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# HUNTING TECHNICAL SERVICES

Field Report of the Soil Reconnaissance of the Sibu-Ulu Oya Road.

(Soil Survey Area No. 28)

by C.J. Grant

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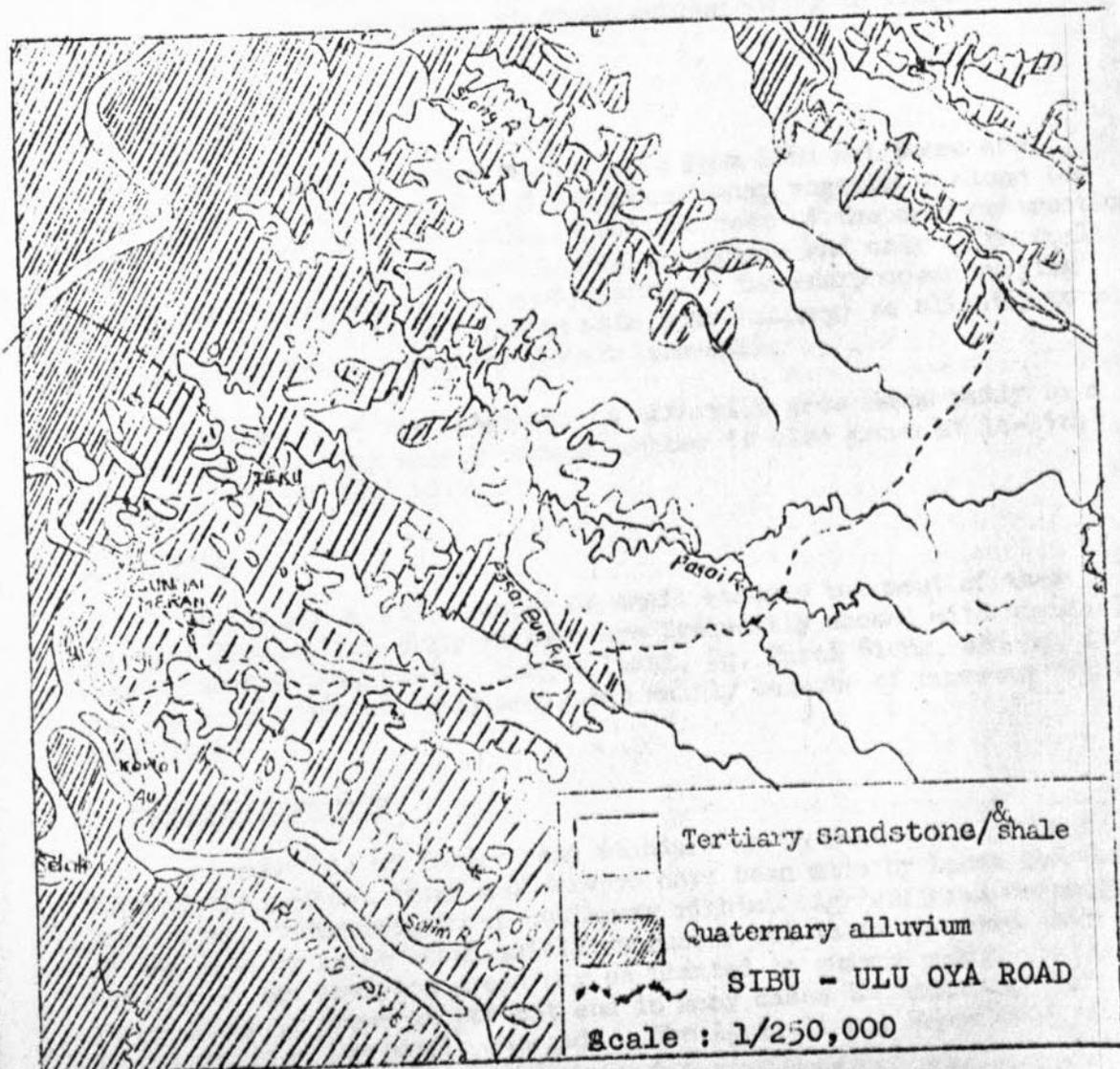
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## LOCATION OF AREA & GEOLOGY



## A. Introduction.

1. General description of Area.

The existing 'Oya Road' is little more than an earth track which extends north west of Sibul for over 33 miles to Batang Oya. The 'road' was formed two years ago and for the greater part of its length follows native tracks. The podsollic soils of the sandy areas and the clay soils of the shales are subject to erosion if unprotected by vegetation so that the track has been badly eroded and washed away in parts. Where the path crosses swamps and marshes bordering the Pasai Bun, Sungei Siong and Sungei Pasai, earth fill has been used to provide a working surface for the road. Elsewhere the path is tortuous and the proposed new feeder road will no doubt cut out many unnecessary loops and bends.

2. Topography and Geology

For the first seven miles of its route from Sibul the track is fairly level, crossing Quaternary deposits of peat, peaty alluvium and a few small patches of high level alluvium. There are one or two small ridges formed by outliers of the main Tertiary mass of Rejang Group geosynclinal sediments. From 7-25th miles the route is over gentle to steeply undulating hilly country with slopes of up to  $25^{\circ}$ . Around the headwaters of the Sungei Pasai Bun (13th-16th miles) and Sungei Pasai (19th-22nd mile) there are extensive peaty swamps. From 25th to 32nd mile the area is strongly dissected, with pronounced strike ridges along the very steeply folded beds of sandstone and grasperwacke, and narrow valleys along the thin outcrops of easily eroded shale. Slopes of  $30^{\circ}$ - $45^{\circ}$  are common. There are frequent rock outcrops on the steeper slopes.

The last mile of the road to the Oya is less steep and there are a series of low but distinct steps corresponding to fragments of river terraces.

3. Vegetation

Rubber gardens extend to 9th mile from Sibul but there are small patches of Alan forest and secondary swamp vegetation along the Sungei Seduan and up to 8th mile. Over the rest of the area destruction of the cover of primary jungle is almost complete and only a few small patches remain, mainly in the swampy areas. Secondary cover varying from dense growths of resam (ferns with some lallang) to slightly more open stands of older secondary forest (temudak).

Farmers from the longhouse at 14th mile grow swamp paddy to a limited extent. Very poorly managed rubber is also grown at 14-15th miles and also at 33rd mile.

4. Drainage

There are a large number of small streams but most of them are slow flowing and their valleys are frequently choked with vegetation causing swampy conditions. Sungei Pasai, Sg. Pasai Siong, and Sg. Pasai Bun are only intermittently navigable mainly because of numerous fallen tree trunks.

5. Purpose of Survey

A new road of feeder road standard is to follow the general line of the present track and surveys have been made by Lands and Surveys, preliminary to extinction of customary rights. Agricultural development of the area is to be based mainly on rubber but it is proposed that certain of the lowlying areas may be planted to swampy paddy. Little swamp paddy is grown at present and in many cases the existing Iban rubber gardens are poorly managed. The Agricultural Department proposes

to establish a small demonstration farm for extension purposes.

The aims of the survey may therefore be summarised as follows:-

- (a) To assess the capability of the area for rubber.
- (b) To map areas suitable for cultivation of swamp paddy or other diversified agriculture.
- (c) To indicate an area suitable for development as an agricultural station.

It was suggested that the area surveyed might be limited to a depth of  $1\frac{1}{2}$  miles on either side of the road but as the road route may differ quite considerably from the existing route the soils have been mapped in a broad belt up to 5 miles wide and an area of 168 square miles (107,651 acres) has been covered.

#### B. Land Use Capability

Five soil associations have been distinguished, covering the following areas.

Soil association	1. Alluvium	...	...	7,668	acres
"	"	2. Peat and Muck	...	19,485	"
"	"	3. Complex of Peat & Hills	...	10,079	"
"	"	4. Hill soils	...	48,182	"
"	"	5. Steep hill soils	...	22,235	"
				<hr/>	
				107,649	acres
				=====	

A sixth classification is shown on the map, that of Deep Peat, but the occurrence of this is localised almost entirely within the Bukit Lima Forest Reserve and outside the area affected by the road.

#### 1. Land suitable for rubber.

The areas considered suitable for rubber are the alluvium, the shallow peat, and the hill land. The area of alluvium is comparatively small and is mostly confined to the banks of the Oya. While rubber would grow well on these alluvial soils it might be advisable to plant other crops such as oil palm, fruit trees, kapok or vegetables on these well drained accessible sites, to provide a diversified farming economy.

The hill land comprising some 48,000 acres is for the greater part good rubber land. The slopes are generally not excessive, varying between  $15-25^\circ$ . The soils are well drained and both texture and structure are suitable for tree crops.

Much of the peat and muck soils could be utilised for rubber if adequate drainage measures could be undertaken but it might be uneconomic to embark on drainage projects for many of the small and scattered areas of peat in the area mapped as a complex of peat and hills.

#### 2. Land suitable for swamp paddy.

Although drainage of the shallow peat areas for rubber cultivation is a feasible proposition it is likely to be uneconomic. The less complete drainage necessary to cultivate swamp paddy might offer a more reasonable land utilisation. To avoid the dangers of a monoculture based on rubber and to provide a subsistence crop, development of swamp paddy land is strongly recommended. There are some 30 to 50 acres of swamp paddy grown in the vicinity of  $14\frac{1}{2}$  milestone and satisfactory yields of paddy are obtained.

### 3. Land unsuitable for agriculture

Undoubtedly rubber may be grown on much of the steep Hill land in this area but the expense of terracing, the dangers of erosion, and the shallowness of the soil preclude rubber plantation. Hill paddy farming in this area should be strongly discouraged. The clearance of the forest vegetation exposes the sandy incoherent topsoil and serious erosion occurs. The present system of Hill paddy cultivation involves clearance of scattered areas of hillside but if this large area of steep hill land were opened to cultivation by good road access the accumulated amount of erosion might well be disastrous.

There are numerous rock exposures (greywacke) in the steep clifflike valley sides and it may be that these could provide material for construction of the road.

### 4. Area suitable for an agricultural station.

The most important function of an agricultural station in this area will be supervision and administration of rubber planting, and demonstration of cultivation methods for crops such as wet paddy, fruit and vegetables. Consequently a fairly large area of flat land is required (50-100 acres) with a plentiful supply of water for irrigation. The most suitable site is at the 20th mile on the alluvial soil of the Pasai Siong. The chief disadvantage of the site is the fragmentation caused by the meanders of the river and it may be that several small wooden bridges may be required. On the other hand the soil is mainly well drained loam or clay loam on that particular site and there is a plentiful supply of irrigation water. The site is extensively forested (Temudak) and it is urged that a more detailed soil survey should be undertaken after clearance and before the agricultural station is laid out.

## C. Soils

### 1. Steep Hill Soils

The soils in this association are the most interesting though potentially the least valuable in the area. The steepness of the hills is due to internal folding of the strata and the resistant nature of the greywacke rock.

Three soil types may be distinguished within the association -

- (a) Red-yellow Podsollic soil on the ridge tops.
- (b) Skeletal soil on the steeper valley slopes.
- (c) Colluvial material in the valley bottoms.

Of these three the podsollic soil is the most extensive. A typical profile is described below.

ASSOCIATION: Steep Hill Soils.                      Vegetation: Temudak  
 SUBDIVISION: Red Yellow Podsollic Soil      Drainage: Imperfect.  
 LOCATION : 32nd Mile, Oya Road.

- |                |        |   |
|----------------|--------|---|
| A <sub>1</sub> | 0 - 1" | 10 YR2/2 (very dark brown) fibrous loam, slight platy tendency. Well developed root mat. Sharp change to  |
| A <sub>2</sub> | 1 - 5" | 25 Y5/2 (gray brown) sandy loam to loamy sand, single grain structure, consistence worse. Dry. Sharp change to  |
| B <sub>2</sub> | 5 - 7" | 10YR/6/4 (Lt yellowish brown) Sandy loam to loam slightly prismatic structure, close pattern of rusty ochre mottles and some spots of manganese. Consistence slightly hard. This horizon corresponds to the iron pan of the Temperate zone podsol and might be described as an orterde. |

- 7 - 20" 5 YR5/8 (Yellowish red) loam, well developed prismatic structure with cracks of prisms extending down to base of this horizon. Slight rusty mottling. A few sharp quartz grains occur. Toots and grayish clay skins along structure faces gradual change to ..
- 20"-22" 2.5 YR 3/6 (dark red) discontinuous line of small sandstone fragments iron coated and weakly cemented with iron.
- 22 - 35" 5 YR6/8 (Reddish Yellow) along loam massive but slight tendency, to angular blocky, a few sandstone fragments, some whitish mottles, moist, sharp change to

C. 35"+ Rotten graywacke.

Soils of this type develop under jungle vegetation but when the tree cover is removed the A horizons are very quickly removed and beheaded profiles are commonly found.

#### Hill Soils

In most respects the soils of this association are very similar to those of the steep Hill association though the sandy surface horizons are much less well developed and may be absent where the soils are predominantly derived from shale. The following profile is typical.

- 0 - 3" 10YR4/3 (dark brown) loam, crumb structure, well developed root mat, frequent woody roots at base of horizon. Sharp change to
- 3 -10 10YR 7/4 (very pale brown) sandy loam single grain, frequent fine roots, faint orange mottling, well marked boundary with
- 10'-40" 10YR 5/8 (Brownish Yellow) loam, angular blocky, occasional long vertical cracks penetrated by roots, faint rusty mottles, moist.
- 40"+ Reddish rock material strongly cemented by iron. Several thin quartz veins run through horizons. Concretions tend to be lenticular and botryoidal in a clay loam matrix.

Rubber grows well on this soil.

#### Alluvium

The soils mapped as alluvium on the accompanying map are not identical in different parts of the area. In general it may be said that the alluvium associated with the Oya is silting whereas that associated with the smaller streams such as the Pasai, is sandy.

Several profiles were dug in the various alluvial areas and wide variations were noted. Accordingly no typical profile can be cited. The dominant characteristics of the alluvium in this area are good drainage and a good open structure which should provide favourable medium for planting tree crops or vegetables.

#### Peat

The peat in this area is of an acid, woody type which may be fairly satisfactorily drained. Most of the rubber already grown along the first seven miles of the Sibul/Oya Road is planted on peat and in most cases the results are encouraging. The main difficulty of planting rubber on this material is the tendency for the trees to dry the peat out and if the peat has a depth greater than ten feet the tree roots become exposed by shrinkage of the peat. Fortunately there is only a limited extent of deep peat in this area and much of that is within the Bukit Lima Forest Reserve.

#### Appendix

Analytical results not yet available.

LEGEND

SOILS	CHARACTERISTICS	TOPOGRAPHY	LAND CAPABILITIES
ALLUVIUM	 Mainly well drained loam and sandy loam Seldom flooded	Flats along river and streams	Suitable for rubber, oil palms or fruit crops wet padi may be grown on Pasai alluvium
PEAT & MUCK	 Poorly drained, woody remains, up to 10' deep on clay Frequently flooded	Basin peat beyond the levees of Rejang and peaty swamps along stream	Suitable for wet padi but might be planted to rubber after drainage
DEEP PEAT	 Woody peat >10' deep always under water Alan forest		Unsuitable for agriculture Rubber would grow But is not recommended
HILL SOILS	 Red-yellow Podsolc and Skeletal Thin topsoil of sandy loam on loam Subject to erosion	Steep ridges with slopes >30° on grey wacke or sandstone, numerous outcrops	
HILL SOILS	 Similar to above but textures generally heavier (loam/clay loam)	Low hills mainly on shale Slopes 10°-30°	Suitable for rubber. Small amount of wet padi might be grown but comprehensive drainage scheme would be expensive
COMPLEX OF HILLS AND PEATY VALLEYS		Low hills similar to above but set in an interconnected flat bottomed, peaty valley	

SOIL SURVEY AREA No.28

SIBU-OYA ROAD  
Scale 1:50,000



Compiled By C. J. Grant Drawn By Lim Chio Chuang