

A BRIEF REPORT ON THE OCCURRENCE OF PEAT IN NETHERLANDS NEW GUINEA

*EEN KORT VERSLAG BETREFFENDE HET VOORKOMEN VAN VEEN
IN NEDERLANDS NIEUW GUINEA*

by/door

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1. INTRODUCTION

Owing to the high temperature no peat is formed on humid to marshy soils in the tropics. Conditions are only conducive to the formation of peat in marshy to swampy areas in which stagnant water prevents the oxidation of organic material.

The regions in Netherlands New Guinea in which conditions may favour peat formation are the extensive swamp areas along the low-lying coasts and the valleys in the mountain areas.

Since references to the occurrence of peat in Netherlands New Guinea are somewhat vague (POLAK, 1941; VAN STEENIS, 1954) mention will be made in this article of areas in which peat was encountered and similar areas in which peat may be expected.

The areas discussed are shown on the accompanying sketch map (fig. 1).

2. THE LOW-LYING COASTAL REGIONS

The low-lying coastal regions in which swampy districts occur are found in the following parts of New Guinea:

1. the northern coast from the eastern frontier, excluding the Cycloop Mountains to the south of the Geelvink Bay;
2. the southern coast of the Vogelkop and parts of the Bombarai peninsula;
3. the extensive flat coastal region of Southern New Guinea.

Peat formation may also be expected in the extensive Meer Plain. In general, however, peat bogs occurring in these extensive low-lying coastal regions do not occupy any large continuous areas.

Where sufficient running water is found in these regions no peat formation occurs. Nor are peat bogs encountered in places where the land is entirely inundated during the rainy season but the water subsequently runs off again during the dry season. This is the case, for instance, in the extensive swamp areas of Southern New Guinea.

In the humid tropical forest or the grass savannah the parts of the plants decay so rapidly that only a thin layer of organic material is found on the soil, or the decomposed parts of the plants are carried off by surface water.

Peat formation only occurs in depressions where there is constantly inadequate drainage and in which the rainwater accumulates together with any surface water from the hilly and mountainous hinterland.

These peat bogs are usually covered by a swamp forest in which a great deal of sago and wild sago (*Metroxylon sp.*) (fig. 2). The soil consists of an aqueous, organic sludge, often many meters deep, of which the top-layer is

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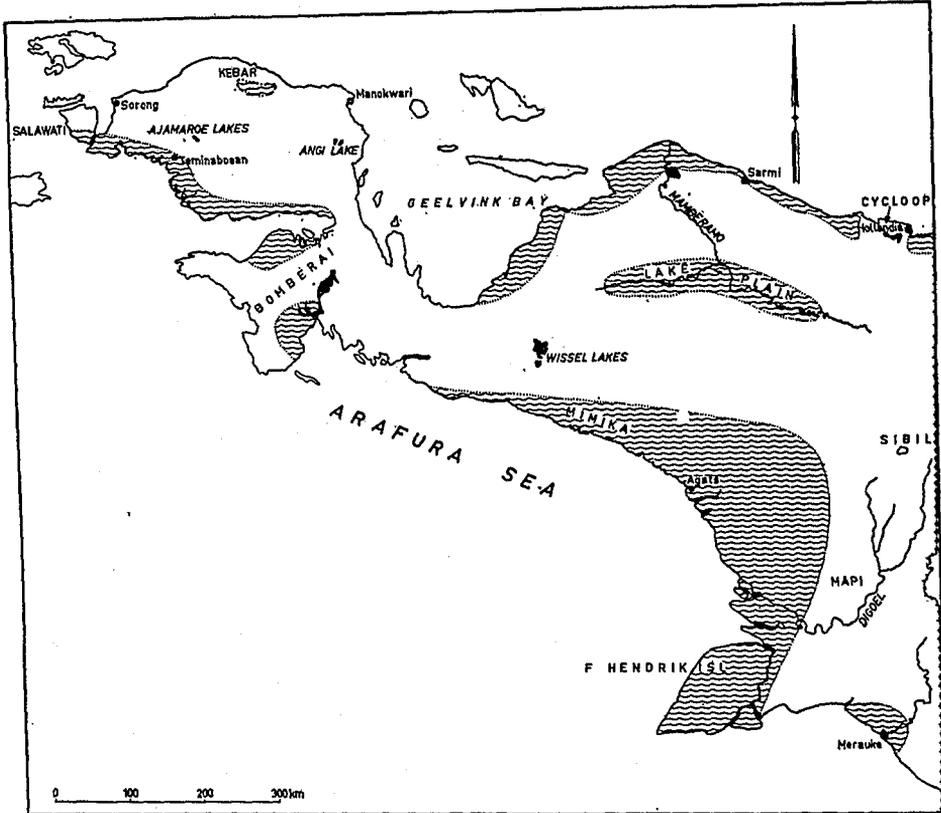


Fig. 1. Sketch map of Netherlands New Guinea, scale 1:10,000,000 indicating areas in which peat growth may occur.

Schetskaart van Nederlands Nieuw Guineë, schaal 1:10.000.000 aangevende de gebieden waarin veenvorming kan optreden.

more compact and firm as a result of root systems and a denser accumulation of organic material. Smaller surface areas of this type were found on the north coast east of Sarmi (Reynders, 1958) and in the swamp forest area south of Teminaboean (Reynders and Razoux Schultz, 1957) south of the Vogelkop. According to verbal reports and aerial observations, such peat bogs may also be expected on the island of Salawati, on the Bombarai peninsula, and in the coastal region of Waropen. Peat bogs occur in places in sago areas in the Merauke area (Reynders and Andriess, 1956).

The literature mentions peat swamp forests in the Agats region. On the soil of these forests peat deposits are formed which may be several feet in depth. Peat swamp forests of this kind are also encountered along the northern coast of Sarmi (Van Soelen, 1957). This type of peat deposit may also be expected in the river levee area of the Mimika District.

Peat bog areas covered with grasses may be expected in extensive locations on the mouth of the Mamberamo and in the Meer Plain (Polak, 1941; Van Steenis, 1954). Many of these bogs must be quagmires or floating bogs.

Small areas of grass and rush peat bogs were found in the Merauke



Fig. 2.
Wild sago palm (*Metroxylon spec.*) forest/*Sagobos* (*Metroxylon sp.*).

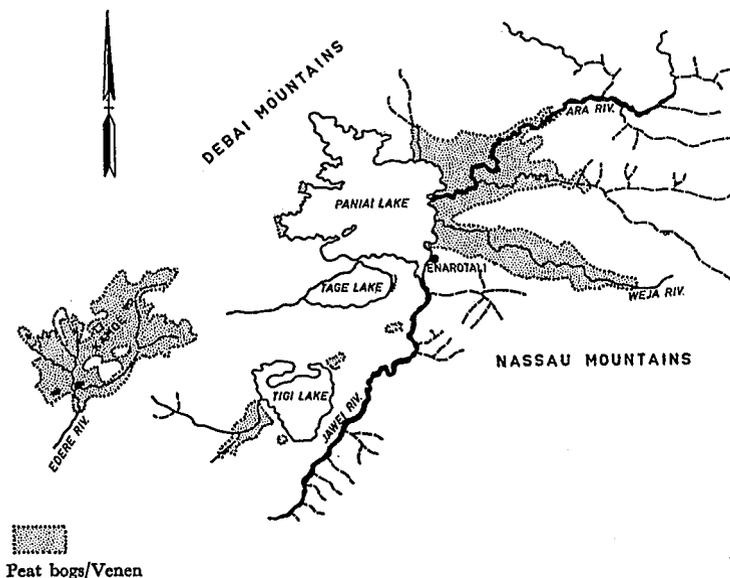


Fig. 3. Wissel lakes and Kamoe valley, scale approx. 1:500,000.
Wisselmeren en Kamoevallei, schaal ca. 1:500.000.

District (Reynders and Mouthaan, 1954). They were met with in the form of peat-filled small basins.

Peat formation also occurs on the bottom of lakes and large open swamps, e.g. in the Sentani lake near Hollandia, and this type of peat may also be expected on Frederik Hendrik Island.

Peat in the subsoil, overlain by recent sediments, was found in various places in the Merauke area (Reynders and Andriessse, 1956; Reynders and Mouthaan, 1954).

3. THE MOUNTAIN DISTRICTS

Peat was found in various places in the mountain districts. In most cases they are thick layers of organic material formed on the banks of lakes slowly silting up.

a. The Wissel lakes (fig. 3)

The Wissel lakes (1,750 metres above sea-level) and the surrounding valleys are encircled by high mountains. Peat formation occurs on the swampy lake-side of the valleys as a result of accumulation of organic material from decayed grasses. Two very extensive floating bog areas are situated east of the Paniai lake in the Ara and Weja valleys (Reynders, 1957).

The accompanying diagram illustrates the frequently occurring structure of the above (fig. 4).

b. The Kamoe valley (fig. 3)

The Kamoe valley (1,650 metres above sea-level), situated to the west of the Wissel lakes, consists of a dried-up lake the bottom of which is covered by peat (Reynders, 1957). The grass peat often consists of layers many feet thick.

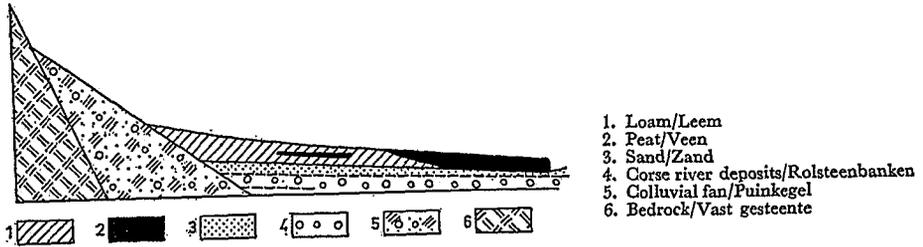


Fig. 4. Schematic longitudinal section of a valley in the Wissel lakes area.
Schematische lengtedoorsnede van een dal in het Wisselmerengebied.

Parts of roots and boles of the former forest vegetation occur in the subsoil. The accompanying diagram (fig. 5) shows the position of river sediments in these peat bogs. Owing to a lowering of the erosion base level the river meanders in its own deposits and peat growth continues. At the same time subsidence of the peat layer takes place.

Small, flat peat bogs with a sedge or fern vegetation are found in the higher mountains around the Wissel lakes.

c. The Cycloop Mountains (Reynders en Van Loenen, 1953)

In the Cycloop Mountains small valleys occur which owing to a high-lying spill-way are insufficiently drained, with the result that a grass peat bog many feet thick has grown in these basins.

d. Sibil valley (Reynders, 1958)

In the Sibil valley (1,300 metres above sea-level) a peat bog originating from grasses and rushes was encountered in the Sterrengebergte (Star Mountains).

Owing to impeded drainage of a part of the land at the foot of an accumulation terrace or at the foot of a mountain slope, conditions here are favourable for peat growth. In addition to the greater humidity in these parts the lower temperature is probably another factor.

e. The Kebar plain (Reynders and Schroo, 1958)

The Kebar plain (600 metres above sea-level) is a depression surrounded by

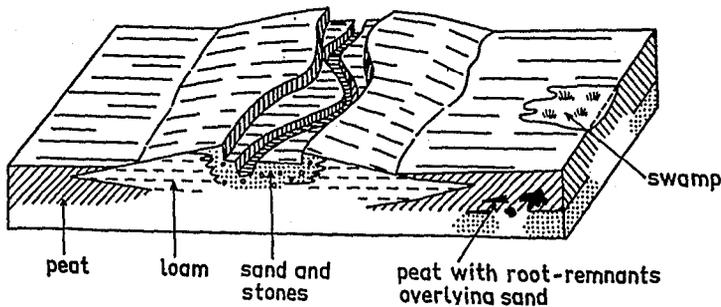


Fig. 5. Schematic block diagram of a river in a peat bog area i.a. in the North Kamoe valley.
Schematisch blokdiagram van een rivier in veengebied o.a. in de Noord Kamoevallei.

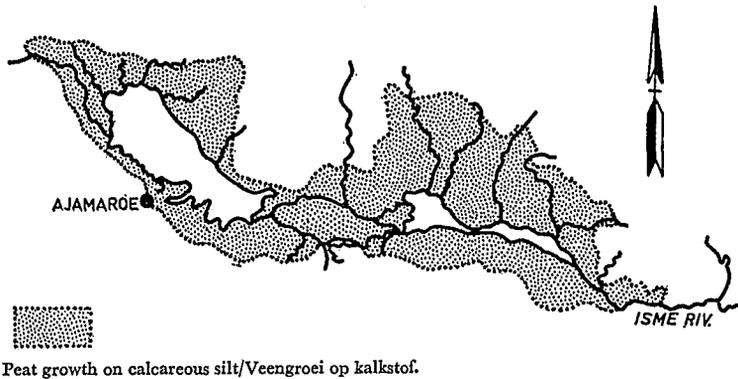


Fig. 6. Ajamaroe lakes, scale approx. 1:250,000. From left to right the Ajamaroe, Maroemège and Jajé lake.
Ajamaroemeren, schaal ca. 1:250.000. Van links naar rechts het Ajamaroe-, Maroemège- en Jajémeer.

high mountains. Between two alluvial fans formed in this plain lies a swampy zone in which floating bogs have grown consisting of a pulpy soil mass rich in organic matter. These peat bogs are covered by grasses and sago forests.

f. The Ajamaroe lakes

These lakes are surrounded by limestone mountains (Reynders en Razoux Schultz, 1957).

Into these lakes, which themselves are shallow, a number of underground river arteries discharge which fill up the borders of the lakes with calcareous silt deposit as a caseous mass. On this silt is formed a thick deposit of organic material from a vegetation of rushes which may become many feet thick. Something of the same kind is also found in places in the Wissel lakes district.

It is remarkable that an apparently acidophil vegetation should develop on this lime silt.

Fig. 6 gives an idea of the silting-up of these lakes.

g. The Angi-Angi lakes

A low strip of shore covered with grass peat is also found around the Angi-Angi lakes (1,850 metres above sea level). In many cases the peat is more than 1 metre in depth (Wentholt, 1933).

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4. SUMMARY

A general view is given of the occurrence of peat in the tropical part of Netherlands New Guinea, as far as known up to the moment. The occurrence is mainly connected with anaerobic conditions in stagnant waters and is not a consequence of low temperatures as it is in temperate regions. A general view is given of lowland and mountainous areas in New Guinea where peat occurs, and of the conditions which give rise to peat growth.

5. SAMENVATTING

Een overzicht wordt gegeven van het voorkomen van veen in het tropische deel van Nederlands Nieuw Guinea voor zover dat bekend is. Het voorkomen is voornamelijk gebonden aan anaërobe omstandigheden in stilstaand water en is niet, zoals in gematigde streken, een gevolg van lage temperaturen. Zowel in het laagland als in het bergland van Nieuw Guinea worden een aantal gebieden en omstandigheden genoemd, waarin veen voorkomt.

LITERATURE

Polak, B., 1941: Veenonderzoek in Nederlands Indië („Peat investigation in Dutch East Indies”). *Landbouw XVII* (1941), p. 1040.
Steenis, C. G. G. J. van, 1954: Nieuw-Guinea, Part II (1954), p. 229.

Unpublished Soil Survey Reports

Wentholt, F. A.,	1933
Reynders, J. J. and F. C. van Loenen,	1953
Reynders, J. J. and W. P. J. L. Mouthaan,	1954
Reynders, J. J. and P. J. Andriess,	1956
Reynders, J. J. and F. H. N. Razoux Schultz,	1957
Soelen, W. J. van,	1957
Reynders, J. J.,	1957
Reynders, J. J.,	1958
Reynders, J. J. and H. Schroo,	1958