

VI	ポンプ年経費	※	A 重油	
	燃料	150 PS	$\times 0.26 \ell / hv$	$\times 4320 hv$
				$\times 70 \text{円} = 11,800 \text{千円}$
	メンテナンス			1,500 千円
	計			13,300 千円

※ 24hv \times 90日 \times 2台 = 4320 hv

② 考 察

今後必要と思われる調査事項

I 地 質 調 査

主要構造物の基礎工に影響があるので、今回調査では資料が全々ないから、一連の地質調査を実施する必要がある。

II 地 図 の 作 成

現在5万分の1しかないから、少なくとも1万分の1の縮尺の地形図は必要である。

特に等高線は0.5 mまでは欲しい。

III 洪 水 位 (年間高水位)

Rhombe Swamp 地区での1~2ヶ所の観測資料が必要である。特にポンプ場設置か所の水位変化については年間を通じて欲しい。

IV 塩分測定及び侵入状況調査

特にポンプ場も含み数ヶ所観測が必要である。

(7) 湿 地 開 発

① 整備の方針

- 二期作の導入により耕作期間が短縮されるため、小型農耕機等の導入を考えた、若干の田面均平、圃場内用排水路、耕作道路等の整備が必要である。
- 工事用材料は工事費の節減ばかりでなく、工事完了後の維持管理が容易な、出来るだけ現地で入手可能な材料を使用するようにした方が良いと思われる。
- 収穫物の流通及び受益農民の生活向上も考慮し PORT LOKO~GBENTI 間既設道路の改修(主要幹線道路)とこれに連結する地区内幹線道路を整備する。主要幹線道路は舗装道路にするのが望ましいと思われる。
- 収穫物の運搬や各集落間の連絡、生活道路等としての役割を果す地区内幹線道路を新設したい。なお本路線は GBENTI から出来るだけ地区内集落を通り KATONGA に通

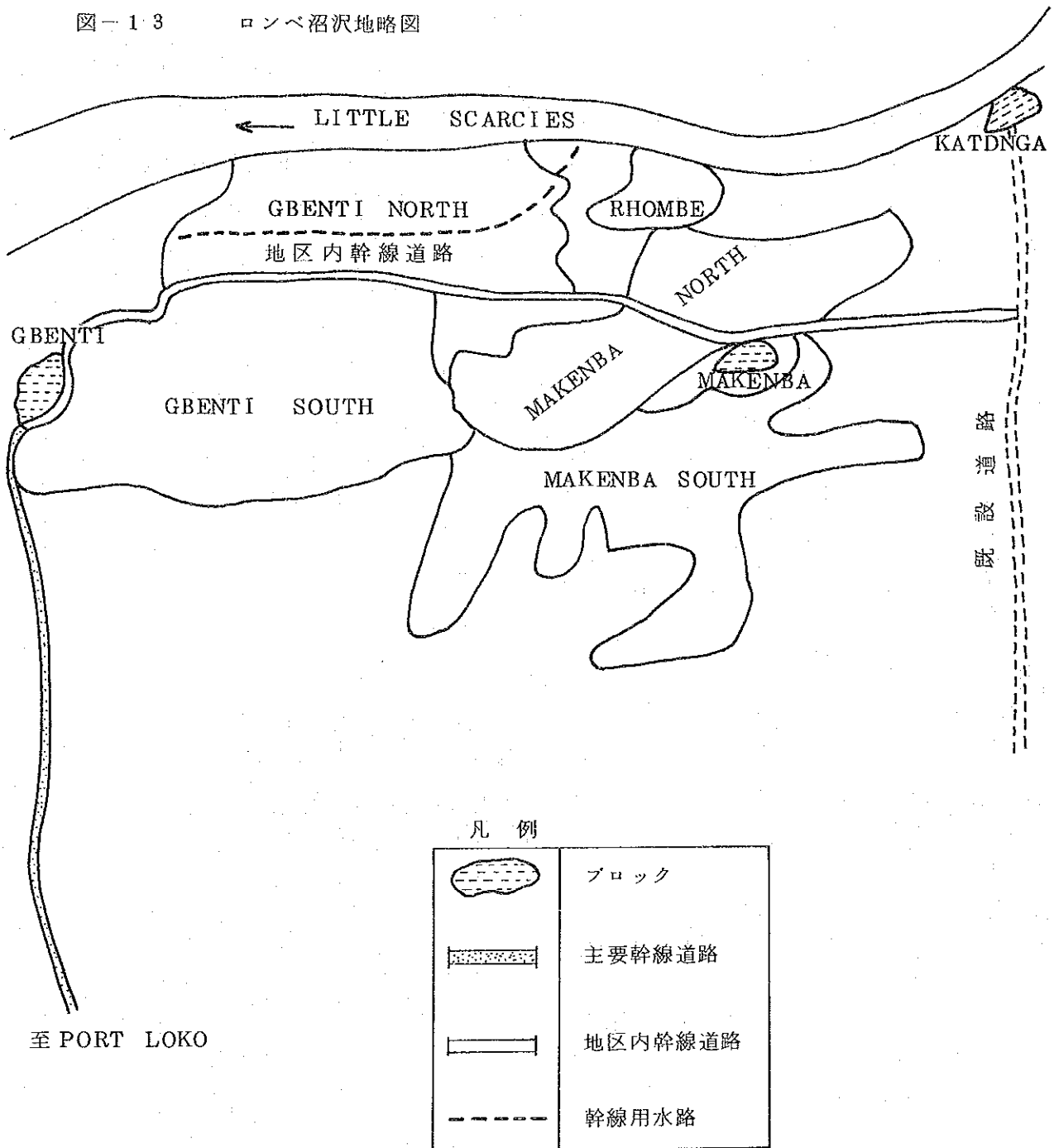
ずる道路に連結させるのも一案であろう。

- 主要幹線道路，地区内幹線道路の方線，幅員，高さ等は詳細調査時点で決定されたい。

② 整備の概要

GBNTI NORTH 地区計画概要

図-13 ロンベ沼沢地略図



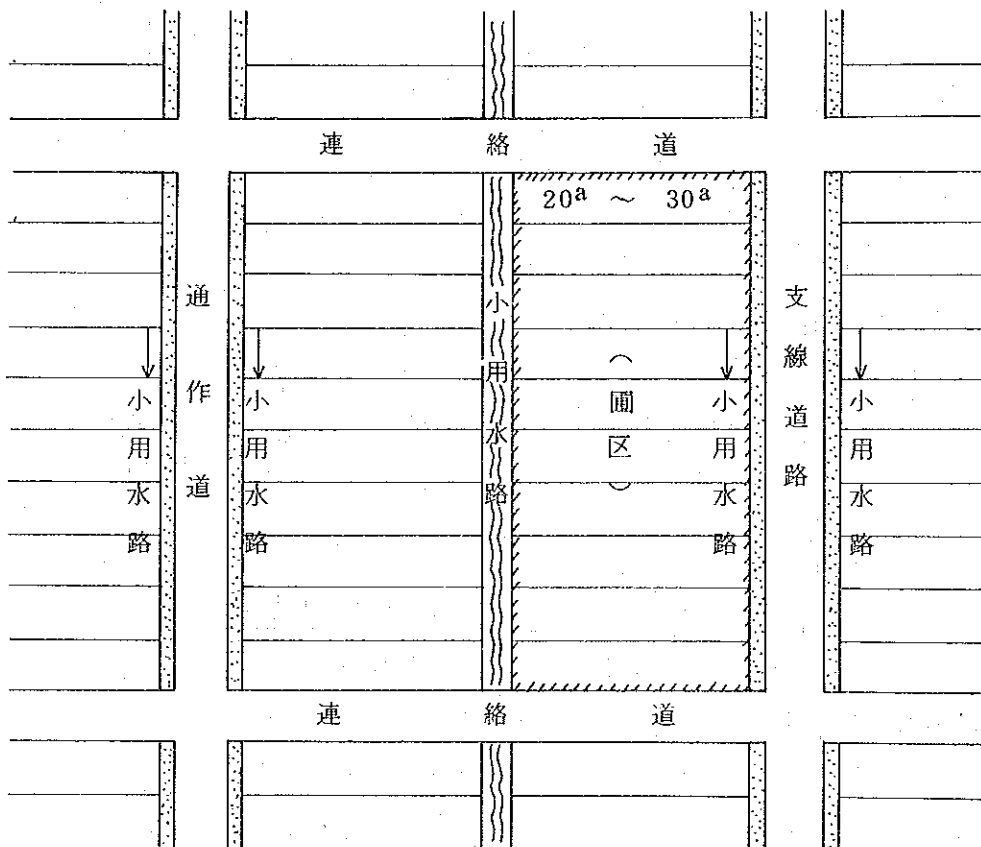
(注) 詳細は別添図面参照のこと

a 区画整理

- 小型農耕機の導入，田面に適正なタン水深を与える等の目的から若干の表土均平が必要と思われる。
- 農耕機の作業能率，用水の適正配分を考えると1区画の大きさ（耕区）は20a（20m×100m）～30a（30m×100m）程度が適当であろう。
- 圃区内は全んど水平であり，用水の効率的使用等を考えると，工事費は若干大きくなるが，小用排水路は分離した方が望ましいと思われる。
- 圃場内連絡道路の間隔や用排水の操作，関係農家の経営面積（計画後の希望2～3ha）を考えると，耕区10枚程度で1圃区位と考えるのが一般的標準と思われる。

図-14

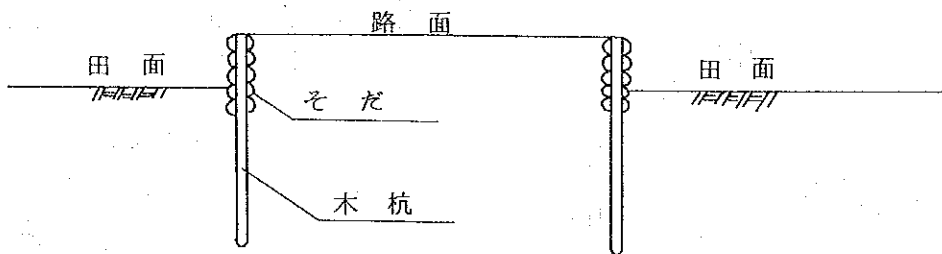
「 区 画 整 理 の 一 例 」



b 圃場内の農道整備

- 圃場内に支線農道，連絡道，通作道を配備し地区内幹線道路と連結し，耕作等の便を計る。
- 圃場内道路幅は使用農耕機，将来の交通量とも関係あるが概ね 3～5 m 程度が考えられるだろう。
- 圃場内道路は工事費が安価で，現地で維持管理が容易な構造を考えた方が良いでしょう。
- 雨期の湛水による法面等の侵蝕を防ぐため，現地で容易に入手出来る材料を利用した防護工が必要であろう。

図-15 < 圃場内道路の一例 >

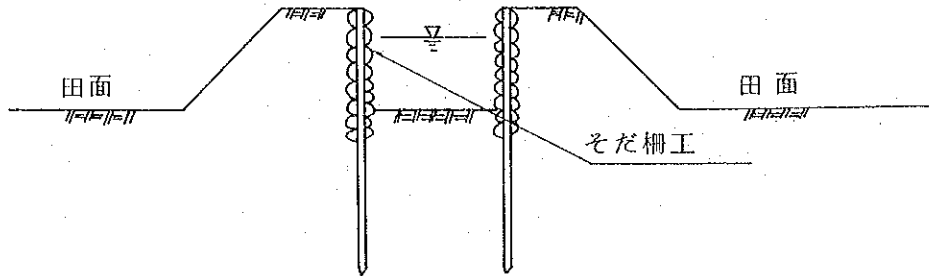


c 圃場内用排水の整備

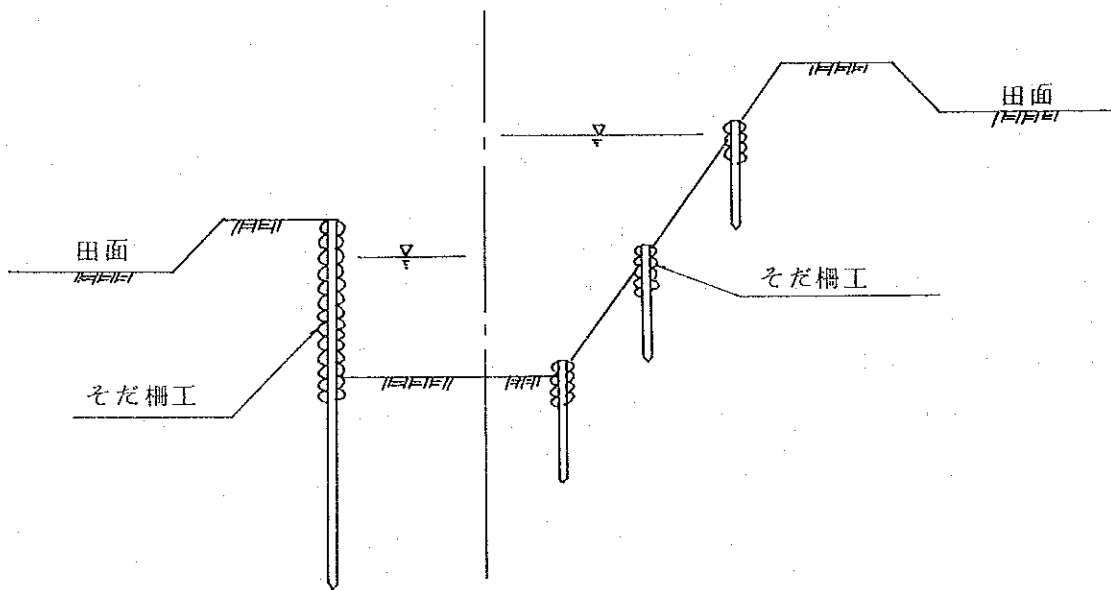
- 用水量の適正使用，地形勾配がほぼ水平なことを考えると用排分離が望ましいと思われる。
- 配水計画は，水稻の栽培期幅，農耕機の作業能率等はもちろんのこと特に現地農民の労働力や作業能力を十分考えて立てるべきと思われる。
- 用排水路は工事費安価で，維持管理が容易に出来る構造（Ex. 土水路）とすべきだと思われる。
- 農道と同じように，雨期の湛水による法面当の侵蝕を防ぐため現地で容易に入手出来る材料を利用した防護工が必要と思われる。

図-16 < 小用排水路の一例 >

(用 水)



(排 水)



6. 今後必要な検討事項

(1) 開発計画

- ① ロンベ地区全体開発計画と第1次開発地域の関連
- ② 第1次開発地域の範囲の確定
- ③ 地形図作成の必要性 1 / 10,000 (コンター 0.5 m)
- ④ 用水源の位置と規模

(2) 農業経済

- ① 使益面からのチェック
- ② 市場の確保と出荷体制の整備
- ③ 国家財政からの開発計画経費の規模設定

(3) 栽培及び土壌と水質

- ① 改良品種の導入計画
- ② 二毛作導入のための留意点
 - i 乾期用水の塩分濃度の許容範囲
 - ii 用水期間の設定
 - iii 小型営農機械の導入の可否(含技術の普及方法等)
 - iv 営農技術の普及方法
 - v 乾期の害虫防除
- ③ 土 壌
土壌の性質をつかむための土壌調査
- ④ 水 質
リトルスカルシー川関係の水質調査(塩分濃度調査)

(4) 水文及び基盤整備

- ① 取水予定地点の塩分濃度調査
- ② 開発地域の水位変動の実態
- ③ 開発地域の降雨量蒸発散量

- ④ 主要構造物地点の地質調査
- ⑤ 減水深調査
- ⑥ 工事費積算の基礎資料
- ⑦ 集落別農業従事者数の把握

付 属 1

1981年2月10日

ロンベ沼沢地農業開発計画事前調査

報 告 書

(シエラレオーネ共和国)

I 調査の目的

シェラ・レオーネ政府の要請により、日本国政府は、国際協力事業団（JICA）を通じ、ロンベ沼沢地の農業開発計画技術協力のための事前調査団を派遣した。

調査団は1981年2月1日から2月10日までシェラレオーネ国に滞在し下記の事項について調査を実施した。

- i) シェラレオーネ政府関係者とロンベ沼沢地農業開発計画に対する日本の技術協力の可能性について協議
- ii) シェラレオーネ国の国家計画とロンベ沼沢地農業開発計画の関連性及びこの位置づけ調査
- iii) F/S として取り上げることが出来るかどうかの技術的、経済的な調査

II 確認の提言

1. 確認の提言

- 1) シェラレオーネ政府は米の自給及び将来の輸出を考慮し、ロンベ沼沢地における稲作栽培を中心とした農業開発計画に新プロジェクトとして、プライオリティーをおいている。
- 2) ロンベ沼沢地農業開発計画事業は農林省と開発省の協同事業として1981年からの国家5カ年開発計画に取り上げ実施したいとしている。
- 3) 本計画については過去に数回調査がなされているが、計画が実施に移されたことはない。
- 4) 本計画を実施するためには、資金融資機関である、アフリカ開発銀行がF/S調査の必要性を述べていると共にアフリカ開発銀行によりF/S調査のT/Rが作成されている。
- 5) 日本国政府としては、シェラレオーネ政府とアフリカ開発銀行との協議により、協力方法の正式過程を経てF/S調査を実施することができる。

2. 農業技術的な観点からの問題点

1) 便益の検討及び経済性の問題点

- i) 国内の平均単収はモミツキでSwamp Land Riceが1400~1500kg/ha
Upland Riceが1,200~1,300kg/haとなっている。
- ii) 一方生産者米価はSLPMB管理のもとで1979~1980年が7レオン/ブッシェル
1981年8レオン/ブッシェルで西アフリカ諸国ではMaliに次いで低価格である。

iii) 従って、便益を考慮した際、計画の事業費にもよるが、現況の低収量水稻1期作に対し、事業実施後の増収と2期作移行の可能性を充分考慮する必要がある。

2) 二期作導入を可能とする営農の改善

i) 3月～5月の塩分濃度の高い用水の流入を防ぐ。

ii) 田植後1ヶ月、出穂前後2ヶ月の用水として必要な水量を確保する。

この場合の水質は $1.5 \text{ m} \cdot \text{mho} (\text{E} \cdot \text{C})$ 以下が望ましい。

iii) 適正な水管理、施肥方法、病虫害防除、栽培方法が高収量品種の導入に不可欠なので農民に対するTrainingが必要である。

iv) 現在の地力は洪水による一種の流水客土に負うところが多いので、雨期での稲作については現行の深水栽培を継続していく。

v) 二毛作には適期の耕耘、田植が重要である。

畜力が利用出来ない場合は小型農耕機の導入が必要である。

vi) 高収量品種の導入には、肥料、農薬等の生産資材が不可欠である。

それら生産資材の保管及び供給方法についての考慮が必要である。

vii) Tidal Swampにおける二毛作のデータがないので、受益地内にいくつかの試験地を設け、試作及び展示栽培をする必要がある。

3) 土木的観点からの問題点

i) 一般事項

- o Rhombe 地区全体を見て、土木的に開発可能と考えられる。(A = 20,000) エーカー
- o 国家財政規模、地区内の農業技術等の観点から考えると、全体開発の同時着手は不可能であろうと考えられる。
- o 全体事業計画を示すと共に、第1次開発として、地区を限定して事業実施に踏み切ることが妥当であろうと考えられる。
- o 第1次開発と併行して、周辺地域への教育波及効果、社会資本の充実に考えながら全体事業計画の実施を図るのが妥当であろうと考えられる。

ii) 全体事業計画

1. Rhombe 地域全体を対象とするが、段階的实施が望ましいと考えられる。
2. 事業目的としては二期作を主体とした耕作が可能となるような用排水の手当をすることである。
3. 具体的には用水源として次の3つが考えられるであろう。

- (1) ダム又は取水工の建設（上流）
 - (2) 既存沼沢地の活用
 - (3) ポンプ動力の導入
4. ダム及び取水工が将来の維持管理の面から考えて最適であろうと判断している。
5. ダム建設の場合、電源開発も併せて期待出来る一方、ポンプ動力の導入については水力電源開発が前提となるであろう。
6. 主要構造物
- ・ ダム又は取水工
 - ・ 用排水路
 - ・ 附帯構造物
 - ・ 河川堤防，開門等

但し、河川堤防については農業開発と分けて別途実施することが望ましい。

iii) 1次開発計画

1. 地区選定

Rhombe 地区は大別して次の三つの型に分けられるだろう。

- (1) 河川デルタ地区
- (2) 内陸低湿地区
- (3) 内陸 upland 地区

この中で(1)河沿デルタ地区の "GBENTI NORTH" を対象としたい。

その理由は

- (1) 既耕地が多く、人口も他に比べ集中している。
- (2) 水上交通の中心となり得、陸上交通と結びつけることにより Rhombe 地区全体開発の核となり得るだろう。
- (3) 地域住民の農業経験、及び開発に対する意欲が高いと判断された。
- (4) シェラ・レオーネ政府も期待している。

2. 地区の内容

(1) 目的

- 地域全体の農民教育の普及も含めて、高度な用排水管理も含めた、二期作栽培、二毛作栽培が可能な基盤を作ることである。
- 農村における道路、住宅、教育等の近代的社会資本を充実する。

(2) 対象地区

GBENTI NORTH 3,240 エーカー（内現況耕作地 2,300 エーカー）の中より国家予算規模に見合う適当な面積，地区を定めるものとする。

選定については今後の調査にまかせたい。

(3) 事業内容

○ 乾期における作付を可能にする用水源としては

- ① ディーゼルエンジンによるポンプ揚水
- ② 沼沢地からの導水
- ③ ダム，取水工からの導水

が考えられる。

○ 用排兼用水路網の充実

事業費と対象面積及び第 1 次開発のモデル的意味も考え合せると ①のポンプ揚水が妥当であろう。

○ 圃場整備

二期作の導入により耕作期間が短縮されるため小型農耕機械の導入を考えた若干の田面均平等，圃場の整備が必要であろう。

○ 営農計画

二期作を目的とした近代的農法を研修させた農民を入植させることが望ましく，一戸当り耕作面積は 2 ha 以上が望ましいと思われる。

さらに研修センターの建設も併せ考える必要があるだろう。

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

P. O. BOX 216 MITSUI BLDG
2-1, NISHI-SHINJUKU, SHINJUKU-KU TOKYO
160 JAPAN

February 10th, 1981.

The Hon. Minister of Agriculture and Forestry,
Tower Hill,
Freetown,
Sierra Leone.

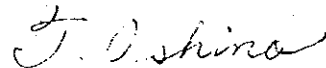
Dear Sir,

RE: THE RESULTS OF JAPANESE PRELIMINARY
SURVEY FOR THE RHOMBE SWAMP AGRICULTURAL
DEVELOPMENT PROJECT

I have the pleasure to submit herewith the "REPORT ON PRELIMINARY SURVEY, RHOMBE SWAMP AGRICULTURAL PROJECT, THE REPUBLIC OF SIERRA LEONE", containing the outline of the results of the survey and suggestions for the next phase of the procedure, on behalf of the Japanese Preliminary Survey Team for the Rhombe Swamp Agricultural Development Project in the Republic of Sierra Leone.

I take this opportunity to express my heartfelt thanks for your active cooperation extended to us and I also wish that the friendship and co-operation between the Republic of Sierra Leone and Japan will be strengthened further.

Yours faithfully



Tomoyuki Oshino
Leader of Japanese Preliminary Survey
Team for the Rhombe Swamp Agricultural
Development Project

THE REPORT ON PRELIMINARY SURVEY

RHOMBE SWAMP AGRICULTURAL DEVELOPMENT PROJECT

THE REPUBLIC OF SIERRA LEONE

1. OBJECTIVES OF THE SURVEY

In response to the request of the Government of the Republic of Sierra Leone, the Government of Japan decided to send a preliminary team, through the Japan International Cooperation Agency (JICA), for technical cooperation for the planning of the Rhombe Swamp Agricultural Development Project.

The team stayed in Sierra Leone from February 1st to February 10th, 1981 and conducted studies with the following objectives:

- i) To discuss with the authorities concerned of the Government of the Republic of Sierra Leone on the contents of her request for possible technical cooperation by the Government of Japan to the Rhombe Swamp Agricultural Development Project.
- ii) To study the significance of the scheme of the Rhombe Swamp Agricultural Project on not only the economic development but also on the overall national development programme of Sierra Leone.
- iii) To study the project for further technical and economic investigations to be taken up as the feasibility study.

II. FINDINGS AND SUGGESTIONS

1. General

- 1) The Government of the Republic of Sierra Leone has given top priority to the implementation of the Rhombe Swamp Agricultural Development Project within her new development programme.
- 2) The strategy aims at increasing the agricultural production, especially in rice, which would be exported abroad after reaching self-sufficiency, and developing the rural area.
- 3) Investigations and Surveys for the Rhombe Swamp Agricultural Development Project have been done several times, but the actual work on the project has not been implemented.
- 4) The African Development Bank, the main financial organization of the project, suggested the necessity of a final feasibility study, prior to the embarkment on the project.

5) The Japanese Government will assist to make the feasibility study reports of the project, after clearing the cooperation procedure formalities among the African Development Bank, the Government of Sierra Leone and the Government of Japan.

2. Agronomic and agro-economic study

1) Agricultural Background

1) Average yield of paddy rice is 1.4 - 1.5 ton per ha. in swamp land and 1.2 - 1.3 ton per ha. of upland rice in the whole country.

2) Producer's price of paddy rice under the control of SLPMB is 7 Leones per bushel in 1979 - 1980 and 8 Leones per bushel in 1981, which is ranked the lowest price, higher than only Mali among all West African countries.

3) Therefore, when the benefit of the project is considered, it is essential to study the possibility of double cropping to achieve higher production of paddy rice, taking off from present single cropping.

2) The Rhombe swamp is considered as a high potential production area for paddy rice and if the following countermeasures are provided, double cropping of paddy rice can be introduced.

1) Prevention of the intrusion of saline water into the project area during the dry season cropping.

2) Provision of irrigation water in dry season cropping

3) Training of the farmers to adopt the proper water management, fertilizer application and plant protection standards for the cultivation of high-yielding varieties in dry season cropping.

4) Introduction of simple machinery such as small power tillers for plowing and puddling of the field on optimum time.

5) Introduction of simple complementary mechanisation such as for harvesting and threshing to facilitate the timeliness of field operations and also eliminate the high cost on labour otherwise incurred.

6) Provision of necessary agricultural inputs and storage facilities.

7) Data collection on the performance of double cropping cultivation of paddy rice on several plots in benefitted area prior to the implementation of the whole project.

3) Civil engineering study

1) General

1) Considering this project from civil engineers' point of view, we get the conclusion that it is feasible to develop the whole of the Rhombe Swamp Area (totaling approximately 20,000 acres).

2) It is impossible or inadvisable for the whole Rhombe Swamp Area to be developed simultaneously or under a single phase development project.

The reasons are:

- i) the limitation of the Sierra Leone Governmental budgets
- ii) the present level of social development in the area concerned
- iii) the present level of agricultural technique in the area concerned

Therefore, the development project should be set on phase by phase.

3) It is necessary not only to propose the Whole Rhombe Swamp Area Agricultural Development Project (hereinafter referred to as "Whole Project") but also at present to show one of possible ideas as the First Stage Development Project of Rhombe Swamp (hereinafter referred to as "First Project") as the first phase of the "Whole Project".

4) While proceeding ^{with} the "First Project", the Sierra Leone Government might try to promote both the spreading of modernized Agricultural techniques and other knowledge among the farmers and filling-up of the infrastructure such as schools, roads, bunds and so on in the area concerned. Only with such governmental endeavours may the "Whole Project" become a possibility and a reality.

2) Whole Project

1) The objectives of the "Whole Project" will be:

- i) To construct the irrigation and drainage systems which enable the farmers to achieve the so-called double cropping of rice

or rice and other crops in the area concerned.

- ii) To develop the modernized infrastructure such as roads, housing, education and so on, especially focused on the rural area.

2) The Procedure

The source of water resources for irrigation in dry seasons may be obtained by

- i) Construction of dams or intakes at the upper reaches of the Little Searcies river
- ii) Rational utilization of inland swamps and leading the water from these into the riverine land
- iii) Introduction of irrigation pumps

The "Construction of dams or intakes" is the most appropriate for the "Whole Project" because of the long-term maintenance and operating costs which are cheaper than those associated with the "Introduction of irrigation pumps". Once dams are constructed, the development of hydro-electricity may be also anticipated.

3) The First Project

1) Selection of development site

Generally, the Rhombe Swamp Area is divided into three kinds of area.

- i) Riverine lands
- ii) Swamps Area
- iii) Uplands

With consideration of the nature of the "First Project", the following conditions should be satisfied for the "First Project".

- i) Existence of a large cultivated area
- ii) Existence of a fairly heavy population in the area
- iii) Existence of many farmers who have intentions of advancing their own agricultural techniques and also increasing their production.
- iv) the possibility in future for the area to become one of the economic, education, market and transportation "cores" of the

whole Rhombe Swamp Area

- v) high priority attached to the development of the area by the Sierra Leone Government.

2) The outline of the "First Project" might be as below

i) Objectives

- a) To improve and construct the agricultural structure which enable the farmers double cropping with high level managements of irrigation and drainage water
- b) To educate the farmers high level agricultural knowledge in the whole Rhombe Swamp Area

ii) Area and Location of the Project

The condition written before should be satisfied. In addition to this, the cost of the project should be suitable to the amount of money of the budget of the Sierra Leone Government.

The details about the area and location of this project site should be made clear.

iii) Projects

The source of irrigation water during dry seasons may be obtained by the same resources referred already at the paragraph of the "Whole Project". However, considering the scale of total cost and small area of this project and taking into account the piloting nature of the project, we prefer the introduction of pumps with diesel engines.

In addition to irrigation, consolidation of paddy field preparing for introduction of small agricultural machinery is also necessary.

**MEMBERS LIST
OF PRELIMINARY SURVEY TEAM
FOR RHOMBE SWAMP AGRICULTURAL DEVELOPMENT PROJECT
IN THE REPUBLIC OF SIERRA LEONE**

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Leader	Mr. Tomoyuki Oshino	Deputy Director, Construction Dept., TOHOKU Regional Administration Office, Ministry of Agriculture, Forestry & Fisheries
Drainage	Mr. Yokichi Yoshida	Technical Officer, Design Div., Construction Dept., KANTO Regional Administration Office, Ministry of Agriculture, Forestry & Fisheries
Swamp Development	Mr. Takashi Ohta	Chief, Technical Section, Land Consolidation Div., NIIGATA Prefectural Construction Technical Center
Irrigation	Mr. Kazuyuki Kobayashi	Chief of 1st Design Examination Section, Design Div., Construction Dept., Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry & Fisheries
Agro-economy	Mr. Isao Hirayama	Deputy Director, Regional Planning Div., Planning Dept., HOKURIKU Regional Administration Office, Ministry of Agriculture, Forestry & Fisheries
Soil Science	Mr. Yasuie Suzuki	Technical Officer, Resources Div., Planning Dept., TOKAI Regional Administration Office, Ministry of Agriculture, Forestry & Fisheries
Agronomy	Mr. Sataro Yazawa	Senior Instructor, Uchihara International Agricultural Training Center, Japan International Cooperation Agency
Coordination	Mr. Yoshihiko Nishimura	Officer, Technical Affairs Div., Agricultural, Forestry & Fisheries Planning and Survey Dept., Japan International Cooperation Agency

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付属 II

SIERRA LEONE TERMS OF REFERENCE FOR A FEASIBILITY STUDY OF RHOMBE SWAMP RICE PROJECT

I. INTRODUCTION

1.01 The proposed study was submitted to the African Development Bank in March, 1975 for consideration and financing. The study aims at the development of the Rhombe Swamp Area along the Little Scarce River north of Freetown for rice production.

1.02 At present rice is grown only in the higher-lying riverian areas of the Rhombe Swamp Area. It is believed that the lower-lying areas could offer great potential for rice growing if adequate drainage and flood control measures were provided. The situation would be further improved with an additional provision of irrigation facilities.

1.03 The MRT Consulting Engineers Ltd conducted some hydrological and engineering studies in 1971/72 and concluded that from the engineering point of view drainage and irrigation are possible in the project area. However, the study would have to be re-examined and up-dated.

1.04 Other studies have been made, though not in detail, including vegetation survey, land-use survey, and topographical survey. Brief notes on some soil types and maps, serial photographs and other information relevant to the project are also available.

1.05 Notwithstanding, in order to justify the implementation of the project, a feasibility study should be undertaken to select the most suitable and favourable areas for the project, and to establish the technical (agronomic and engineering) and financial feasibility and the economic viability of the project.

1.06 It is intended to develop the project in phases with phase I implemented as a pilot scheme.

II. OBJECTIVES

2.01 The objectives of the study would be as follows:

- i) To identify the most suitable areas in the Rhombe Swamp area for rice production, and to map plan out an area for project implementation and delineate an area from within such mapped plan out project area for a pilot scheme ;

- ii) To determine the technical and financial feasibility of the project, and to identify the various project components and their integration to evolve a viable project ;
 - iii) To prepare a comprehensive plan for project development and its implementation in phases ;
- and iv) To make recommendations on the organization and management of the project.

III. TERMS OF REFERENCE

The study should include, but not limited to, the following headings which should be discussed in detail :

3.01 General Situation in the Project Area

- i) Climate including rainfall, temperature, relative humidity evaporation rates and wind velocities etc... ;
- ii) Vegetation, topography and soils ;
- iii) Population including growth, age distribution, farm families farm labour availability etc... ;
- iv) Land tenure system ;
- v) Crop production including production techniques, yields and total output, varieties and seed multiplication programmes, distribution of farm inputs and availability of farm machinery services, crop pests and diseases, marketing and processing facilities and extension services ;
- vi) Infrastructure including road and agricultural track network, transport and communications, and availability of other social services eg. health centres, schools and drinking water.

3.02 The Project

- i) Soil Survey : Make a semi-detailed soil survey to cover about 25,000 acres and prepare a soil map of a scale 1:16,000 ;
- ii) Engineering Studies : Review the engineering and hydrological studies completed by the MRT Consulting Engineers Ltd. to confirm their findings and to establish if further details would be required for project implementation ;
- iii) Designs : Prepare preliminary designs for flood control, drainage and irrigation systems and access roads. Indicate the phasing of the works and prepare cost estimates for each phase.
- iv) Land Development : On the basis of the soil survey, determine the total area suitable for rice production and make recommendation with

respect to the total acreage to be included in the project. Make recommendations on the development of the project land in phases with phase I as a pilot scheme and state the physical, financial, economic and managerial criteria used for the development phasing. Describe development methods indicating machinery and other investment requirements and estimated costs.

- v) Farm Production : Determine the number of farmers/farm families and groups that would participate in the project and describe the production techniques to be adopted. Make recommendations on paddy varieties to be used, the seed multiplication programme to be adopted, supply of farm inputs including farm machinery, and pest and disease control measures. Determine the cost of production.
- vi) Extension Service : Examine the extension service system in the project area and describe an organisation and methods to be used to supervise the farmers and to train them in modern farming techniques.
- vii) Agricultural Credit : Determine the credit requirements of project farmers and whether existing institutional arrangements are adequate to meet those requirements. Suggest methods of improvement, if necessary, of existing arrangements.
- viii) Processing : Determine the requirements in processing facilities and prepare investment and installation schedules and cost estimates ; describe the processing organization and production methods.
- ix) Marketing : Make yearly projections of rice yields and physical output and describe the organizational arrangements for the purchase, transport and marketing of the project output giving the estimated cost involved. Discuss the prevailing pricing policy of the Government and comment on the effects of any future price changes including farm-gate, import and export prices. Discuss the rice supply and demand situation of the country as a whole and comment on how they would affect the marketing of the project output.
- x) Infrastructure : Examine the existing infrastructure eg. roads and agricultural tracks, in the project area and assess their adequacy and the need to construct new ones. Give cost estimates of all new infrastructural constructions including maintenance costs. Indicate how they would be maintained during and after project implementation.
- xi) Cost Estimates : Project costs should be grouped under a) Capital investment costs, for example land development, buildings, farm machinery and equipment, vehicles, plant and equipment, and infra-

付 属 Ⅲ

関 係 者 名 簿

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M.M. Bangura	Deputy Secretary, Ministry of Agri. & Forestry
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収 集 資 料 リ ス ト

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1	Land in Sierra Leone: A Reconnaissance Survey and Evaluation for Agriculture (Coloured maps and plates)	U.N.D.P. and F.A.O.
2	Land Resources Survey; Vegetation and Land Use in Sierra Leone: A Reconnaissance Survey AG:DP/SIL/73/002 Technical Report 2	"
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4	Land Resources Survey; Proceedings of the First National Remote Sensing Seminar on Land Resources Technical Report 3	"
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16	Proposal for the Phombe Swamp Feasibility book Study	Tate & Lyle Technical Services Ltd.
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22	Rhombe Swamp Engineering Feasibility Study volume 3 Plan Supplement	"
23	Rhombe Swamp Engineering Feasibility Study volume 1 Main Report	"
24	Tide Tables 1981	Sierra Leone Government
25	Priority Project for Financing from OPEC	
26	Rice Statistics Yearbook (Abstracts)	West Africa Rice Develop- ment Association
27	Occasional Paper ; Prospects of Self- Sufficiency in Rice in West Africa No.1	"
28	Occasional Paper ; Types of Rice Cultivation in West Africa No.2	"
29	Rice Development Strategies WARDA/SD/79/8 Rice Policy in Sierra Leone	"
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33	Gbinti S 1:50,000	Directors of Overseas Surveys
34	Rhombe Swamp Project S 1:50,000	
35	Rice Statistics Yearbook [Abstracts]	West Africa Rice Develop- ment Association
36	Review and Planned Programmes of the Agricultural Sector	The Ministires of Agri- culture & Forestry and Natural Resources
37	Agricultural Statistical Survey of Sierra Leone 1970/71	Central Statistics Office
38	National Development Plan 1974/75 - 1978/79	Ministry of Development and Economic Planning Central Planning Unit
39	Estimates of Revenue and Expenditure 1980 - 81	Government of Sierra Leone

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