

Report No.86

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Report on a Semi - Detailed Soil Survey
of the

SEMADANG COCONUT PLANTING SCHEME AREA

4 th Division

by

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The survey was made at the request of the Fourth Division Development Committee to investigate the soils and determine the areas suitable for a Coconut Planting Scheme.

Summary

A semi-detailed soil survey was made in the coastal area between Kuala Bintulu and Sg. Mas to investigate the suitability of the soils for a Coconut Planting Scheme. Out of the 2,450 acres covered by the survey, 460 acres of Kabong Family, 160 acres of Tatau Family and 240 acres of Igan Family (peat depth phases of less than 12"), can be used for coconut after improvement. Chemically all the soils are very poor. The other 1,590 acres, which consist of Igan (peat depth phases of more than 12"), Anderson and Buso Families, are considered to be unsuitable for agriculture.

The topography of the area consists of lines of low ridges which are not about parallel to the coast, separated by slightly lower valleys. With increasing distance inland past swampy areas, the ridges develop. The ridges are usually from 2 to 3 feet higher above the coast. Immediately inland this line was about 200 feet wide, is a stretch of peatland covered by a layer of water. The vegetation is extremely poor for grazing. The rest of the area is covered by primary swamp forest. Trees such as Meranti, Kapong and Ramin are being extracted from the area to supply a small mill at Kuala Bintulu.

Despite the numerous heavy rains of the soil, the water table throughout the area was fairly high at the time of the survey. This could have been due to the rain which fell immediately during that period. The water table along the coastal fringe was on an average 20-25" but further inland the water table was as high as 40" from the surface.

The 1:10,000 scale map for this report has been prepared by enlarging the 1:50,000 existing land and survey map. Due to such magnification distortion is made and error is introduced. It is to be expected.

TITLE

1. NAME OF SURVEY

The semi-detailed soil survey is situated for Forest. Briefly the survey is described as follows:

Aerial photographs were studied prior to field work. The main interpretation lines of topography and vegetation gives a preliminary idea of the soil likely to be encountered in the field. This knowledge helps in the choice of layout of the soil lines, which is laid out in the field. The soil survey is carried out in the field in the form of a grid. The soil survey is carried out in the field in the form of a grid. The soil survey is carried out in the field in the form of a grid.

INTRODUCTION.

The survey was made at the request of the Fourth Division Development Committee to investigate the soils and demarcate the area suitable for a Coconut Planting Scheme.

The L-shaped area examined lies adjacent to the coast and is located between Sungei Mas and Kuala Bintulu. The coastline forms the northern boundary and a straight line half way between Sungei Sebuhan Besar and the coast, forms the approximate southern boundary. The total area covered is about 2,450 acres.

The same area was surveyed by Dames in 1959, and comprises part of the Bintulu-Tatau survey, (Wall, 1963), both of which were made at a reconnaissance level. The present survey enlarges upon the findings of these two reports.

The topography of the area consists of lines of low beaches close to and almost parallel to the coast, separated by slightly lower swales. With increasing distance inland peat swamps begin to develop. Casuarina sumatrana trees form a thin fringe along the coast. Immediately behind this line and about 300 feet wide, is a stretch of grazing land covered by 'rumpu nglae' (Ischaemum imberbe), Lycopodium sp. moss and some low 'simpur' trees. This vegetation is extremely poor for grazing. The rest of the area is covered by primary swamp forest. Trees such as Meranti, Jongkong and Ramin are being extracted from the area to supply a small saw-mill at Kuala Bintulu.

Despite the permeable sandy nature of the soil, the watertable throughout the area was fairly high at the time of the survey. This could have been due to the rain which fell intermittently during that period. The watertable along the coastal fringe was as low as 20-25" but farther inland the watertable was as high as six inches from the surface.

The 1:10,000 scale map for this report has been prepared by enlarging the 1:50,000 existing Land and Survey map. Due to such magnification distortion in scale and error in acreages figures is to be expected.

SOILS

1. METHOD OF SURVEY

The semi-detailed method adopted is standard for Sarawak. Briefly the method is described as follows:

Aerial photographs are studied prior to field work. The photo interpretation base of topography and vegetation gives a preliminary idea of the soils likely to be encountered in the field. This knowledge helps in the choice of layout of the cut lines (rentises), which in this area were made at 800 feet intervals cutting across as many vegetation, topography and probable soil boundaries as possible.

Auger descriptions were made at 100 to 200 feet intervals along the rentises. This detailed information is used for map soil boundaries during a final air photograph analysis.

The fieldwork was completed during August/September by the reporter with the help of two Agricultural Assistants, Basmawi Mahli and Augustine Dom.

2. SOIL CLASSIFICATION.

At a semi-detailed level, soils are normally mapped at 'Family' level. A Soil Family is a group of soils whose characteristics are closely similar and which present similar problems for cultivation. Similar soils found by Dames are now classified into Kabong, Tatau, Igan and Anderson Families.

1. Kabong Family (460 acres)

The soils of this family belong to the Regosol Great Soil Group. They are undeveloped soils found close to the coast, and in this area comprise deep pale brown to light yellowish brown fine sandy soils. The soils are quartzose highly permeable and structureless. Watertable levels are found below 24 inches associated with gleyed deep subsoil. It has also been noticed that a layer of grey to dark grey sands (many fine fragments of shells) containing medium to well decomposed sulphurous smelling organic matter is commonly present at depths exceeding forty inches.

Soils of this family are low in all nutrients, except possibly calcium, elsewhere in Sarawak.

2. Buso Family (30 acres)

This family is classed in the Ground-Water Podsol Great Soil Group and occurs close to Sungei Sebuang Besar developed in old quartzose beach sands. The soils are characterised by thin surface humus with a distinct dark greyish brown A1 horizon. This overlies very pale coloured sand to sandy loam giving way to a soft continuous dark coloured B2h horizon. The soils are moderately well drained and are believed to contain very low levels of nutrients except in the topsoil.

3. Rajang Family (80 acres)

This family of soils belongs to the Saline Soil Group. The natural vegetation associated with these soils is mangrove and nipah. Rajang Family soils in this area are found close to Sungei Mas and Sungei Semadang.

The soil is characterised by a greyish brown sticky and plastic clay topsoil of varying depth and mixed with partly decomposed organic matter. The subsoil consists of greenish grey silty clay to clay with a distinct sulphurous smell. This commonly indicates soil conditions that lead to 'catclay' on drying out. This material can be highly sulphatic and acid, conditions which are deleterious to most crops including coconut. Internal drainage is poor or very poor.

4. Tatau Family (160 acres).

The soils of this family belong to the Low Humic Gley group of soils. They are developed in quartzose beach sand deposits, and are characterised by a thin Al horizon of dark grey to slightly humic sandy loam to loamy sand, or thin (less than 6 inches) peat or muck. Beneath, the soil consists of pale coloured fine- to coarse textured sand to loamy sand. Below about 24 inches there is commonly a dark grey layer with faint sulphurous smell as described in the Kabong Family. The ground water is permanently close to the surface giving poor or very poor internal drainage. Judging by analysis of Tatau soils elsewhere in Sarawak the nutrient levels are low except where the topsoil is humic.

5. Igan Family (1,400 acres)

These soils belong to the Half-Bog group of soils. The inorganic part of the profile is developed in the coarse textured, quartzose marine sands, and the organic surface material consists of Peat Swamp Forest debris.

The soils are continuously wet with a high ground water-table giving very poor internal drainage. The profile consists of organic deposits 6 to 36 inches deep overlying pale to dark coloured sands. The fertility of the sand is believed to be low and similar to that of the Tatau Family. The surface organic material, although probably equally poor on a dried soil basis, has a higher potential to store added fertilizers.

6. Anderson Family (320 acres)

This consists of brown to dark brown, raw, organic deposit deeper than 36" running directly into the brown loose sand. The drainage is very poor and the soils are acid in nature.

4. CONCLUSIONS AND RECOMMENDATIONS.

The soils that can be used after improvement (drainage) to grow coconuts are the narrow coastal strips of the Kabong Family (460 acres) isolated patches of the Tatau Family (160 acres) and the shallow phases of the Igan Family, (with peat less than 12 inches deep) (240 acres). Chemically all these soils are believed to be poor and may prove costly to fertilize properly to give continued high yields. From observation in other parts of coastal Sarawak, unfertilized coconuts on these soils yield very poorly if at all. Soils of the Rajang and Buso Families and the deeper peat of the Igan Family are excluded as they are at present considered unsuitable for agriculture.

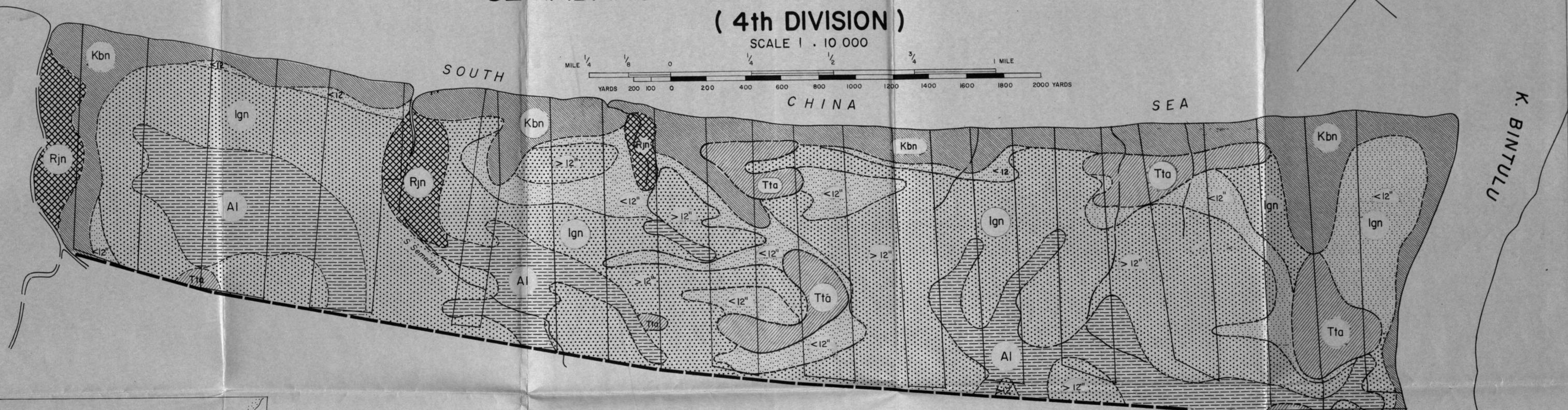
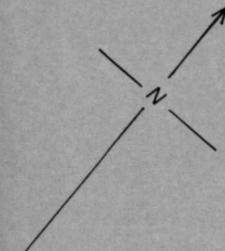
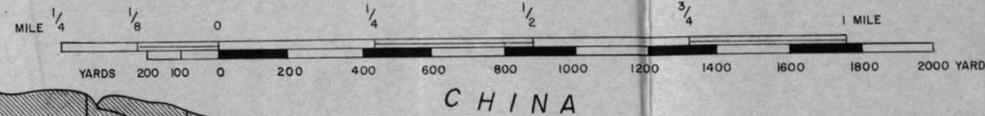
For coconuts to grow well the water table of the soils should be kept below three feet. The water table of both the Tatau and Igan soils comes very close to the surface and it will be necessary to reduce the level to the required depth. It would be advisable to request advice from the Drainage and Irrigation Department on this matter. If on investigation by the Drainage and Irrigation, it was found uneconomical to drain the waterlogged 400 acres of Tatau and Shallow Igan soils, it is felt that the whole area should be rejected for planting under the Coconut Planting Scheme. Rather than subsidizing the planting of the thin coastal strip of Kabong soils it is suggested that a new area be sought and investigated.

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SEMI-DETAILED SOIL SURVEY MAP OF THE SEMADANG COCONUT PLANTING SCHEME (4th DIVISION)

SCALE 1 : 10 000



KEY TO THE SOILS

MAPPING UNIT	SOIL FAMILY	MAIN SOIL CHARACTERISTICS	APPROX. ACREAGE	MAIN LIMITATIONS FOR COCONUT	SUITABILITY FOR COCONUT
	KABONG	Deep well drained sands with low watertable (below 24")	460	Low fertility	Marginal to Suitable
	BUSO	Well drained pale sands over dark brown humic rich horizons.	30		Unsuitable
	RAJANG	Poorly drained light grey to dark grey saline clays containing much organic matter	80	Excessively saline	
	TATAU	Poorly to very poorly drained sands with high watertable (above 24")	160	Low fertility poor drainage	Marginal to suitable.
 	IGAN	Very poorly drained shallow acid peat over sands of very low fertility, peat depth 6-36"	<12" peat 240 >12" peat 1160	Low fertility, very poor drainage and poor rooting	Marginal to suitable after drainage
	ANDERSON	Dark brown, raw woody peat A1 - 3 - 6' deep peat	320		Unsuitable

