

【資料 編】

- 資料 - 1 調査団員・氏名
- 資料 - 2 調査行程
- 資料 - 3 関係者（面談者）リスト
- 資料 - 4 討議議事録(M/D)
- 資料 - 5 事業事前計画表（基本設計時）
- 資料 - 6 参考資料 / 入手資料リスト
- 資料 - 7 初期環境評価（IEE）に係わる
コメントに対する回答
- 資料 - 8 MCTTD による IEE 調査結果

資料 - 1 調査団員・氏名

(1) 基本設計調査現地調査

現地調査の調査団員の構成は、以下のとおりである。

氏 名	担 当	所 属
武下悌治	総 括	国際協力機構 フィジー事務所
金川 誠	計画管理	国際協力機構 経済基盤開発部 運輸交通・情報通信グループ 運輸交通・情報通信第二課
越智 裕	業務主任	株式会社エコー
生田目信	港湾土木	株式会社エコー
酒井 均	環境社会配慮	有限会社プロジェクト環境
青山高久	施工計画 / 積算	株式会社エコー
村瀬博一	自然条件調査	株式会社エコー
土田 肇	機材計画	株式会社エコー
伊藤雅文	海運需要分析	株式会社エコー
山本雄平	業務調整	株式会社エコー

資料 - 2 調査日程

現地調査の調査日程は、以下のとおりである。

【官団員】

日 程	月 日	曜 日	官団員		コンサルタント
			武下 倭治 総 括	金川 誠 管 理	越智、生田目、村瀬、酒井、 土田、青山、伊藤、山本
1	6/16	月			成 田
2	6/17	火		成 田	ナンディ ナンディ タラワ
3	6/18	水		ブリスベン ブリスベン	現地調査 / 資料収集
4	6/19	木	ナンディ タラワ 表敬・協議	ナンディ ナンディ タラワ 表敬・協議	表敬・協議
5	6/20	金	協 議	協 議	協 議
6	6/21	土	現地踏査	現地踏査	現地踏査
7	6/22	日	資料整理	資料整理	資料整理
8	6/23	月	ミニッツ協議・署名	ミニッツ協議・署名	ミニッツ協議・署名
9	6/24	火	タラワ ナンディ スバ	タラワ ナンディ スバ	現地調査 / 資料収集
10	6/25	水	大使館・JICA報告	大使館・JICA報告 スバ ナンディ	現地調査 / 資料収集
11	6/26	木		ナンディ 成 田	現地調査 / 資料収集
12	6/27	金			現地調査 / 資料収集
13	6/28	土			現地調査 / 資料収集
14	6/29	日			現地調査 / 資料収集
15	6/30	月			}
34	7/19	土			現地調査 / 資料収集
35	7/20	日			現地調査 / 資料収集
36	7/21	月			現地調査 / 資料収集
37	7/22	火			現地調査 / 資料収集
38	7/23	水			現地調査 / 資料収集
39	7/24	木			タラワ ナンディ スバ
40	7/25	金			大使館・JICA報告 スバ ナンディ
41	7/26	土			ナンディ 成 田

キリバス国ベシオ港拡張計画基本設計調査

【コンサルタント団員】

日 程	月 日	曜 日	コ ン サ ル タ ン ト						
			越智 裕 業務主任	生田目 信 港湾土木	村瀬博一 自然条件	酒井 均 環境社会	土田 肇 機材計画	青山高久 施工積算	伊藤雅文 海運需要
1	6/16	月	成 田			成 田			
2	6/17	火	ナンディ ナンディ タラワ			ナンディ ナンディ タラワ			
3	6/18	水	港湾公社 運輸省表敬・打合せ 現地踏査			港湾公社 運輸省表敬・打合せ 現地踏査			
4	6/19	木	外務省、運輸省、 港湾公社表敬		再委託調査打合せ 事務所設置		ナンディ タラワ		
5	6/20	金	環境省協議 港湾公社打合せ		再委託調査打合せ		現地踏査 資料・情報収集		
6	6/21	土	入港船舶調査 荷役状況調査			入港船舶調査 荷役状況調査			
7	6/22	日	荷役状況調査 ミニッツ打合せ		荷役状況調査 資料整理		荷役状況調査 資料整理		
8	6/23	月	ミニッツ協議・署名 資料作成		再委託作業監理 資料収集		資料・情報収集		資料・情報収集 連絡・調整
9	6/24	火	港内踏査 資料収集		再委託作業監理 資料収集		成 田 インチョン インチョン		資料・情報収集 連絡・調整
10	6/25	水	現地調査 資料収集		再委託作業監理 資料収集		ナンディ		資料・情報収集 連絡・調整
11	6/26	木	現地調査 資料収集		再委託作業監理 資料収集		ナンディ タラワ		資料・情報収集 連絡・調整
12	6/27	金	環境関連事項協議 再委託調査打合せ		現地調査 資料収集		再委託作業監理 資料収集		環境関連事項協議 資料収集
13	6/28	土	団内会議 現地踏査			現地踏査 団内会議			
14	6/29	日	背後地調査 資料整理			背後地調査 資料整理			
15	6/30	月	現地調査 背後地調査		再委託作業監理 資料収集		環境関連事項協議 資料収集		成 田
16	7/1	火	情報収集 港湾公社打合せ		再委託作業監理 資料収集		環境関連事項協議 資料収集		ナンディ ナンディ タラワ
17	7/2	水	航路標識調査 情報収集		再委託作業監理 資料収集		資料・情報収集		ナンディ ナンディ スバ
18	7/3	木	荷役状況調査 港湾公社打合せ		再委託作業監理 資料収集		資料・情報収集		ナンディ インチョン インチョン 成 田
19	7/4	金	荷役機械実地調査 コンテナヤード調査		再委託作業監理 資料収集		資料・情報収集		荷役状況調査 港湾公社打合せ
20	7/5	土	団内会議、資料整理 背後地調査			資料・情報収集			スバ ナンディ
21	7/6	日	入港船舶調査 荷役状況調査			ナンディ プリズベン			
22	7/7	月	荷役状況調査			資料・情報収集			
23	7/8	火	出港船舶調査 コンテナヤード調査		再委託作業監理 資料収集		資料・情報収集		出港船舶調査 コンテナヤード調査
24	7/9	水	荷役機械関連調査 セミコン船荷役調査		再委託作業監理 資料収集		環境関連事項協議 資料収集		出港船舶調査 コンテナヤード調査
25	7/10	木	港内踏査 資料収集		再委託作業監理 資料収集		資料・情報収集		港内踏査 資料収集
26	7/11	金	資料収集 事務処理		再委託作業監理 資料収集		資料・情報収集		資料・情報収集 事務処理
27	7/12	土	団内会議、資料整理 事務処理						
28	7/13	日	背後地調査 資料整理						
29	7/14	月	環境関連事項協議 現地調査		資料収集 資料整理		再委託作業監理 資料収集		環境関連事項協議 現地調査
30	7/15	火	資料収集 資料整理		資料収集 資料整理		再委託作業監理 資料収集		資料・情報収集
31	7/16	水	情報収集 資料整理		資料収集 資料整理		再委託作業監理 資料収集		資料・情報収集 資料作成
32	7/17	木	資料収集 現地踏査		資料収集 資料整理		再委託作業監理 資料収集		環境関連事項協議 資料収集
33	7/18	金	港湾公社協議 資料整理		資料収集 資料整理		再委託作業監理 資料収集		環境関連事項協議 資料収集
34	7/19	土	港湾公社協議 資料整理		資料整理		再委託作業監理 資料収集		港湾公社協議 資料整理
35	7/20	日	報告資料作成			資料整理			
36	7/21	月	資料収集 港内踏査		資料収集 資料整理		再委託作業監理 資料整理		運輸省・ 港湾公社報告
37	7/22	火	資料収集 報告資料作成		再委託作業監理 資料整理		タラワ ナンディ		
38	7/23	水	資料収集 港湾公社打合せ			ナンディ インチョン インチョン 成 田			
39	7/24	木	タラワ ナンディ ナンディ スバ		タラワ ナンディ				
40	7/25	金	大使館・JICA報告 スバ ナンディ		ナンディ インチョン インチョン 成 田				
41	7/26	土	ナンディ 成 田						

資料 - 3 関係者（面談者）リスト

1. Ministry of Communication, Transport and Tourism Development (通信・運輸・観光開発省)

Hon. Temate Ereateti	Minister (大臣)
Mr. David Yeeting	Permanent Secretary (次官)
<u>Ms. Tarsu Murdoch</u>	<u>Deputy Secretary (次官補)</u>
<u>Mr. Tion Uriam</u>	<u>Assistant Transport Economist (次席経済専門家)</u>

2. Ministry of Foreign Affairs (外務省)

Mr. Tom Murdoch	Acting Deputy Secretary (首席次官補)
Mr. Timoa Tokataam	Acting Assistant Secretary (次席次官補)
Ms. Paam Arobati	Desk Officer (職員)
Mr. Tawaria Komwenga	Desk Officer(Economic) (経済担当職員)

3. Ministry of Environment, Lands, Agriculture and Development (環境国土農業開発省)

Ms. Teboranga Tioti	Deputy Secretary (次官補)
Ms. Tererei Abete-Reema	Director of Environment Conservation (環境保護局長)
Mr. Mike Foon	Acting Environment Inspector (首席環境検査官)
Ms. Farran Redfen	Senior Environment Inspector (上級環境検査官)
Ms. Taouea Titaake-Reiher	EIA Officer (環境影響評価職員)
Ms. Marii Marae	EIA Officer (環境影響評価職員)
Mr. Ata Binoka	Plant Protection & Quarantine Officer Division of Agriculture (農業局首席検疫官)

4. Ministry of Finance & Economic Development (財務経済開発省)

Mr. Tiimi Kaiekieki	Acting Director of Planning(National Economic Planning Office) (国家経済計画局計画局長代理)
Mr. Tekena Tiroa	Acting Republic Statistician(National Statistic Office) (首席統計官)
Ms. Saitofi Mika	Economist Aid Coordinator (経済専門家援助まとめ役)

5. Ministry of Public Works and Utilities (公共事業施設省)

Mr. Tiaon Kabaua	Civil Engineer (土木技術者)
Mr. Buibui Areing Tiwari	Manager Power Engineering, Power Generation, Distribution (Public Utilities Board) (公共施設局電力技術発電配電部長)
Mr. Itianang Timona	Water Engineer Water Engineering Department (公共施設局水道部水道技術者)
Ms. Teaborai Uriam	General Manager of Plant and Vehicle Unit (プラント車両部本部長)

6. Ministry of Fisheries & Marine Resource Development (漁業海洋資源開発省)

Mr. Ribanataake T. Awire	Director of Fisheries (漁業局長)
Mr. Miteti Abete	Director of Marine (海洋局長)
Ms. Reeuate Willie	Marine Officer (海洋部長)

7. Ministry of Health & Medical Services (保健医療省)
Ms. Beia Tiim Acting Chief Health Inspector (首席保健検査官)
8. Kiribati Ports Authority (キリバス港湾公社)
Ms. Rubee Eromanga General Manager (総裁)
Capt. Bonteman Tabena Operation Manager (運営部長)
Ms. Etita Rubi Acting Finance Manager (財務部長代理)
Mr. Katewea V Taoaba Human Resource Manager (人事部長)
Mr. Mwanaa Keree Marine Engineering Superintendent (機械管理者)
9. Meteorological Office (気象局)
Mr. Moreti Tibiriano Chief Meteorological Officer (気象局長)
10. Kiribati Oil Company Ltd. (KOIL) (キリバス石油公社)
Mr. Rutete Ioteba Chief Executive Officer (総裁)
Mr. Kabuaua Tenangibo Operation Manager (運営部長)
11. Kiribati Copra Mill Company Ltd. (キリバスコブラミル公社)
Ms. Katarina Tofinga Chief Executive Officer (総裁)
Mr. Aree Redfern Operation/Administration Manager (管理運営部長)
Mr. Paul Tekanene Product/Development Manager (生産開発部長)
12. Kiribati Shipping Co., Ltd. (キリバス海運公社)
Mr. Itibwinnang Aiaimoa General Manager (本部長)
Capt. Moote Tiia Operation Manager (運営部長)
13. Kiribati Inter-Island Shipping Services (キリバス島嶼間海運サービス)
Capt. Koubwere Ienraei General Manager (本部長)
14. Central Pacific Producers Ltd. (中央太平洋生産公社)
Mr. Iannang Teaioro General Manager (本部長)
15. Betio Town Council (ベシオ町行政区)
Ms. Karakeman Teido Clerk (職員)
16. Kiribati Recycling (廃棄物資源化施設)
Mr. Derek Andrewartha Manager (部長)
Mr. Ono Onorio Industry Promotion Officer (産業促進部長)

(下線は、カウンターパート)

資料 - 4 討議議事録 (M/D)

(1) 現地調査

**Minutes of Discussions
on the Basic Design Study
on the Project for Expansion of Betio Port
in the Republic of Kiribati**

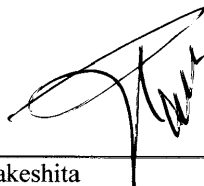
Based on the results of the Preliminary Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Expansion of Betio Port (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Kiribati the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Teiji Takeshita, Resident Representative, JICA Fiji Office, and is scheduled to stay in the country from 17 June to 24 July, 2008.

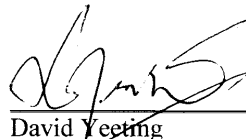
The Team held discussions with the officials concerned of Kiribati and conducted a field survey in the study area.

In the course of discussions and field survey, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

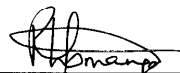
Tarawa, 23 June, 2008



Teiji Takeshita
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan



David Yeeting
Permanent Secretary
Ministry of Communications, Transport and
Tourism Development
The Republic of Kiribati



Rubee Eromanga
General Manager
Kiribati Ports Authority
The Republic of Kiribati



ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the Betio Port facilities and capacity to secure safety and efficient cost effective cargo handling.

2. Project Sites

The Project site is the Betio Port in Tarawa, as shown in Annex-1.

3. Responsible and Implementing Organizations

(1) The responsible ministry is the Ministry of Communications, Transport and Tourism Development (MCTTD).

(2) The implementing agency is the Kiribati Ports Authority (KPA).

The MCTTD is in charge of the planning, designing and construction work of the Project in collaboration with KPA. After completion of the construction work, responsibility for operation and maintenance shall be handed over to KPA with the exception of the navigation aid which shall be maintained by the Marine Division of MCTTD.

The organization charts are shown in Annex-2-1 and 2-2 respectively.

4. Items Requested by the Government of Kiribati

After discussions with the Team, the items below were finally requested by the Kiribati side.

- 1) Construction of Pier 200m long*¹
- 2) Construction of Access Trestle 250m long*¹
- 3) Navigation Aids
- 4) Cargo Handling Equipment

*¹/ Appropriate location and scale shall be examined by the Team.

5. Japan's Grant Aid Scheme

The Kiribati side has shown a full understanding of the Japan's Grant Aid scheme and the necessary measures to be taken by the Kiribati side as explained by the Preliminary Study Team and described in the Annex-3 and 4 of the Minutes of Discussions signed by both sides on 16th August, 2007.

(1) The Kiribati side understood the Japan's Grant Aid scheme explained by the Team, as described in Annex-3.

(2) The Kiribati side will take the necessary measures, as described in Annex-4, for smooth implementation of the Project as a condition for the Japan's Grant Aid to be implemented.



6. Further Schedule of the Study

- (1) The consultant members of the Team will continue further studies in Kiribati until 24 July, 2008.
- (2) JICA will prepare the draft report and dispatch a mission to Kiribati in order to explain its contents around October 2008.
- (3) When the contents of the report are accepted in principle by the Government of Kiribati, JICA will complete the final report and send it to the Government of Kiribati by January 2009.

7. Environmental and Social Considerations

- (1) MCTTD shall obtain the Development Consent (Supplementary Explanation to IEE), by the end of October, 2008.
- (2) When MELAD issued the Development Consent to MCTTD, the Kiribati side shall immediately notify the result to the Team through the JICA Fiji Office.

8. Undertakings by Kiribati Side

The Kiribati side confirmed that the following undertakings should be taken by Kiribati expenses.

- (1) Stage of the Basic Design Study
 - 1) Necessary arrangement for the tax exemption of imported equipment and materials of the Team including their sub-consultants.
 - 2) Removal and disposal of unexploded objects in case such objects are found. The Team will conduct the magnetic exploration around the Project area during the Basic Design Study and inform the result to Kiribati side by the end of July, 2008.
- (2) Stage of the Project implementation
 - 1) Removal of the crawler crane from the existing wharf of the new port, by the end of June, 2009.
 - 2) Securing the temporary construction yard which is adjacent to the Betio Port.
 - 3) Relocation and/or removal of existing utilities (power lines, water lines, etc.) from the Project site, if necessary.
 - 4) Budget allocation for the commissions for the banking services based upon banking arrangement (B/A).
 - 5) Necessary arrangement for the tax exemption of imported equipments, materials and machineries of the Consultant and Contractor of the Project.
 - 6) Exemption of following port charges against consignee / consignor for importing construction materials and equipments for the Project including importing construction materials such as rocks, stone aggregate, sand, rubble and cement.
 - Litterage
 - Wharfage
 - Loading / unloading charge
 - Barge with tug hire costs for loading / unloading

9. Other Relevant Issues

- (1) The Kiribati side shall submit answers to the Questionnaire to the Team, which the Team handed to the Kiribati side, by July 14, 2008.
- (2) The Kiribati side shall provide necessary number(s) of counterpart personnel to the Team during the field survey in Kiribati.
- (3) The Kiribati side shall provide a suitable space with necessary office equipment and furniture for the Team.

Annex-1 Project Site Map
Annex-2 Organization Chart



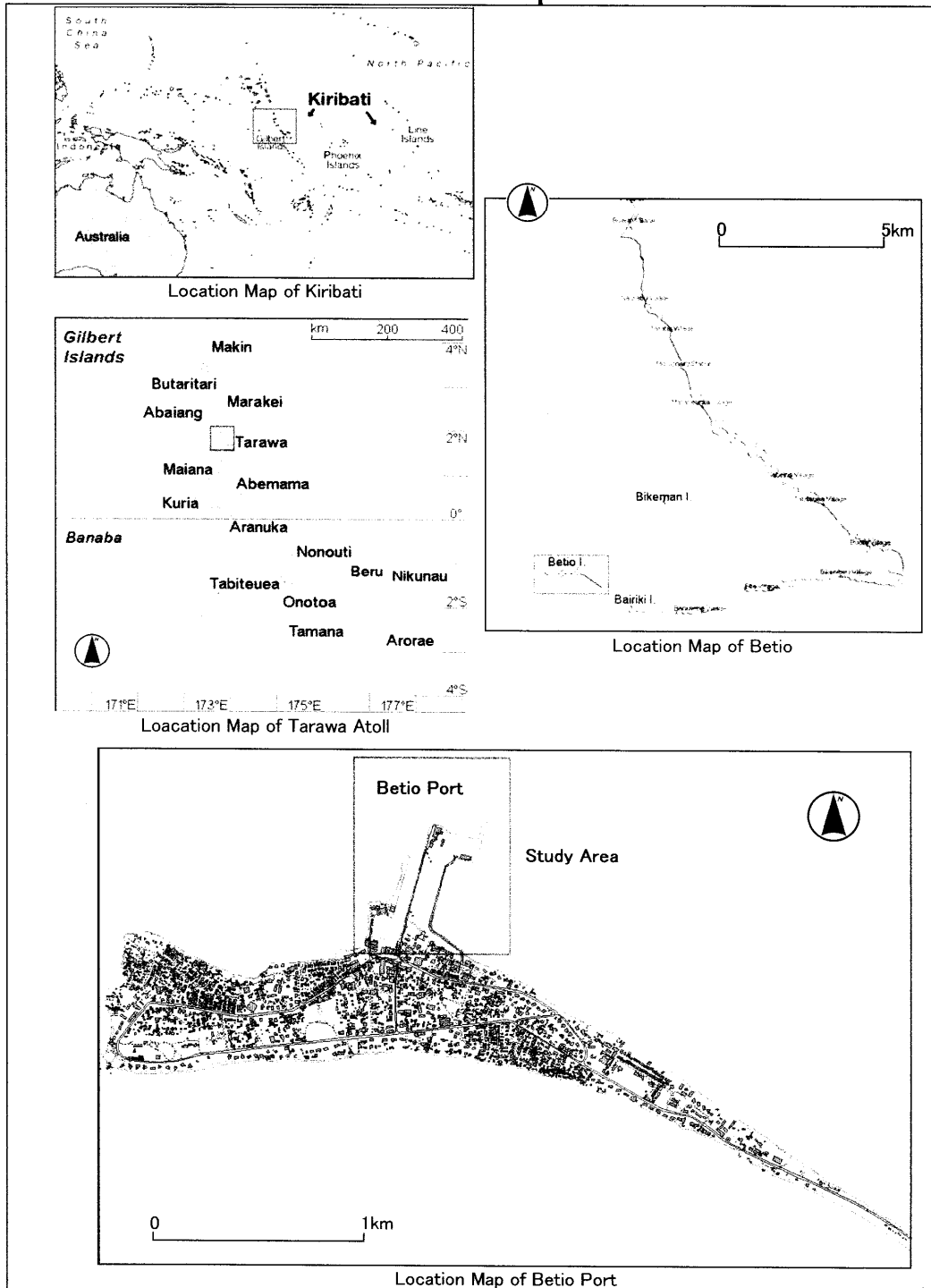
Annex-3 Japan's Grant Aid Scheme
Annex-4 Major Undertakings to be taken by Each Government
Annex-5 Flow Chart of Japan's Grant Aid Procedures



3



Location Maps

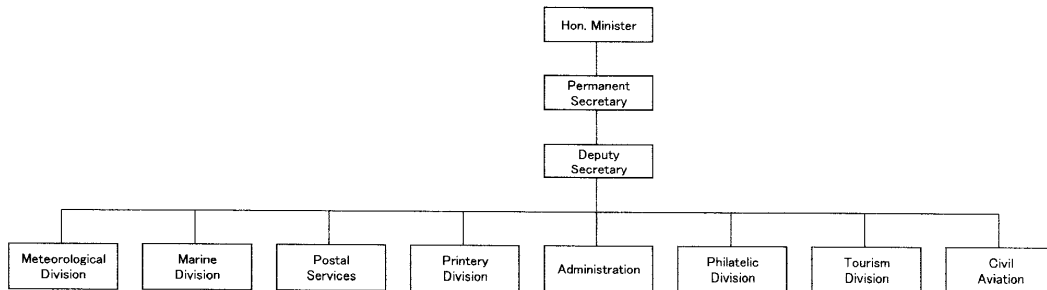


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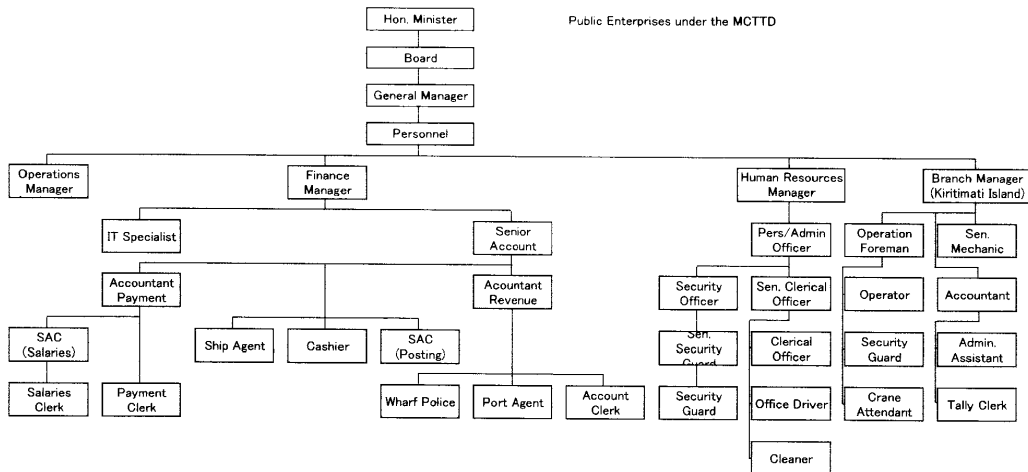
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Annex-2-1



**Organization Chart of
Ministry of Communications, Transport and Tourist Development (MCTTD)**

Annex-2-2



**Organization Chart of
Kiribati Ports Authority (KPA)**

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JAPAN'S GRANT AID

The Grant Aid Scheme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

Japan's Grant Aid Scheme is executed through the following procedures.

Application	(Request made by the recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by the Cabinet)
Determination of recipient	(The Note exchanged between the Governments of Japan and Implementation country)

Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

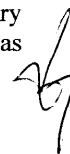
Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:



- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- Preparation of a basic design of the Project.
- Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consultant firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

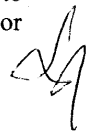
3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

(2) "The period of the Grant Aid" means the one fiscal year, which the Cabinet approves, the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as national disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)



(4) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(5) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the Project,

b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

c) To secure buildings prior to the procurement in case the installation of the equipment,

d) To ensure all the expenses and prompt excursion for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,

e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,

f) To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(7) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.

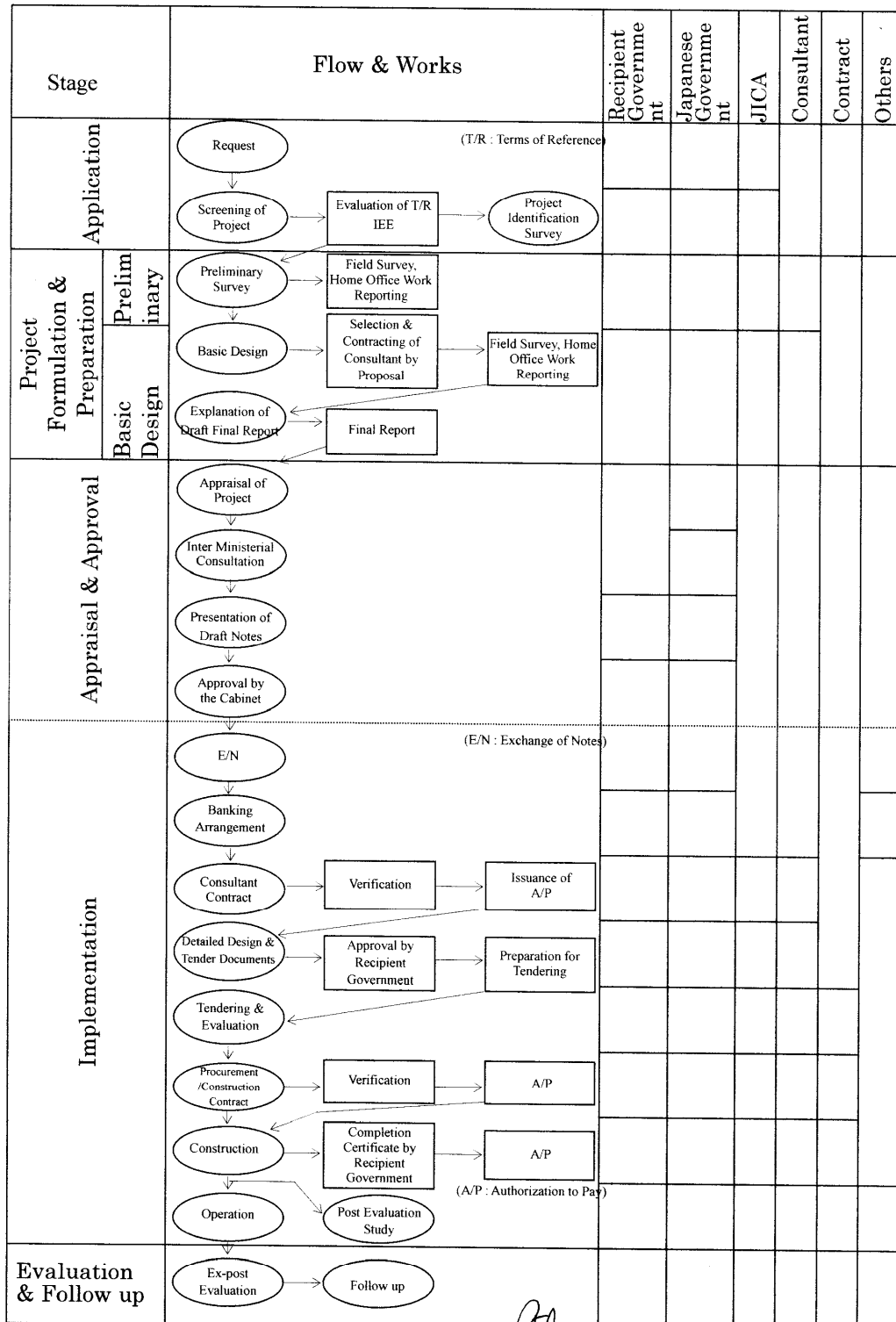
(End)

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Kiribati Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
5	To ensure unloading and customs clearance at the port of disembarkation in Kiribati		
	1) Marine (Air) transportation of the products from Japan or third countries to Kiribati	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Exemption of any port charges against consignee / consignor for importing construction materials, equipments and machineries for the Project.		●
	4) Internal transportation from the port of disembarkation to the Project site	●	
6	To accord Japanese nationals whose service may be required in connection with the supply of the products and the services under the Verified Contract, such facilities as may be necessary for their entry into Kiribati and stay therein for the performance of their work.		●
7	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Kiribati with respect to the supply of the products and services under the Verified Contracts		●
8	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
9	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

Flow Chart of Japan's Grant Aid Procedures



資料 - 5 事業事前計画表

1. 案件名
キリバス共和国 ベシオ港拡張計画 基本設計調査
2. 要請の背景
<p>キリバス共和国(以下“「キ」国”)は、広大な海域に33の環礁が散在する、大洋州の島嶼国の中でも国土の拡散性、国際市場からの地理的隔絶が最も顕著である。生活必需品等の物資の輸送は、海上輸送に依存しており、港湾は国際及び国内貨物輸送の拠点として必要不可欠な社会基盤施設となっている。</p> <p>ベシオ港は、外貨貨物を扱う同国唯一の港であるとともに、クリスマス島のロンドン埠頭をはじめとする散在する島嶼部とを結ぶ国内輸送の拠点として機能している。同港は、1950年に小型船を対象とした整備が実施された後、2000年に我が国の無償資金協力によって1,000トクラスの船舶を対象とした水深6.0mの岸壁の整備及びコンテナヤード及び管理事務所、貨物倉庫等の現在の港湾施設整備が行われた。</p> <p>ベシオ港では、国際貨物のコンテナ化の一層の進行と貨物量の増加によって、コンテナ貨物の取扱い量が急増している。定期運行を行っているコンテナ船は、10,000～20,000トクラスで、岸壁水深及び岸壁延長の不足から直接着岸できず、台船で中継する沖取り荷役を余儀なくされている。沖取りによるコンテナ荷役は、安全面及び効率面で問題となっているとともに、荷役時間が長くなることからコンテナ船の寄港時間の延長を招いている。また、当該コンテナ船が寄港する港湾のなかで、コンテナ船が岸壁に接岸できないのはベシオ港のみであることから、コンテナ船の着岸可能な係留施設の整備が急務となっている。</p> <p>係留岸壁の投入によって荷役システムが変更となることから、係留施設を有効に活用するための、最小限の港湾荷役機械を投入する。また、入出港船舶の航行安全性の確保のため、老朽化・損傷の著しい航路標識の更新、及び新係留施設への接離岸のための航路標識をあわせて整備する。</p> <p>本計画は、上記の施設・機材の整備による港湾機能の強化を目的とし、荷役作業の効率化・安全化、及び入出港船舶の航行安全性の向上を図ることによって、住民生活の安定や経済活動の発展に資するものである。</p>
3. プロジェクト全体計画概要
<p>(1) プロジェクト全体計画の目標(裨益対象の範囲及び規模)</p> <p>ア ベシオ港において安全で、効率的な荷役作業環境が確保される。</p> <p>イ 寄港船舶の接岸・荷役環境が整備される。</p> <p>ウ 寄港船舶の航行安全性が改善される。</p> <p>【裨益対象の範囲及び規模】</p> <p>ベシオ港従事者： 179人</p> <p>南タラワの住民： 45,989人</p> <p>キリバス国国民： 92,533人</p>
<p>(2) プロジェクト全体計画の成果</p> <p>ア <u>ベシオ港の港湾施設が拡張される。</u></p> <p>イ <u>港湾荷役機械が投入される。</u></p> <p>ロ <u>航路標識が整備される。</u></p>

(3) プロジェクト全体計画の主要活動

- ア 上記の施設・機材を使用して、港湾活動を実施する。
- イ 施設・機材を運営・維持管理するための組織整備と人員配置をする。

(4) 投入(インプット)

- ア 日本側：無償資金協力 46.13 億円
- イ キリバス国側：
 - (ア) 本無償資金協力案件の実施に係わる負担額：0.29 億円
 - (イ) 本無償資金協力案件対象施設の維持管理経費：年平均 0.69 億円

(5) 実施体制

- 主管官庁： キリバス国 通信・運輸・観光開発省
- 実施機関： キリバス港湾公社

4. 無償資金協力案件の内容

(1) サイト

キリバス国タラワ環礁ベシオ市 ベシオ港

(2) 概要

ベシオ港の係留棧橋及び連絡橋の整備
港湾荷役機械の整備
航路標識の整備

(3) 相手国負担事項

環境ライセンスの取得
仮設ヤードの貸与
港湾荷役費の免除
サイトクリアランス
不発弾の処理
免税措置
銀行取極め
滞在許可
パイプラインの敷設

(4) 概算事業費

概算事業費 46.42 億円 (日本側負担 46.13 億円、キリバス国側負担 0.29 億円)

(5) 工期

詳細設計・入札期間を含め約 45 ヶ月 (予定)

(6) 貧困、ジェンダー、環境及び社会面の配慮

環境関連法及び環境ライセンスに付帯する環境関連事項の遵守

5. 外部要因リスク

干ばつによる水不足、設計対象波を上回る異常波浪等の想定外の天災が発生しない。
キリバス国内の政情・治安が悪化しない。

6. 過去の類似案件からの教訓の活用

(1) 相手国負担事項

日本側負担費用の低減のため、費用負担が容易な実施機関のキリバス港湾公社に関連する港湾荷役費の免除を相手国負担事項として要請した。

(2) 施設建設に係わる施工条件

キリバス国における施設建設のための資材及び機材の調達条件を参考とした。

(3) 自然条件を含む計画条件

タラワ環礁の自然条件を含む計画条件の立案に際して、過去の類似案件を参考にした。

(4) 施設の維持管理

過去の類似案件から、キリバス港湾公社の維持管理体制の重要性について認識した。
境関連法及び開発許認可に付帯する環境関連事項の遵守

7. プロジェクト全体計画の事後評価に係わる提案

(1) プロジェクト全体計画の目標達成を示す成果指標

貨物輸送距離の短縮

成果指標	2008年の実績値	計画値(2012年)
運搬距離	海上： 700m	海上： なし
	陸上： 200m	陸上： 600m

コンテナ荷役効率の向上

成果指標	2008年の実績値	計画値(2012年)
実入りコンテナ荷役	5.7 個/時間	29 個/時間
空コンテナ荷役	7.5 個/時間	29 個/時間
車両荷役	5.1 台/時間	29 台/時間

寄港船舶の係船時間の短縮

Kiribati Chief (実入りコンテナ 300 個、空コンテナ 300 個当たり)

成果指標	2006年の実績値	計画値(2012年)
係船時間	109.8 時間	25.0 時間

South Islander (実入りコンテナ 100 個、空コンテナ 100 個、車両 30 台当たり)

成果指標	2006年の実績値	計画値(2012年)
係船時間	44.4 時間	9.6 時間

(2) その他の成果指標

特になし。

(3) 評価のタイミング

協力対象施設供用開始後、1年経過後

資料 - 6 収集資料リスト

調査名：キリバス国ベシオ港拡張計画基本設計調査

番号	名 称	形態 図書・ビデオ 地図・写真等	枚数・部数	発行機関	発行年
1	キリバス国国家開発計画（2008～2011年）	書類	コピー	Government of Kiribati	2008年
2	キリバス国国家予算書（2008年）	書類	コピー	Government of Kiribati	2008年
3	キリバス港湾公社業務規定	書類	コピー	Kiribati Ports Authority	2006年
4	キリバス港湾公社海事安全規定	書類	コピー	Kiribati Ports Authority	2006年
5	キリバス港湾公社タリフ表	書類	コピー	Kiribati Ports Authority	2007年
6	タラフ島地形図(1996年測量)	地図	コピー	Ministry of Environment, Lands and Agriculture	1997年
7	気温データ（1996～2008年）	電子データ	コピー	Meteorological Office	--
8	降雨量データ（1993～2008年）	電子データ	コピー	Meteorological Office	--
9	風向・風速データ（2000～2008年）	電子データ	コピー	Meteorological Office	--
10	潮位データ（2003～2007年）	電子データ	コピー	Meteorological Office	--
11	ベシオ地区水道配管図	書類	コピー	Public Utility Board	--
12	ベシオ地区汚水配管図	書類	コピー	Public Utility Board	--

調査名：キリバス国ベシオ港拡張計画基本設計調査

番号	名 称	形態 図書・ビデオ 地図・写真等	オリジナル・北-	発行機関	発行年
13	キリバス電話帳	図 書	オリジナル	Telecom Service Kiribati Limited	2007年
14	ニュージーランド建設ハンドブック22飯	図 書	オリジナル	Rawlinsons	2007年
15	オーストラリア建設ハンドブック 26飯	図 書	オリジナル	Rawlinsons	2008年
16	TARIF DU BENIN 1999 (政府タリフ料金表)	資料	オリジナル	財務省	1999年

資料 - 7 初期環境評価 (IEE) に係わるコメントに対する回答

THE PROJECT FOR EXPANSION OF BETIO PORT

ANSWER FOR THE COMMENTS

OF

MINISTRY OF ENVIRONMENT, LAND AND AGRICULTURAL
DEVELOPMENT (MELAD)

ON

INITIAL ENVIRONMENTAL EVALUATION REPORT (IEER)

JULY 2008

MINISTRY OF COMMUNICATIONS, TRANSPORT AND TOURISM
DEVELOPMENT (MCTTD)

I. COMMENTS FROM MELAD

Ministry of Communications, Transport and Tourism Development (MCTTD) prepared the Initial Environmental Evaluation Report (IEER) for the Project for Betio Port Expansion (referred to "the Project" hereinafter) and submitted it to Ministry of Environment, Land and Agricultural Development (MELAD), which was assisted by the JICA Preliminary Study Team in October 2007. MELAD examined the contents of the IEER and issued the first comments, dated December 28, 2007, on environmental concerns in the implementation of the Project as follows:

- (1)-a. Erosion anticipated from this project to adjacent areas.
- (1)-b. Disturbance to flora and fauna including fisheries resources within the vicinity.
- (1)-c. Increase of sedimentation that may affect coral conditions and other marine organisms further downstream.
- (1)-d. Marine pollution from unexpected oil spill from construction vehicles and other sources.
- (1)-e. Solid wastes that will be produced from construction debris, and
- (1)-f. Disturbance to marine habitats and fishing ground of local fishermen anticipated from the Project.

In response to the first comments of MELAD, MCTTD prepared the Supplementary Paper of the IEER in February, 2008 to explain and clarify the environmental potential impacts and mitigation measures to be taken in the implementation of the Project. In spite of the efforts of MCTTD to have prepared the Supplementary Paper, MELAD further issued the second comments to show the environmental concerns as follows.

- (2)-a. It was stated in the comments on the Supplementary Paper that any possible oil leakage into the sea would be contained by an oil boom. More information is needed on what method the applicant is going to use to remove any oil contained in the oil boom and what are the means of disposing waste collected from oil boom.
- (2)-b. As quoted from the Supplemental Paper, "the contractor shall re-export construction equipment and waste when the project is completed in line with the government regulation." However it was not specifically indicated as where to export to, and who is going to bear the cost for returning malfunctioned equipments; the applicant (Kuibati Port Authority), the funding agency which is JICA or the contractor.
- (2)-c. Baseline data on coral conditions to ensure monitoring of coral reefs located within the vicinity of the Project.
- (2)-d. Further clarification of the scope of work including the quantity of materials and list of equipment required and to indicate who will be responsible for what.
- (2)-e. List of government authorities consulted. There is a proposed major offshore dredging operation by the MFMRD in the Betio lagoon and therefore the concerned ministry needs to be aware of this important project, and
- (2)-f. Use of water and electricity in the project. It is important to state if there is significant quantity of water and electricity needed and, if so, where to source these from.

Based on these first and second comments on the environmental concerns of the Project, the MCTTD examined to resolve them with the assistance of the Basic Design Study Team dispatched by JICA in June 2008. The result of the examination are described below.

II. ANSWER

Comment (1)-a.

Erosion anticipated from this project to adjacent areas.

The analysis on critical traction based on the data on sand particles of the seabed at the location of the Beio Port Expansion indicated that basically there is very limited possibility for the sand particles to move with the wave agent under the existing depth of the sea, which means this area is featured with a relatively stable topography. This fact is proved by the result of bathymetric survey conducted in the Basic Design Study in June 2008. The survey result indicated that there is little difference between the depths of the seabed in and around the Project site in 2006 and this year.

As mentioned in the Supplementary Paper of IEER, the Project does not include excavation/dredging in front of the new pier after expansion. Also, in case the substructure of the new pier would be steel pipe pile type, almost no obstacle against tidal current flow and wave motion will be provided in the Project and the change in current is expected to be very limited.

In the Project, however, leveling operation, or removal of some seabed materials in front of (north side) the proposed pier (refer to Figure 1) might be operated. This operation is to be done before the pile driving if the design depth is set at -9.0 m required for safe shipping and mooring along the pier. In this case, the area of the leveling operation will be approximately 3,300m². Almost all of the area is deeper than 8.8 m at present according to the bathymetric survey conducted by JICA Study Team in June 2008, meaning that the thickness of deepening is less than 20cm.

Leveling operation will be carried out using a grab type dredging machine, specifically, so-called clamshell or orange peel dredging machine. In the proposed leveling area, seabed materials will be once removed by dredging machine and loaded on a barge. A silt protector will be installed around the dredging machine on a barge for curtaining off the leveling operation site from surrounding area, so as to prevent the fine particles from dispersing around the site. Thus, the turbidity discharge will be mitigated.

The removed seabed materials will be transported by a barge to the area with a depth of more than -9.0m and, in turn, be discharged over the area. During this operation, a silt protector will also be installed to prevent the dispersion of discharged materials and sedimentation. Discharge of the materials will not be concentrated at one location but be scattered so as to keep the depth of more than -9.0 m.

However, if the design depth is set at -8.8m, which is a minimum required depth for the targeted ships of 8 m draft (The minimum required depth is set as the draft depth (8.0m) +10% (0.8m) of the draft depth for the safety.), no leveling operation is needed. The JICA Basic Design Study Team is now examining the design depth envisaged at -8.8m.

Thus, the modification of the seabed, i.e., even the change of the depth by the leveling operation, is minimized. It is hardly expected to change the tidal current flow or wave motion and cause erosion by the leveling operation.

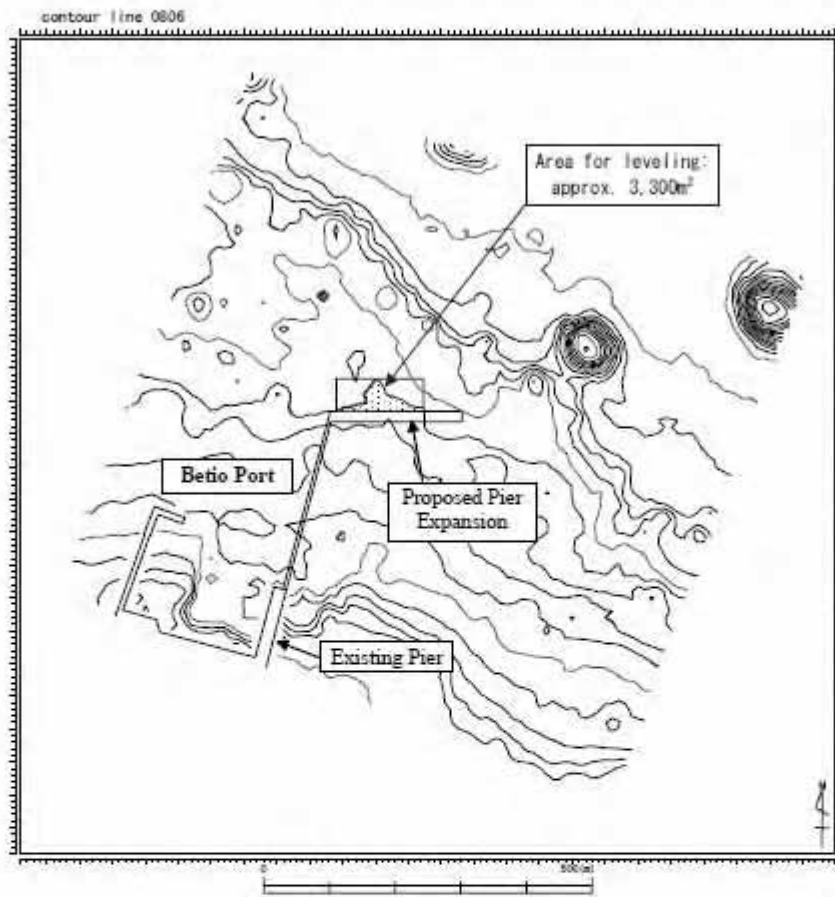


Figure 1 Location of the Area for Leveling Operation if Design Depth is Set at -9.0m

Comment (1)-b.

Disturbance to flora and fauna including fisheries resources within the vicinity.

Disturbance of flora and fauna was examined dividing into two aspects; the disturbance of 1) marine biota and 2) terrestrial biota.

1) Disturbance of marine biota

The results of coral survey at the Project site and its surrounding areas showed that there is no living coral. This is supposedly due to high turbidity in the sea (refer to item (2)-c. for the details). The marine biota other than coral, including fish and benthic organisms, is also not wealthy in and around the Project site. Further, it is understood that no valuable or endangered species exist in and around the Project site under such marine conditions.

In the Project, it is not proposed to conduct excavation/dredging which may produce high turbidity to often become a major impact source to damage coral reefs. The only activity that may cause some disturbance of marine organisms is the leveling operation of the seabed in case of the design depth is set at -9.0m as mentioned above (1)-a. This leveling activity will be done with a silt protector to prevent the seabed materials from dispersing and to mitigate turbidity discharge.

Thus, the degree of disturbance of marine biota will be limited. No significant impacts on coral reef and other marine biota are anticipated because there is no living coral or no wealthy marine biota. Consequently, it is expected that after the leveling the seabed, the marine biota will return to the existing condition.

As for the risk of waste oil leakage and marine pollution during the pile driving, such method that will not cause any oil spill or leakage, specifically, Vibro-hammer type or Hydraulic hammer type of pile driving at the floating barge, will be adopted in the Project (refer to (2)-a. for the details). Accordingly, no impact of waste oil contamination on marine biota will occur.

Regarding the disturbance of fisheries resources, the fishery activities are not done around the Project site because this area is too crowded by shipping boats to do fishing. Further, the fishing ground of the South Tarawa is far from the Project site – main fishing grounds are located along the outfall at the west of lagoon of Tarawa Atoll and the south area of the north Tarawa islands (refer to item (1)-f for the details). Thus, no significant impact on fisheries resources is expected.

2) Disturbance of terrestrial biota

The construction work will not take place on land except for some preparatory works in the temporary construction yard. The expected location of the temporary construction yard is at south of KPA complex with an area of 0.81ha (90m X 90m). (refer to Figure 2)

In the temporary construction yard, a base camp for the construction works including a Contractor's office will be established. Some preparatory works such as concrete mixing, preparatory works for concrete formwork fabrication, rebar fabrication will be carried out within the yard. There is currently no vegetation in this site and is open space although a heap of aggregate is piled in it (refer to Photo1 and 2). Thus, there is no wild plant and tree and therefore no habitat of wild animals, either. Further, there will be no other place than this temporary construction yard to be exclusively used for the implementation of the Project.

Consequently, there will be no impact on terrestrial flora and fauna during the implementation of the Project.



Figure 2 Location of Temporary Construction Yard of the Project



Comment (1)-c.

Increase of sedimentation that may affect coral conditions and other marine organisms further downstream.

As mentioned in item (1)-b., it was confirmed by the coral survey conducted during the Basic Design Study that no living coral exists within the lagoon area around the Project site (refer to item (2)-c. for the details).

In general, the spread of turbidity water causes an impact on the coral reefs. However, no excavation/dredging works will be implemented under the Project.

Regarding the leveling operation of the seabed in case of the design depth is set at -9.0 m along the proposed pier, a silt protector to prevent the seabed materials from dispersing will be mobilized (refer to item (1)-a.). Thus, the degree of disturbance of marine biota will be limited and no significant impacts on marine biota. Consequently, it is expected that after the leveling the seabed, the marine biota will return to the existing condition.

Comment (1)-d.

Marine pollution from unexpected oil spill from construction vehicles and other sources.

The answer for this comment is described at the item (2)-a.

Comment (1)-e.

Solid wastes that will be produced from construction debris.

The answer for this comment is described at the item (2)-b.

Comment (1)-f.

Disturbance to marine habitats and fishing ground of local fishermen anticipated from the Project.

As for the risk of impact on marine habitats, there will be no significant impact foreseen as mentioned in item (1)-b.

Regarding the potential impact on fishing ground of local fishermen, JICA Study Team carried out interview survey with Mr. Ribanataake T. Awira, Director of Fisheries, Ministry of Fishery and Marine Resources Development, for obtaining the information on location of fishing ground and other base line data of fisheries in South Tarawa.

According to Mr. Awira, the main fishing ground of commercial fishing is located along the outfall along the west edge of the lagoon in Tarawa Atoll. Another fishing ground is located along the south side of north Tarawa islands (refer to Figure 3). Thus, there is no commercial fishing ground in and around the Project site. The Project site is one of the busiest area for

shipping of cargo handling vessels. Thus, no fishing activity is done in the vicinity of the Project site. Regarding subsistence fishing, i.e., the fishing for domestic consumption, the fishing is done in a small scale or by individual households in Tarawa Atoll using fish net, fishing rod, etc. Even so, there is no fishing activity in and around the Project site because of the same reason as above.

As for the possibility of impacts on marine habitats, the risk of marine pollution by waste oil or disturbance of habitat of seabed organisms by construction works of the Project will not be anticipated as described in item (1)-b.

Accordingly, there will be no impacts on marine habitats or fishing ground of local fishermen. According to Mr. Awira, "after the completion of the pier expansion, the new pier can be utilized by the locals for fishing using fishing rod more or less when there is no ship mooring at the pier and the Project is not negative at all but positive effect for their subsistence fishery."

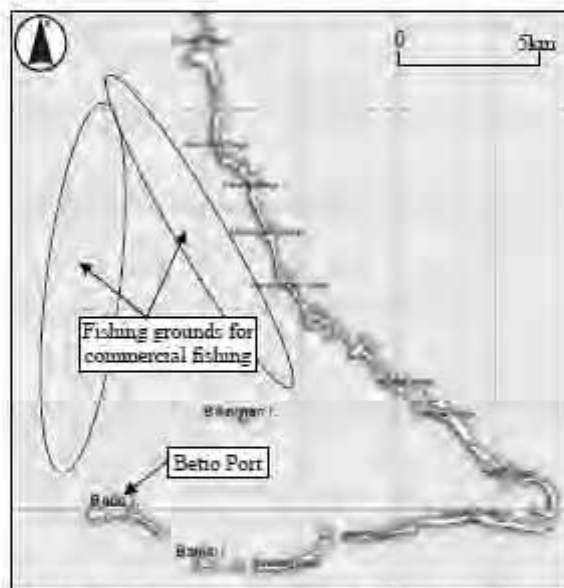


Figure 3 Main Commercial Fishing Grounds in Tarawa Atoll

Comment (2)-a.

It was stated in the comments on the Supplementary Paper that any possible oil leakage into the sea would be contained by an oil boom. More information is needed on what method the applicant is going to use to remove any oil contained in the oil boom and what are the means of disposing waste collected from oil boom.

The risk of oil leakage during the construction work of the Project is divided into two aspects: 1) oil spill from pile driver on a floating barge, and 2) unexpected oil spill or leakage from the Project activities on land.

(1) Risk of Oil Spill from Pile Driver

There are several methods of pile driving in terms of the method of driving force, including diesel hammer pile driver, vibro-hammer one, hydraulic hammer one, etc. In case of diesel hammer pile driver, there is a risk of marine pollution from the oil spill from floating pile driving barge. It is necessary to establish an oil boom (fence) around the pile driving barge to prevent the leaked oil from spreading over the sea and causing marine pollution.

In this Project, accordingly, the vibro-hammer pile driver, or the hydraulic hammer pile driver will be adopted to avoid the risk of oil spill leakage. These types of pile driver do not cause oil spill or leakage in terms of machine structure. Thus, the impacts of marine pollution by oil leakage during the pile driving on a floating barge can be eliminated.

In spite of the advantage of the adoption of vibro-hammer pile driver or hydraulic hammer pile driver mentioned above, an oil boom (fence) will be prepared for the unexpected oil spill accident for in case. The Contractor will select the type and structure of the oil boom. The necessity of the preparation of an oil boom is to be incorporated in the tender documents for the selection of the Contractor. In case of oil spillage accident, the spilled oil will be prevented from diffusing over the sea and will be removed using an absorption mat for collection. The collected waste oil will be entrusted to KOIL for an appropriate treatment and disposal.

(2) Risk of Oil Spill or Leakage from the Project Activities on Land.

The risk of oil spill or leakage from heavy machine and vehicles on land including crawler crane, dump truck, trailer, payloader, etc. is very limited under the normal working operation.

The risk of oil leakage during the preparatory works in the temporary construction yard is also limited. In the construction yard, a base camp for the construction works will be established. Some preparatory works such as concrete mixing, preparatory works for concrete formwork fabrication, rebar fabrication will be carried out in it. These construction works, however, does not use / treat oil for these operations expect for using fuel for functioning machines and vehicles.

Further, the construction yard does not directly face the sea. The north and the south of the yard are bounded by the next block, an open space where some containers are placed, and the west and the east are bounded by roads (refer to Figure 2).

Thus, the risk of oil leakage and marine pollution is not anticipated.

Comment (2)-b.

As quoted from the Supplemental Paper, "the contractor shall re-export construction equipment and waste when the project is completed in line with the government regulation." However it was not specifically indicated as where to export to, and who is going to bear the cost for returning malfunctioned equipments: the applicant (Kiribati Port Authority), the funding agency which is JICA or the contractor.

In this Project, the waste management plan will be proposed as a result of Basic Design Study. The following is the tentative outline of the waste management plan.

(1) Policy of Waste Management

- 1) To follow the principal of "Polluter Pays."
- 2) To reduce the generation of waste.
- 3) To facilitate reuse and recycle in case that reduction of waste cannot be done.
- 4) To comply with the waste disposal system in South Tarawa in case that reuse or recycle cannot be done.
- 5) To avoid illegal dumping of waste.

(2) Treatment of Construction Equipments and Vehicles

Construction equipments and vehicles to be used for the construction works in the Project will be basically procured from Japan, Kiribati and the third country by a Contractor. After the construction work is finished, they will be still usable and re-exported to Japan or procurement country. No scrap cars or equipments will be remained or disposed of in Kiribati.

(3) Waste Management Plan

Wastes to be generated during the implementation of the Project are categorized into two: 1) construction waste and 2) general waste. Table 1 lists the types of wastes to be generated and briefs their management method.

1) Construction waste

Construction wastes include plywood, steel board, concrete debris, rebar debris, steel debris, plastics and cement bags. All of which, except for concrete debris, can be entrusted to Kiribati Recycling for reuse and recycle. Kiribati Recycling is a waste recycling facility established and supervised by Kiribati Government (Ministry of Commerce and Ministry of Environment, Land and Tourism Development). The facility is currently privatized and run by Mr. Derek Andrewartha, who is entrusted for managing the facility by the government.

The Kiribati Recycling can accept steel, iron (rebar), plastics to be sent (sell) to Australian Company of SIMS Group which is a world wide waste recycling company. Other materials, plywood and cement bags can also be accepted at Kiribati Recycling for its effective use within the premise of the facility. Concrete debris cannot be accepted at the facility but can be effectively used for materials for beach protection, reclamation, etc. in place. Entrustment to Kiribati Recycling is one of the options for reuse and/or recycle of construction waste. If there

is other receiver for effective reuse or recycle, the construction waste can be delegated to it.

2) General waste

General wastes include paper rubbish, organic rubbish, beverage cans, plastic bottles and sewage (human waste) as listed in Table 1. All the general wastes are generated at the base camp, the Contractor's office of the Project. Of these wastes, beverage cans (aluminum cans) and plastic bottles will be entrusted to Kiribati Recycling for recycling. Paper rubbish and organic rubbish will be entrusted to BTC for its waste collection and disposal under the waste disposal system in BTC. Sewage from the toilet of the base camp will be entrusted to PUB for collection and disposal.

3) Cost for waste management

The cost for entrust to Kiribati Recycling is free and no payment from it according to Mr. Andrewartha. Entrustment of waste collection and disposal to BTC costs \$650 annually as the rate of 2008. Also, entrustment of sewage collection and disposal to PUB costs \$110 for one mobilization of sewage collecting vehicle (vacuum car). The cost of waste management incl. entrustment to Kiribati Recycling, BTC and PUB shall be covered by the Contractor.

Table 1 List of Wastes and Management Method

Category	Waste materials	Usage for the construction work	Anticipated volume of generation	Possible management method
Construction waste	1. Plywood	Concrete formwork	Approx. 3,000m ² of plywood	Entrustment for reuse at Kiribati Recycling*
	2. Steel board	Concrete formwork (Steel formwork)	Approx. 1,200m ² (20% of 6,000m ²) of steel board	Entrustment to Kiribati Recycling for recycle
	3. Concrete debris	Residue of concrete work or test piece of concrete	Unpredictable	Reuse for beach protection, reclamation material, etc.
	4. Rebar debris	Reinforced concrete work	Unpredictable	Entrustment to Kiribati Recycling for recycle
	5. Steel debris	Pipe pile driving	Unpredictable	Entrustment to Kiribati Recycling for recycle
	6. Plastics	Packaging and miscellaneous use	Unpredictable	Entrustment to Kiribati Recycling for recycle
	7. Cement bags	Container of cement	560 bags (\$40 ton / 15 ton/bag)	Entrustment for reuse at Kiribati Recycling
General waste (from base camp)	1. Paper rubbish	Waste paper used in a base camp (office)	2 kg/day (Assuming that unit generation volume is 0.2 kg/person/day**, and average number of workers at the office of base camp is 10 persons*** on average.)	Disposal based on BTC waste disposal system
	2. Organic rubbish	Food residues in a base camp		ditto
	3. Beverage cans (aluminum cans)	Refreshments		Entrustment to Kiribati Recycling for recycle
	4. Plastic bottles	Drinking water		Entrustment to Kiribati Recycling for recycle
	5. Sewage	Human waste		Sewage from 10 persons / days on average

*: Kiribati Recycling is a waste recycling facility established and supervised by Kiribati Government.

**: Data source is "Draft National Waste Management Strategy," Oct. 2007

***: The numbers of persons who are regularly working at the Contractor's office is estimated to be 10 persons.

(3) Monitoring of Waste Management

To make sure the implementation of the abovementioned waste management plan, it is necessary to appoint a waste manager in the Contractor office, who is responsible for facilitate and supervise the implementation waste management plan. He/She to be appointed shall monitor and record the kind of waste, volume and date of entrust to Kiribati Recycling for reuse and recycle, and to BTC and PUB for waste collection and disposal. The record shall be kept in the office for inspection when requested by the government authority.

(4) Responsibility of Waste Management and Cost

All the waste management activities, including reuse, recycle and disposal for construction waste and general waste are the responsibility of the Contractor to be selected by MCTTD and KPA as a result of tender. The responsibility of waste management mentioned above is to be clearly described in the tender documents for the selection of the Contractor. The Engineering Consultants will be in charge of supervision of the waste management. MCTTD and KPA also have a final management responsibility as the Project implementing bodies.

Comment (2)-c.

Baseline data on coral conditions to ensure monitoring of coral reefs located within the vicinity of the Project.

Coral survey was conducted aiming to inspecting the habitat environment focusing on living conditions of coral and other marine organisms in and around the Project site.

(1) Methodology

The location of the survey area is illustrated in Figure 4. The survey was conducted by an experienced diver who is an expert to inspect coral and other marine organisms in the lagoon of southern pacific ocean.

Inspection was done by means of direct observation for living condition and distribution of coral, and other marine organisms at quadrats with an area of 1m^2 ($1\text{m} \times 1\text{m}$) set along the transect (line) in the survey area. The survey was conducted during 27 June and 1 July, 2008.

(2) Survey Result

Quadrats were laid along the entire proposed length of the new port at every 10m interval on either side of a tape measure. A total of 170 quadrats were set and therefore 170m^2 of seabed was surveyed.

As a result of direct observation, no living coral was identified in the survey area and surrounding areas. The following are the brief description of observation result (The details of the survey result are now being consolidated).

The proposed port expansion area is gently sloping between 6 and 11m deep with the benthic substrate (seabed) composed mainly of fine silt material. A thin film of red filamentous algae covers most of the seabed with occasional patches of Halimeda algae and sponges scattered

along the transects and quadrat locations.

The area is heavily sedimented with fine silt/sand materials and is considered typical for such lagoon environment that is normally sheltered and calm. In addition, as it is an active port, boat/ship traffic around the harbor contribute to some extent to poor water quality and visibility in the harbor.

Coral disease, predation or bleaching could not be established as no live hard coral were found in the area. Very few fish and no invertebrate life were recorded in the area.

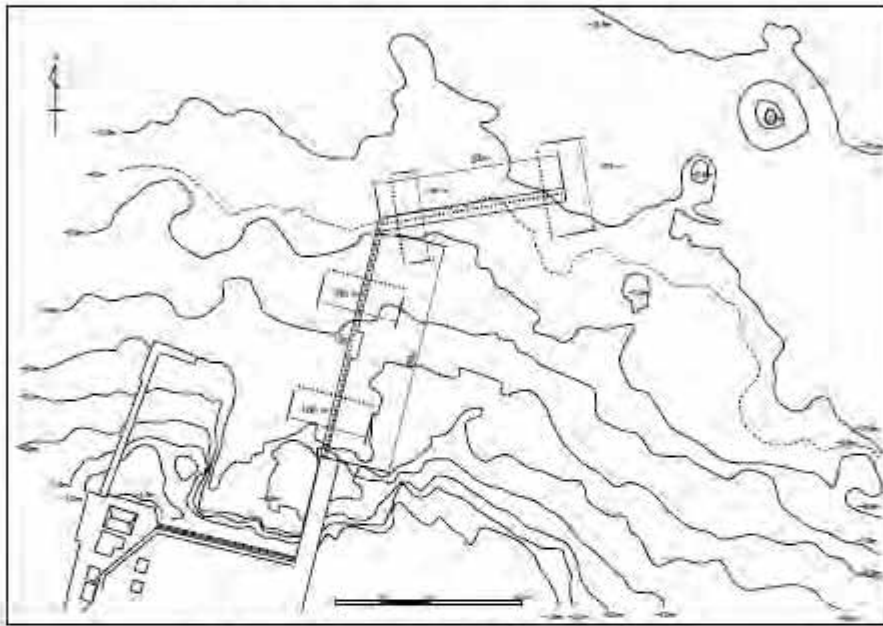


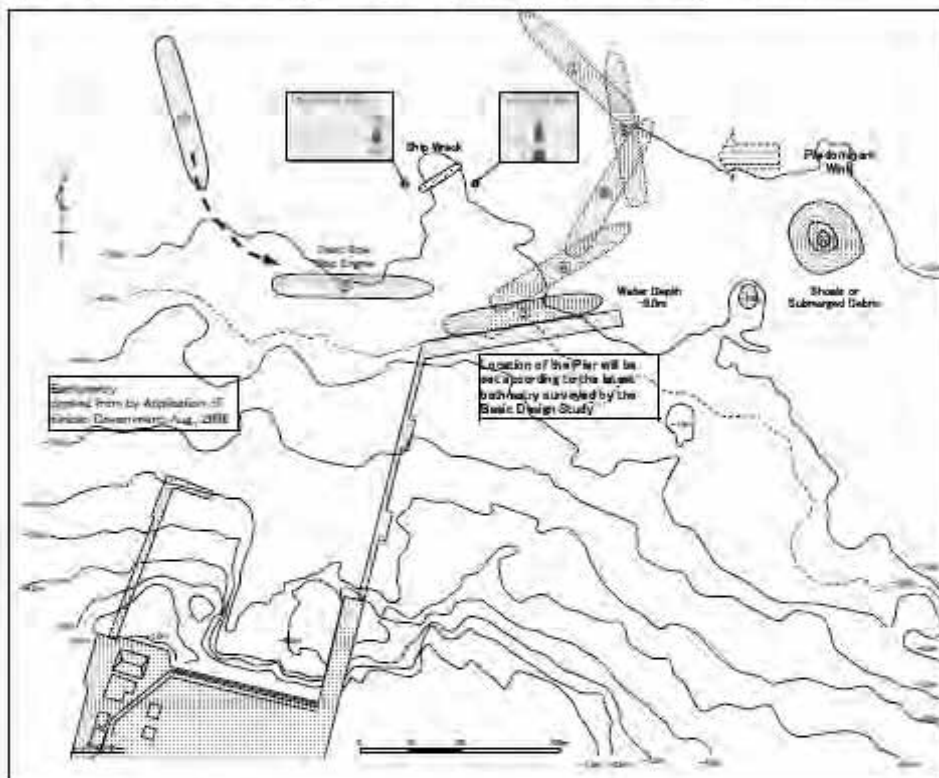
Figure 4 Location of Coral Survey Area

Comment (2)-d.

Further clarification of the scope of work including the quantity of materials and list of equipment required and to indicate who will be responsible for what.

(1) Port Layout

Proposed port layout of the expansion of the pier is shown on the figure below:



Note) The layout can be subject to minor change in the Basic Design Study.

Figure 5 Proposed Port Layout of the Pier Expansion

(2) Proposed Facilities

The Project includes the facilities listed in the table below:

Table 2 Proposed Facilities in the Project

No.	Facilities	Dimension / Number	Remark: (Change after Preliminary Study)
1	Loading/Unloading Pier	200m long, 18m wide, depth: - 9.0 m (under examination)	Width has been changed from 14m at Preliminary Study to 18m.
2	Trestle	180m long, 5m wide, Passing place : 2 locations	Length has been changed from 270m at Preliminary Study to 280m.
3	Navigation Aids	Repair/Replace of buoys: 8 nos.	Signs for Obstacles, NO ENTRY

		Others: - Sign of Obstacle: 2 nos., - Sign of NO ENTRY: several nos., - Beacon (to be installed at pier): 2nos.	and Beacon have been added.
4	Procurement of Container Handling Equipments.	Top lifters: 1 no., Forklifts: 2 nos., Trailers for 15 feet containers: 5 nos.	The number of trailers has been increased from 3 at Preliminary Study to 5.

Note) Dimension/number can be subject to minor change in the Basic Design Study.

(3) Construction Method

Process of the construction of the pier and trestle is as illustrated below:

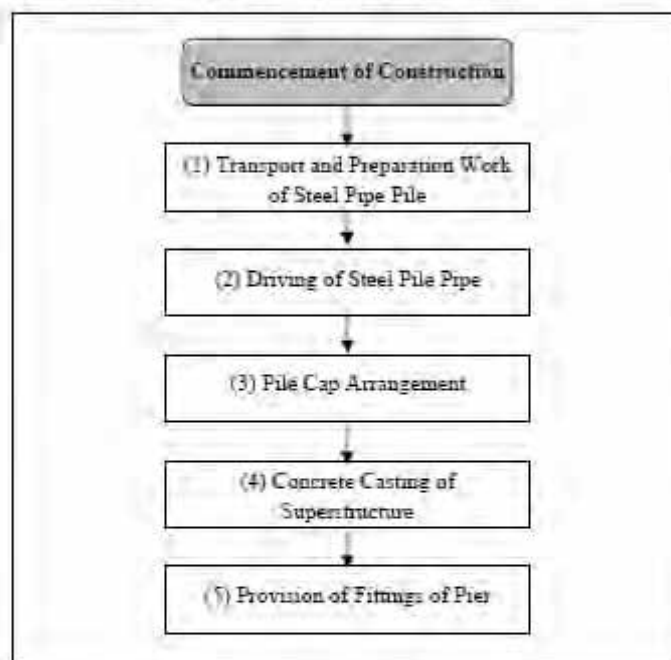


Figure 6 Brief Flowchart of Pier/Trestle Construction Process

Construction methods of each process indicated above flowchart are discussed in SUPPLEMENTARY PAPER of IEE Draft Report submitted in Feb. 2008. The details of them are now being examined in Basic Design Study by JICA Study Team.

(4) Construction Equipments

1) Equipments for pile driving

Necessary equipments for pile driving are listed below. In this Project, vibro-hammer pile driver or hydraulic hammer pile driver will be adopted for pile driving to avoid the risk of oil spill leakage as mentioned in item (1)-b. These equipments for pile driving will be procured from Japan, Kiribati or the third country by the Contractor.

Case 1) Equipments Required for Vibro-Hammer Pile Driver

Name	No.	Remarks
1. Crane barge	1 no.	
2. Rock pile driver	1 no.	
3. Vibro-hammer	1 no.	
4. Power generator	1 no.	
5. Power generator	1 no.	
6. High water pressure pump	3 nos.	For jeting
7. High water pressure pump	1 no.	For grouting
8. High water pressure pump	1 no.	For cooling
9. Grout pump mixer	1 set	
10. Anchor handling boat	1 no.	
11. Tugboat	1 no.	
12. Barge	1 no.	
13. Traffic boat	1 no.	

Case 2) Equipments Required for Hydraulic Hammer Pile Driver

a. Pile Driving Vessels

Name	No.	Remarks
1. Hydraulic hammer type pile driving vessel	1 no.	Full evolution Spud type is best.
2. Anchor handling boat	1 no.	
3. Tugboat	1 no.	
4. Barge	1 no.	
5. Traffic boat	1 no.	

b. Superstructure Work Vessels Equipped with a Crane

Name	No.	Remarks
1. Barge equipped with a crane	1 no.	Spud type is best.
2. Anchor handling boat	1 no.	
3. Tugboat	1 no.	
4. Barge	1 no.	
5. Traffic boat	1 no.	

2) Other equipments:

Equipments other than those for pile driving are listed below. These will be procured from Japan, Kiribati or the third country by the Contractor.

Name	No.	Remarks
1. Concrete batch plant	1 no.	
2. Concrete casting pump	1-2 nos.	Not yet fixed.
3. Dump truck	1 no.	
4. Crawler crane	1 no.	
5. Trailer	1 no.	
6. Payloader	1 no.	
7. Backhoe	1 no.	
8. Diesel power generator	2 nos.	
9. Dredging machine	1 no.	For leveling operation in case of the design depth is set at -9.0m.

3) Maintenance of construction machines

Construction machines and equipments to be procured are not old type or poorly maintained ones, but well functional, rather improved types and well maintained ones. During the construction work, the machines and equipments are to be kept proper maintenance for not only enough workability and function but also environmental considerations, i.e. minimizing noise, vibration, emission gas, etc.

(5) Construction Materials to be Procured

Main construction materials necessary for the Project include cement, aggregate, rebar and steel pipe pile, plywood, steel board. Necessary volume and the number of the materials as well as procurement country are listed in the table below. Procurement of all the construction materials is the responsibility of the Contractor.

Materials	Specification / Dimension	Volume / Number	Procurement Country
1. Cement	Portland cement	Approx. 840 ton	Fiji
2. Aggregate	< 25 mm	Approx. 1,540 ton	Fiji
3. Rebar	13 - 32 mm	Approx. 280 ton	Japan, Australia, New Zealand, or Fiji
4. Steel pipe pile	φ 700 x 12t x 30m	300 - 350 nos. in total	ditto
5. Plywood	0.9 x 1.8 m x 12mm	Approx. 3,000m ² of area	ditto
6. Steel board	0.3 m x 1.0 m	Approx. 6,000m ² of area	ditto

Note) Volume/number can be subject to minor change in the Basic Design Study.

(6) Implementation Schedule

Approximately three years is needed for the completion of the Project. This does not include the period required for detailed design and tender.

- 1) Preparation work (mobilization and procurement): 6 months
- 2) Construction works (Construction of pier, trestle, etc.): 2 years
- 3) Procurement of Container Handling Equipments and Demobilization: 6 months

(7) Responsibility

The responsibility agency is listed below by task:

- 1) Implementation of the Project: MCTTD and KPA
- 2) Construction Work: Contractor to be selected by MCTTD and KPA
- 3) Construction Supervision: Engineering Consultants to be selected by MCTTD and KPA
- 4) Waste Management during Construction Work: Contractor to be selected by MCTTD and KPA
- 5) Management of the Constructed Facility (after Handover): KPA

Comment (2)-e.

List of government authorities consulted. There is a proposed major offshore dredging operation by the MFMRD in the Betio lagoon and therefore the concerned ministry needs to be aware of this important project.

JICA Study Team contacted an official (Ms. Reevate Willie, Mineral Development Officer) of MFMRD for the collection of information related to the said offshore dredging operation. As a result, the details of the said operation and the relationship with the Betio Port Expansion Project were made clear as summarized below.

The offshore dredging operation is an extraction of submarine sand from Vinstra Shoal deposit located in the Tarawa lagoon (refer to Figure 7). An Economic Feasibility Study (F/S) and Environmental Impact Assessment (EIA) were conducted by US Consulting Company in 1997. The following description is based on the F/S and EIA report of the proposed operation.

The purpose of the operation is to discontinue the mining of sand beaches on the islands of Tarawa and to replace these activities with the mining of submarine sand from the Vinstra Shoal deposit, an offshore deposit located in the Tarawa lagoon approximately 3 km north of Betio in less than 10m water depth. Consultants' review of available reserves indicated more than 6 million m³ of sand and gravel, sufficient for well over 100 years at 1990's rate of usage. A production rate of 45,000 m³/yr is assumed, using a 6" submerged suction pump, mounted on a 40 meter motorized barge with a capacity of 250 m³. The dredge would operate on site for 3 hours each working day and discharge to a stockpile at the wharf in Betio.

Environmental effects which were subjected to specific and relatively detailed analysis include (1) impacts on the lagoon and lagoon shorelines due to the removal of the Vinstra Shoal deposit, (2) dispersion of the fine sediment from the dredge overflow, and (3) possible effects on nearby bottom fish and some corals.

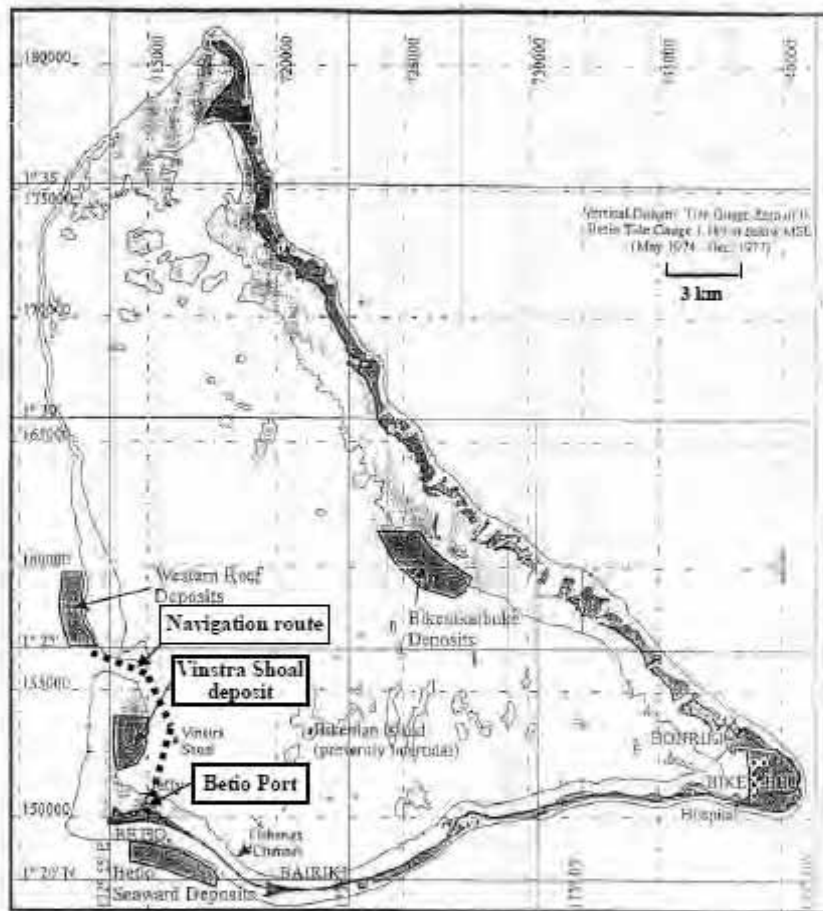
Regarding the 1st effects above, removal of offshore sands by dredging has been resulted in increased erosion of nearby beaches due to alteration of the wave energy impinging on the beach. As a result of analysis in the report, however, it was revealed that the removal of the sand deposit would not be expected to degrade significantly the capacity of the barrier reef to protect the lagoon. As for the 2nd effects, a simulation of mathematical model was conducted to predict the dispersion of fine particles from the dredging site. As a result of the simulation, it was found out that the highest value for fines concentration was 0.1 mg/l. Given the fact that there is currently significant natural turbidity in the water of Vinstra Shoal deposit, it was concluded that turbidity from the offshore mining operation will not cause significant impacts. Regarding the 3rd effects, suspended sediments in the water column can do serious damage to growing corals. However, high sediment loads are already present in the water column of Vinstra Shoal deposit. Thus no significant impact would be anticipated on the biological environment according to the report.

Consequently, the operation of sand and gravel mining at Vinstra Shoal deposit will not any significant impacts on lagoon and lagoon shoreline, dispersion of fine particles and sedimentation or marine organisms.

Based on these information, the following conclusion can be obtained. The location of the Vinstra Shoal deposit is far enough (3 km) from Betio Port, and is situated outside (south) of

the navigation route to the Betio Port, which indicates there will be no impact on navigation of ships to moor the Betio Port. Thus, there will be no such significant impacts as conflict with the Project activity, erosion, sedimentation or disturbance of fishery resources, and therefore no impacts on the implementation of the Project.

After 10 years has passed since the issuance of the F/S and EIA report in 1997, the operation has proceeded to implementation supported by EU. MCTTD will keep monitoring the progress of the operation by contacting time to time with MFMRD and the Project Coordinating Committee, management body of the dredging project to avoid any conflict.



Tarawa Atoll

WGS72 Projection Zone 66
 (Modified from the chart presented in Smith and Biriba, 1995)
 Michael J. Courchot and Charles L. Morgan, Consultants to the
 Ministry of Natural Resources Development, Republic of Kiribati
 Sotterley, 1997

- Airport
- Road of 100m
- Land
- Reef
- Fish Ponds

Figure 7 Location of Vinstra Shoal Deposit for Sand Mining Operation by MFMRD

Comment (2)-f.

Use of water and electricity in the project. It is important to state if there is significant quantity of water and electricity needed and, if so, where to source these from.

(1) Water Use

1) Water required for construction work

Water required for the construction work is the one for concrete manufacturing by mixing of cement and aggregate. The amount of necessary water is 500m³ at most in total throughout the construction work. Other water use is temporary and minor.

2) Water use at base camp

Water use at base camp including the Contractor's office is daily throughout the construction work until the completion. Required water volume depends on the number of persons working in the office. It is estimated to be 10 on average who are regularly working in the Contractor's office according to the labor mobilization plan. The unit water consumption per day per capita can be estimated to be less than 20 liter except for drinking water (Drinking water is supplied by bottle water.). Thus, the daily consumption of water in an office is estimated to be 0.2 m³ at most.

3) Procurement of water

Water required for construction work and daily water needs at the base camp will be procured by PUB. JICA Study Team has contacted Public Utility Board (PUB) and PUB agreed with water supply. Water will be procured by water delivery vehicle upon a request from the Contractor.

(2) Power Use

1) Power required for construction work

The power required for the construction work is basically provided by the Contractor's diesel power generators. It is, therefore, not necessary to get power provided by PUB.

2) Power use at base camp

Power use at the base camp including the Contractor's office is daily needs throughout the construction work until the completion. Required power needs depend on the number of persons working in the office as well as the power for the illumination, air conditioner, personal computers and other office machinery. The power demands at the office are estimated to be ordinary level at the office with regular workers of 10 persons.

3) Procurement of power

Power required at the base camp for daily needs is to be provided by PUB. JICA Study Team has contacted PUB and PUB agreed with power supply.

資料 - 8 MCTTD による IEE 調査結果



REPUBLIC OF KIRIBATI
MEMORANDUM

From: Secretary for Communications To: Secretary, MELAD
Transport and Tourism Development

File Ref: 3/21 ATTN: Marii Manse

Date: 16 October 2007

Subject: Draft IEE report – Betio port expansion project

Attached is an extract from Mr. Hatakeyama's report which we hope to use in our final IEE report. Much of the information Mr. Hatakeyama has provided we hope has covered some of the major issues that need to be addressed regarding the projects social and environmental impacts. The extract is also a sort of draft IEE report; however, I know there may other issues that have yet to be covered which you will be able to comment on.

Please contact this office if you have any queries.

Kam abwa

Tiron Uriam
for Secretary- Ministry of Communication, Transport and Tourism Development

Enclosed: Draft report – Betio port expansion project.

Cc: OIC KPA
Operations Manager KPA

Registry Copy MCTTD

(DRAFT) IEE Report

1. Title of the Cooperation Project

Expansion of Betio Port

2. Categorization and its reason

Categorization: B

Its Reason: This project, its impacts on the environment may be limited. However, several impacts on the environment and society such as coastal zone, sanitation and environmental pollution need to be reviewed in advance

3. Outline of the Location

The Project site is at the Betio Port in Tarawa as shown in Figure 1 and 2. Betio port is located in the lagoon of Betio islet surrounded by coral reef at the west and North Tarawa at the east.

3-1 Natural Environment

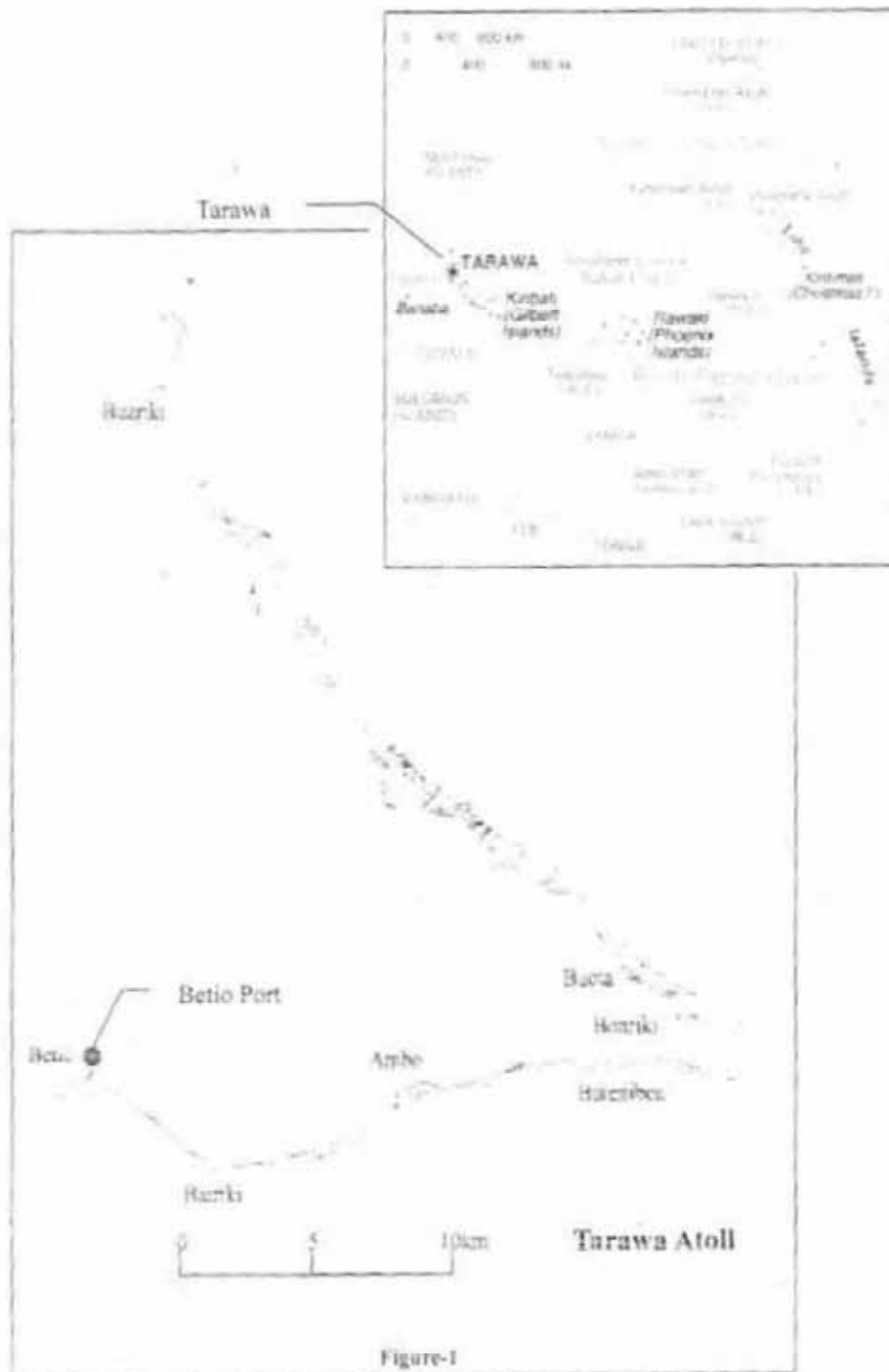
Temperature varies between 25 and 33°C and 50 to 63 percent of the annual possible sunshine of 4134 hours. The wet season extends from December to May and rainfall variation is high in most of the islands. A gentle breeze from the easterly quarter is predominant.

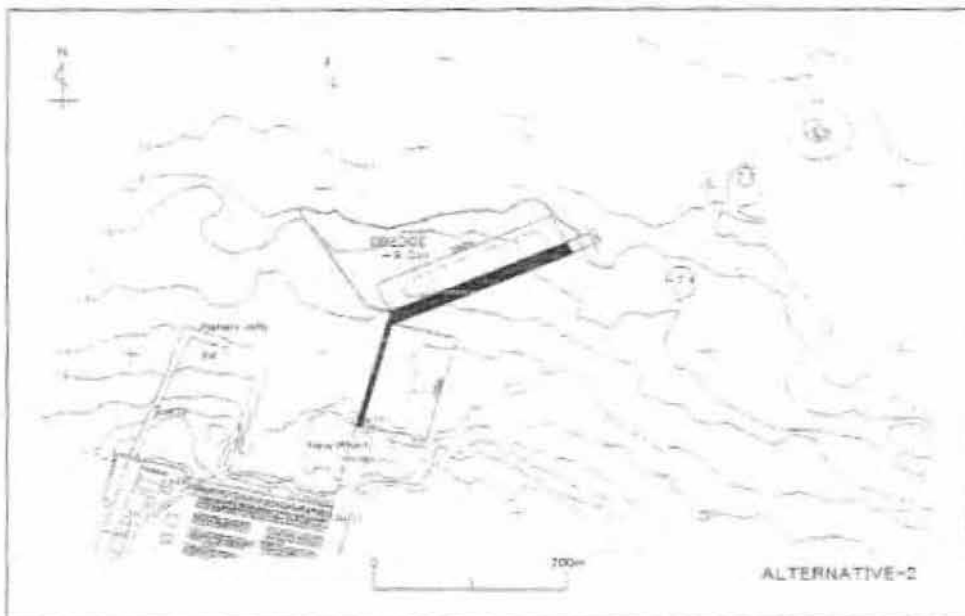
It is estimated that the coral located inside the lagoon is not alive due to water pollution accumulated by the wastewater discharged from the residence situated along the island and no important coral species exist in the lagoon area.

The wave climate inside the atoll is rather calm since it is not a zone of storm belt and is less experience of strong depression due to proximity to the equator.

There is no record of earthquakes more than magnitude 4 occurred within a radius of 300 km from Betio port.

The upper layer of subsoil at Betio port comprises coral sand and coral fragments of about 10 meter thick with N-Value of 0 to 30. The lower layer, deeper than 5 meter from the sea bottom, is relatively dense and a hard coral rock can be encountered at some places.





4. Outline of Relevant Agency and Institution

4-1 Responsible organization: Ministry of Communications, Transport and Tourism Development (MCTTD)

Ministry of Communications, Transport and Tourism Development is in charge of the planning, designing and construction work of the Project in collaboration with KPA and JICA.

4-2 Implementing organization: Kiribati Ports Authority (KPA) and JICA

After completion of the construction work, responsibility for operation and maintenance will be handed over to KPA with the exception of the navigation aid which will be maintained by the Marine Division of MCTTD.

5. Outline of the Project

5-1 Objectives:

The objective of the project is to improve the Betio Port facilities and capacity to secure safety and efficient cost effective cargo handling

5-2 Items Requested by the Government of Kiribati

- 1) Construction of Pier 200m long
- 2) Construction of Access Trestle 250m long
- 3) Navigation Aid
- 4) Cargo Handling Equipment

5-3 Analysis of Alternatives

The alternative-2 in Figure-2, which requires dredging work, is not preferable in consideration of the sedimentation, unavailability of the dredging equipment, and adverse environmental impacts evaluated as "A"; serious impact is expected as shown in Table-2. In zero option social environment such as "local economy" and "the poor" is evaluated as "B"; some impact is expected due to price rise in the country of which transport by barges was recognized as one of the central causes.

Table-2 Comparative examination of alternatives

No.	Impact	Zero Option	Alternative-1	Alternative-2
Social Environment				
1	Involuntary Resettlement			
2	Local economy such as employment and livelihood, etc.	B		
3	Land use and utilization of local resources			
4	Social institutions such as social infrastructure* and local decision-making institutions			
5	Existing social infrastructures and services			
6	The poor, indigenous and ethnic people	B		
7	Misdistribution of benefit and damage			
8	Cultural heritage			
9	Local conflict of interests			
10	Water Usage or Water Rights and Rights of Common			
11	Sanitation		B	B
12	Hazards (Risk) Infectious diseases such as HIV/AIDS		B	B
Natural Environment				
13	Topography and Geographical features			
14	Soil Erosion		B	A
15	Groundwater			
16	Hydrological Situation		B	A
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)		B	A
18	Flora, Fauna and Biodiversity		B	A
19	Meteorology			
20	Landscape		B	B
21	Global Warming			
Pollution				
22	Air Pollution		B	B
23	Water Pollution		B	A
24	Soil Contamination		B	B
25	Waste		B	B
26	Noise and Vibration		B	B
27	Ground Subsidence			
28	Offensive Odor			
29	Bottom sediment		B	A
30	Accidents		B	B

Rating:

A: Serious impact is expected.

B: Some impact is expected.

C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.)

No mark: No impact is expected. IEE/EIA is not necessary.

6. Adverse Environmental and Social Impacts

It is necessary to examine the impacts of the project on the marine environment carefully since the construction of large-scale facilities is assumed. The IEE level study based on the JICA guidelines for environmental and social considerations was executed with Kiribati side. Table-3 shows the Results of Scoping. None of the items of serious impacts, "A" were expected. Some impacts, "B" were expected from some of social, natural and pollution items.

Table-3 Results of Scoping

No.	Impact item	Rating	Reason
Social Environment: *Regarding the impacts on "Gender" and "Children's Right", might be related to all criteria of Social Environment.			
1	Involuntary Resettlement		Neither housing nor stores, and no existence of illegal settlers in the project site.
2	Local economy such as employment and livelihood, etc.		Positive impact is expected such as creation of employment.
3	Land use and utilization of local resources		The project does neither occupy the existing land nor utilize local resources such as sand, stone, woods, water, etc.
4	Social institutions such as social infrastructure and local decision-making institutions		Low accessibility to social institutions is not caused because the project is carried out inside a port area.
5	Existing social infrastructures and services		The project does not use large quantity of infrastructure services such as power and water beyond local demand.
6	The poor, indigenous and ethnic people		No squatters occupies around the port. Most people of Kiribati are Micronesians and the others are Polynesians and Europeans etc.
7	Misdistribution of benefit and damage		The project is for the profit of people nationwide, not for that of a specific group.
8	Cultural heritage		No cultural heritage exists in the site.
9	Local conflict of interests		The project is for the profit of people nationwide, not for that of a specific group.
10	Water Usage or Water Rights and Rights of Common		No fishing right is established in the port. Port facilities are constructed away from the beach.
11	Sanitation	B	Possible deterioration of public health and sanitary conditions owing to generation of garbage and increase of vermin.
12	Hazards (Risk) Infectious diseases such as HIV/AIDS	B	Infectious diseases such as HIV/AIDS may be introduced due to immigration of workers associated with the project.
Natural Environment			
13	Topography and Geographical features		No important geographical features
14	Soil Erosion	B	Beach erosion may occur due to construction of port facilities.
15	Groundwater		No possibility of lowering of groundwater table because groundwater is not overused.

No.	Impact item	Rating	Reason
16	Hydrological Situation	B	The project may cause changes in hydrological and/or seabed conditions around the area concerned due to construction of port facilities.
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)	B	The project site is located on coral reefs (Tarawa Atoll).
18	Flora, Fauna and Biodiversity	B	Some impact of offshore works on marine organisms is expected.
19	Meteorology		The project does not change meteorological conditions such as temperature, precipitation, winds, etc. as the results of construction of port facilities, etc.
20	Landscape	B	The project may deteriorate aesthetic harmony in the area concerned by installation of construction of man-made structures.
21	Global Warming		The project does not include factors that may cause the problem of global warming.
Pollution			
22	Air Pollution	B	The project may cause air pollution by exhaust gas and/or toxic gas from construction vehicles and boats employed during construction.
23	Water Pollution	B	There is a possibility of minor accidental spills of fuel and other oil products from construction equipment.
24	Soil Contamination	B	Some possibility is expected due to dust from stockpiles of construction materials.
25	Waste	B	Generation of construction waste and general waste is expected.
26	Noise and Vibration	B	Impacts of noise and vibration on residents are expected, when construction equipment and/or vehicles is operated on the land.
27	Ground Subsidence		The project does not include excessive groundwater pumping to cause ground subsidence.
28	Offensive Odor		The project does not use offensive odor materials such as dredged sludge, etc.
29	Bottom sediment	B	The project may cause the contamination of bottom sediments by discharges or dumping of materials, such as hazardous materials from workboats and the related facilities.
30	Accidents	B	There may be any risks of accidents such as handling of hazardous materials, spills fire, explosion, traffic accidents and exposure of the project to natural disasters (high waves, strong wind, etc).

Rating:

A: Serious impact is expected.

B: Some impact is expected.

C: Extent of impact is unknown. (Examination is needed. Impacts may become clear as study progresses.)

No mark: No impact is expected. IEE/EIA is not necessary.

7. Mitigation and Monitoring for Key Impacts

Table-4 shows Envisioned mitigation measures for the impact items evaluated as "B". Monitoring for key impacts will be started at the basic design study, and KPA will be a responsible agency to continue monitoring during and after construction. The monitoring results will be published in accordance with Article 28 of the Environment Act 1999.

Table-4 Envisioned mitigation measures

Likely Impacts	Rating	Impact severity (e.g. magnitude, area extent, duration, frequency, reversibility, likelihood of occurrence)	Methods used to predict	Assumed mitigation measures
Sanitation	B	Possible deterioration of public health and sanitary conditions.	- To investigate the complaints from local residents - Periodic medical examination to laborers	- Waste water management - Solid waste management
Hazards (Risk) Infectious diseases such as HIV/AIDS	B	Infectious diseases such as HIV/AIDS may be introduced.	- To collect information about HIV/AIDS from local health centers, WHO etc.	- AIDS education to laborers
Soil Erosion	B	Beach erosion may occur.	- Investigation of present beach erosion and its cause	New landing bridge is constructed with piers attached to the seabed, not reclaimed.
Hydrological Situation	B	Changes in hydrological and/or seabed conditions.	- Investigation of tidal current - Computer simulation	- ditto
Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)	B	Located on coral reefs (Tarawa Atoll).	- Study of distribution of coral	- Avoidance of the area where valuable species inhabit.
Flora, Fauna and Biodiversity	B	Some impact of offshore works on marine organisms.	- Inventory of flora & fauna around the proposed site.	- Avoidance of the area where valuable species inhabit.
Landscape	B	Deterioration of aesthetic harmony in the area concerned.	- Tourist spot and archeological site survey - Landscape forecast (photomontage and perspective diagram)	- Shape and color of facilities are decided taking resident's awareness of landscape into consideration. - Role of landscape (religious belief and tourism) in the region is considered.
Air Pollution	B	Air pollution by exhaust gas and/or toxic gas.	- Air quality survey - Air pollution prediction	- Proper maintenance of construction equipment - Use of road sprinklers
Water Pollution	B	Minor accidental spills of fuel and other oil products.	- Water quality survey - Water pollution prediction	- Periodic monitoring - Implement proper storage of fuel, lubricant and the like
Soil Contamination	B	Dust	- To monitor stockpiles of construction materials	- Cement is placed in storage.

Waste	B	Generation of construction waste and general waste.	- Order to a waste disposer - Use of Municipal waste collection system	- To reduce waste generation - Proper disposal of waste
Noise and vibration	B	Impacts of noise and vibration on residents	- Noise and vibration level measurement - Noise and vibration prediction	- Use of low noise and vibration machine - To cover digging equipment such as diesel hammer with acoustic insulating material - No construction activity during nighttime
Bottom sediment	B	The project may cause the contamination of bottom sediments by discharges or dumping of materials.	- Sediment quality survey - Sand drift prediction	- No dredging work is done for this project. - Storage of hazardous materials must be appropriate
Accidents	B	There may be any risks of accidents.	- Traffic survey - Emergency simulations have to be performed.	- Proper signage and information dissemination - Storage of construction materials must be appropriate, specially flammable and explosive materials.

Note: Rating Criteria
 A: Serious impact is expected.
 B: Some impact is expected.

8. Important Notice on Basic Design Study

8-1 Mitigation measures

To make a suitable plan to take mitigation measures as shown in Table-4.

8-2 Review of IEER

To review IEER which KPA submitted to MELAD and got development consent for this project and to make the above plan maintaining compatibility with the IEER.

8-3 Coral survey

To obtain distribution of coral to secure piling work in the project site.

8-4 Environmental survey

To carry out environmental survey in the project site. The items to be surveyed are;

- 1) water quality- pH, DO, COD, SS, coliform group, oil content, transparency
- 2) sea bed quality- heavy metals, specific gravity, moisture content, grain size

8-5 Waste Management

To make a waste management plan during and after construction.