

西パキスタン
フィテイクリーク港建設計画現地調査
中間報告及び質問状

昭和46年2月

フィテイクリーク港建設計画調査団
海外技術協力事業団

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受入 月日	84. 4. 30	117
登録No.	04043	72.8
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GOVERNMENT OF PAKISTAN
PRESIDENT'S SECRETARIAT
Economic Coordination and
External Assistance Division.

Islamabad, February 2, 1971.

From:

K. Mahmood,
Joint Secretary.

My dear Ambassador:

1. Please refer to the correspondence regarding the Plan of Operation for an Engineering and Economic Survey by an eight-man team of Japanese Experts for development of a New Ocean Port at Phitti Creek near Karachi.
2. Your attention is specially invited to article 11 of the Plan of Operation in regard to the desirability of keeping all the information, documents, etc. supplied to the Survey Team confidential. Could you be good enough to confirm that you will kindly ensure that the report etc. prepared as a result of the Survey will likewise be kept confidential.
3. Please accept the assurances of my highest consideration.

Yours sincerely,

(K. Mahmood)

His Excellency Mr. Akira Sono,
Ambassador of Japan in Pakistan,
Islamabad.

PLAN OF OPERATION
ENGINEERING AND ECONOMIC SURVEY
FOR
THE DEVELOPMENT OF A NEW OCEAN PORT
AT
PHITTI CREEK IN WEST PAKISTAN

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INTRODUCTION

1. After two decades of development since independence in 1947, Pakistan has shown substantial growth of economy with the consequent rapid increase in sea-borne traffic. In West Pakistan, the Port of Karachi has been serving the entire sea-borne traffic, which is estimated to be quadrupled by 1984-85 from about 9 million tons in 1967-70. The Government of Pakistan is considering the possibility of developing a new ocean port at Phitti Creek as well as expansion of Karachi Port in order to handle the increasing amount of port traffic.
2. The hydraulic feasibility of constructing a deep-water port in Phitti Creek has been established by the Hydraulics Research Station, Wallingford, England, commissioned by the Government of Pakistan.
3. The Government of Japan, desirous of further promoting technical cooperation between Pakistan and Japan, has decided to provide, at the request of the Government of Pakistan, a team of experts (hereinafter referred to as "the team") within the framework of its Technical Cooperation Program in order to conduct an engineering and economic survey for the development of a new ocean port at Phitti Creek in West Pakistan (hereinafter referred to as "the survey").
4. The Government of Japan has entrusted the implementation of the survey to the Overseas Technical Cooperation Agency (OTCA), which is an executing agency of the Government of Japan.
5. The present document sets forth a plan of operation regarding the survey.

I. Scope of Survey

6. The Government of Japan will provide necessary technical assistance to the Government of Pakistan in carrying out the survey with particular reference to:

- 1) Assessment of future traffic for West Pakistan ports and that of the requirements for the second port in West Pakistan;
- 2) Evaluation of the potential of Phitti Creek site for the development of the second port in West Pakistan;
- 3) Allocation of traffic to Phitti Creek;
- 4) Preparation of short and long term plans for development of Phitti Creek including estimates of cost and time based on the traffic allocated to Phitti Creek;
- 5) Comparative study of Phitti Creek, Sonmiani and the Western Backwater of Karachi Harbour.

7. The conclusions and recommendations submitted by the Hydraulics Research Station, Wallingford, concerning the hydraulic feasibility of constructing a deep-water port will be taken as the basis for the survey.

II. Execution of Survey

8. The team will conduct field survey and data collection as follows for about one month in Pakistan.

- 1) Examination and review of data already collected by the Government of Pakistan;
- 2) Collection of additional data as may be considered necessary;
- 3) Review of various reports and studies relevant to the survey;
- 4) Inspection of Phitti Creek site;
- 5) Inspection Sonmiani site;
- 6) Inspection Karachi Port;
- 7) Survey of the present situation and future development plans of Karachi Port;
- 8) An estimate of traffic forecast based on economic development plans of Pakistan;
- 9) Survey of local conditions affecting cost estimates for harbour, port and other ancillary works and utilities; viz.
 - a. Availability, quality and prices of necessary construction materials;
 - b. Availability, quality, and cost of labour;
 - c. Availability and cost of utilities such as electricity, gas and water.
- 10) Preliminary analysis of data collected, formulation of basic ideas, and discussions of the prospect of Phitti Creek site as a new ocean port with the officials of the Government of Pakistan.

9. The team will conduct the following work for about 4 months in Japan.

- 1) Traffic Analysis for West Pakistan Ports
 - a. Assessment of future foreign and domestic traffic by type (dry bulk, petroleum, general cargo) for the ports in West Pakistan primarily based on the the data supplied by the Government of Pakistan

concerning Fourth Five Year Plan and Perspective Economic Development Plan of the Government of Pakistan, taking into account import and export of major commodities;

- b. Estimation of port and inland transport capacity required to handle the future traffic through ports;
- c. Assessment of the requirements for a second port in West Pakistan and allocation of estimated traffic to Phitti Creek;
- d. Assessment of capacity requirements in terms of berths and equipment based on allocation of projected traffic to Phitti Creek.

2) Potential of Phitti Creek Site

Examination of Phitti Creek area as a potential site for the development of a new ocean port taking into consideration various factors including; inter-alia:

- a. location;
- b. inland transportation system;
- c. engineering and hydraulic features;
- d. navigation aspects;
- e. utilities;
- f. port-oriented industries;
- g. supporting township;
- h. scope of development and future expansion;
- i. town planning aspects.

3) Long Term Plan

Preparation of "Long Term Plan" for the development of a port, in particular, covering the Perspective Economic Development Plan period including; inter-alia:

- a. general land use planning;
 - 1) for port requirements,
 - 2) for industrial requirements,
 - 3) for housing requirements in relation to other developments in the neighbourhood,

- 4) for requirement of access to port defining road and railway alignment to the port.
- b. general planning and layout of various port facilities,
 - c. general planning and layout of various harbour works, including dredging, training, and maintenance of the approach and navigation channel, aids to navigation, pilotage, tugboat service etc.,
 - d. general planning and layout of road, railway, bridges, ferries, pipelines (water, gas, oil etc.), powerlines, conveyor system etc.,
 - e. phasing of the Long Term Plan,
 - f. cost estimates.
- 4) Short Term Plan

Preparation of "Short Term Plan" for the first stage of development of a port/anchorage with recommendations converging:-

- a. the dredging, training, buoyage and aids to navigation for the outer bar and the navigation channel leading to the proposed port/anchorage;
- b. the construction of a port/anchorage in Phitti-Jhari Creek;
- c. the construction of berthing facilities for lighters in Jhari Korangi Creek;
- d. the construction of a fish harbour in Korangi Creek;
- e. the construction of road, railway, power, gas and water supply lines connecting the existing facilities with proposed port/anchorage;
- f. the possibility of locating some port-oriented industries such as steel mill, fertilizers plant, refineries, petrochemicals etc., on the Bandal and Khaprianwala islands and/or on the high land bordering Korangi Creek and transferring bulk cargo direct from ships to these industrial establishments by means of overhead conveyors;
- g. estimates of cost and time for construction work for port and inland communications as well as maintenance cost of port.

- 5) Comparative Study of Phitti Creek, Sonmiani, and the Western Backwater of Karachi Harbour*
- a. economic appraisal of Phitti Creek site primarily based on the cost of Short Term Plan with consideration of benefits such as additional port capacity, benefits from greater depth, differential inland distribution costs, and effect on Karachi problems;
 - b. economic appraisal of Sonmiani and the Western Backwater of Karachi Harbour primarily based on the examination of the feasibility studies for both sites;
 - c. comparison of the costs and benefits of three sites.
-

*
Note: The exact methodology to be adopted for the economic appraisal and comparative study will be decided after consultation with various authorities concerned during the team's visit to Pakistan depending on the nature of data available.

10. Based upon the aforementioned surveys and works, a survey report will be prepared, and 100 copies of the report will be presented to the Government of Pakistan by the end of July in 1971. The report will be written in English with the adoption of both the metric and foot-pound-second systems. The monetary value will be expressed in local currency with foreign exchange component in U. S. dollars.

11. The data and various documents/reports etc. obtained during the survey will be kept confidential and be returned to the Government of Pakistan after the completion of the report.

III. Arrangements to be made by the Government of Pakistan

12. The following information, local services and facilities will be provided to the team by the Government of Pakistan.

- 1) Economic development plan of Pakistan and related statistics and details relevant to the survey;
- 2) All available charts, maps, data and previous studies relevant to the survey;
- 3) All available statistics, data, reports etc. relating to Karachi Port and Sonmiani relevant to the survey;
- 4) Access to aerial photographs of Phitti Creek area during the survey in Pakistan;
- 5) Local transport during the survey (excluding travel by air and train)
- 6) Liaison with various Government and other agencies in Pakistan for discussions and collection of additional data and information required for the survey;
- 7) Rent-free office accommodation and equipment at Karachi to be available within and beyond office hours, preferably inside or near the hotel;
- 8) Liaison officers to accompany the team during the survey;
- 9) Appointment of, at the cost of the Government of Pakistan, counterpart local consulting firm to assist the team in Pakistan.

IV. Privileges and Exemption to be granted to the Team

13. The members of the Team engaged in the survey will be entitled to such privileges and exemptions as the Government of Pakistan normally extends to Colombo Plan Experts.

V. Signature

The undersigned agreed on the foregoing on behalf of the parties on this date of February 2, 1971.

AKIRA SONO

Ambassador of Japan
in Pakistan

S.S. IQBAL HOSAIN

Secretary to the Government of
the Islamic Republic of Pakistan,
Economic Co-ordination and
External Assistance Division,
President's Secretariat.

PAKISTAN

Phitti Creek 港建設計画調査

中 間 報 告

1971年 2月

団長 佐 藤 肇

日 本 政 府 派 遣

Phitti Creek 港建設計画調査団

ま え が き

Mr. Rizui により周到に計画された視察のスケジュールによって、また、海軍、K D A、K P T の親切な協力によってわれわれの短い調査期間が実り多いものであったことを確信し、関係者に感謝する。

しかし、はじめて訪れたこのような広大な国について、しかも急速に経済が伸びつつある現状では、経済や社会の実体を十分に認識出来なかったことは事実であるし、Phitti Creek における自然的環境についても S W モンsoon 期における状況等を確実に envisage することが出来なかったことも事実である。

したがって以下に述べる現地調査の所見はいささか大胆に過ぎるものや、的を外しているものがあると思われるが、それらについては卒直な意見を承りたい。

所 見

1. 独立以来の西パキスタンにおける経済の成長は年率約4%、特に工業生産の増大は年率約8%であって、急速に経済が拡大しつつある。

また西パキスタンの Leading City である Karachi は1947年には400,000人の人口であったものが現在は3,000,000人を超える程の驚異的な人口増加を示している。

このような急激に増加する人口に対し、職が与えられ、住宅が与えられるとともに Karachi Metropolitan Region の整備が計画的に進められていることは敬服に値いする。

2. 上述の如き西パキスタンにおける経済の成長と Karachi 市及びその周辺における人口の著しい増加および工業化の進展によって、Karachi 港の港湾取扱貨物量も急激に増加している。

1949 ~ '50	2,881	千屯
1959 ~ '60	4,503	
1969 ~ '70	9,339	

さらに Planning Commission の既往の予測によれば5年後には現在

1974 ~ '75	18,053	千屯
1979 ~ '80	27,510	
1984 ~ '85	40,288	

の2倍に、10年後には現在の3倍に、15年後には現在の4倍に増加することになる。すなわち、5年ごとに現在のカラチ港を1つつつ作って行くことになる。

このような状況のもとにおいては Karachi 港の将来計画と同時に Second Port の適地調査が行なわれることは当然である。

3. 古い歴史をもち繁栄を続けてきた世界の港は現在転換期に遭遇している。Karachi 港としてその例外ではない。

このような転換期をもたらした原因は2つある。1つは船舶のもたらしたものであり、Bulk Carrierを中心とした船型の大型化と荷役の機械化、ならびに雑貨のContainerisationである。もう1つは背後の都市の成長であって、港と都市とは限られた土地を奪い合い更に港と背後地を結ぶ道路は市街地を通過する部分が隘路となり貨物の流動が阻害されてくる。

このような傾向から世界の主要な港はいずれもold portから離れた場所にNew portを建設しつつある。

Port of London AuthorityのTillbery DockやPort of New York AuthorityのPort Newark, Port Elizabeth等はNew portの成功した例である。

また日本の神戸港に目下建設されつつあるPort IslandもNew portのcategoryに入る。

4. 西パキスタンにおけるsecond portの問題をこのような視野から眺めることとする。Karachi港のWestern Back Water, Sommiani Phitti Creekの3者の比較にあたっては、まず西パキスタンの都市と内陸交通網がインダス河沿いに発達している現状を認識する必要がある。この事実からSommianiはKarachi市ならびに西パキスタンにおけるHighly Developed Areaから離れ過ぎていて、たとえ港が作られたとしても陸上輸送費が割高となることは避けられない。むしろSommianiは西海岸地方の資源開発が進んだ段階でwest coastの門戸として考えるのが妥当ではなからうか。

次にKarachi港のWestern BackwaterとPhitti Creekとのいずれがnew portの位置としてふさわしいかは

a. 将来予測される船型の大型化に対し、いずれが適合のflexibility

を有しているか。

- b. 背後地との陸上交通においていずれが Smooth な流れをとり得るか、かつ Karachi 市の市街地交通に過剰な load をかけないで済むか。
- c. 都市計画上港湾関連工業の立地をいずれの site により多く期待出来るか。
- d. いずれが将来の拡張に対して弾力性を持っているか。

の観点から決めるべきであろう。

5. a については最大船型 50,000 D/W を想定し岸壁水深 42' を確保するものとして既往の調査にもとづいて判定すれば

Karachi Western Backwater 約 30,000,000 yd³

Phitti Creek 約 18,000,000 yd³

の浚渫が必要となっており Phitti Creek が有利である。

なお Wolling Ford の報告によれば maintenance についても Phitti Creek の有利性が述べられている。

b については背後地との内陸交通が市街地の traffic 密度の高い道路をとらなくても済むことから一般的に Phitti Creek が有利と思われるが Karachi 港周辺ならびに西部工業地帯に対する大量な bulk cargo の輸送に対しては Western Backwater の方が便利である。

c Port oriented industry の今後の立地特に heavy industry に対する原材料輸入の場合を考慮すれば Phitti Creek の方が優れていると考えられる。

d については Karachi 港の港口、航路の維持のためには Karachi Western Backwater は無制限に埋立が出来ない。

以上の判定から Phitti Creek の開発は Karachi 地区の new port area としての適合性を証明している。

6. 以上の考察は西パキスタン唯一の門戸として活躍している Karachi 港

に対し、競合する港を建設するということではなく、Phitti Creek をカラチ港の new port area として発展せしめようとするものである。これは Karachi 港の活動を輸送革新の時代に適応させ、かつ port oriented industries の今後の立地を予想させて、それらの工業のために望ましい条件を備えた土地を準備すると云うことであり、Great Karachi Port の構想を suggest するものである。この構想はより広い港域を生かし、自然条件を充分に活用して将来の発展に備えようとするものである。なおこのような構想によれば proposed southern highway の早期実現が望ましい。

(Korangi Chinna Creek)

7. 以上述べたことを本調査団は帰国後日本において別添のごとき item によって報告書を作成するものである。
8. 以上の考察は Phitti Creek の水理学的分野については英国 H. R. S の研究の中間報告にもとづいて行なわれたものである。水理学的可能性については更に詳細な検討を行なう必要があるが水理学的問題点については十分なデータの提供を受けていない。これらの問題点が英国 H. R. S の最終報告によって解消されることを期待したい。

報 告 書 目 次 (案)

序 論

結 論 と 勧 告

PART I 計画の前提

CHAPTER 1. 西パキスタン港湾関係輸送需要の推計と港湾関連工業の見透し

CHAPTER 2. 西パキスタン新港建設の必要性に関する考察

CHAPTER 3. 西パキスタン新港建設予定地点の考察

PART II Phitti Creek の計画

CHAPTER 1. 長期計画

CHAPTER 2. 短期計画

CHAPTER 3. ソンミアニ, WB of karachi フィティクリークの
経済評価及比較

注)

- 1) PART I, CHAP. Iにおいては政府によって提出された経済予測値を用いて
 - a) 政府によって提出された港湾貨物の推計
 - b) 政府によって提出された陸上輸送計画をチェックして必要があれば修正を行なう。尚港湾関連工業についても政府によって提出された経済計画にもとづいて推定を行なう。
- 2) PART I, CHAP. 2においては
 - a) カラチ港の当面している問題
 - b) カラチメトロポリタン開発計画との関連を考慮して
 - b) 貨物量の増大
 - b) 船型の大型化
 - c) 内陸輸送との結合
 - d) 港湾関連工業の発展等を中心に検討する
- 3) PART I, CHAP. 3において
 - a) 水理的
 - b) 開発計画及内陸輸送との結合
 - c) 在来の調査結果にもとづいたソンミアニカラチ港の建設費に対する考察を行なう。
- 4) PART II, CHAP. 1においては
 - a) フィティクリークの特性(水理的, 内陸輸送港湾関連産業等)
 - b) カラチとの貨物の分担
 - c) 港湾の規模と性格
 - d) 港湾関連企業の規模と性格
 - e) 平面計画
 - f) 維持
 - g) 建設計画
 - h) 建設費を中心に検討する
- 5) PART II, CHAP. 2においては
 - a) フィティクリーク開発のタイミングと当面の利用計画
 - b) 初期投資額とtime scheduleを中心に検討する。
- 6) PART II, CHAP. 3においては
 - a) 経済比較(建設費, 船型の大型化による利益, 内陸輸送費)
 - b) 各港の特性(金で比較出来ないもの)の比較を行なう。

February 15, 1971

The Secretary
Planning Commission
Government of Pakistan

Dear Sir:

It is my great pleasure to present you an interim note per attached on the engineering and economic survey for the development of a new ocean port at Phitti Creek. It was only possible through the generous cooperations by the Planning Division, the Pakistan Navy, Karachi Development Authority, and Karachi Port Trust, and through the skillfull arrangement of survey schedule by Mr. S.Z.H. Risvy that we could have performed our fruitful mission here in a very limited period of time. I hereby wish to express my sincere thanks to the Pakistan officials concerned for their cooperations and efforts extended to us.

We should recognize however that we, upon our first visit here, could have only a partial understanding of the economy and society of this wide country which is making a rapid economic progress. We also could not have envisaged all of the environmental conditions of the Phitti Creek area, especially these during the southwest monsoon.

These limitations in our survey are possible to have affected our opinions expressed in this interim note at the stage of its formulation; some of them may be premature at this time and some other may be astray of the right situation. I would like to invite your active discussions on this interim note, by which we shall have the honor to receive your great contribution to the preparation of the survey report.

Very truly yours,

Hajime Sato
Dr. Eng. Chief,
Japanese Survey Team for
New Ocean Port at
Phitti Creek

INTEL A REPORT
on
The Engineering and Economic Survey
for
the Development of a New Ocean Port
at Phitti Creek

1. The economy of West Pakistan has rapidly been expanding its scale with the rate of four per cent per year since the independence of Pakistan in 1947; among several sectors the growth of industrial product stands with the rate of eight per cent per year.

At the same time Karachi, which is the leading city of West Pakistan, has undergone an explosion of population from about 400,000 in 1947 to more than 3,000,000 at present. Admiration should be given to the officials concerned who have provided means of working and place of living for such exploding population and have undertaken the systematic planning and improvement of Karachi Metropolitan Region.

2. The expansion of the economy of West Pakistan, the tremendous increase in the population in and around Karachi City, and the resultant progress of industrialisation sketched in the above have brought a great increase in the amount of cargo handled at Karachi Port as follows:

1949/50	2,881	(unit: thousand tons)
1959/60	4,503	
1969/70	9,339	

According to the projection previously given by the Planning Commission, the cargo is expected to increase in the future as follows:

1974/75	18,053	(unit: thousand tons)
1979/80	37,510	
1984/85	40,288	

The figures indicate that the amount of cargo will become two-fold in five years, three-fold in ten years, and four-fold in fifteen years, of the present amount. In other words, one port equivalent to the present port of Karachi in its capacity needs to be developed in every five years.

It is a natural consequence under such situations that a survey for the development of a second port is undertaken in parallel with the planning of the future expansion of Karachi Port.

3. The ports around the world with long histories of prosperity are now encountering the period of innovation in the port planning and operation. The one factor is the changes in ships and cargo: i.e., the increase in the size of ship, especially of bulk carriers, the mechanisation in cargo handling work, and the containerisation of general cargo. The other factor is the growth of cities behind a port, which causes the competition between the cities and port for the utilization of limited land available. The growth of cities also produces the problem of road congestion in the city area, which becomes the bottleneck for smooth traffic of cargo between the port and hinterland.

Major ports in the world are now constructing new ports at the sites away from the old ports under such circumstances of port innovation. Successful examples of new port area development are Tilbery Dock of the Port of London Authority, Port Newark and Port Elizabeth of the Port of New York Authority. The Port Island under construction at Kobe Port in Japan also belongs to the category of the new port area development.

4. We shall examine the problem of second port development in West Pakistan from the view point of port innovation. The fact which should be first recognized for the comparison of three candidate sites, i.e., Sonmiani, the Western Backwater of Karachi, and the Phitti Creek, is the present situation that cities and in-land communication network in West Pakistan has been developed along the Indus. The situation excludes Sonmiani from the candidate sites for a second port, since a port development at Sonmiani will result in much higher cost of inland transportation than at the other two because of its greater distance to Karachi City and other highly developed area in West Pakistan. Sonmiani will be better reconsidered as a gate way to the West coast area at the stage when the exploitation of mineral resources in the area will be materialised.

The next comparison of the Western Backwater of Karachi and the Phitti Creek for the suitability as the site of new port areas should be made from the view point of the following:

- a) Which site has more flexibility for adaptation to the expected increase in ship size in the future?
- b) Which site will produce a smoother traffic flow for

inland transport to and from the hinterland without adding excessive load upon the urban traffic inside Karachi City?

- c) Which site can provide better location for port-oriented industries from the standpoint of city planning?
- d) Which site is more flexible for the future expansion?

5. The itemized comparison of the two sites are made in the following:-

- a) The assumption of accomodating a maximum ship of 50,000 D/W associated with the construction of wharves with the depth of 42 ft. yields the initial dredging of the following amounts.

At Karachi Western Back-water-about 30 million yd³
At Phitti Creek -about 18 million yd³

according to the preliminary calculations. The comparison of two figures indicates the advantage of the Phitti Creek over the Western Backwater of Karachi.

In addition, the preliminary report on hydraulic feasibility of the Phitti Creek site submitted by the Hydraulic Research Station, Wallingford, Maglend forecasts the amount of maintenance at the Phitti Creek being lose than the amount at the present port of Karachi.

- b) The inland transport between the Phitti Creek and the hinterland in general will need not to pass through the urban area which has the high traffic density, whereas the Western Backwater of Karachi will need to communicate with the hinterland through the urban area. This fact favours the Phitti Creek. But the transport of bulk cargo to and from the industrial development in Western Karachi and around the Port of Karachi will be better handled through the Western Backwater of Karachi.
- c) Future locations of port-oriented industries, especially with consideration for the imports of raw materials for heavy industry, suggests the superiority of the Phitti Creek to the Western Backwater of Karachi.
- d) The Western Backwater of Karachi can be reclaimed only to such an extent that the reclamation will not affect the maintenance of the channel and harbour entrance significantly, whereas the reclamation at the Phitti

Creek can be done almost unlimitedly.

The comparisons in the above indicate the suitability of the Phitti Creek as the area for new port development around Karachi City.

6. The arguments given in the above are not intended to suggest the development of a new port which will compete with Karachi Port, which is functioning as the only gate way to West Pakistan. The arguments are rather oriented to the development of the Phitti Creek as the new port area of Karachi Port. This is to make the function of Karachi Port adapt to the age of transport innovation and to prepare the well-qualified industrial reservations for port-oriented industries, which we expect will come to the new port area in near future. Thus our considerations suggest a concept of "Greater Karachi Port", which with a wider harbour area will make full utilization of the environmental conditions of the area for the flexible activities in the future. Under this concept, the construction of proposed southern highway (Korangi-China Creek) at earliest stage will be recommended.

7. The foregoing arguments, considerations, and suggestions will be further analysed and combined upon our return to Japan, and will be compiled in a survey report; a tentative table of contents of the report is attached at the end of this report for your reference.

8. The preparation of the present report, as far as the hydraulic aspects are concerned, is based on the interim report on hydraulic feasibility of the Phitti Creek site mentioned before. However, we have not been able to obtain full information on several questions concerning the hydraulic feasibility which requires further examination in detail. We shall expect that these questions will be clearly answered by the final report on hydraulic feasibility of the Phitti Creek area to be submitted by the Hydraulic Research Station, Wallingford, England.

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PART II. NEW PORT PLANNING AT PHITTI CREEK

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February 16, 1971

The Additional Secretary
Planning Commission
Government of Pakistan
Secretariat Block P
Islamabad

Dear Sir:

I am very glad to acknowledge the today's fruitful discussion on our interim report. The discussion we believe will be of great help for the formulation of the final report.

As agreed during the meeting, the additional questions on hydraulic feasibility are formulated per attached. I should be very grateful if the questions are forwarded to the Hydraulic Research Station, Wallingford, England.

At the same time, a list of the report and data which are requested to be delivered at the earliest time possible is attached. The report and data are vital for the preparation of the final report. I hope that they will be delivered to my office in Japan by the end of March 1971 so that we can work but the final report in due time. I must add that a delay in arrival of the requested report and data will result in another delay in the completion of the final report.

I avail myself of this occasion to express my sincerest wishes for the success of the Phitti Creek Project.

Very truly yours,

Hajime Sato, Dr. Eng.
Chief,
Japanese Survey Team for
New Ocean Port at Phitti Creek

LIST OF REPORT AND DATA ON REQUEST

1. Final report on hydraulic feasibility by the Hydraulic Research Station, Wallingford, England.
2. Traffic projections made by the Economic Intelligence Unit and reviewed by the Planning Division.
3. Variations of the consumptions of major commodities, which include wheat, rice, cement, oil, iron and steel, lizer, cotton, and sugar, for the last ten years in the eastern, western, and whole wings of Pakistan.
4. Capacities, numbers of employee, and locations of existing factories and plants, being classified according to manufactured goods.
5. Present conditions of highways and railways in West Pakistan and their future development plans.
6. Variations of the numbers of automobiles, being classified according to types and sizes. (Trucks should be classified according to their freight capacities.)
7. Recent distribution of population in each province and city.

Additional questions to be raised for the
Establishment of Hydraulic Feasibility of
the Development of a New Ocean Port at
the Phitti Creek.

1. Effect of Waves on Sedimentation in the New Channel

Dredging of a deep channel across the offshore bar will create an artificial bottom configuration which has not existed. The new configuration will be subject to considerable wave actions during the southwest monsoon. The effect of wave actions on sedimentation in the new channel is expected to be quite different from what have been taking place in that area in the past. The field survey which has been undertaken does not include the investigation of the wave climate at the locality which seems to be most relevant to this subject.

What will be, in the opinion of H. R. S., the effect of wave actions on the sedimentation in the new channel?

We expect that the amount of maintenance dredging for the approach channel will be estimated with due consideration for the wave effect.

2. Wave Climate in and outside the Phitti Creek

The southwest monsoon is known to send continuous trains of sea and swell to the coast of West Pakistan during its season. The execution of a dredging work is mostly affected by the height of waves prevailing in the area. The efficiency and cost of dredging work is governed by the number of days of high waves. The cargo handling work are also affected by the wave conditions at berth.

- i) What is the estimation of wave climate outside the Phitti Creek with description of the numbers of days exceeding certain levels of wave heights in a year?
- ii) If the estimation cannot be given, what additional study will be suggested by H. R. S. for the estimation of wave climate?
- iii) What will be the height distribution of waves invading from the Arabian Sea into the Phitti Creek?
- iv) What is the estimation of wave climate inside the Phitti Creek?

3. Ship Navigation in the Phitti Creek

What will be, in the opinion of H. R. S., the easiness of ship navigation into and from the Phitti Creek in presence of sea and swell during the southwest monsoon, compared to the navigation into and from the entrance of Karachi Port?

QUESTIONNAIRE

Submitted to Karachi Port Trust

by

Japanese Survey Team

KARACHI

February, 1971

QUESTIONNAIRE

1. Waiting Time of Ships

Ships are said to be waiting outside the harbour for about one day on the average.

What are the factors which are forcing ships to wait for such long periods?

2. Inland Transportation of Cargo from and to Karachi Port

- i) What is the distribution of cargo between railway and road from and to Karachi Port?
- ii) Has there been any change lately in the distribution of cargo between railway and road?
- iii) The percentage of cargo traffic carried by railway is generally high in country, like Pakistan, where the distance of transportation is great.
Is it true for Pakistan also?
- iv) What will be, in the opinion of K.P.T., the likely future distribution of cargo between railway and road?
- v) It is believed that the traffic flow of goods from and to the Port is slow if the inland transportation is not well co-ordinated.

Is it the case with Karachi Port also?

3. Increase in Ship Size

- i) Has there been any tendency towards increase in the size of ships entering Karachi Port?
- ii) If not so, is it due to limited depths at the present wharfs?
- iii) Is there any demand by shipping companies for accommodation of deep drafted vessels?
- iv) If there is, what kind of cargo is proposed to be carried by deep-drafted vessels?

4. Containerization

Japanese ports are now under the process of containerization with the result that most of the major regular

lines will be operated with container ships in very near future.

- i) Is there any concrete move for containerization in Karachi Port?
- ii) Has any shipping company approached you in this respect?
- iii) What is the prospect of containerization in Karachi Port?
- iv) Container ships require berths with depth of 40 ft. length of 980 ft. and back-up area of about 120,000 sq. yds. as the minimum conditions.

Has any concrete plan been prepared for receiving container ships in Karachi Port?

5. Inland Transportation of Containers

- i) Where will goods be stowed in and dismantled from a container upon containerization in Karachi Port: inside the port area or outside?
- ii) The latter case involves transportation of containers, each having a size of 8' x 8' x 40', by railway and/or by road.

Is the inland transportation of containers considered possible in West Pakistan?

6. Development Plan of Karachi Port

The anticipated rapid development of Pakistan economy is likely to result in rapid increase in cargo traffic, especially of bulk cargo such as iron ore, oil etc.

- i) Has any development plan been prepared for Karachi Port to cater for this rapid increase in traffic?
- ii) A new steel mill is said to be established at Buleji, which will require transport of iron ore, coal, and other raw materials through Karachi Port.

What are the development plans of Karachi Port for the handling of these materials?

7. Future Size of Ships to be accommodated

The increase in cargo traffic is expected to be associated with the increase in ship's sizes.

- i) What size of ships are planned to be accommodated in Karachi Port in near future?
- ii) What depth and width of channels and basins are considered technically and economically feasible?

8. Development of Waterfront Industries

The future development of Pakistan economy is likely to be largely dependent on the growth of such key industries as steel, petroleum, etc. Such key industries depend for their raw materials on overseas resources. Their economy largely depends on transportation cost of raw materials, which can be lowered by locating them along the waterfront area.

- i) What will be, in the opinion of Karachi Port, prospects of developing waterfront industries in Pakistan?
- ii) Is the development of waterfront industries considered appropriate or feasible in and around Karachi Port?
- iii) Is there any industrial development plan for Karachi waterfront?

9. Some details of the Supplementary Report (Sept. 1969)

- Karachi Port Master Plan

- i) What are the hydraulic aspects of increasing the depth of basin to 42 ft. (channel to 38 ft.)?
- ii) What kind of training works (e.g. breakwater, groynes etc.) are proposed for the harbour entrance against siltation if existing depths are proposed to be improved as above.
- iii) How much capital dredging is involved?
- iv) How much maintenance dredging is estimated annually to maintain the depth of 42 ft., if considered feasible?
- v) What are the breakdown of cost estimates given on page 21 according to the types of works?

10. Transport of Bulk Cargo

Bulk cargo such as grain and cement seems to be exported and imported in the form of General Cargo. It is believed that the efficiency of the Port will increase if this cargo is transported by bulk carriers and handled

by proper bulk cargo handling equipment.

What are the circumstances under which this method is not being adopted?

11. Request for Additional Data

It will be appreciated if the data requested in separate sheet, which are considered too detailed for present discussions, are kindly provided to us preferably before February 17, 1971.

February 1, 1971

Mr. S. Z. H. Rdzvi
Project Director,
Phitti Creek Project Cell
Planning Division
Government of Pakistan

Dear Mr. Rizvy:

I have a pleasure to inform you that the recommendations are made in the following for a consulting firm to be appointed as the counterpart to the survey team:

- i) Techno-Consult, Ltd. is best qualified for the execution of the work to be directed by the team and is recommended to be appointed as the counterpart to the team.
- ii) Engineering Consultants are qualified for the execution of the work to be directed by the team, but they remain as a second choice after Techno-Consult, Ltd.
- iii) ASCON is not considered suitable for the present objective of the work to be directed by the team and is not recommended to be appointed as the counterpart to the team.

The above recommendations have been drawn from the interviews with the representatives of the above three consulting firms and the inspections of some of previous/current works related to port projects as well as the discussions with engineers in their offices. It appears that ASCON has several distinguished engineers who have a great deal of experiences in the field of port planning, construction, and operation: Their experiences will be invaluable for a project of a new port development. To my regret, the supporting staff to them at present is limited in number and seems to lack the experience in port facility designing. Because the work to be assigned to a counterpart consulting firm is of the character of structure designing which requires the experiences by not only senior engineers but also supporting staff, ASCON is not recommended as the counterpart to the team.

On the otherhand, Engineering Consultants are supported by

a corps of working staff and are currently conducting a number of design works. Their engineers and supporting staff will be of good assistance to the team. Their experience in designing various types of port facilities does not seem to be large, however. Because our stay in Pakistan is short and I can supply only sketches of structures to be designed, I am afraid that they may come behind the schedule after design assignments will have been given to them. Thus, Engineering Consultants are considered to be appointed as the counterpart to the team only after Techno-Consult, Ltd. will have been rejected for a candidate firm by some justifiable grounds which I cannot see at this moment.

Techno-Consult, Ltd., which happened to be the last of the interview and inspection, is found to have experiences in port facility designing with comparative studies of various types of structures under the given design specifications. They have a good corps of working staff which will guarantee a prompt execution of assignments. Therefore, Techno-Consult, Ltd. is regarded most suited for the execution of the work to be directed by the team and is recommended to be appointed as the counterpart to the team.

I hope that you will convey my recommendations to the authorities concerned and assist their realization.

Yours sincerely,

Hajime Sato, Dr. Eng.
Chief,
Japanese Survey Team
for New Ocean Port at
Phitti Creek

PROPOSED SCOPE OF WORK TO BE ASSIGNED
TO LOCAL CONSULTANTS AS COUNTERPARTS
TO JAPANESE SURVEY TEAM

1. Study existing ports and harbour facilities in Karachi Port and analyse/prepare cost estimates of typical structures at the current market price based on selected standard cross-sections.

The typical structures should include quay walls, detached piers, lighterage wharves, breakwaters, groynes, revetments, transit sheds, ware-houses, navigation aids etc.

2. Study suitable dredging and reclamation projects carried out by the Karachi Port and analyse cost estimates based on the current market price.

3. Study and analyse cost of maintenance dredging in Karachi Port for two alternative situations viz.,

- i) to dredge and dump outside Karachi Harbour;
- ii) to dredge and use the spoil for reclamation.

4. Prepare cost estimates for the construction of detached piers and quay walls each of two types and for four different depths i.e. 16 variations.

Rough sketches for each variation will be supplied by the Japanese Survey Team.

5. Prepare cost estimates for standard cross-sections of revetments/groynes in three different depths.

Rough sketches will be supplied by the Japanese Survey Team.

6. Prepare cost estimates, expressed in terms of unit length, for typical public utilities viz., water supply, sewerage, gas, power, telephone etc.

The proposed design capacity of these utilities will be supplied by the Japanese Survey Team.

7. Prepare cost estimates for the construction of roads and railways from the existing systems to and within the Phitti Creek area.

The construction cost will include the cost of the construction of bridges or causeways, if required.

The alignments of the proposed roads and railways will be indicated by the Japanese Survey Team.

- NOTE: 1. All costs, wherever applicable, will be expressed in rupees with foreign exchange component in US dollars.
2. It is estimated that the total manpower required to carry out the above work will be 4 engineers working for 3 weeks at 8 hours a day i.e. 672 man-hours.

(S.Z.H. Rizvi)
Project Director
Phitti Creek

(Hajime Sato, Dr. Eng.)
Chief
Japanese Survey Team

