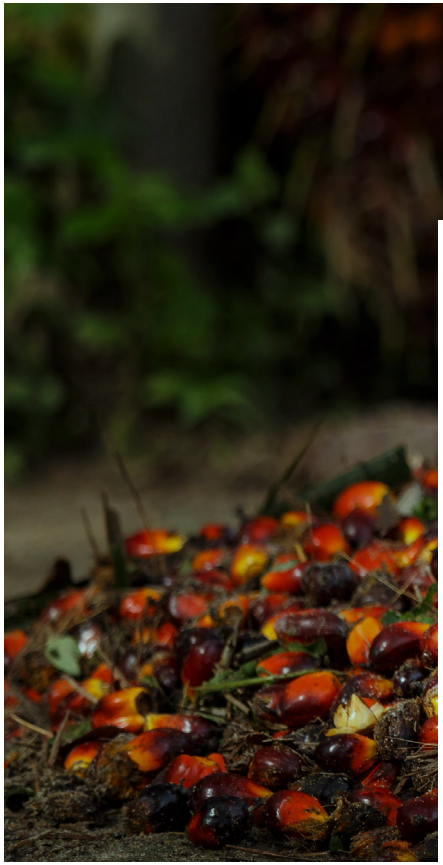
RSPO Smallholder Best Management Practices Manual

for Existing Oil Palm Cultivation on Peat

Chapter 1

Introduction



DISCLAIMER

The statements, technical information and recommendations contained in this Manual are based on best practice and experiences, and prepared by the members of the RSPO Peatland Working Group 2 (PLWG 2) and the RSPO Independent Smallholder (ISH)-PLWG subgroup. The guidance in this Manual does not necessarily reflect the views of the RSPO Secretariat or any of the individual contributors, sponsors and supporters of the process. The publication of this Manual does not constitute an endorsement by RSPO, the PLWG, or any participants or supporters of the development of new oil palm plantations in peatland areas. While every effort has been made to ensure the accuracy and completeness of the information in this Manual, no guarantee is given nor responsibility taken for any errors or omissions, in both typographical and content, and over time the contents may be superseded. Therefore, this Manual should be used as a guide and is not intended for the management of farms on peatlands. As the results of the implementation of these practices may vary according to local conditions, neither RSPO nor the PLWG or any contributors or supporters of the process can be held liable for the results of the application of the guidance in this Manual.

This handbook is applicable to smallholders in general (refer to RSPO ISH Standard).

ACKNOWLEDGEMENT

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HOW TO USE THIS BMP MANUAL

This BMP Manual was developed with seven Chapters that focus on topics relevant for existing oil palm cultivation on peat.

Along with this BMP, an extract from the RSPO ISH Standard Auditor Checklist is provided in Annex 1 as a guide for certification bodies and it may also be used by Group Managers (GM).

Non-compliances issued to an Independent Smallholder (ISH) group shall be for the non-compliance to the requirement of the RSPO ISH Standard and not against this BMP Manual.

HOW A GM CAN BENEFIT FROM THIS BMP MANUAL

(Across all chapters)

The objective of this Manual is to provide a set of practical guidance on BMPs for GM and/or smallholders to manage existing oil palm cultivation on tropical peat in line with Criteria 4.4 and 4.5 of the 2019 RSPO ISH Standard.

APPLICABILITY OF THIS BMP DURING AUDIT

This BMP Manual was produced as a recommended guidance for ISH with existing oil palm cultivation on peat. This is not to be taken as a compulsory practice and used against certification since ground conditions may vary according to location. It is the role of the GM or smallholders to evaluate the condition of the farm before the implementation of these BMPs.

CHAPTER 1: INTRODUCTION

This chapter covers some of the basic information that a GM and/or ISH needs to know about planting oil palms on peat.

01

1.1 WHAT IS PEAT?

A peatland is an area with a layer of naturally accumulated organic matter[1]. Most tropical peat soils belong to the soil order Histosols (organic soil) and the sub-orders Fibrists and Hemists. Soils are classified as peat soils when they reach an accepted threshold (e.g. host-country, FAO, or Intergovernmental Panel for Climate Change (IPCC)) for the depth of the peat layer and the percentage of organic matter composition. Some classifications adopt a minimum organic matter percentage of 35% in a minimum accumulated organic layer of 30 cm, others specify an organic content of 65%, while some require an accumulation of at least 40 cm or even 50 cm to be qualified.

Simple definition: A peatland is an area of land with layers of semi decomposed organic matter such as plants residues, mainly roots, leaves, twigs, etc.

1 Soil organic matter is the fraction of the soil that consists of plant or animal tissue in various stages of breakdown (decomposition). Agronomy Fact Sheet Series, Cornell University

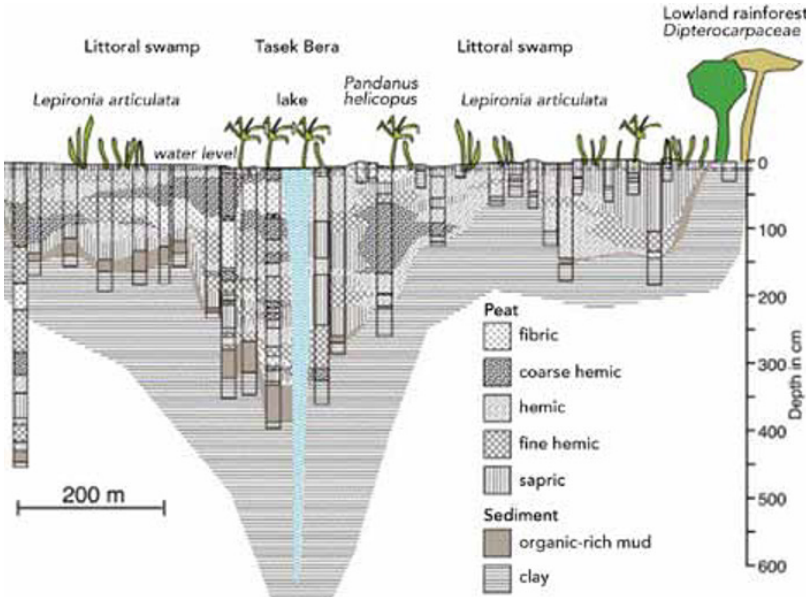


Figure 1: Cross section diagram of basin peat in Tasek Bera in Malaysia (Source: Wüst, R. A., & Bustin, R. M. 2004)

For example, some countries have already made classification, i.e. National Interpretation:

Malaysia – Peat is defined as soils with an organic layer of more than 50 cm in the top 100 cm of soil containing more than 65% of organic matter[2] (more than 65% loss on ignition) or 35% or more organic carbon (Leamy and Panton 1966, Paramananthan 2016, drawing on IUSS 1930).

Indonesia – Peat is defined as soils with an organic layer of more than 50 cm in the top 100 cm of soil containing more than 65% of organic matter.

Countries that do not have a clear definition of peat should refer to RSPO, or the National Interpretation.

Definition adopted by RSPO – Histosols (organic soils) are soils with cumulative organic layer(s) comprising more than half of the upper 80 cm or 100 cm of the soil surface containing 35% or more of organic matter (35% or more loss on ignition) or 18% or more organic carbon (FAO 1998, 2006/7; USDA 2014; IUSS 1930).

The percentage of organic matter is used in determining the types of peat. Peat samples need to be sent to the laboratory for loss on ignition (LOI) test to determine organic matter, refer to Section 1.3.

1.2 MEASURING PEAT DEPTH

In their natural condition, peatlands generally have a high-water table and are invariably waterlogged. When peatland is drained, this results in the decomposition and mineralisation of the organic matter, hence it is common to see the soil profile of drained peat consisting of three horizons differentiated by sapric (mostly decomposed), hemic (partially decomposed), and fibric (raw, undecomposed). Deeper peats tend to be less decomposed (woodier), but as peatlands are drained and developed, decomposition increases.

For peat depth, the use of peat auger is recommended (Figure 2). The main section (sampler) of a peat auger consists of a hooked blade (fin) and a half-cylindrical tube (gauge) that has one sharp edge to cut the peat. The sampler can be easily connected to the extension rods and auger handle. Simple procedure to measure peat depth is as follows:

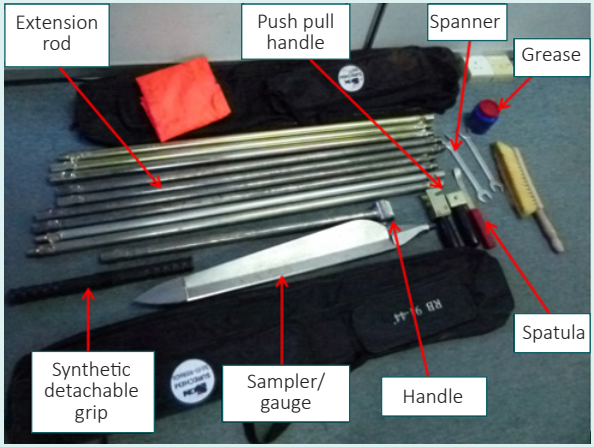


Figure 2: Peat auger tools and method to use this auger (Credit: Global Environment Centre, GEC)

1. Attach the handle and the extension rods
2. Connect the main sampler/gauge of the auger to the extension rods
3. Turn the fin to have the concave part facing the outside of the tube
4. Push the auger vertically into the peat without turning
5. Collect the sample by turning clockwise at least 180° (preferably a full 360° cycle) to ensure the gauge is filled with peat and the fin closes so that no additional peat enters the gauge
6. Pull the auger slowly out and lay on the ground to check samples
7. Extend the length of the rods until they reach the mineral layer
8. Measure peat depth using the formula below:

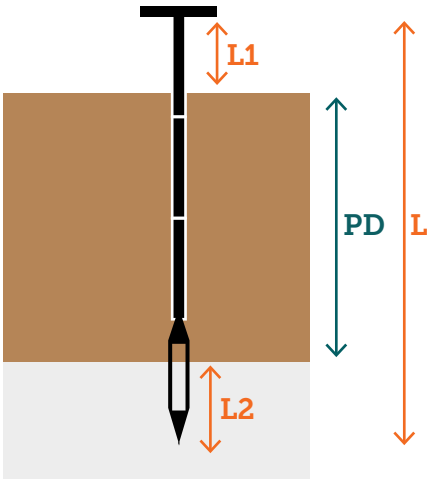


Figure 3: Cross section showing auger depth (Credit: Global Environment Centre, GEC)

Peat depth = L – L1 – L2

L = Total length of the peat sampler used = Length of the handle + Length of the sampler + Length of extension rods

L1 = length from the top of the handle to ground surface
L2 = length of the sampler with mineral layer

1.3 DIFFERENTIATION OF ORGANIC CONTENT AND LOSS ON IGNITION

Loss on ignition is determined by collecting samples of soil that will be heated at a specified temperature, allowing volatile substances to escape, until its mass ceases to change.

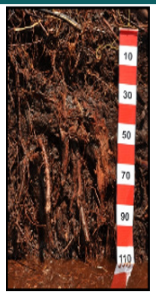
Table 1: Type of soil and its percentage of organic matter

Type	Percentage of organic matter	Loss on Ingnition
Organic clay	20-35%	20-35%
Muck	35-65%	35-65%
Peat	> 65%	> 65%

1.4
TYPES OF PEAT

There are three main types of peat classification as shown below:

Table 2: Peat classification *(Image courtesy: Malaysian Palm Oil Board, MPOB)*

Type	Fibric	Hemic	Sapric
Reference			
Fiber content	Fibric > 66%	Hemic 33-66%	Sapric < 33%
Description	Fibric (immature) peat is peat at early maturity stage with the original materials still recognisable, brown to light brown in colour, and when squeezed, more than two-thirds of the original amount remains on your hand.	Hemic (medium) maturity is half-decomposed peat with some of the original materials still recognisable, brown in colour, and when squeezed, between one-third and two-thirds of the original amount remains on your hand.	Sapric (mature) peat is at an advanced stage of decomposition with the original materials not recognisable, dark brown to black in colour, and when squeezed, less than one-third of the original amount remains on your hand.

1.5 IDENTIFICATION OF PEATLAND LANDSCAPE

Many tropical peatlands, especially in Indonesia and Malaysia, are formed in the lowlands in between rivers in areas that may have been swamp with water as a result of slow drainage, flooding or sea level rise. In these conditions marshy vegetation formed, which built up layers of peat over time (see Figure 4). The high-water level and acidic conditions prevented the breakdown of plant material and the peatland grew to 10 m or thicker in the center (at a rate of 0.5-2 mm/year). Many of these tropical bogs are dome-shaped with a rise in elevation of the peat in the areas in between adjacent rivers.

It is the landowner's responsibility to identify the type of land before conversion to oil palm plantation.

The second main type of tropical peatland is basin or topogenous peatlands, which formed depressions in the landscape or in lake basins, oxbow lakes, or river flood plains (see example in Figure 4). They may also be formed when drainage is impeded in the riverine systems due to reasons such as siltation, longshore sediment drift, or rising sea levels. The high water table in existing peatland requires drainage for conversion.

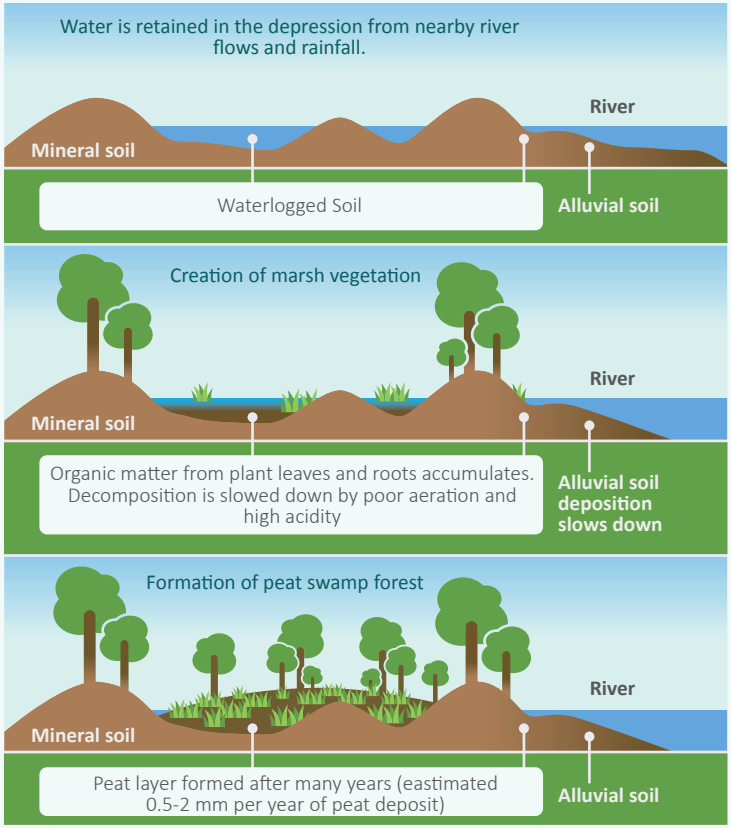


Figure 4: Formation of peat

In relation to criterion 4.4 of the 2019 RSPO ISH Standard – 'New plantings of independent smallholders, since November 2019: ….are not on peat areas of any depth'. It is important to smallholders to understand peatland landscape to prevent violation of RSPO standards. The following are some measures to be taken:

1. Be aware of areas demarcated as peatlands by referring to government demarcation regulations.

   Some examples are:

   i. Forest gazettement by Forestry Department

   ii. Any areas demarcated in Indonesia's forest moratorium order

   iii. Fall in legal boundaries and mapping made by local legal government agencies

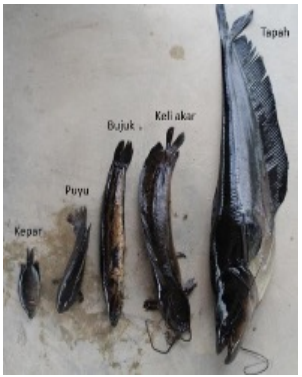
2. Conduct assessment to verify the existence of vegetation, hydrology/ water section and fauna in the peatland. Typical evidence is as follows:

Table 3: List of vegetation, hydrology/water section and fauna for different types of peatlands

Type	Either Fibric, Hemic, Sapric	 *(Credit: Global Environment Centre, GEC)*
Hydrology / water	• Areas with high water table/ flood consistence for years. • Water colour - brown/black • Acid water - pH <4 *Note: The high water table in existing peatland requires drainage for conversion.*	 *(Credit: Global Environment Centre, GEC)*

Vegetation	1. Forest Plant with special character, can prolonged in high water table condition. • Stilt root • Knee root 2. Basin area, lake • Emergent plant • Floating plant • Submersed plant	 Stilt root *(Credit: Global Environment Centre, GEC)*  Knee root *(Credit: Global Environment Centre, GEC)*  Floating mats *(Credit: ASEAN Peatland Forests Project)*  Emergent plant *(Credit: ASEAN Peatland Forests Project)*

Fauna	In big landscape areas, mammals can possibly be found. Example in Peat Swamp Forest (PSF).	 *(Credit: elements.envato.com, lightpoet)*  *(Credit: elements.envato.com, anankkml)*  *(Credit: elements.envato.com, Edwin_Butter)*

Fauna (Continued)	Endemic Fish – a variety of fish can be found in peat swamp.	 *(Credit: IMP NSPSF 2014-2023, SSFD, 2014)*  *(Credit: Global Environment Centre, GEC)*

ANNEX 1:
RSPO ISH STANDARD AUDITOR CHECKLIST

Criteria		Indicators		Checklist
4.4	Where smallholder plots exist on peat, subsidence and degradation of peat soils is minimised by use of best management practices. **Do any smallholders within the group have existing plots on peat? If no, SKIP**	**4.4 E**	Group manager confirms presence of peat on existing plots within the group and smallholders on peat commit to using best management practices and minimizing subsidence and degradation of peat soils (Reference 1.1 E, Annex 2).	1. Has the group manager identified the existence of peat within the group members existing plots? 2. How many of the group members have peat on their existing plots? 3. Have the smallholders signed a declaration to commit to using best management practices and minimizing subsidence and degradation of peat soils? 4. Is the group manager aware of best management practices for peat?
		4.4 MS A	Smallholders complete training on best management practices (BMPs) for peat. The group has an action plan to minimise risk of fire, to apply BMPs for plantings on peat and manage a water system in the certification unit.	1. Have smallholders participated in training on best management practices (BMPs) for peat? 2. What are the evidence of training conducted? 3. Who provided the training? 4. When was the training provided? 5. Has the group developed an action plan to minimise risk of fire, to apply BMPs for plantings on peat and manage a water system in the certification unit? 6. What are the fire fighting system available? 7. Can the smallholder demonstrate understanding on the best management practices (BMPs) for peat including the action plan to minimise risk of fire and, manage water system?

4.4	Where smallholder plots exist on peat, subsidence and degradation of peat soils is minimised by use of best management practices. **Do any smallholders within the group have existing plots on peat? If no, SKIP** (Continued)	**4.4 MS B**	Smallholders implement the group's action plan based on best management practices, including fire and water management and monitoring of subsidence rate for existing plantings on peat.	1. Have the smallholders implemented the action plan to minimise risk of fire, to apply BMPs for plantings on peat and manage a water system in the certification unit? 2. What are the evidence of implementation of the action plan ? 3. What are the fire prevention and control systems available ? 4. How are the smallholders monitroing subsidence rate for existing plantings on peat ? 5. How are the smallholders monitoring the water levels for existing plantings on peat ?
4.5	Plots on peat are replanted only on areas with low risk of flooding, saline intrusion as demonstrated by a risk assessment. **Do any smallholders within the group have plans for replanting plots that are located on peat? If no, SKIP**	**4.5 E**	Smallholders commit to provide information on all plans for replanting and commit that replanting will only be in areas with low risk of flooding and saline intrusion (Reference 1.1.E, Annex 2).	1. Have the smallholders signed a declaration to commit: • to provide information on all plans for replanting and • that replanting will only be in areas with low risk of flooding and saline intrusion. 2. Has the group manager collected and compiled information on replanting by group members?

Criteria		Indicators	Checklist
4.5	Plots on peat are replanted only on areas with low risk of flooding, saline intrusion as demonstrated by a risk assessment. **Do any smallholders within the group have plans for replanting plots that are located on peat? If no, SKIP** (Continued)	**4.5 MS A** Smallholders with plots on peat complete training on identification of future risks of flooding associated with subsidence and alternate land development strategies.	1. Have smallholders with plots on peat participated in training on identification of future risks of flooding and alternate land development strategies? 2. What are the evidence of training conducted? 3. Who provided the training? 4. When was the training provided? 5. Are the smallholders aware of the risk associated with subsidence? What are the identified risk associated with subsidence? 6. Have alternate land development strategies been identified?
		4.5 MS B Prior to replanting on peat smallholders complete a risk assessment related to flooding associated with subsidence and, where there is high risk, present a plan that includes alternate land development strategies, preferencing alternative livelihood planning.	1. Is there replanting on peat by the smallholders in the group? 2. Has a risk assessement related to flooding associated with subsidence been carried out prior to replanting ? 3. What was the risks identified in the risk assessement ? 4. For high risk area, is there a plan that includes alternate land development strategies, preferencing alternative livelihood planning ? 5. Is the group manager aware of replanting activities (on peat) by group members ?

ANNEX 2:
RECOMMENDED SOP FOR FIRE PREVENTION AND CONTROL PLAN

(Adapted version courtesy of Standard Operasional Prosedur Pemadaman Kebakaran Lahan, KUD Makarti No.23/SOP-KUD-MKRSM/IV/2019)

When encountered the risk of fire, there are several steps that can be taken towards fire prevention and control:

1. Should there be fire hotspot detected, the flames should be stopped immediately with basic equipment.
2. The group members shall report to the Internal Control System of the group or Fire Emergency Unit should the basic equipment is not enough to quench the flames.
3. The Fire Emergency Unit will immediately report to the Fire Agency or related agency.
4. All group members are responsible to quench the flames and conduct the evaluation.

ANNEX 3:
RECOMMENDED TABLE/SOP FOR WATER LEVEL MONITORING

(Adapted version courtesy of ISH Group 1 Asosiasi Petani Sawit Swadaya Amanah No.022/ DOK/ SOP/ APSSA/2020 dated 12 February 2020)

1. Maintain the water level by establishing drainage channels and installing modest dams to monitor the water level.
2. Modest dam is established at specific points; specifically, main outlet and the cost will be borne by the smallholder group.
3. The high point of water level on the modest dam will be monitored every one month.
4. In order to monitor the water level, the drainage channel will be set as a water level measurement tool, which is made by PVC pipe. The length of the PVC pipe shall be 2 m (1.5 m above the collecting channel surface and the rest (50 cm) should be rooted in the soil.
5. The measurement on the modest dam will be set as 0 from the soil surface.
6. The measurements in the PVC pipe (0 cm, 10 cm, 30 cm, …150 cm) should be marked in red with a white base color and the optimum measurements (60 cm and 80 cm) should be marked in black.
7. The material of the modest dam should be waterproofed and used as a cantilever (such as bamboo) and placed in a sand sack.
8. The High Conservation Value (HCV) team identifies the location points to establish the modest dam.
9. The modest dam will be constructed once the request has been approved by the group manager.
10. Once the modest dam has been constructed, the HCV team will evaluate the effectiveness of the dam and monitor the water level every month.
11. Install the subsidence stake from the iron pipe to monitor the decrease of water level.
12. The HCV team identifies the location points from the installed subsidence stack.
13. The result shall be reported to the group manager to get approval for establishing the modest dam.
14. The subsidence stack will be constructed once the request has been approved by the group manager.
15. Once the subsidence stack has been constructed, the HCV team will evaluate the effectiveness of the dam and monitor the water level every month.

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RSPO is an international non-profit organisation formed in 2004 with the objective to promote the growth and use of sustainable oil palm products through credible global standards and engagement of stakeholders.

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