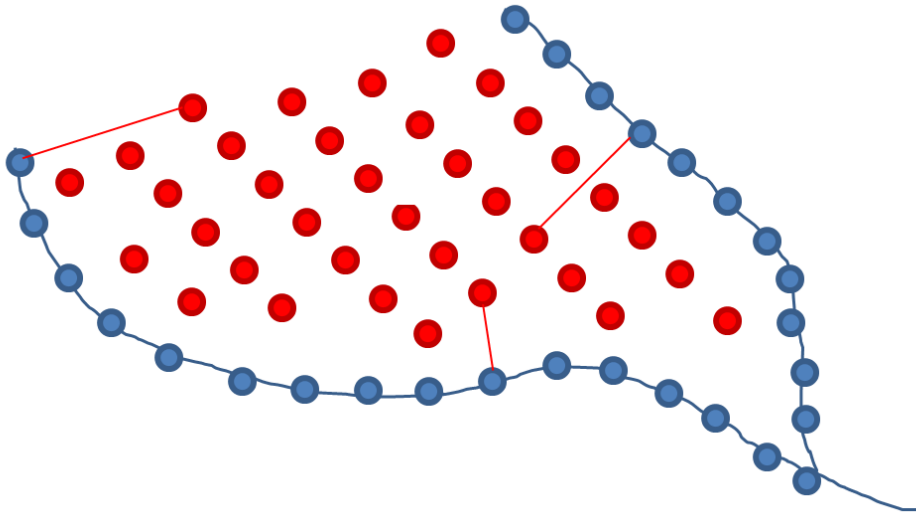


Figure xxx. Illustration Drainage Limit interpolation layout. Blue line: Water body lines, Blue dots: Segment vertices along water body lines, Red dots: Drainage Limit sampling points (DLSP), Red lines: Distances to the nearest water body vertex.

In the next step, DLSPs and river vertices are pooled together to become the source of interpolation points. It is recommended to use standard geostatistical procedure (Kriging) in the interpolation process. The raster that resulted in the Kriging process is ready for a Quality Control process. See Annex xxx for the quality control process.

B2. Site drainability map

B2.1. Create a DEM for the peat area of scope

B2.1.1. Source of data, sampling and interpolation

As the sizes of area to be evaluated (concession size) is usually far smaller than peatland landscape within which they are situated, direct measurements (land survey or LIDAR flight) are feasible sources of data for site DEM and peat map generation. For LIDAR-based DEM generation, standard practices have been developed (for example by University of Colorado) and the subject is not covered in this guideline.

Creating a land survey-based site DEM (such as by theodolite or optical water pass) might be a challenge. In most cases, the land surface of peatlands is so soft that it makes stabilizing the theodolite or water pass tripod difficult and time consuming. Failing in stabilizing the tripod introduces systematic errors to DEM. As an alternative for the theodolite / optical water pass, traditional U-hose water levelling can be used instead.

The basic principle of the U-hose method is to make use of the flatness property of the water surface across any U-pipe (or U-hose in this case), as depicted in figure xxx. The land elevation difference between point A and point B (ΔH_{A-B}) is obtained as

$$\Delta H_{A-B} = a - b$$

As the survey advances along a transect, the measurements proceed from point B to point C, from C to D, and so forth, until we cover sufficient transect length and that the ups and downs of the points across the line are fully presented. It is not necessary to record coordinates at every step, because it may be laborious; therefore only points intended (planned) as sample points require coordinate-recording. Details of this method are given in Annex xxx.

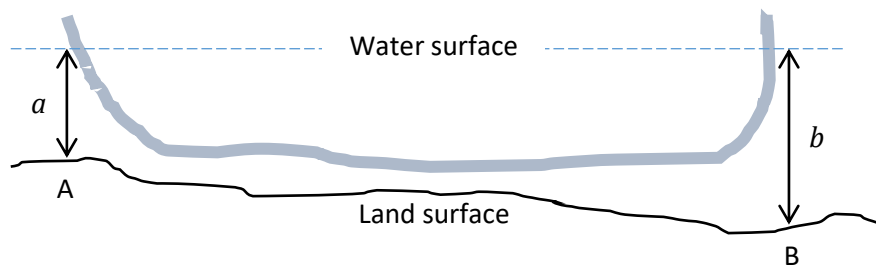


Figure xxx. Illustration U-hose water levelling survey.

B2.1. Create a peat depth map for the area of scope

A peat depth map is needed to create the site drainability map. And although for the GHG Assessment Procedure it is allowed to use a default value of 3 meters for the peat depth, for the Drainability Assessment it is required to create a peat depth map. Peat thickness measurements can be done by using

manual auger. Detailed procedure has been given in RSPO guideline no xxx. It is recommended to place peat thickness measurements at the same location as levelling sample points, to increase work efficiency.

It is recommended to base the minimum number of sample on Slovin's formula (Guilford and Frucher, 1973; Yamane, 1967):

$$n = \frac{N}{1 + Ne^2}$$

Where

n : Minimum number of required sample points

N : Number of population, i.e. total number of cells of the output DEM or peat map raster covering the actual area

e : Planned margin of error = 100% – Confidence level

Example:

Plantation area = 25,000 hectares

Planned mapping unit (DEM or peat map resolution) = 1 hectare (100 m cell-size)

Planned confidence level = 95%

Solution:

$$N = \frac{25,000 \text{ ha}}{1 \text{ ha}} = 25,000$$

$$e = 100\% - 95\% = 5\% = 0.05$$

$$n = \frac{25,000}{1 + 25,000 \times 0.05^2} = 394$$

Having determined the minimum number of sample (points), the next step is to arrange the sample points over the survey (concession) area. For this purpose the area is partitioned into n sub-areas (grids), each for a sample point. For the above example, the concession is partitioned into 394 grids. Centre points of the grids are assigned a sample point location (see also figure xxx).

For concession areas that have been set up with planting blocks, the block can be used as partition grids if preferred so, as long as the number of blocks suffices the minimum required sample points. If not, more than one sample points per block need to be assigned while maintaining even spatial distribution.

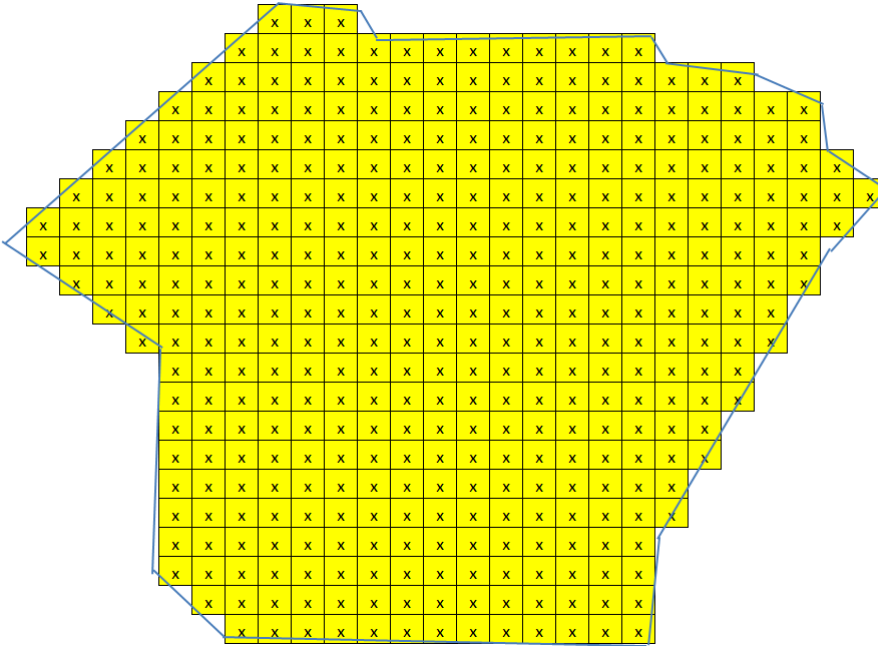


Figure xxx. Illustration of 25,000 hectares concession area, partitioned into 394 grids. Centers of the grids are marked (x) as sample points. Connecting sample points with lines makes transects.

Plotting the points on map, a visual inspection can be made to determine the most efficient way (based on vicinity to roads, other access, distance between points, etc) of extending (connecting) the points into transects. Additional sampling points may be added along transects, when required, especially in cases where micro-topography of the land has been altered into mini-domes (more detail is given in Annex xxx).

Transects may or may not connect each other, but every transect must be connected (referenced) to known elevation benchmark(s) or to location(s) with known elevation(s), in order to calculate elevations of each sampling points. For more detail see Annex xxx.

Elevations and peat thickness determined on the sample points are used to generate the site Digital Elevation Model and peat map in raster format by using standard geostatistical method (Kriging). More information about geostatistical analysis can be found in ESRI documentation web page 2.

B2.1.2. Quality control

Quality of the resulted site DEM and peat map can be assessed by using standard cross correlation method in geostatistical procedure (see also ESRI documentation web page 1)

B2.3. Subsidence

It is important that companies place permanent monitoring points in each peat block and conservation area with a piezometer (to measure water table depth) and a subsidence pole (to measure peat subsidence over time) or a combined piezometer/subsidence pole). For the Drainability Assessment it is not possible to use a default value for soil subsidence which is not site-specific.

Subsidence poles must be placed in such a way that they cover variability of the land, namely peat thickness and physical properties (especially bulk density). The maximum number of variability class from the combination is

$$V = d \times b$$

Where

V : Maximum number of land variability class

d : Number of peat thickness class

b : Number of bulk density class

Each variability class is best covered by at least three subsidence poles. Measurements must be made at regular intervals every few months. Peat soils swell in wet season and shrink in dry season due to alternate rise and fall of pore water pressure. Also between years the rainfall can differ. Therefore it is recommended to perform long term (10+ years) of soil subsidence measurements to get a reliable representative estimation of site specific soil subsidence. Analyzing the graph trend over several years is more reliable in estimating subsidence rate than short term (one-year) measurements. More detail on subsidence measurements is covered in annex xxx.

B2.4. Drainability report

B2.4.1. Depth to drainage base

Depth to drainage base is the vertical distance between present land surface to the position of drainage base, as illustrated in figure xxx. Depth to drainage base can be mapped by using simple raster arithmetic over the site DEM and the drainage base map.

$$D_{DB} = Z_S - Z_{DB}$$

Where

D_{DB} : Depth to drainage base (m)

Z_S : Land elevation, i.e. from site DEM (m-msl)

Z_{DB} : Drainage base elevation, i.e. from drainage base map

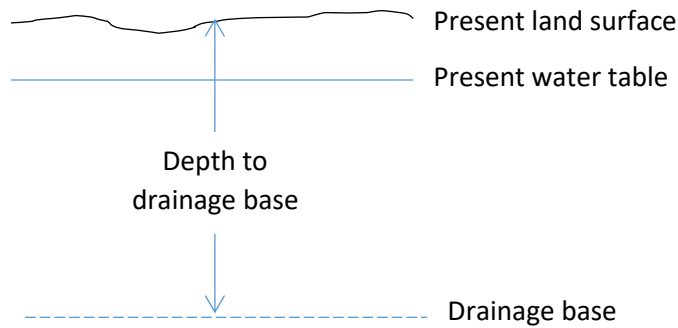


Figure xxx. Illustration of positions of land surface, drainage base, and depth to drainage base

B2.4.2. Basal contact elevation class zonation

Basal contact of peat or peat base can be mapped by overlaying site DEM against peat map, by using simple raster arithmetic:

$$Z_{BC} = Z_S - D_P$$

Where

Z_{BC} : Basal contact elevation (m-msl)

Z_S : Land elevation, i.e. from site DEM (m-msl)

D_P : Peat thickness, i.e. from site peat map (m)

The resulted basal contact raster must be compared against drainage base map created in B1.4.2. There are two zones that need to be distinguished

- (1) Shallow basal contact, i.e. areas where peat basal contact resides above drainage base
- (2) Deep basal contact, i.e. areas where peat basal contact resides below drainage base

Shallow basal contact means the risk of exposing or draining subsoil beneath peat layer is higher than that of deep basal contact. Many countries apply regulations related to peat basal contacts drainage or exposure in certain conditions. For example, in Indonesia, wherever subsoil beneath peat layer contains quartz sand or acidic clay basal contact exposure or drainage is prohibited. In the same goal, other regulation renders draining acidic clay as damaging the environment.

Basal contact positions also determine future fate of the peat soil. In shallow basal contact, drainage and subsidence may continue without land ever reaching its drainage base. So, future drainability may not be an issue but there is a risk of complete peat depletion (see figure xxx).

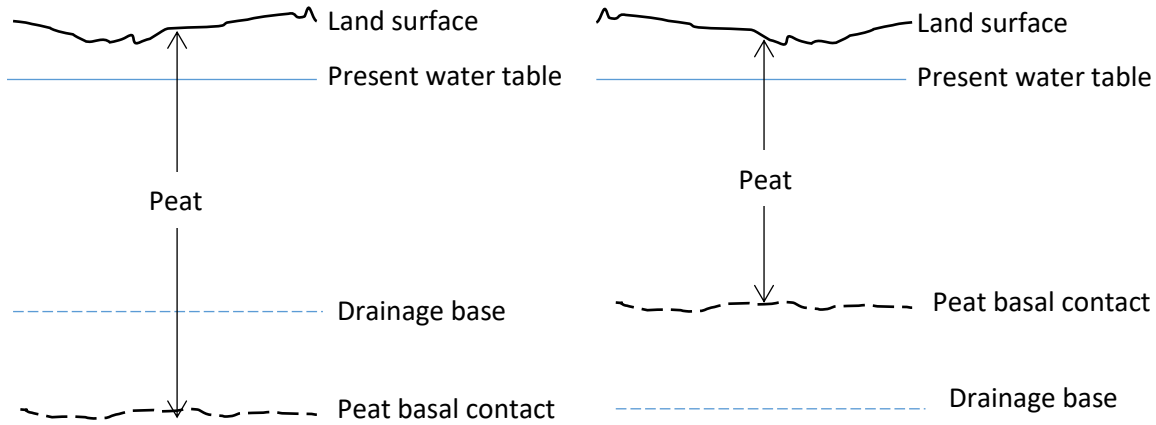


Figure xxx. Illustration of vertical profile of peat soils showing relative positions of peat basal contacts against drainage bases: deep basal contact (left) and shallow basal contact (right).

B2.4.3. Drainage Limit Time

Drainage Limit Time (DLT) is the time required, with continuing subsidence, for land surface to drop to the position of drainage base. DLT can be calculated, and can be mapped with raster arithmetic, by the following formula:

$$DLT = \frac{D_{DB}}{S}$$

Where

DLT : Drainage Limit Time (year)

D_{DB} : Depth to drainage base (m)

S : Subsidence rate (m/year)

For areas within shallow basal contact zone DLT must be calculated based on D_P instead of D_{DB} :

$$DLT = \frac{D_P}{S}$$

Where

DLT : Drainage Limit Time (year)

D_P : Peat thickness (m)

S : Subsidence rate (m/year)

B2.4.4. Two-crop cycle threshold map

Two-crop cycle threshold map is a map showing areas of:

- (1) Green zone, i.e. areas where $DLT > 50$ years (2 crop cycles)
- (2) Red zone, i.e. areas where $DLT \leq 50$ years

This map can be created by using DLT map produced in B2.4.3, i.e. by subtracting 50 years from DLT in raster arithmetic. Areas with positive values are classified as green zone, while those with negative values as red zone.

References

Guilford, J.P. and B. Frucher. 1973. Fundamental Statistics in Psychology and Education. MC Graw-Hill. New York.

Yamane, Taro. 1967. Statistics: An Introductory Analysis, 2nd Edition. Harper and Row. New York.

University of Colorado. Web page:
http://www.uccs.edu/~bvogt/courses/ges4050/helpful_stuff/las_to_dem.html

ESRI documentation web page 1: <http://pro.arcgis.com/en/pro-app/help/analysis/geostatistical-analyst/performing-cross-validation-and-validation.htmvalidation>

ESRI documentation web page 2: <http://help.arcgis.com/en/arcgisdesktop/10.0/pdf/geostatistical-analyst-tutorial.pdf>

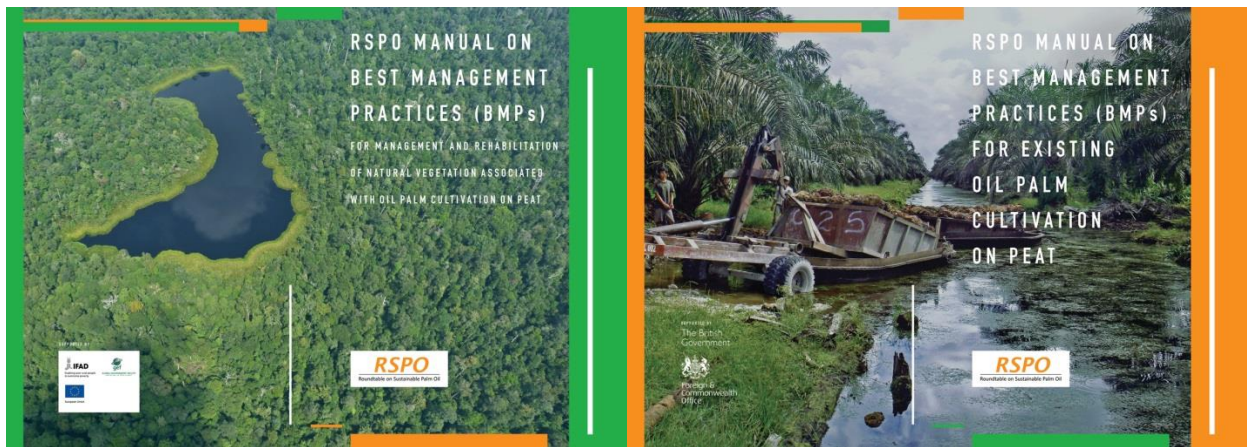
Annex xx Quality control processes

B1.4.2. Quality Control

In the quality control process the raster resulted in B1.4.1 against artefacts such as bull's eyes, unrealistic values, extremes, and areas whose slopes exceed pre-defined slope limit, i.e. 0.0002 m/m. Bull's eyes and unrealistic values are the results of individual or clustered outliers and can be corrected by masking and removing the outlier points and re-doing the geo-statistical process using the corrected point source. Similarly, areas whose slopes exceed slope limit are used as mask for removing undesired interpolation points, after which geo-statistical analysis is re-done. Conservatively, the mask size can be enlarged somewhat, to ascertaining that the resulting slopes would remain below 0.0002. Usually, enlarging the mask by spatial-buffering twice the length of the raster cell-size returns sufficient results. If not, we can keep increasing the mask size (one cell-size at a time) until achieving sufficient result. Detailed explanation of the process is given in Annex xxx.

+ other quality controls

Review and Update of existing RSPO Manuals on BMPs relating to Peat



Prepared by:



**Global Environment
Centre**

For RSPO Secretariat

Revised 16 September, 2017

Introduction

In August 2017, the RSPO Secretariat invited the Global Environment Centre (GEC) to take up the facilitating role for the review of both RSPO Manuals on BMPs for Peatlands. The proposed scope of work is described in the draft ToR as shown in Annex 1.

This current proposal responds to the TOR and indicates the proposed approach and workplan for the tasks to be undertaken. The proposal was discussed in and revised after the meeting of the RSPO Peatland Working Group (PLWG) on 8 September 2017.

Background

GEC is a Malaysian non-profit organization with more than 18 years of experience in assessment, management and rehabilitation of peatland/ peat swamp forest in Southeast Asia. GEC had also been actively involved in RSPO for the past 14 years and has been an active member of the RSPO PLWG and ERWG.

Both of the RSPO manuals were prepared and published in 2010-2012. There has been significant progress in the past five years in relation to the cultivation of oil palm on peat and maintenance of associated natural vegetation. It is deemed timely that both manuals should be reviewed and updated in order to provide better clarity and include the latest experiences relating to Best Management Practices on peatlands.

Objective:

To facilitate the review and update of the:

- 1) RSPO Manual on Best Management Practices (BMPs) for Existing Oil Palm Cultivation on Peat; and
- 2) RSPO Manual on Best Management Practices (BMPs) for Management and Rehabilitation of Natural Vegetation Associated with Oil Palm Cultivation on Peat.

The scope of the work undertaken will focus on BMPs appropriate for existing medium to large plantations on peat following the scope of the existing BMP manuals.

The PLWG has recommended that a separate initiative will be developed by RSPO to work in parallel to develop BMP guidance for existing smallholder plantations on peat. This will draw on the updated BMP guidance from the current proposal but will involve separate consultations with smallholders and visits to site-specific of smallholder cultivation on peat. It is anticipated that this process will result in materials appropriate for communication to smallholders such as videos, posters, booklets etc. This will be linked with but implemented separately from the current work under this proposal.

It is proposed that the process for the work on smallholders needs to be discussed and jointly agree by the RSPO Smallholder Working Group and through a proposed consultation on 27th November prior to the RT15.

Assignments/Tasks

The key proposed assignments/tasks for the work will be (additional tasks to those mentioned in the TOR are highlighted as new):

Task 1 Conduct a consultation workshop for RSPO members, to collate information and feedback relating to challenges and/or usefulness of RSPO Manuals; existing piloting or implemented good practices which should be referenced; and (if any) recommendations to further improve the usefulness of RSPO BMPs document.

Proposed approach: It is proposed that two workshops are organized – one at the time of RT15 in Bali (on Monday 27th November) and a second in Malaysia in Maybe Feb 2018.

Task 2 Develop and issue call for inputs and undertake literature review (new)

Proposed approach: A call for input or comments will be prepared and widely circulated within RSPO and other stakeholder Groups (eg through MPOIB, MPOA, GAPKI etc). A Literature review to identify and collate recent publications on BMPs for peatland management will also be undertaken

Task 3: Identify and document gaps within current version of RSPO Manuals on BMPs requiring update.

Proposed approach: Based on the workshops, meetings, call for inputs and literature review gaps in the existing BMPs will be identified and materials developed to fill gaps

Task 4 Identify new practices or innovation

Proposed approach: This will be combined with task 3.

Task 5 Plan and conduct relevant field visit to document relevant practices and/or (if any) innovation identified.

Proposed approach: It is proposed that up to three field visits be undertaken in Indonesia and, Malaysia to see current practices, challenges and innovations.

Task 6 Preparing relevant reports or documents for relevant workshops and field visits.

Proposed approach: Short reports will be prepared to summarise key results of meetings and field visits

Task 7: Facilitating inputs, drafting and finalising updated version of Manuals

Proposed approach: GEC will work to facilitate targeted inputs to fill gaps or update or current wording. It will also prepare two drafts and a final version of the manuals including sourcing/ collating illustrations.

Task 8: Circulation of drafts for review and collation of responses (new)

Proposed approach: The drafts prepared will be circulated to PLWG members and selected external specialists for inputs. Responses will be collated and integrated as appropriate.

Task 9: Design and artworks for the updated Manuals

Proposed approach: Once the final version has been prepared the design and layout of the manuals will be undertaken. It will be prepared in versions suitable for printing as well as for electronic distribution.

Task 10 Production Supervision (new)

Proposed approach: The production of the printed version will need to be monitored and supervised – for quality, accuracy of colour reproduction etc.

Team members and time allocation

Faizal Parish – Peatland management specialist and team leader

Serena Lew - Peatland management specialist

Julia Lo Peatland rehabilitation specialist

Yap Ni Yan – Graphic designer and publication specialist

The indicative time allocations for the team members is as follows:

Tasks	Time (person days)				Total
	Faizal Parish	Serena Lew	Julia Lo	Yap Niyan	
Review existing Process and workplan for updating manuals at PLWG meeting	1	1	1		3
Develop and issue call for inputs and undertake literature review	1	1	8		10
Conduct consultation workshop at RT 15	2	1	4		7
Identify and document gaps	2	2	6		10
Conduct second consultative workshop	2	4	6		12
Identify new practices or innovations	2	2	3		7
Plan and conduct relevant field visits	6		8		14
Prepare relevant meeting/visit reports or documents	3		6		9
Facilitating inputs, drafting and finalising updated version of Manuals	10	4	10		24

Circulation of drafts for review and collation of responses			4		4
Design and artworks for updated Manuals	1	1	5	20	27
Production supervision			1	6	7
Total time input	30	16	62	26	134

The allocations will be adjusted according to the actual inputs required – and the level of stakeholder engagement and feedback

Deliverables

The deliverables are as follows:

- i. A workplan of the whole review and update process in discussion with PLWG-2
- ii. Post-workshop and field-visit summary reports
- iii. Drafts of BMPs
- iv. Final updated manuals

Timeline

Both updated RSPO Manuals is to be finalised by RT 16 in November 2018. The timeline for specific assignments and tasks required over the review process is given below. This may be adjusted in future based on guidance from the PLWG-2:

Tasks	Q3	Q4 2017			Q1 2018			Q2 2018			Q3 2018		
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept
Review existing Process and workplan for updating manuals at PLWG meeting	█												
Develop and issue call for inputs and undertake literature review	█	█	█	█									
Conduct consultation workshop at RT 15			W1										
Identify and document gaps			█	█	█	█							
Conduct second consultative workshop						W2							
Identify new practices or innovation				█	█	█							
Plan and conduct relevant field visits						V1	V2	V3					
Prepare relevant meeting/visit reports or documents				█									
Facilitating inputs, drafting and finalising updated version of Manuals							D1	█	█	D2	█	█	FD and approval
Circulation of drafts for review and collation of responses								█	█	█	█	█	█
Design and artworks for updated Manuals													█
Production													

Note: W1, W2 are consultation workshops. W1 in Bali 27 November 2017 and W2 in Malaysia in February 2018.

V1-3 Are field visits – tentatively one in Indonesia, one Sarawak and one Peninsular Malaysia

D1-2 are draft 1 and 2 of the revised manuals. FD is the final draft for approval by PLWG

Production of the manuals is targeted for November 2017 (RT16)

Proposed Budget

GEC staff time input

Tasks	Time (person days)				Total
	Faizal Parish	Serena Lew	Julia Lo	Yap Niyam	
Total time input (man-day)	30	16	62	26	134
Unit Cost (RM)	1,600	900	800	500	
Total cost (RM)	48,000	14,400	49,600	13,000	125,000

Expenses

The expenses to be met separately by RSPO include:

- Workshop venues, facilities, meeting package, translation (if required) and cost of materials.
- Travel and subsistence for GEC staff and other participants (as required) for Workshops and site visits.
- Printing of drafts and other materials for consultation meetings etc
- Final production costs for manuals
- Expenses will be covered by RSPO directly or on a reimbursable basis.

Annex 1: Terms of Reference: Review and Updates of existing RSPO Manuals on BMPs relating to Peat

1. Background

The first RSPO Peatland Working Group (PLWG) was established in 2010 and operated till late 2012. The WG produced a number of outputs in 2011 and 2012, specifically the

- 1) RSPO Manual on Best Management Practices (BMPs) for Existing Oil Palm Cultivation on Peat; and
- 2) RSPO Manual on Best Management Practices (BMPs) for Management and Rehabilitation of Natural Vegetation Associated with Oil Palm Cultivation on Peat.

It is now five years after the completion of the work of the RSPO Peatland Working group and much further work has been done on peatlands. Hence, the establishment of RSPO PLWG-2 which first met in March 2017.

RSPO PLWG-2 tasked with reviewing and updating both Manuals to provide better clarity and relevant latest development relating to Best Management Practices on peatlands. The PLWG will appoint consultant (or facilitation team with one or two person) to facilitate the whole review and update process. RSPO Secretariat will provide logistic support and resources.

2. Objectives

To facilitate the review and updates of:

- 3) RSPO Manual on Best Management Practices (BMPs) for Existing Oil Palm Cultivation on Peat; and
- 4) RSPO Manual on Best Management Practices (BMPs) for Management and Rehabilitation of Natural Vegetation Associated with Oil Palm Cultivation on Peat.

3. Assignments/Tasks

The key assignments/tasks for the consultant will be:

- i. **Conduct consultation workshop** for RSPO members, to collate information and feedback relating to challenges and/or usefulness of RSPO Manuals; existing piloting or implemented good practices which should be referenced; and (if any) recommendations to further improve the usefulness of RSPO BMPs document.
- ii. **Identify and document gaps** within current version of RSPO Manuals on BMPs requiring update.
- iii. **Identify new practices or (if any) innovation**
- iv. **Plan and conduct relevant field visit** to document relevant practices and/or (if any) innovation identified.
- v. **Preparing relevant reports or documents** for relevant workshops and field visits.
- vi. **Drafting and finalising updated version of Manuals**
- vii. **Design and artworks for updated Manuals**

4. Deliverables

- v. A workplan of the whole review and update process in discussion with PLWG-2
- vi. Post-workshop and field-visit summary report
- vii. Drafts of BMPs
- viii. Final updated manuals

5. Timeline

Both updated RSPO Manuals is to be finalised by December 2018. Timeline for specific assignments and tasks required over the review process would be based on discussion outcomes with PLWG-2.

Annex 8. Peat Mapping Proposal from FRIM

As pdf document.