

- 1 The soils in wet, marshy lands usually have anaerobic conditions that inhibit decomposition. As a result of this, dense layers of semi-decayed organic matter, known as marshland peat, build up.

The table below shows some of the components of marshland peat.

Component	Chemical nature	Main source
Cutin	Polymer of organic acids linked by ester bonds	Waxy layers of leaves and fruits
Lignin	Polymers of phenyl propene	
Hemicellulose	Branched polysaccharide Monomers include hexoses and pentoses linked by glycosidic bonds	Cell walls of all plant cells
Cellulose		Cell walls of all plant cells

(a) Describe the chemical nature of cellulose.

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(b) Name a plant tissue that could be the main source of the lignin found in marshland peat.

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(c) All of the components shown in the table are organic carbon compounds. Describe the role of microorganisms in the recycling of the carbon from these compounds.

(3)

(d) Landscapes rich in peat act as carbon sinks. However, during recent decades, some countries have been draining and clearing marshy peatlands to grow crops, such as palms, to produce biofuels. During this clearance and drainage, the rate of decomposition in the peat increases and the organic debris is burnt. This change of use of the peatlands has turned carbon sinks into carbon sources.

(i) Suggest **one** reason why some countries may decide to drain their marshy peatlands for the production of biofuels.

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