

Drainability Study Prior to Replanting on Peat

1.0 Introduction

Drainage of peat soils for oil palm cultivation will lead to gradual subsidence and Greenhouse Gas (GHG) emission. To minimize peat subsidence and GHG emission, the ground water table must be kept as high as is practical, between 40-60 cm below the planted peat surface or 50-70 cm below the planted peat surface when measured in collection drains.

Excessive peat subsidence can lead to prolonged flooding in parts of existing oil palm plantations on peat. Oil palm yield on frequently flooded peat fields is low as prolonged floods interfere with harvesting, FFB evacuation, loose fruit collection and other estate operations especially fertilizer application.

Before replanting a peat area, it is therefore essential to carry out a drainability study to determine whether it is economically feasible to replant or to leave the affected fields as conservation areas.

2.0 Drainability classes

Class 1 - Good Drainability - where the excess water in the field can be drained by gravity even during the highest tide.

Class 2 - Moderately Good - where excess water in the field can be drained by gravity > 50 % of the tidal cycle.

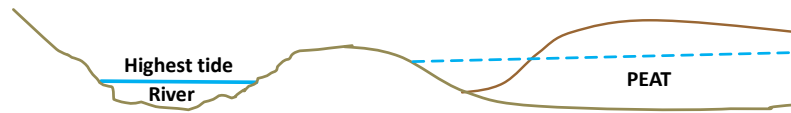
Class 3 - Poor Drainability - where excess water in the field can be drained by gravity < 50 % of the tidal cycle.

Class 4 - Very Poor Drainability - where excess water in the field cannot be drained by gravity even at lowest tide.

In this case, mechanical pumping is required, which is costly.

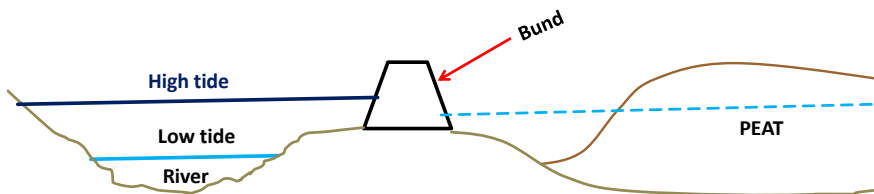
DRAINABILITY – CLASS 1

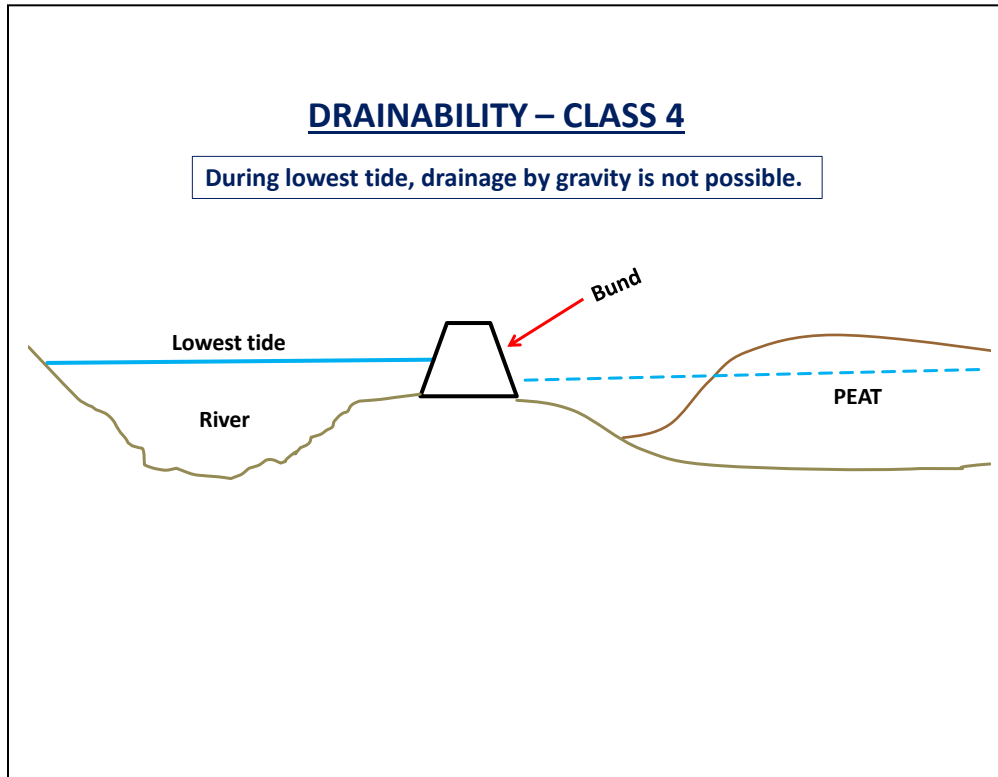
During the highest tide, drainage by gravity is still possible.



DRAINABILITY – CLASS 2 & 3

Can drain only during low tide





3.0 Measurement of water levels

Drainability studies should be carried out in frequently flooded fields. Before carrying out a study, it is important to ensure that the flooded condition is not caused by silting up of the drainage system or main outlets. A round of desilting/ degrassing will be required.

All stop-offs and water-gates must be opened before carrying out the study.

The fluctuation in water level in the main drains and adjacent rivers should be measured at hourly intervals, according to the tide cycle, by using water-level gauges installed at strategic locations.



Installation of water-level gauge to measure fluctuation in water level.

4.0 Recommendations for replanting

- Drainability Class 1 is suitable for replanting.
- For Drainability Class 2 and Class 3, replanting can be carried out if an effective water management system, complete with perimeter bund and tide-gates, is installed. When screw-gates are used, the attendants should be trained on the timely operation of the water gates. During high tide screw gates must be closed to prevent tide water from entering the estate and during low tide screw gates must be opened to discharge excess water out of the estate. The gate attendant must be guided by the local tide table.
- For Drainability Class 4, it is recommended not to replant but to leave the land as a conservation area.

Appendix – Glossary of terms

Bund - A perimeter embankment or dike to prevent floodwater or tidal water from entering a low-lying peat plantation.

Desilting - Removal of sediment in the drainage system in order to facilitate drainage and water flow.

Degrossing - Removal of aquatic vegetation in the drainage system to facilitate drainage and water flow.

Stop-offs - Structures built across the main drains and collection drains at regular intervals, to maintain water level at an optimal level in a peat plantation.

Water-gates - Structures to regulate optimum water level in a low-lying plantation eg. Screw-gates

Screw-gates – Water gates that are operated manually using a screw-up or screw-down mechanism.

Tide table - A table showing the expected times and levels of tides at a specific place.

Tide-gates - A structure to prevent excessive tidal water from flowing into a plantation during high tides that can cause flooding. It also helps to prevent excessive water discharge from the plantation during low tides that will result an undesirable low water level in a peat plantation that can result in excessive peat subsidence and GHG emissions.