

Ⅲ 今後の検討課題

1 農業一般

基本的な計画方法については問題はないものと判断されるが次の点については検討する必要がある。

- ① 物価変動等に伴う既存資料の up-date
- ② 定着農民に対する農業経営の安定化及び遊牧民に対する定着化のためのかんがい増加面積の配分についての具体的方策の検討
- ③ 農家経済改善計画の検討
- ④ 労働力バランス及び資本装備計画の検討
- ⑤ 各種検討結果に基づく内部収益率の再計算
- ⑥ Salinity防止のための土壌調査及び土壌管理

現地踏査の範囲内においては、作物生産に支障があると思われる土壌は見られなかったが、当該地域のように高温乾燥地帯の土壌はSalinity化し易いため、Salinityを惹起させない水の使い方と、畑作営農を立地させるための、土壌調査と土壌管理を検討する必要がある。

土壌調査の点数については、現地土壌の生成過程から推察すると多くの土壌に区分されないはずであり、したがって、調査点数も多くを必要としないと思われる。

- ⑦ 作物増加生産量の基礎資料のチェック

P/C プロフォーマの増加生産量は、過去の実績等に基づいて算出されていると思われるが詳細な記載資料がないため、作物増加生産量の計測手法及び生産計画の基礎資料について検討する。

- ⑧ 畜産の位置づけ

このプロジェクトの目的の一つに、遊牧民の定着があげられ、P C - I Proformaの作物生産計画に飼料作物が導入されているが、畜産の位置づけが明らかにされていないため、飼料生産と飼養頭数及び飼育形態についての検討を要する。

2 かんがい

2-1 Water Allocation

先づは、Projectを推進する場合のパキスタン国、バルチスタン州の機構と機能はどうなっており、又、Projectを推進する場合の諸制度（土地改良法あるいは河川法に類似するもの）はどうなっているかを聞いたのであるが、残念ながら諸制度については納得のいく解答を得られなかった。

更に、かんがい部門に限ったことであるが、今回の調査では、

- ① Indus 河の水は他国からの流量、特にインド側からの水をどの様に使用することになっているのか。
- ② Indus 河の現状での水利用及び将来の水資源開発計画も含め、農業用水、発電の利用計画及び洪水調節計画はどの様になっているのか。
- ③ その様な計画の中で、Guddu Barrage からの取水はどう位置づけられているのか。
- ④ 更に、Guddu Barrage から取水する Desert Pat Feeder Canal の流量はシンド州とバルチスタン州とはどのように配分する計画になっているのか。について聞いた。このことに関して連邦政府の権威ある役人からの解答によれば、それらの水配分を決定するのは連邦政府であり、どの位の水が必要であるのかさえ決めてもらえばそれで良いとのことであった。確かに各州間の水配分について、その Soft な面は WAPDA がやり、Hard な面は Indus Water Commission が行うことになっている様であるが、今後、更にこの調査を進めるといふことになれば、Guddu Barrage から、Kharif、Rabi の両 Season を通じ周年かんがいが可能となるためには、以下の調査が是非とも必要となろう。すなわち、
 - ① Guddu Barrage 地点の流量と Desert-Pat Feeder への取水量の検討
 - ② Desert と Pat Feeder との配分計画の検討
 - ③ 将来のバルチスタン州 (Kachhi 平原) へのかんがい可能性の把握これらの解析のため、Indus 河本川の水分解析が是非とも必要と思われる。

2-2 Irrigation Requirement

- ① Culturable Command Area の確定

Pat Feeder の左岸部で Kirthar Branch と Desert Canal の受益を除き、シンド州との境界までになっている。
- ② District 以下の路線選定

既存の自然に出来た排水路を利用することである。
- ③ 作物の消費水量及び蒸発散量の算出根拠
- ④ Minor, District 及び Main Canal の水路面からの Loss は浸透のみで蒸発は考えないのか。
- ⑤ Field Level での Water course 15%、farm Level 10% の Loss の妥当性
- ⑥ Minor, District, 及び Main Canal の Absorption Loss の妥当性これらの積上げは、過去の実績に基づきかなり精度は高く計算されていると思われるが今一度検討の必要性があると思う。

2-3 水利構造物

- ① Guddu Barrage から Desert Pat Feeder Canal へ分水する Head Regulator での分水可能量の Check

- ② PC-1 Proforma では将来の RD-109 でのポンプアップ以外に RD-342 付近でのポンプアップも考えるべきであると述べているが、その水量は何らカウントされていない。このことの確認及び確定。
- ③ Waterlogging に対する検討
田面が Main Canal 水面より著しく低い地点ではタン水被害が出ているが、これの解消には次の3案が考えられる。この3案についての検討
- (a) 堤防の再構築（土が粘土性の不透水性土であるため、施工方法によっては不透水性堤防の築造も可）
- (b) 堤防沿いに排水路的なものを設けて、排水をキャッチし Main Canal へポンプアップする。
- (c) 総かんがい面積からみれば、小面積であるため放置する。
- ④ 新設及び改修すべき橋梁の総点検、又それに要する経費の計算。既設の橋においても拡幅に伴う改修（橋の延長）が要求される。従って、これに要する費用も計上されるべきであろう。（PC-1 Proforma では改修費は計上されていない。）
- ⑤ PC-1 Proforma によれば、Regulator 改修の必要はない。（RD 558 以外）と述べているが、その確認及び通水量増大に伴う上下流水路への影響の Check。
- ⑥ 水路法面勾配が 1:1 で計画されており、これは円弧すべり面法により計算して安全であるとの WAPDA の意見であるが、その check。
- ⑦ Pat Feeder Canal の流量を Manning 式で求めると表-9 の通りである。現況水路から判断しても粗度係数 $n = 0.28$ 程度と想定されるが、その場合要求量は流れなくなる。このことに対する検討。
- ⑧ PC-1 Proforma に表示されている分水施設以上に、多くの小分水工、及びポンプアップ施設が存在する。それらの量は無視出来る量なのかどうか。

最後に、あの乾ききった苛酷なまでの条件下にさらされている限りなく平らでしかも肥沃な土地を、あの貧しい人達の安らぎの生活の場として与えてやれないものかと、今にしてその思いを強くするのである。

別添資料

December 21, 1981

Mr. Ejaz Ahmad Naik
Secretary
Economic Affairs Division

Dear Sir:

It is my pleasure to send herewith the Report on the Preliminary Survey for the Project on Widening or Pat Feeder Canal in Pakistan, which is the fruitful result from the survey and discussion with the officials concerned of the Pakistan Government.

The Team was impressed by the irrigation facilities such as Gudu Barrage, main canal and so on, and we believe firmly that if the Project is carried out, it will contribute greatly to the agricultural development in this area.

The Team had reported and conveyed all kinds of information obtained to the Japanese Government, and now the Japanese Government is making necessary arrangement to dispatch the Feasibility Study Team as soon as possible.

All the members of the Team wish to extend their heartfelt thanks for you and your staff members for the kind cooperation extended to them during their stay in your country.

Sincerely yours,

cc.:
Mr. Habee Hussain
Additional Secretary
Planning & Development Division
Government of Pakistan

Mr. Maj. Gen. Agha Manzoor Rauf
Additional Secretary
Ministry of Water & Power
Government of Pakistan

Mr. Ata Mohammad Jafar
Secretary
Planning & Development Department
Government of Baluchistan

Kazushige MATSUO
Leader,
Preliminary Survey Team for
the Project on Widening of
Pat Feeder Canal

FINDINGS OF PRELIMINARY SURVEY
FOR
AGRICULTURAL DEVELOPMENT PROJECT
ON
WIDENING OF PAT FEEDER CANAL
IN
BALUCHISTAN
OF
THE ISLAMIC REPUBLIC OF PAKISTAN

DECEMBER 1981

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO

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1. Member of The Preliminary The Survey Team

<u>Assignment</u>	<u>Name</u>	<u>Position</u>
Leader	Mr. Kazushige MATSUO	Director, Land Improvement Engineering Service Center, Chugoku-Shikoku Regional Agricultural Administration Office, Ministry of Agriculture, Forestry and Fisheries (MAFF)
Irrigation	Mr. Shin TAMURA	Senior Officer of Agricultural Civil Engineering, Design Div., Construction Dept., Tohoku Regional Agricultural Administration Office, MAFF
Hydro-Structure	Mr. Teruhisa TAJIRI	Officer of Agricultural Civil Engineering, Design Div., Construction Dept., Chugoku-Shikoku Regional Agricultural Administration Office, MAFF
Agricultural Economy	Mr. Kunio TANAKA	Deputy Director, Regional Planning Div., Tohoku Regional Agricultural Administration Office, MAFF
Agronomist	Mr. Isao YANO	Deputy Director, Resources Div., Planning Dept., Tohoku Regional Agricultural Administration Office, MAFF
Coordinator	Mr. Joji INOUE	Officer of Technical Affairs Div., Agricultural, Forestry and Fisheries Planning and Survey Department, Japan International Cooperation Agency (JICA)

2. Objectives

In response to the request of the Government of the Islamic Republic of Pakistan, the Government of Japan has been considering to provide the technical services for the feasibility study on Agricultural Development Project for Widening of Pat Feeder Canal in Buluchistan as a part of the technical cooperation programme of the Government of Japan.

Prior to the feasibility study, the Japan International Cooperation Agency, which is the governmental organization responsible for implementation of the above mentioned technical cooperation programme, has dispatched the team in order to carry out the preliminary survey with the following objectives.

- (1) To make reconnaissance survey on the Project area.
- (2) To ensure the request of the Government of Pakistan.
- (3) To collect data prepared by the Government of the Pakistan.
- (4) To make contact and discussion with the Pakistani Authorities concerned.
- (5) To formulate the tentative schedule for the feasibility study.

3. Schedule of Preliminary Survey

Oct. 27 (Tue.)	Five members arrived at Karachi.
28 (Wed.)	Visited Japanese Consulate General in Karachi for courtesy call. Left Karachi for Islamabad.
29 (Thu.)	Visited Japanese Embassy, EAD and MWP for courtesy call and discussed on survey schedule.
30 (Fri.)	Discussed on survey schedule with in the team.
31 (Sat.)	Visited PDD for courtesy call and discussed on survey schedule. Discussion with MWP's staff on detail survey schedule.
Nov. 1 (Sun.)	Left Islamabad for Karachi
2 (Mon.)	Mr. Matsuo (Leader) arrived at Karachi. Left Karachi for Quetta. Visited the Provincial authorities concerned for courtesy call and discussed on survey schedule, contents and background of the request.

- Nov. 3 (Tue.) Mr. Inoue stayed at Quetta to make data collection and other members left Quetta for Dera Murad Jamali.
- 4 (Wed.) Visited Guddu Barrage, diversion weir of Desert Canal, Pat Feeder Canal and RD 42 point of the Pat Feeder Canal.
- 5 (Thu.) Observed Pat Feeder Canal below RD 489 point until the end of the Canal, diversion weir of Bary District and Balam District.
- 6 (Fri.) Left Dera Murad Jamali for Quetta.
- 7 (Sat.) Arranged the survey results.
- 8 (Sun.) Visited the Secretary of PDD for courtesy call and discussed about the Project on Widening of Pat Feeder Canal.
- 9 (Mon.) Moved to Islamabad.
- 10 (Tue.) Collected data and discussed on survey results.
- 11 (Wed.) Reported the reconnaissance survey results to the Japanese Embassy and MWP.
- 12 (Thu.) Visited Mr. Ejaz Ahmad Naik, Secretary of EAD for courtesy call.
- 13 (Fri.) Left Islamabad for Lahore.
- 14 (Sat.) Visited WAPDA for courtesy call and discussed on PC-1 Proforma.
Left Lahore for Islamabad.
- 15 (Sun.) Left Islamabad for Tokyo.

4. Findings of Preliminary Survey

- (1) According to PC-1 Proforma, the main canal of 105 miles and distributary of 217 miles had been already extended under the Pat Feeder Canal Project in Baluchistan Province. About 210,000 acres of the land is irrigated for agricultural use and the population in the area reaches to 275,000. At present, the available water for the canal is not sufficient enough and the expansion of agricultural land is limited, so that the climate in the area is arid and the annual precipitation about 4 inches in average. For the solution of this problem, it is required to widen and extend the present main

canal and distributary and to introduce certain amount of available water from the Indus River.

It means that implementation of the Project on Widening of Pat Feeder Canal (hereinafter referred to as "the Project") will enable to change the waste land to the productive land, and the preliminary survey team (hereinafter referred to as the "the Team") understood the reason why the Government of Pakistan and the Provincial Government of Baluchistan requested eagerly implementation of the Project.

- (2) Based on the survey and observation at the representative points in the area, the Team judged that most of the soils which were made of silt and silty loam and covered with the thick surface-layer, are suitable for crop production.

However the saline soils, normally existing in the arid zone, were recognized in one part of the east area. For the promotion of agricultural development, it may be necessary to consider the adequate countermeasure about irrigation and cultivation methods for salinity accumulation in the future.

- (3) The Team obtained various kinds of information on Pat Feeder Canal Project from PC-1 Proforma prepared by WAPDA. When the Feasibility Study on the Project is implemented, the following items on PC-1 Proforma should be considered;

- 1) Delineation of irrigated area,
- 2) Calculation of water requirement,
- 3) Selection of suitable construction equipment,
- 4) Study of construction methods,
- 5) Squaring of construction cost,
and
- 6) Estimation of local costs and foreign exchange costs.

- (4) The Team highly appreciates the agricultural development potentiality of the Project and recommends that the Government of Japan should give high priority to the conduct of the Feasibility Study as soon as possible.

Mr. Afzaluddin Ahmad,
Deputy Chief,
Economic Affairs Division,
Government of Pakistan,
ISLAMABAD

Dear Mr. Ahmad,

The visiting JICA Preliminary Survey Team on Widening of the Pat Feeder Canal Project requires certain documents, maps, charts and other data, as detailed in the enclosure to this letter, for the purpose of conducting their Survey and formulation of their Report.

I shall be grateful to you for requesting the concerned authorities to provide the requisite information at the earliest date, preferably before the Team departs from Quetta for Islamabad.

With kind regards,

Yours sincerely

Y. OSHIMA

Third Secretary

Encl: As stated

cc.

1. Mr. S. Faiz Zaidi,
Deputy Chief (Water Resources)
Planning & Development Division,
Government of Pakistan,
ISLAMABAD
2. Mr. Salim Abbas Jilani,
Development Commissioner
Government of Baluchistan,
QUETTA
3. Mr. Taj M. Naim,
Chief
Planning & Development Directorate,
Government of Baluchistan, QUETTA
4. Mr. S. M. Ayoob,
Member (Water), WAPDA, LAHORE
with reference to the Pat Feeder Project PC-1 Proforma prepared
by the P & I Division, WAPDA, in August 1979.

1. Organisation Chart of Government of Pakistan, Government of Baluchistan and other related Government Agencies concerned with the implementation of the Project on Widening of Pat Feeder Canal (hereinafter 'the Project').
2. Various laws and systems concerning with agriculture and irrigation in Government of Pakistan and in Government of Province.
3. Water treatment of Indus River (water distribution between other countries).
4. Water Resources Development Plan of Indus River (referred to as "WRDP") at present and in future (irrigation, hydro-power, flood control).
5. Relation between WRDP (Water Resources Development Plan of River Indus) and water intake plan from Guddu Barrage at present and in future.
6. Water distribution plan and its agreement with particular reference to Desert-Pat Feeder Canal between the Sind Province and Baluchistan Province.
7. Basis of the proposed water requirement of Pat Feeder Canal (PC-1 proforma) (discharge, length, width, depth, slope, distribution).
8. The history of Guddu Barrage (when, who, how and why) and the structure of it, in detail.
9. Administration system (cooperation and maintenance) of water distribution. (Guddu Barrage, regulators, main, secondary and tertiary canal).
10. Agricultural census in Pakistan, Baluchistan and Project Area. (Total population, farm household population, number of farm household, income).
11. Marketing organisation and network in Project area (roots from farmers, through sales organisation (cooperation etc.) to consumers).
12. System of agricultural finance in Baluchistan Province.
13. Price of major agricultural product in Project area.
14. Investigation of farmer's economy.
15. Land-use classification (at present and in future) system, area and amount of cropping.
16. Climate data near the Project area (maximum, minimum and level temperature, precipitation, evaporation).
17. Maps in detail concerning the Project.
 - a. Topographic map
 - b. Geological map
 - c. Soil map
 - d. Land-use map.

SCOPE OF WORK

FOR

THE FEASIBILITY STUDY

ON

AGRICULTURAL DEVELOPMENT PROJECT

WITH

WIDENING OF PAT FEEDER CANAL

IN

THE ISLAMIC REPUBLIC OF PAKISTAN

AGREED BETWEEN

JAPAN INTERNATIONAL COOPERATION AGENCY

GOVERNMENT OF JAPAN

AND

MINISTRY OF FINANCE, PLANNING AND ECONOMIC AFFAIRS

GOVERNMENT OF PAKISTAN

AT ISLAMABAD

ON JANUARY 23, 1982

I. INTRODUCTION

1. In response to the request of the Government of Pakistan for technical assistance in conducting a comprehensive study to formulate the Agricultural Development Project with Widening of Pat Feeder Canal (hereinafter referred to as "the Project"), the Japanese Government has decided to carry out the Feasibility Study on the Project (hereinafter referred to as "the Study") through providing the engineering services of the Japanese Study Team (hereinafter referred to as "the Team").
2. Japan International Cooperation Agency (JICA), which is the governmental organization responsible for the implementation of the Japanese technical cooperation programmes, will be the executing agency for the Study. Whilst, the counterpart agency on Pakistani side will be Water and Power Development Authority (WAPDA), and Irrigation and Power Department, Government of Baluchistan (IPD).
3. According to the PC-1 Proforma prepared by WAPDA in 1979, the envisaged outline of the Project is as follows: (refer to Location map, Annex I):
 - 1) Location: the area is situated in the central south eastern part of Baluchistan Province, in Nasirabad District.
 - 2) Culturable Commanded Area:
 - a) Phase-I (Irrigation by gravity flow): 612,000 acres
 - b) Phase-II (Irrigation of upland by pumping up): 159,000 acres (at present not part of PC-1).
 - 3) Objectives: The principal purpose of the project is to increase agricultural production in the area by more effective use of Indus River flows available at the existing Guddu Barrage which may be assigned to the Pat Feeder Canal, whereby improving the general standard of living in the area.
 - 4) Development Plan: In Phase I, the following works are to be included:
 - a) Widening of the Pat Feeder Canal System and remodelling/ construction of related structures and so on, and
 - b) Strengthening agricultural supporting services in the area.

II. OBJECTIVES OF THE STUDY

1. The objectives of the Study are as follows:

- 1) to carry out a detailed feasibility study and update/modify the PC-1, and
- 2) to undertake transfer of related technology in the course of the Study, to the extent possible.

2. The study will be centered on Phase I of the Project, mentioned in para 3 of I (assuming availability of water of 6,700 cusecs and 8,200 cusecs, without going into the question of distribution of water).

However, water requirement (2,000 cusecs) for Phase II of the Project should also be taken into account while examining the capacity of the Pat Feeder Canal System.

III. OUTLINE OF THE STUDY

1. The activities of the Team will be divided in two stages as mentioned below:

- 1) Field Works in Pakistan
- 2) Home Office Works in Japan

2. Field Works

The field works will cover the following aspects:

- 1) to collect and review the relevant existing information and data on the subjects listed below (the data collected by the preliminary survey team should be utilized as much as possible):
 - a) Topography,
 - b) Meteorology and hydrology,
 - c) Soil and geology,
 - d) present land use,
 - e) Existing irrigation and drainage facilities, including water management practices,
 - f) Salinity and Waterlogging,
 - g) Materials and costs for construction works,
 - h) Cultivation methods and livestock farming,
 - i) Agricultural supporting services,
 - j) Agricultural economy,
 - k) Agro-based industry, and

- 1) Infrastructure, such as roads, transportation, domestic water supply.
- 2) to carry out the field survey in and/or around the project area to confirm the results obtained through the above-mentioned study and to carry out additional survey which would include the following activities:
 - a) Checking the longitudinal section of the main canal, i.e. Desert-Pat Feeder Canal and Pat Feeder Canal,
 - b) Checking the cross-section at some representative points along the main canal and its distributaries,
 - c) Discharge measurement at suitable sections, and
 - d) Soil survey with digging pits, sampling and laboratory tests.
- 3) to determine the following basic ideas or strategy for the Project, based on the results obtained by the study and survey mentioned above:
 - a) Project boundary and acreage,
 - b) Proposed land use,
 - c) Proposed cropping pattern and intensity,
 - d) Water requirement for crop and domestic use,
 - e) Layout of irrigation and drainage system and facilities in the Project area,
 - f) Construction method for widening of the canal system,
 - g) Method for operation and maintenance of irrigation and drainage system, and
 - h) Method for strengthening agricultural supporting services.

3. Home Office Works

Based on the field survey, the Team will prepare the project feasibility study report in the home office which should include the following:

- 1) An overall irrigated agricultural development plan,
- 2) A design of related structures,
- 3) Bills of quantity and estimate of costs and benefits,
- 4) An economic evaluation, and
- 5) An implementation schedule.

IV. REPORTS

The following reports written in English will be prepared and submitted to the Government of Pakistan in the manner as specified hereunder:

1. Plan of Operation

Twenty (20) copies at the beginning of the Study.

2. Interim Report

Twenty (20) copies at the completion of the field works.

3. Draft Final Report

Twenty (20) copies at the completion of the home office works.

The Government of Pakistan will be requested to provide JICA with its comments within two months after receipt of the above-mentioned draft final report.

4. Final Report

One hundred (100) copies within one month after receipt of the comments by the Government of Pakistan.

V. WORK SCHEDULE

The time span required for the survey, study and preparation of report is as shown in Annex II.

VI. UNDERTAKING BY THE GOVERNMENT OF PAKISTAN

For the smooth implementation of the Study, the Government of Pakistan will undertake the following:

1. to provide the Team with available relevant data, information and materials necessary for the execution of the Study.
2. to provide required equipment, if available, to the Team.
3. to provide the services of a Liaison Officer, who should be a senior irrigation engineer, to assist the Team, throughout the period of field works, in respect of all local arrangements.
4. to assign the following counterparts to assist the Team, as and when required, for the purpose of the Study.
 - a) Irrigation engineer
 - b) Structural engineer (specialized in hydraulic structure)
 - c) Soil scientist

- d) Hydrologist
 - e) Agronomist
 - f) Agro-economist
 - g) Topographic surveyor
5. to exempt the Team from any taxation or duty on the income and any other emoluments as well as equipment, materials and personal effects which are to be brought into Pakistan in connection with the Study.
 6. to provide the following facilities and conveniences to the extent possible, for the Team whose members may be ten (10) at the most:
 - a) Office accommodation both in Quetta and in Dera Murad Jamali (or Jhat Pat) with adequate floor space and necessary office equipment.
 - b) Necessary lodging accommodation with adequate floor space, with lighting and water supply, in the project area.
 - c) 4 units or more of 4-wheel-drive vehicles with drivers, a motor-boat and a boat.
 - d) Permission for the Team to use wireless telephones necessary for carrying out the field survey.
 - e) Medical cover for the Team during their stay in Pakistan when necessary.
 7. To ensure the security of the Team during the field works.

VII. CONTRIBUTION BY THE GOVERNMENT OF JAPAN

In order to achieve the objectives of the study, the following assistance will be extended by the Government of Japan:

1. to dispatch a team to Pakistan to conduct the study,
2. to bear international and inland travel expenses as well as boarding and lodging expenses of the Team within Pakistan,
3. to bear expenses necessary for tele-communication between Japan and Pakistan in connection with the study,
4. to bear expenses necessary for hiring of such equipment and facilities which are not available with the Government of Pakistan and are arranged through the Liaison Officer,
5. to transfer the knowledge and technology to the counterparts during the period of the Study,
6. to arrange training in Japan for a few counterparts during the Study period, and
7. to provide the equipment necessary for the execution of the Study.

ANNEX II

TENTATIVE WORKING SCHEDULE

WORKING ITEMS	1982											
	Year Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sep.	Oct.	Nov.
1. S/W Mission		□										
2. Field Works		□										
3. Home Office Works												
4. Advisory Group Visit to Pakistan					□				□			
5. Study and Preparation of Comments for D.F.R. by Pakistan												
6. Submitting of Reports												
			△ P.O.		△ Int.	R.			△ D.F.R.			△ R.F.

(Remarks)

- F/S : Feasibility Study
- P.O. : Plan of operation
- Int. R. : Interim Report
- D.F.R. : Draft Final Report
- F.R. : Final Report

This Scope of work is signed by the following two authorities concerned:

Economic Affairs Division,
Ministry of Finance, Planning
& Economic Affairs,
Islamic Republic of Pakistan,
Islamabad

Japan International Cooperation Agency,
the Official Agency responsible for the
implementation of technical cooperation
programmes of the Government of Japan.

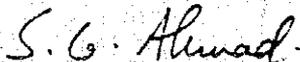
To confirm the aforementioned, the Scope of work is herewith attached and
signed by the responsible personnels of the said authorities concerned.

Date: 23rd January, 1982

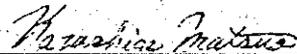
Issued at Islamabad.

For Economic Affairs Division
Ministry of Finance, Planning
& Economic Affairs,
Government of Islamic Republic
of Pakistan.

For Japan International
Cooperation Agency,
the Government of
Japan.



(S. GHULAM AHMAD)
Joint Secretary
Economic Affairs Division
Government of Pakistan



Kazushige Matsuo
Leader of the Scope of
Work Mission for the
Feasibility Study on
Agricultural Development
Project with Widening of
Pat Feeder Canal

ATTACHEMENT

- LIST OF PARTICIPANTS -

A series of discussions on the contents of the said Feasibility Study's Scope of Work was held in frank and friendly atmosphere, on 19th, 20th and 21st January 1982, consecutively, between Pakistani Government officials concerned, officials concerned of Japanese Embassy in Islamabad and members of currently visiting JICA's S/W Mission, on the basis of PC-I Proforma and the survey result by the previous JICA team which visited Pakistan from 28th, Oct. to 15th Nov. 1981.

The name list of participants in the above-mentioned discussions is as follows.

I. PAKISTANI SIDE

1. Federal Government

a) Economic Affairs Division (EAD)

Mr. M. Lutfullah Joint Secretary

Mr. Afzaluddin Ahmed Deputy Chief

Mr. Mohammad Athar Section Officer

b) Water & Power Division (WPD)

Maj. Gen. Agha Manzoor Rauf Additional Secretary

Mr. Bashir Ahmed Deputy Secretary

c) Planning & Development Division (PDD)

Mr. S.A. Ghafoor Chief

Mr. M.F. Zaidi Deputy Chief

Mr. Shahnawaz Hussain Research Officer

2. Baluchistan Government

a) Irrigation and Power Department (IPD)

Mr. Mohammad Amin Superintending Engineer

3. Water & Power Development Authority (WAPDA)

a) Planning and Investigation Division (PID)

Mr. Mohammad Hussain Deputy Director

II. JAPANESE SIDE

1. Embassy of Japan in Islamabad

Mr. Yoshinari Ohshima

Third Secretary

Mr. Abdullah Farooqui

Economic Adviser

Mr. Jaffar Hyder

Economic Adviser

2. Scope of Work (S/W) Mission

Mr. Kazushige Matsuo

Leader

Mr. Makoto Shimada

Member

Mr. Kouji Inoue

Member

4 パキスタン関係機関機構図及び組織図

(1) パキスタン国機構図

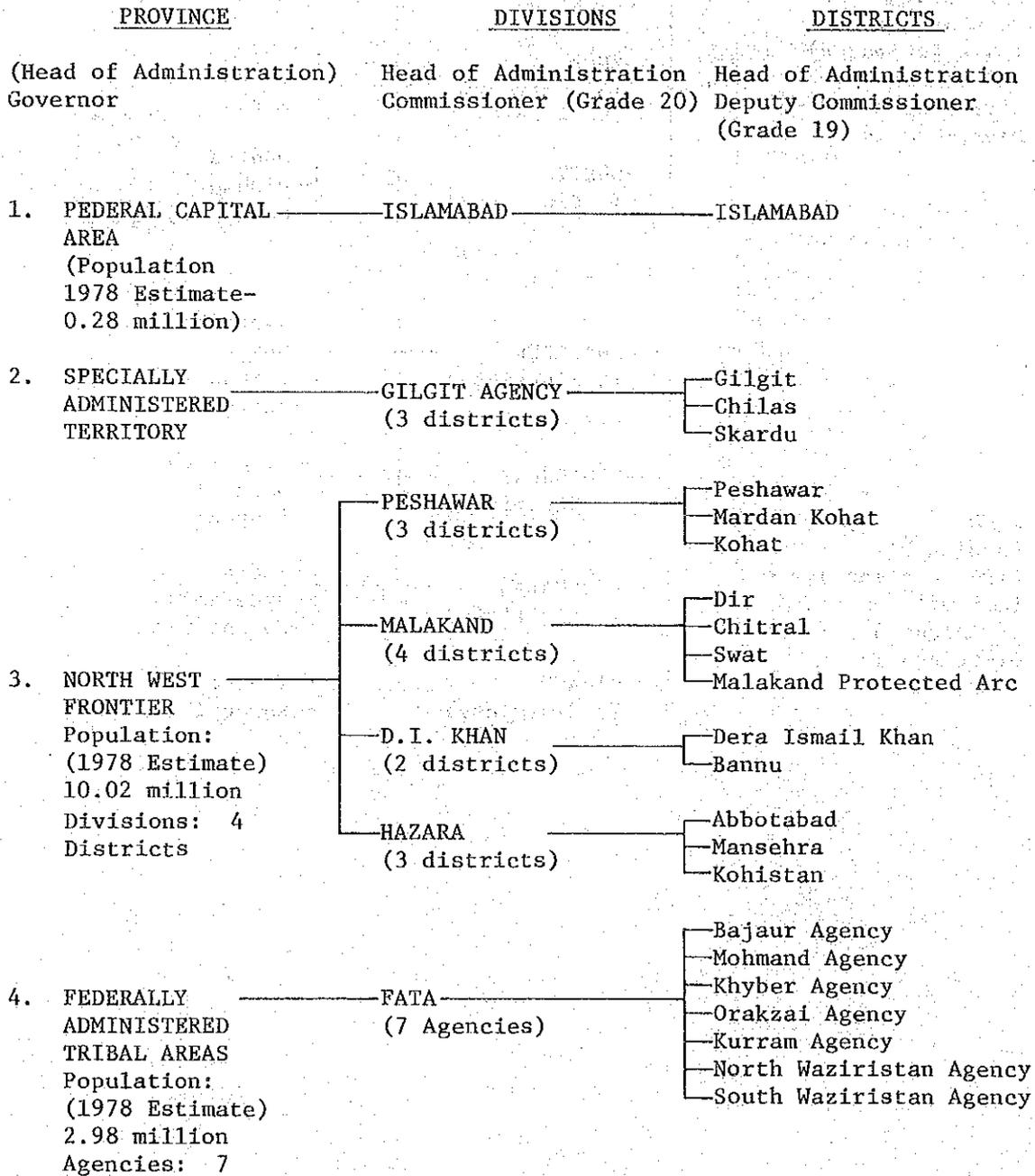
Population: (1978 Estimate) 77.98 million

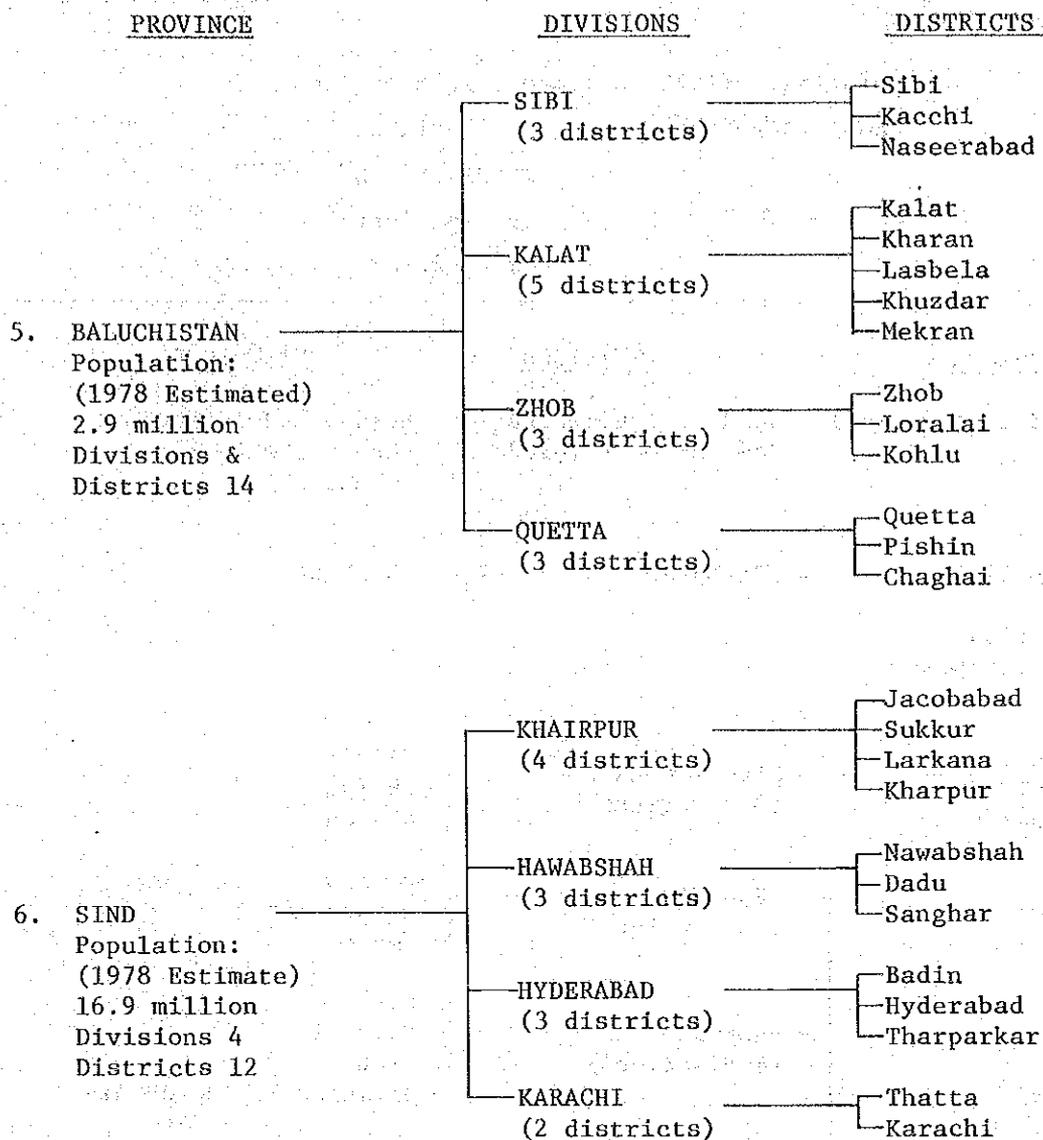
Administrative Set-up: 4 Provinces

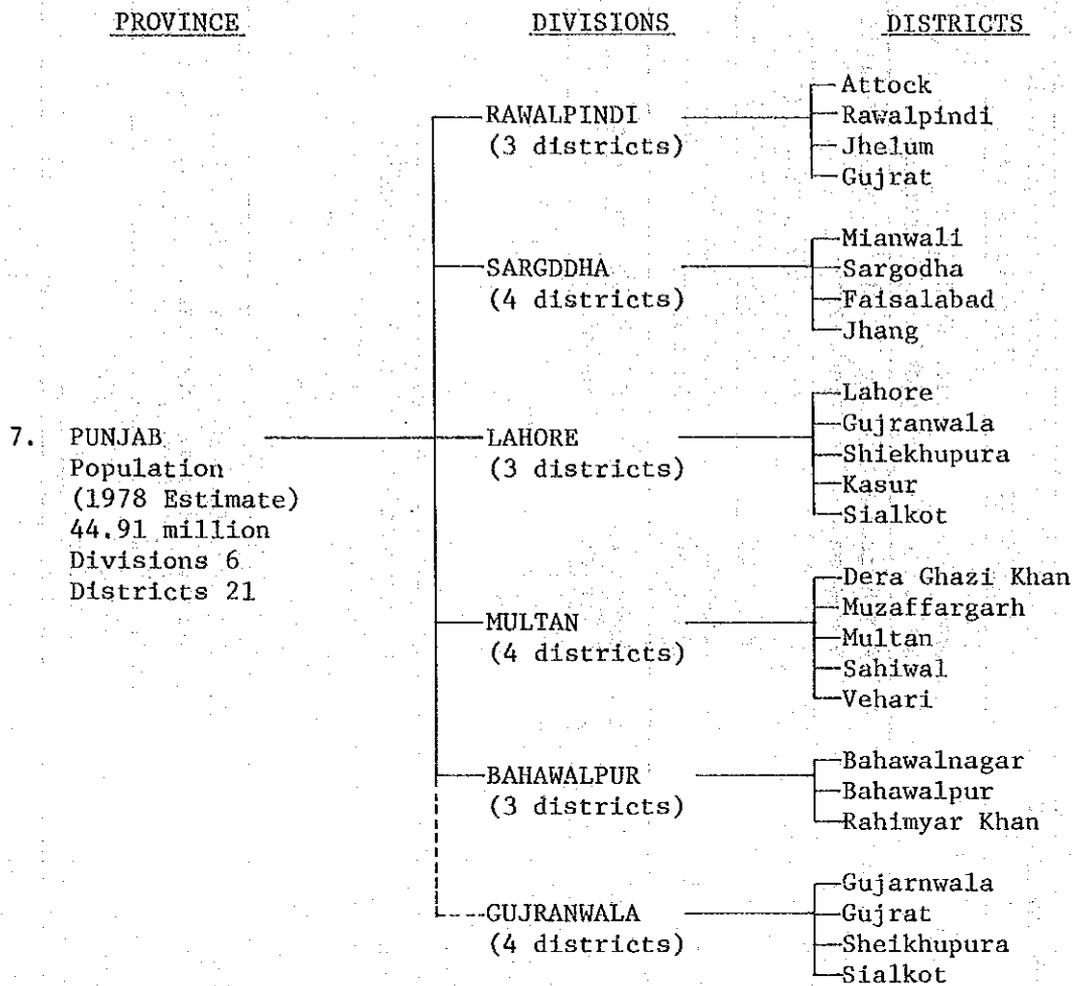
18 Divisions

59 Districts

7 Agencies







PRESIDENT AND CHIEF MATERIAL LAW ADMINISTRATOR: HIS EXCELLENCY GENERAL MOHAMMAD ZIA-UL-HAQ

S. NO.	NAME OF MINISTRY/ SECRETARIAT	NAME OF MINISTER, MINISTER OF STATES OR ADVISED TO THE PRESIDENT	S. NO.	NAME OF DIVISION	NAME OF SECRETARY TO THE GOVERNMENT
1.	CABINET SECRETARIAT	C.M.L.A.	1.	Cabinet Division	Mr. Zhur Azar Cabinet Secretary
			2.	Establishment Division	Mr. S. Ijlal Haider Zaidi Secretary
			3.	O & M Division	Dr. M. Tariq Siddiqi Additional Secretary I/C
			4.	Women's Division	Miss Gulzar Bano Secretary
2.	COMMERCE	Mr. Hamid D. Habib, Adviser to the President on Foreign Trade and Chairman Export Promotion Bureau. Sheikh Ishrat Ali, Adviser to the President on Business Coordination and Internal Trade.	5.	Commerce Division	Mr. S. Izharul Haq Secretary
3.	COMMUNICATIONS	Mr. Mohyuddin Baluch, Minister Mr. Mustafa Gokal, Adviser to the President on Shipping	6.	Communications Division	Mr. F. K. Bandial Secretary
4.	CULTURE, ARCHAEOLOGY SPORTS & TOURISM	Arbab Niaz Muhammad, Minister Begum Viqar-un-Nisa Noor, Chairman PTDC.	7.	Culture, Sports & Youth Affairs Division	Mr. Masud Nabi Noor Secretary
			8.	Tourism Division	

S. NO.	NAME OF MINISTRY/ SECRETARIAT	NAME OF MINISTER, MINISTER OF STATES OR ADVISER TO THE PRESIDENT	S. NO.	NAME OF DIVISION	NAME OF SECRETARY TO THE GOVERNMENT
5.	DEFENCE	Mir Ahmad Ali Talpur, Minister	9.	Aviation Division	Maj. Gen. (Rtd) M. Rahim Khan Secretary-General, Defence
			10.	Defence Division	Mr. Asif Rahim Secretary
			11.	Defence Production Division	Mr. Tariq Mustafa Additional Secretary Incharge Defence Production
6.	EDUCATION	Mr. Mohammad Ali Khan of Hoti, Minister. Dr. Mohammad Afzal, Adviser to the President on Higher Education (Also Chairman, University Grants Commission)	12.	Education Division	Mr. A. Z. Farooqui Addl. Secretary-in-charge
7.	FINANCE AND ECONOMIC AFFAIRS	Mr. Ghulam Ishaq Khan, Minister	13.	Economic Affairs Division	Mr. Ejaz Ahmad Naik Secretary
			14.	Finance Division	Mr. H. U. Beg Secretary
8.	FOOD, AGRICULTURE AND COOPERATIVES	Vice Admiral Mohammad Fazil Janjua, Minister. Mir. Zafarullah Khan Jamali, Minister of State for Food, Agriculture and Cooperatives	15.	Food and Agriculture Division	Mr. M. Saeed Qureshi, Secretary
			16.	Agriculture Research Division	Dr. Amir Muhammad, Secretary
			17.	Livestock Division	
9.	FOREIGN AFFAIRS	Mr. Agha Shahi, Minister	18.	Foreign Affairs Division	Mr. S. Shahnawaz Secretary-General Mr. Riaz Piracha Secretary

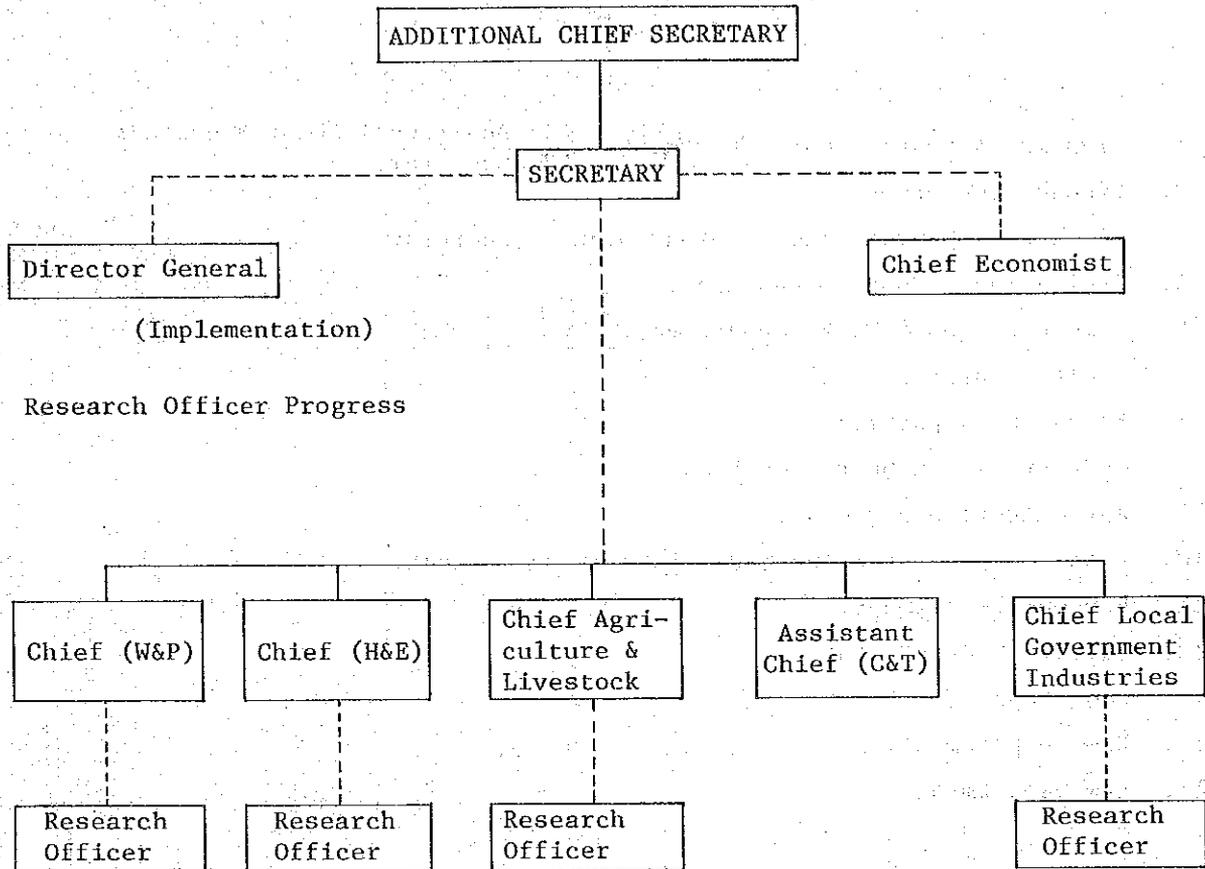
S. NO.	NAME OF MINISTRY/ SECRETARIAT	NAME OF MINISTER, ADVISER TO THE PRESIDENT	MINISTRY OF STATES OR ADVISER TO THE PRESIDENT	S. NO.	NAME OF DIVISION	NAME OF SECRETARY TO THE GOVERNMENT
10.	HEALTH AND SOCIAL WELFARE	Dr. Nasiruddin Jogezeai, Minister. Mr. Mahmud Ali, Minister of State and Chairman, National Council of Social Welfare Hakeem Mohammad Saeed. Adviser to the President on Tibb. Dr. Basharat Jazbi, Adviser to the President on Health. Begum Afifa Mamdot, Minister of State for Social Welfare.		19.	Health and Social Welfare Division	Mr. A. Sami Qureshi Secretary
11.	HOUSING AND WORKS	Air Marshal Inamul Haq Khan, Minister		20.	Housing and Works Division	Maj. Gen. Shafiq Ahmad Secretary
12.	INDUSTRIES	Mr. Elahi Bux Soomro Minister		21.	Environment and Urban Affairs	
13.	INFORMATION AND BROADCASTING	Raja Zafarul Haq, Minister		22.	Industries Division	Mr. Iqbal Saeed Secretary
14.	INTERIOR	Mr. Mehmood A. Harron, Minister		23.	Information & Broadcasting	Maj. Gen. Mujibur Rahman Khan Secretary
15.	KASHMIR AFFAIRS AND NORTHERN AFFAIRS	Maj. Gen. (Rtd) Jamaladar Khan, Minister		24.	Interior Division	Mr. Roedad Khan Secretary
16.	LABOUR, MANPOWER AND OVERSEAS PAKISTANIS	Mr. Ghulam Dastgir Khan, Minister Mr. Moazzam Ali, Adviser to the President on Overseas Pakistanis		25.	Kashmir Affairs and Northern Affairs.	Mr. H. M. Chohan Additional Secretary/ Incharge
				26.	LABOUR AND MANPOWER Division	Mr. S.M.A. Kazmi, Secretary

S. NO.	NAME OF MINISTRY/ SECRETARIAT	NAME OF MINISTER, ADVISER TO THE PRESIDENT	NAME OF STATES OR NO.	S. NO.	NAME OF DIVISION	NAME OF SECRETARY TO THE GOVERNMENT
17.	LAW AND PARLIAMENTARY AFFAIRS	Mr. S. Sharifuddin Pirzada, Minister and Attorney-General for Pakistan		27.	Law Division	Mr. Justice S. A. Nusrat Principal Law Secretary
				28.	Parliamentary Affairs Division	
18.	LOCAL GOVERNMENT AND RURAL DEVELOPMENT	Mr. Fakhar Imam, Minister		29.	Local Government and Rural Development	Mr. Muzaffar Hussain Secretary
19.	NATIONAL ASSEMBLY SECRETARIAT			30.	National Assembly Secretariat	Mr. Aminul Haq, Secretary
20.	PETROLEUM AND NATURAL RESOURCES	Maj. Gen. (Rtd) Rao Farman Ali, Minister		31.	Petroleum and Natural Resources Division	Mr. M. Masihuddin Additional Secretary/ Incharge
21.	PLANNING, DEVELOPMENT AND POPULATION	Mr. Ghulam Ishaq Khan Minister Incharge		32.	Planning & Development Division	Mr. Ejaz Ahmad Naik Secretary
				33.	Statistics Division	Mr. S. Munir Hussain Secretary
		Dr. Mrs. Attiya Inayatullah Adviser to the President		34.	Population Division	Mr. S. K. Mahmud Addl. Secy.-in-charge
22.	PRODUCTION (including National Logistics Board)	Lt. Gen. Saeed Qadir, Minister		35.	Production Division	Mr. A. Majid Mufti Secretary
23.	RAILWAYS	Lt. Gen. Saeed Qadir, Minister		36.	Railways Division	Mr. Hasan Zaheer Secretary

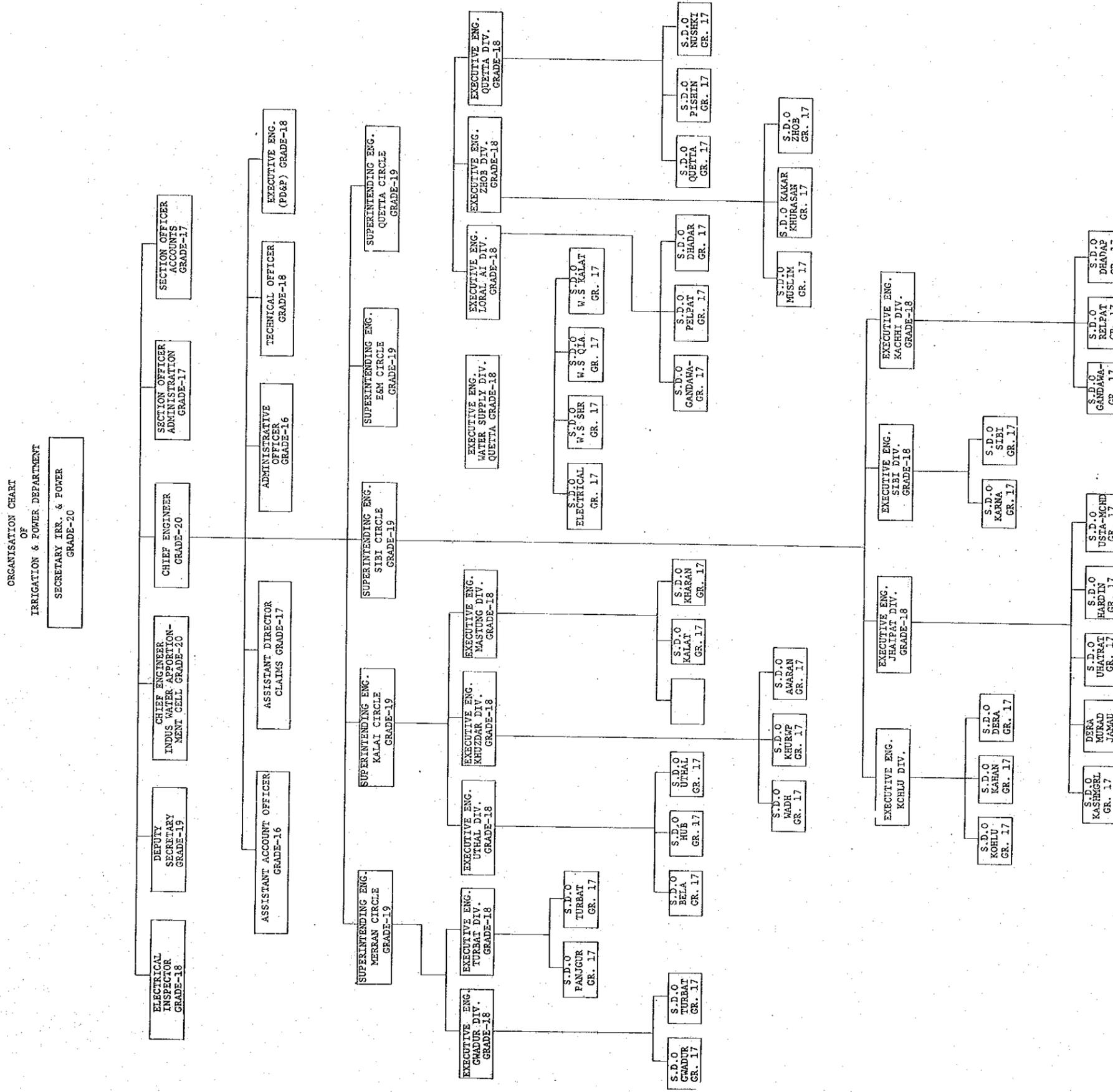
S. NO.	NAME OF MINISTRY/ SECRETARIAT	NAME OF MINISTER, ADVISER TO THE PRESIDENT	MINISTER OF STATES OR ADVISER TO THE PRESIDENT	S. NO.	NAME OF DIVISION	NAME OF SECRETARY TO THE GOVERNMENT
24.	RELIGIOUS AFFAIRS AND MINORITIES AFFAIRS	Al-Haj Mohammad Abbas Khan Abbasi, Minister Incharge Raja Tridov Roy, Adviser to the President on Minorities Affairs.		37.	Religious Affairs and Minorities Affairs	Mr. I. A. Imtiaz Acting Secretary and Administrator-General, Central Zakat Fund.
25.	SCIENCE AND TECHNOLOGY	C.M.L.A. Dr. M. A. Qazi, Adviser to the President on Scientific Technology		38.	Science and Technology Division	Mr. Manzoor Ahmad Sheikh Secretary
26.	STATES AND FRONTIER REGIONS	C.M.L.A.		39.	States and Frontier Regions Division	Mr. S. M. Niazi Secretary
27.	WATER AND POWER	Raja Sikandar Zaman, Minister		40.	Water and Power Division	Mr. A. Wahab F. Sheikh Secretary

(4) バルチスタン州のPDDの機構図

ORGANIZATIONAL CHART OF PLANNING
& DEVELOPMENT DEPARTMENT BALUCHISTAN



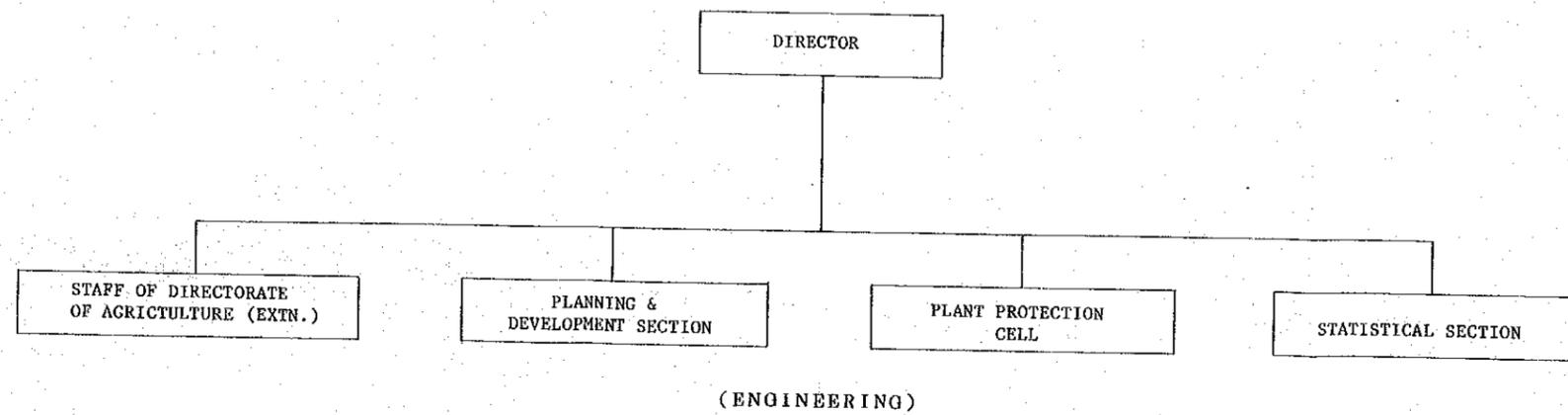
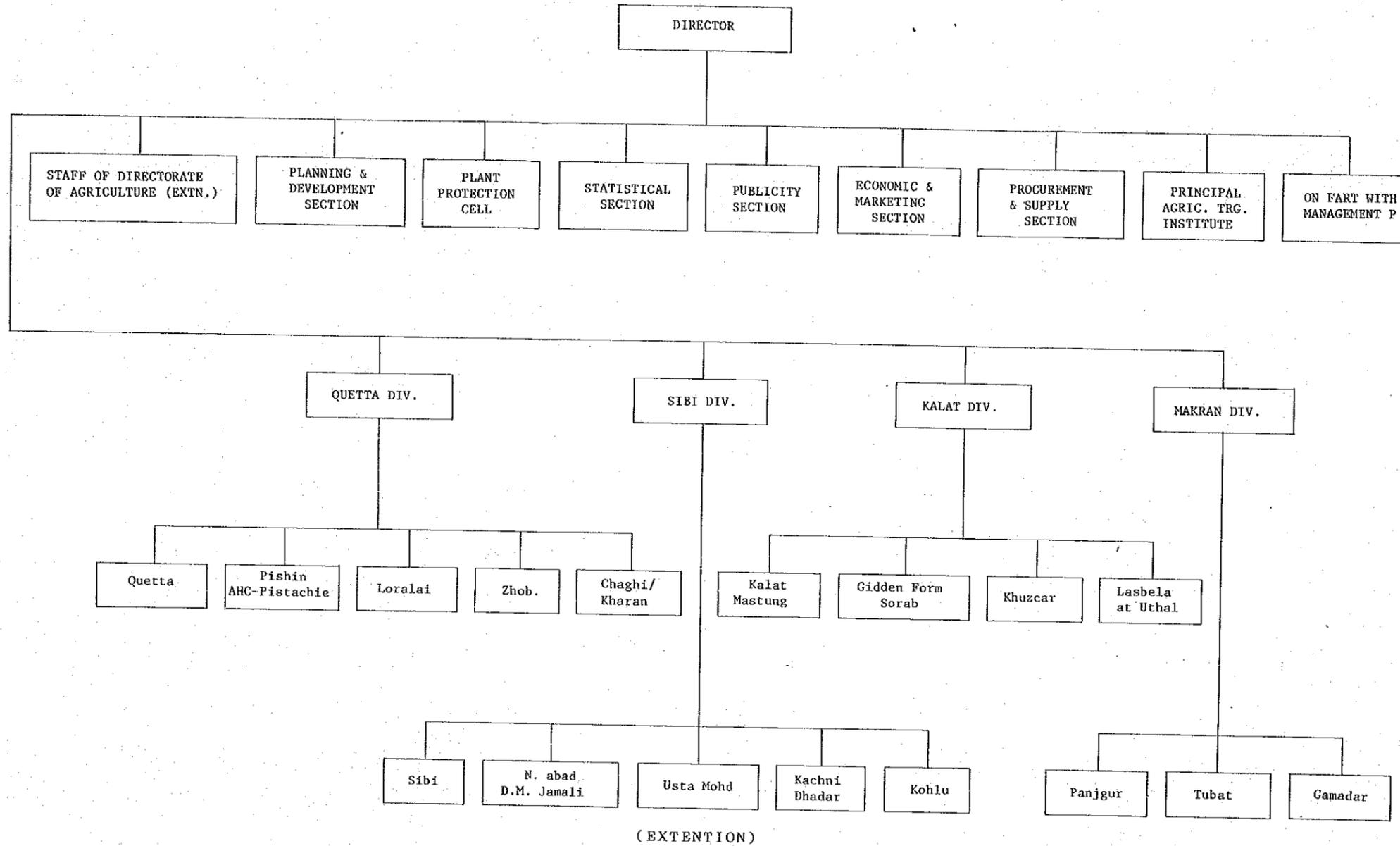
(5) پاکستان州のIPDの組織図



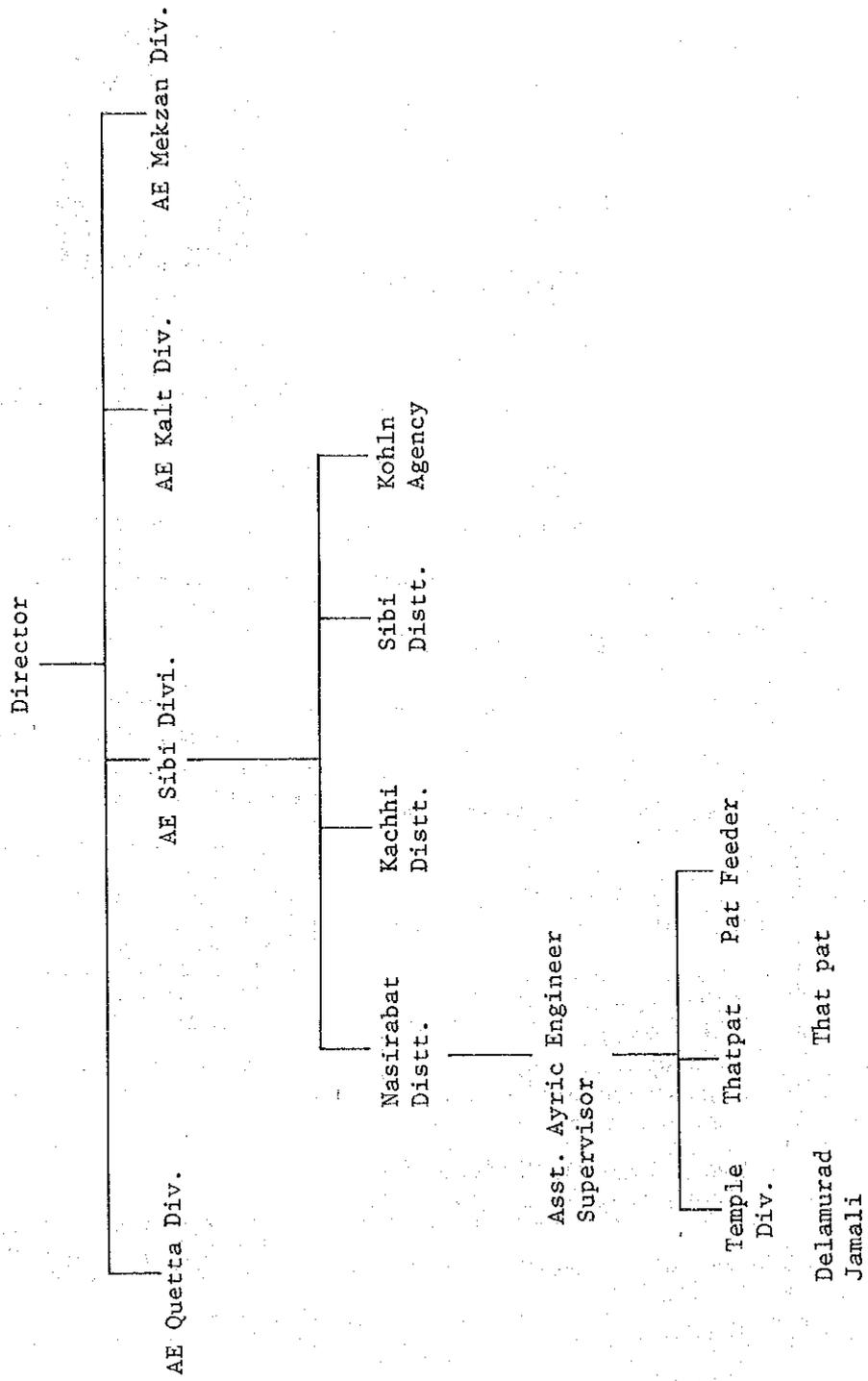
ABSTRACT OF ESTABLISHMENT BORNE ON GRADES LOWER THAN-17

1. SUB ENGINEER GRADE-11 160
2. DRAWING ESTABLISHMENT GRADE-10 TO 16 251
3. MINISTERIAL ESTABLISHMENT GRADE-6 TO 16 297
4. TECHNICIAN GRADE-6 TO 11 79
5. MISCELLANEOUS ESTABLISHMENT GRADE-1 TO 5 1395

(6) パルキスタン州のADの組織図



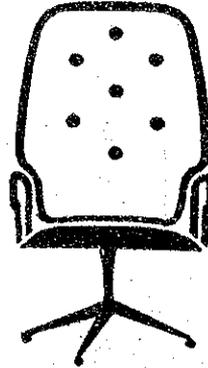
Agricultural Engineering Department



HIRE

Operation
maintenance
repair

(7) WAPDA の組織図



ORGANISATION CHART

AUTHORITY

CHAIRMAN
MEMBER (FINANCE & ADM)
MEMBER (WATER)
MEMBER (POWER)
Secretary

INSPECTOR GENERAL
CHIEF ENGINEER
(EVALUATION)

**MANAGING DIRECTOR
(POWER)**

GM (Generation)
GM (Transmission &
Grid System)
GM (Distribution)
GM (Coordination)
GM (Finance) Power

**MANAGING DIRECTOR
(FINANCE & ADM)**

GM (Adm)
Manager Finance (Coordination)
Chief Auditor
GM (Computer Centre)
Legal Adviser
DG (Public Relations)
CE (Central Contracts Cell)
CE (Purchase & Disposal)

**MANAGING DIRECTOR
(WATER)**

GM (Planning)
GM (Dams)
GM (Tarbela Dam Project)
GM (Chashma Right Bank Canal)
GM (North)
GM (South)
Manager Finance (Water)

**MANAGING DIRECTOR
PROJECT PLANNING AND
REVIEW ORGANISATION**



CHARTER OF DUTIES

WAPDA WAS SET UP BY AN ORDINANCE ISSUED IN FEBRUARY, 1958 WHICH WAS AMENDED IN MARCH, 1959 TO COVER TRANSFER OF THE ELECTRICITY DEPARTMENT TO IT. THE CHARTER OF DUTIES OF WAPDA INCLUDES INVESTIGATIONS, PLANNING AND EXECUTION OF SCHEMES IN THE FOLLOWING FIELDS -

- * GENERATION, TRANSMISSION AND DISTRIBUTION OF POWER.
- * IRRIGATION, WATER SUPPLY AND DRAINAGE.
- * PREVENTION OF WATERLOGGING AND RECLAMATION OF WATERLOGGED AND SALINE LANDS.
- * FLOOD CONTROL AND
- * INLAND NAVIGATION.

AUTHORITY FUND

The Authority Fund consists of:

- a) Grants made by the Federal and Provincial Governments.
- b) Loans obtained from the Federal and Provincial Governments.
- c) Sale proceeds of bonds issued under the authority of the Government.
- d) Loans obtained by the Authority with the special or general sanction of the Government.
- e) Foreign aids and loans obtained from the IBRD, ADB and other international loan-giving agencies on such terms and conditions as may be approved by the Government.
- f) Sale of Power.
- g) All other sums received by the Government.

The Authority as a Corporate Body is entitled to draw upon Authority Fund for meeting its expenditure on the execution of the various schemes and to discharge its functions under WAPDA Act. WAPDA is required to finance a part of its Power Wing Development Programme from funds available from the revenue surplus of the Electricity Operations Branch. The quantum of self-financing is determined by the Federal Government.

After dissolution of One Unit, prior to the year 1974-75, the responsibility for provision of funds for Water Schemes rested with the provincial government concerned but from 1974-75 onwards this responsibility has been assumed by the Federal Government under the Accelerated Programme (Scarps). The Federal Government is also financing the General Investigations schemes of inter-provincial nature by way of grants to WAPDA. Since WAPDA was facing difficulty in getting funds from the provincial governments, the Federal Government has assumed responsibility to provide funds for surface water schemes namely, Karachi Irrigation Project and Khanpur Dam from 1976-77 onwards on behalf of the provincial governments. Funds for Chashma Right Bank Canal Project and Kalabagh Dam are also provided by the Federal Government.

Funds for the other water schemes which are of provincial nature are provided by the respective provincial governments to WAPDA which acts as the executing agency on their behalf. Under an arrangement approved by the Federal Government the Scarp tubewells installed by WAPDA after initial running for one year are to be handed over to the provincial governments for operation and maintenance. During test running, the operation and maintenance cost of the Scarp tubewells is to be provided by the provincial government concerned.

The Power Annual Development Programme is financed by the Federal Government through foreign loans and cash development loans in rupees. The debt servicing liability in respect of power schemes is that of WAPDA.

WAPDA is also responsible for discharging its debt liability in respect of expenditure incurred on electrification of Scarp tubewells installed by it.

The debt liability of the construction portion of the Scarp tubewells as well as other provincial water schemes is the responsibility of the respective provincial governments.



AUTHORITY AND ITS MANAGERS

The Water and Power Development Authority is headed by Chairman and comprises Member (Finance), Member (Power) and Member (Water). The affairs of the Authority are carried out through the Secretary, WAPDA. The Member (Power) and Member (Water) also act as Managing Directors of their respective Wings and are, thus, the executive heads of the organizations working in the two wings.

The work in the two wings is supervised by the General Managers who are in charge of specified fields of activities like Generation, Transmission and Grid System and Coordination in the Power Sector and Dams and Planning in the Water Sector. The General Manager (Distribution) is in charge of power distribution and is assisted by Regional Chief Engineers. On the Water side, the General Managers (North) and (South) are in charge of the execution of Scarps and other surface water development schemes. These General Managers have also under them Chief Engineers and Project Directors who are field officers entrusted with the execution of projects.

The above General Managers report to their respective Managing Directors.

Member (Finance) is in charge of Administration, Internal Audit and Budget. The General Manager (Admn) and General Manager (Computer Centre), Chief Engineer (Purchase & Disposal), Director General, Public Relations and the Resident Representative, Karachi also report to the Member (Finance). The Secretariat of the Authority which is headed by the Secretary (WAPDA) is responsible for maintenance of records of the various divisions taken by the Authority and for circulating the policy directives of the Authority.

The Inspector General, WAPDA reports directly to the Chairman and is responsible for carrying out inspection of all works on his behalf. The Chief Engineer (Evaluation) works for the Chairman in evaluating the progress of works. He is in charge of recently established Management Information System which monitors progress of works.

The Authority has also established a Central Contracts Cell to scrutinize the contract documents in respect of these contracts which are to be approved by it.

ANNUAL DEVELOPMENT PROGRAMME 1979-80

WAPDA prepares its Annual Development Programme for the Power and Water Wings in accordance with the objectives outlined in the Five-year plans and the policy directions given by the Federal Government. WAPDA also undertakes execution of projects on behalf of the Provincial Governments in the Water sector for which funds are allocated by the respective Government.

The Annual Development Programme for Power Wing for the year 1979-80 was approved by the Federal Government for Rs. 3,541,000 million with a foreign loan of Rs. 914.00 million.

The Annual Development Programme for Water Wing was approved for Rs. 1,309,700 million with a foreign exchange component of Rs. 175,500 million.

The Federal Government exercised two cuts, first of 12.6% and then of 10% on ADP allocation for 1979-80. These cuts were calculated on the total allocations but were passed on to rupee allocation alone leaving the allocation under foreign loan intact. As a result, the foreign loan financing was put at a higher figure as compared to the local currency.

Power ADP was, therefore, reduced to Rs. 2,787,149 million with foreign loan of Rs. 914,000 million.

The Water ADP was also reduced to Rs. 1,105,979 million with foreign loan of Rs. 175,500 million. The adverse effect of these cuts on actual works was reduced by observing economy in expenditure on transport, T.A., telephone, stationery and printing and maintenance of buildings etc.

The final ADP allocations for Water and Power sectors at the end of financial year 1979-80 stand as under. (These figures include interest, servicing charges & overheads. The actual figures for work are far lesser).

	(Rupees in million)	
	Total	Foreign loan
Power sector	2,482,778	609,629
Water sector	1,033,170	69,011

HYDROGEOLOGY DIRECTORATE (WAPDA)

Contents

1. Project Director	1	
2. Directors	2	Junior Officers
3. Senior Hydrogeologists	6	↑
4. Senior Engineers	3	↓
5. Senior Research Officer (Soil)	1	
6. Senior Research Officer (Water)	1	
7. Senior Hydrometeorologist	1	
8. Senior Geophysicist	1	

Works:

i) Hydrogeological:

a) Reconnaissance survey

b) Ground water investigations

Drilling of test items

Installation of tube wells

Installation of turbine pumps

Performance of pumping tests

Levelling of watering points

Monitoring of ground water levels

Collection, interpretation and analysis of all hydrological/
surface and ground water data

Measurement of ground water budget

ii) Geophysical:

a) Resistivity surveys

b) Electrical well logging of test holes

c) Analysis and interpretation of data

iii) Hydrometeorological:

Collection, analysis and interpretation of data.

iv) Soil:

- a) Soil classification survey
- b) Land classification survey
- c) Analysis and interpretation of data

v) Water:

- a) Chemical and Mechanical analysis of all water and soil samples.
- b) Analysis and interpretation of data.

Acts:

- A) Writing of hydroseological reconnaissance survey, seophysical survey, soil survey reports.
- B) Writing, compilation and publication of ground water investigation development and planning reports.

Sub-basional
Basional Reports

付章 1.

政府開発プロジェクトの審査の仕組み

政府開発プロジェクトの審査の仕組みは、次のとおりである。(バルチスタン州の政府開発プロジェクトの例で、図示する。)

開催頻度

州政府の現局が審査フォームを記入し、

↓

州の Planning and Development Dept. に提出(窓口)

↓

バルチスタン政府の

P. D. W. P. …………… 500万ルピー迄の金額の計画は、この P. D. W. P. 限りで最終決定できることとなっている。

議長は州政府の開発担当の Additional Chief Secretary Planning Division に提出。

↓

連邦 Planning Division

↓

1カ月に1回開催 CDWP …………… 500万RPを越え、2000万RP迄のものは、ここで最終決定。

3カ月に1回開催 ECNEC …………… 2,000万RPを越えるプロジェクトは、ここで最終審査決定をする。

(なお、この上部機関として、NECがあり、これは政策決定を行う。)

CDWP (Central Development Working Party) のメンバーは、関係各省の次官、4州の Chief Secretary, であり、議長は、Planning Div. (連邦) の Secretary (次官) である。

ECNEC (Executive Committee of the National Economic Council) のメンバーは、全州の Chief Secretary (4人)、運輸通信大臣 (Ministry for Communication) 教育大臣 (Ministry for Education)

食糧，農業共同組合大臣（Minister for Food, Agriculture & Co-operatives）
住宅，公共事業，水資源，電力大臣（Minister for Housing & Works and Water & Power）
工業，生産大臣（Minister for Industries & Production）
情報，放送大臣（Minister for Information & Broadcasting）
労働大臣（Minister for Labour & Manpower）
であり，議長は，計画，財政大臣（Minister for Finance & Economic Affairs）

プロジェクトの審査機関ではないが，政策決定をする機関として，ECNECの上部機関のNEC（National Economic Council）

NECのメンバーは，

計画，財政大臣（Minister for Finance & Economic Affairs）
運輸通信大臣（Minister for Communication）
教育大臣（Minister for Education）
食糧，農業共同組合大臣（Minister for Food, Agriculture & Co-operatives）
住宅，公共事業，水資源，電力大臣（Minister for Housing & Works and Water & Power）
工業，生産大臣（Minister for Industries & Production）
情報，放送大臣（Minister for Information & Broadcasting）
労働大臣（Minister for Labour & Manpower）
鉄道大臣（Minister for Railways）
4州の知事（戒厳令司令官）
4州のChief Secy Secretaryであり，
議長は，大統領（戒厳令司令長官）— President, Chief Martial Law Administrator

である。

2. 政府開発プロジェクト審査要請フォーム

上述の審査を求めるに際し，審査フォームが定形化されており，これは次の通り2種に分かれている。

PC フォーム……これは，フィージビリティ調査或は技術的調査プロジェクトの審査を求める際必要となるフォームである。

PC フォーム………上記調査が終了し、当該プロジェクトの実施の承認を求める際、
その審査に必要なとなるフォームである。

CONVERSION TABLE

1 mile	=	1.609 kilometer
1 acre	=	0.4047 hectare
1 inch	=	25.4 mm.
1 sq. mile	=	2.59 sq. kilometer
$\frac{5}{9}$ (F-32)	=	°C
1 acre foot	=	0.1234 hectare-meter
1 foot	=	0.3048 meters
1 cu. ft./Sec.	=	0.028 cu. meter/Sec.
1 sq. ft.	=	0.093 sq. meters
1 kilometer	=	0.621 mile
1 hectare	=	2.47 acres
1 mm	=	0.039 inches
1 sq. kilometer	=	0.386 sq. miles
°F	=	$\frac{9}{5} C + 32$
1 hectare-meter	=	8.103 acre foot
1 meter	=	3.28 feet
1 cu. meter/Sec.	=	35.714 cu. ft./Sec.
1 sq. meter	=	10.752 sq. ft.
1 kilogram	=	2.2 Lbs (82.27 Lbs = 1 Mnd.)

JICA