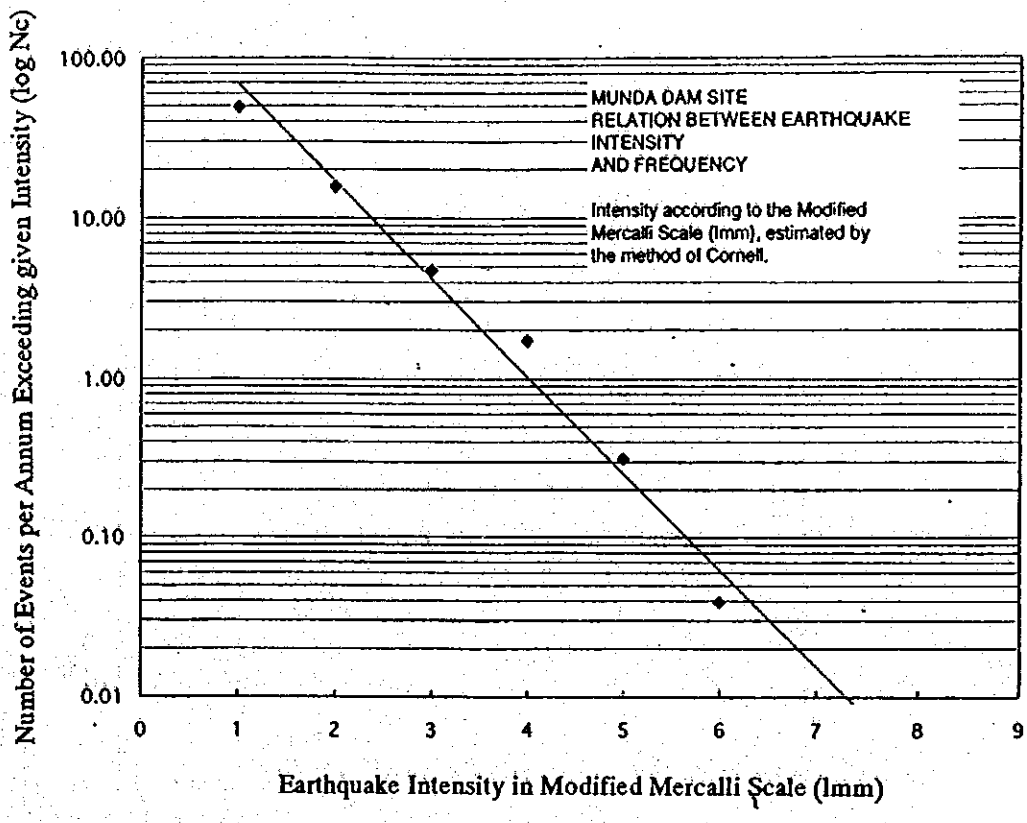
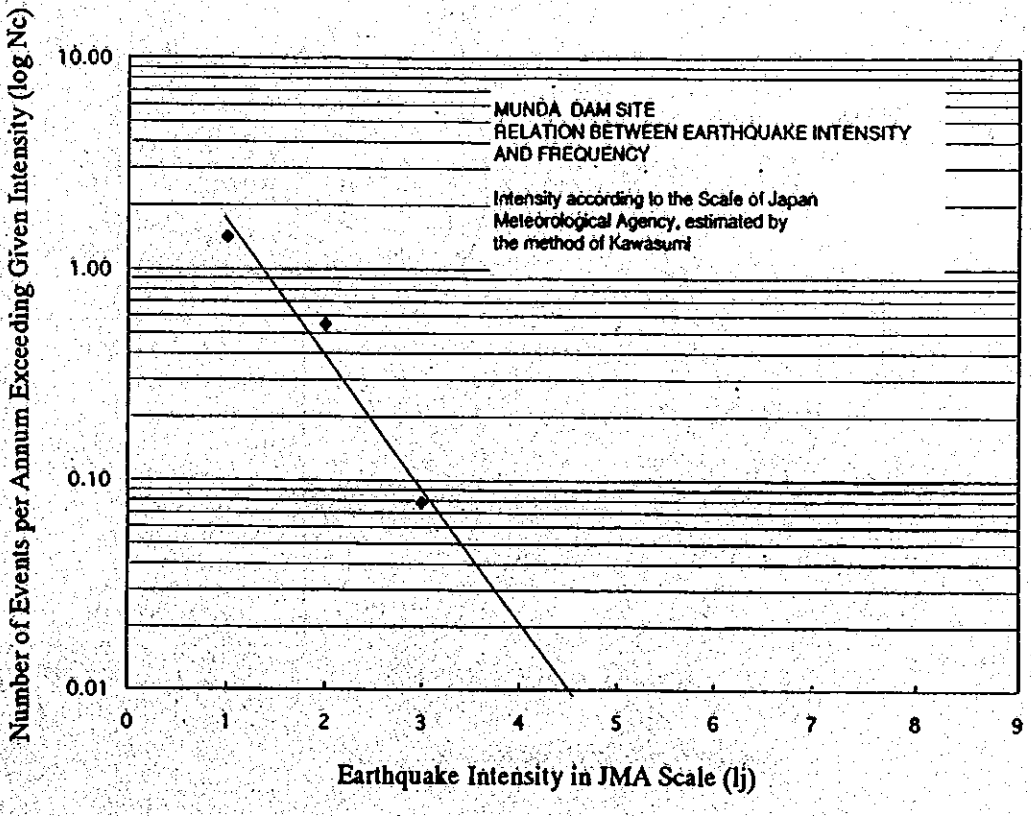
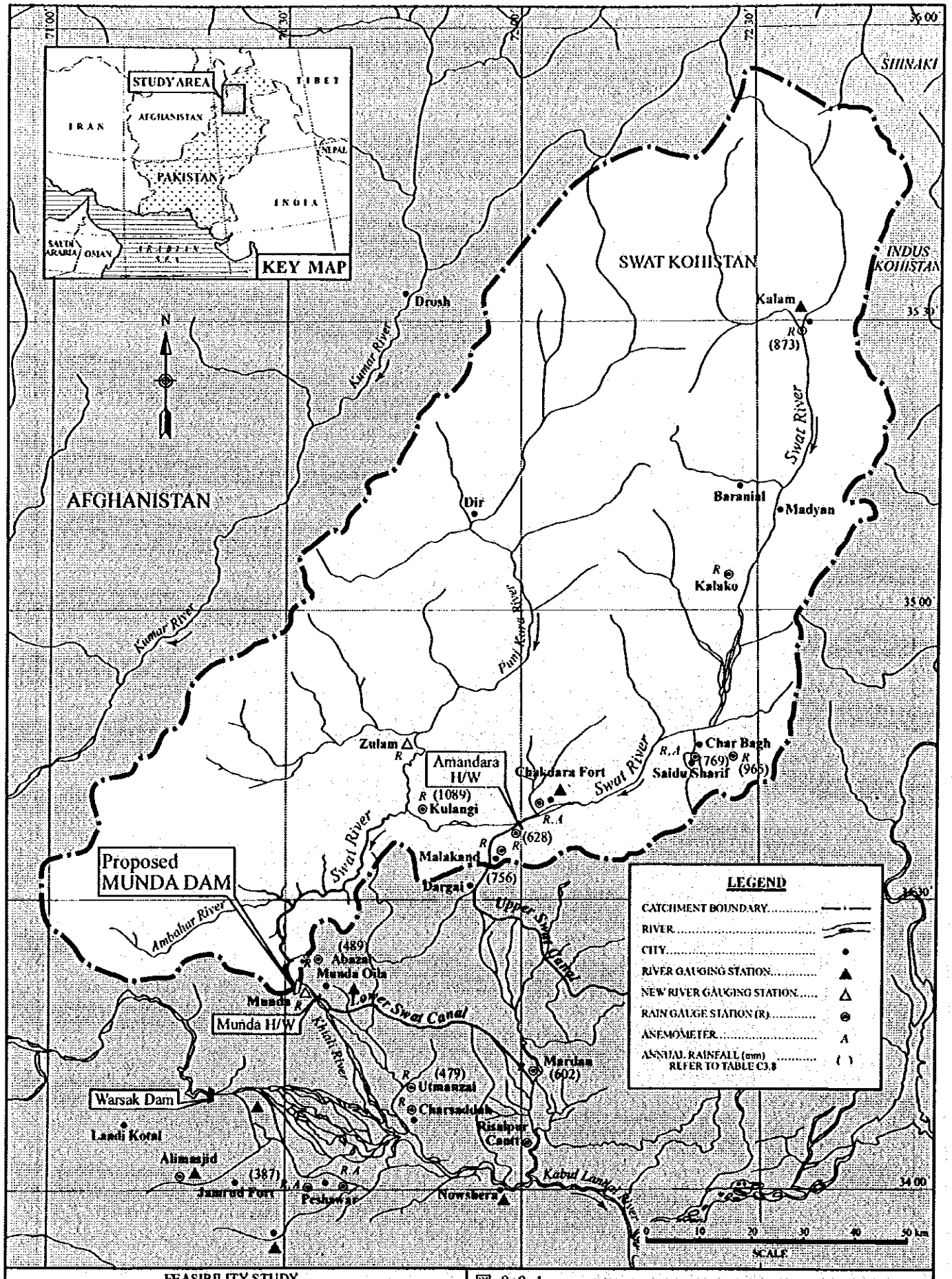




FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.2.11 地震震度と頻度の関係



FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
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図 3.3.1
スワット川流域の既存水文気象観測所

FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
JAPAN INTERNATIONAL COOPERATION AGENCY

図 3.3.2

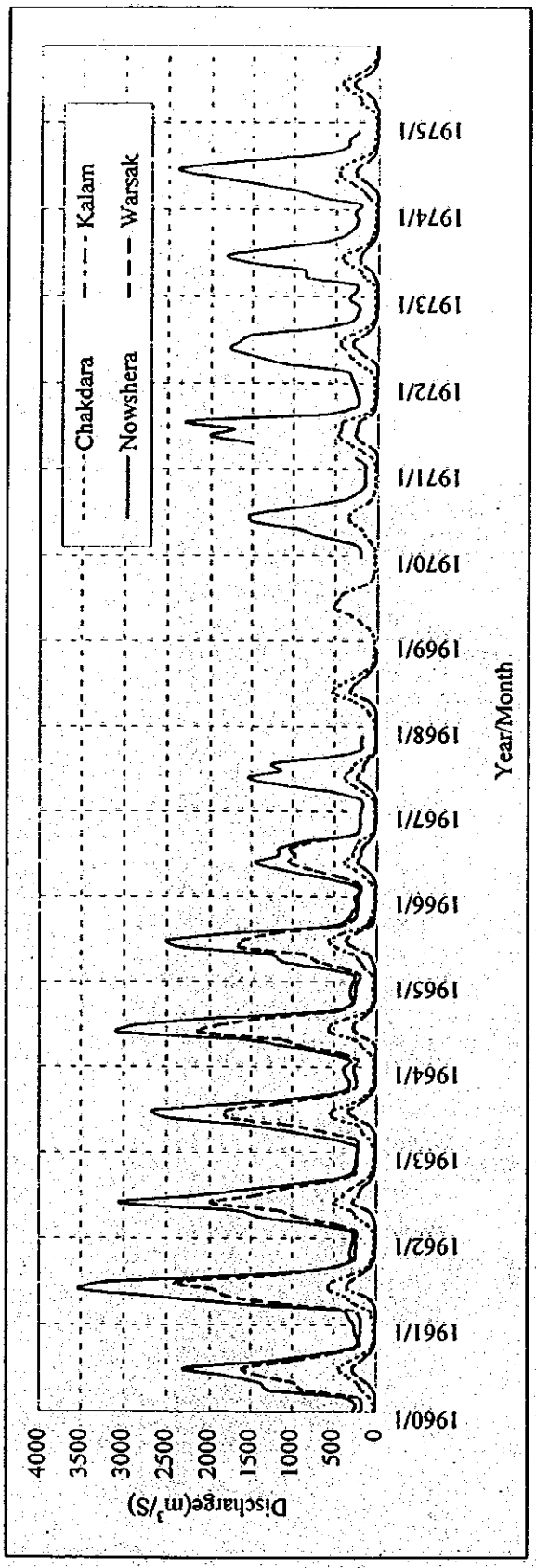
現地調査での収集気象データ

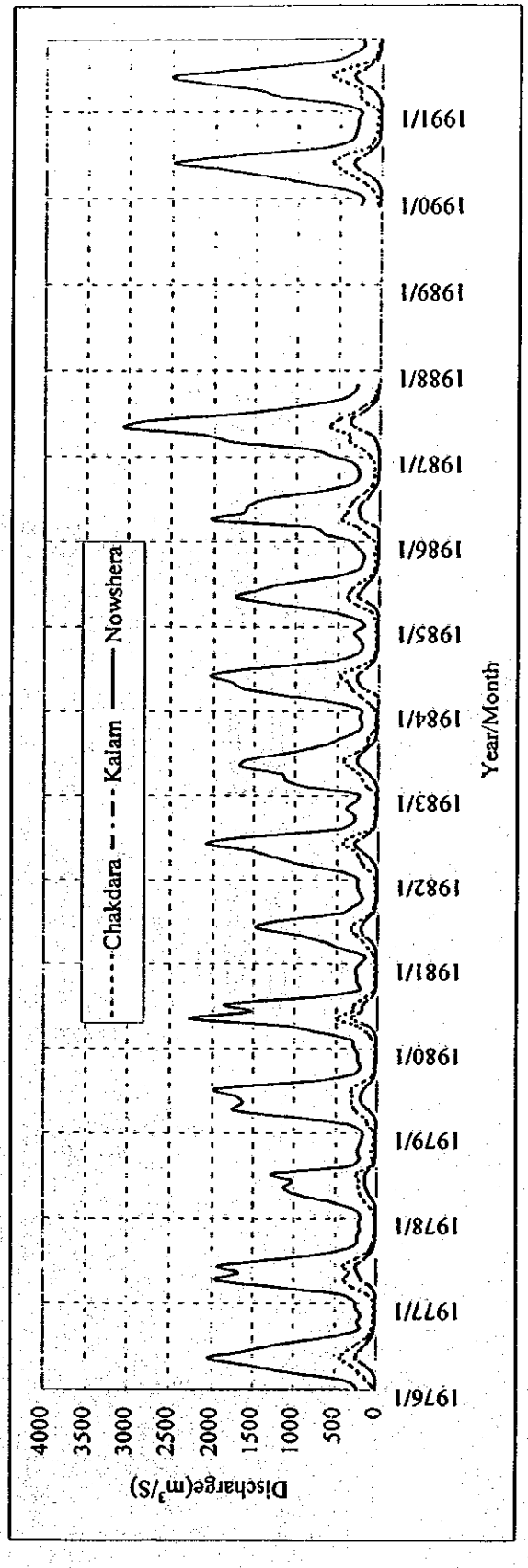
FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN

JAPAN INTERNATIONAL COOPERATION AGENCY

図 3.3.3

現地調査での収集流量データ

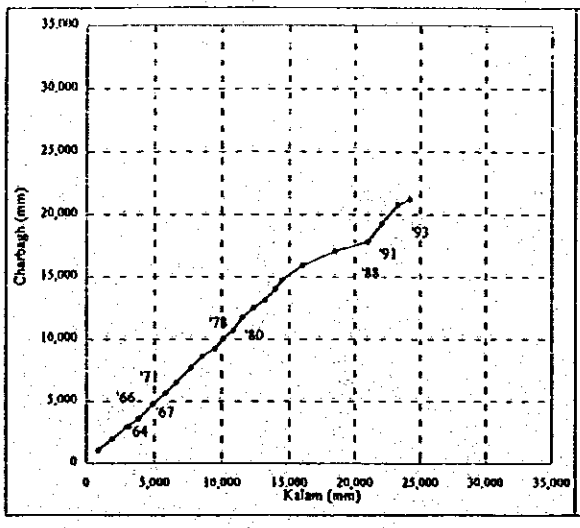




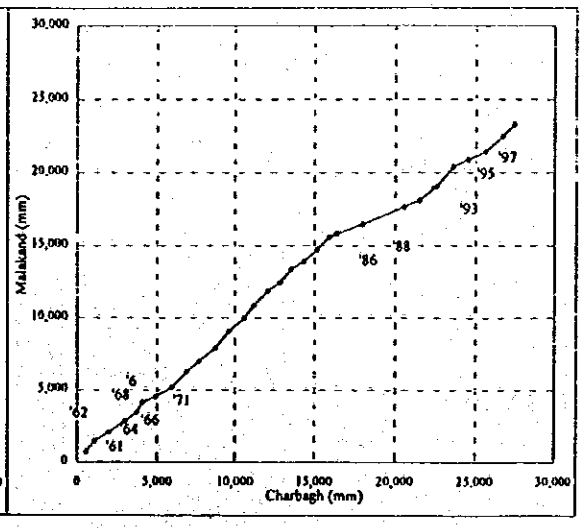
FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.4 各観測所間の月間平均流量

FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
JAPAN INTERNATIONAL COOPERATION AGENCY

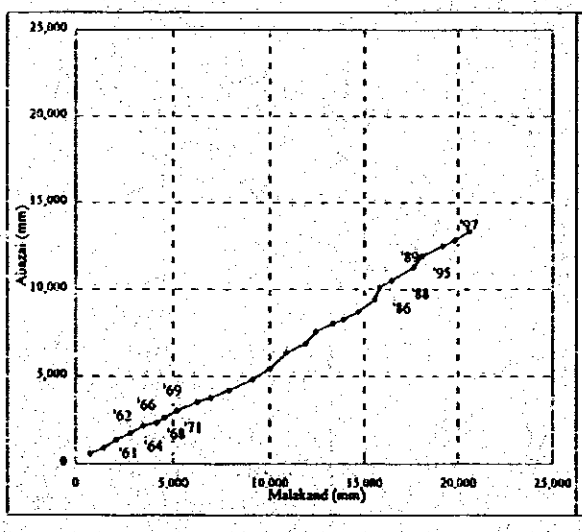
図 3.3.5
各観測所の月間平均雨量（1961-1997）



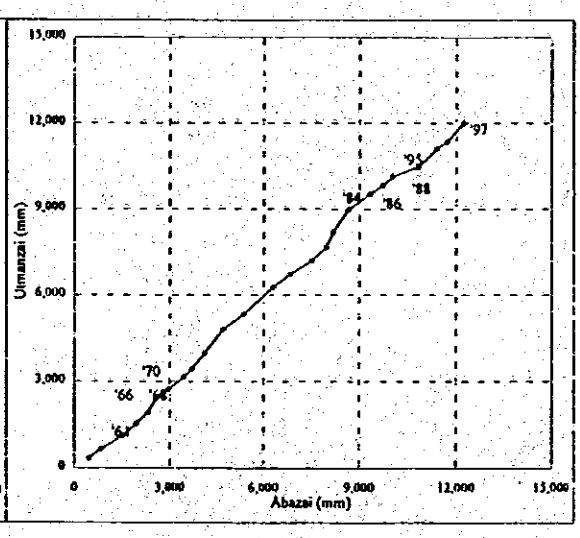
(a) Kalam and Charbagh



(b) Charbagh and Malakand

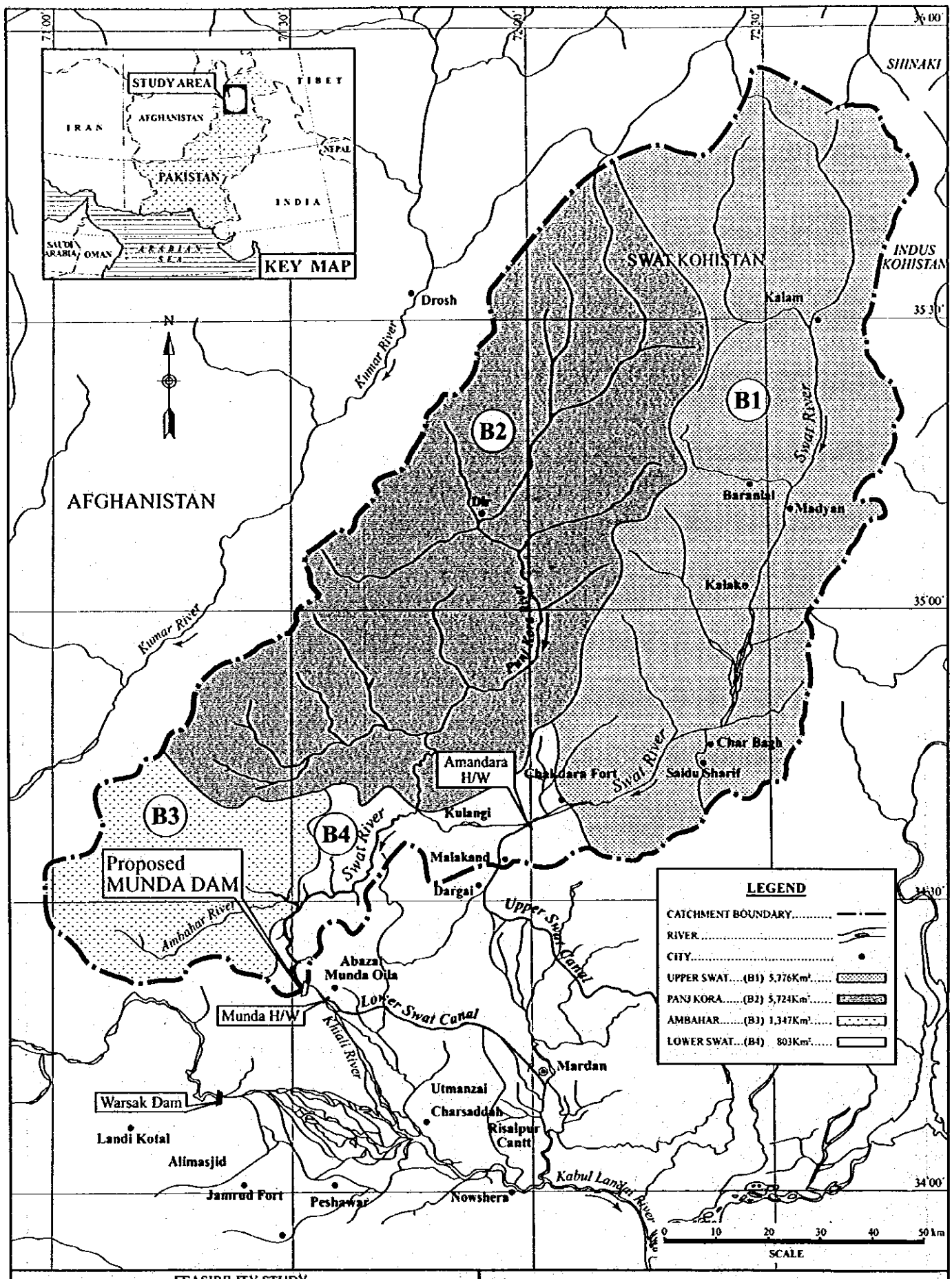


(c) Malakand and Abazai



(d) Abazai and Utmanzai

FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.6 雨量観測所間のダブルマスカーブ



FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
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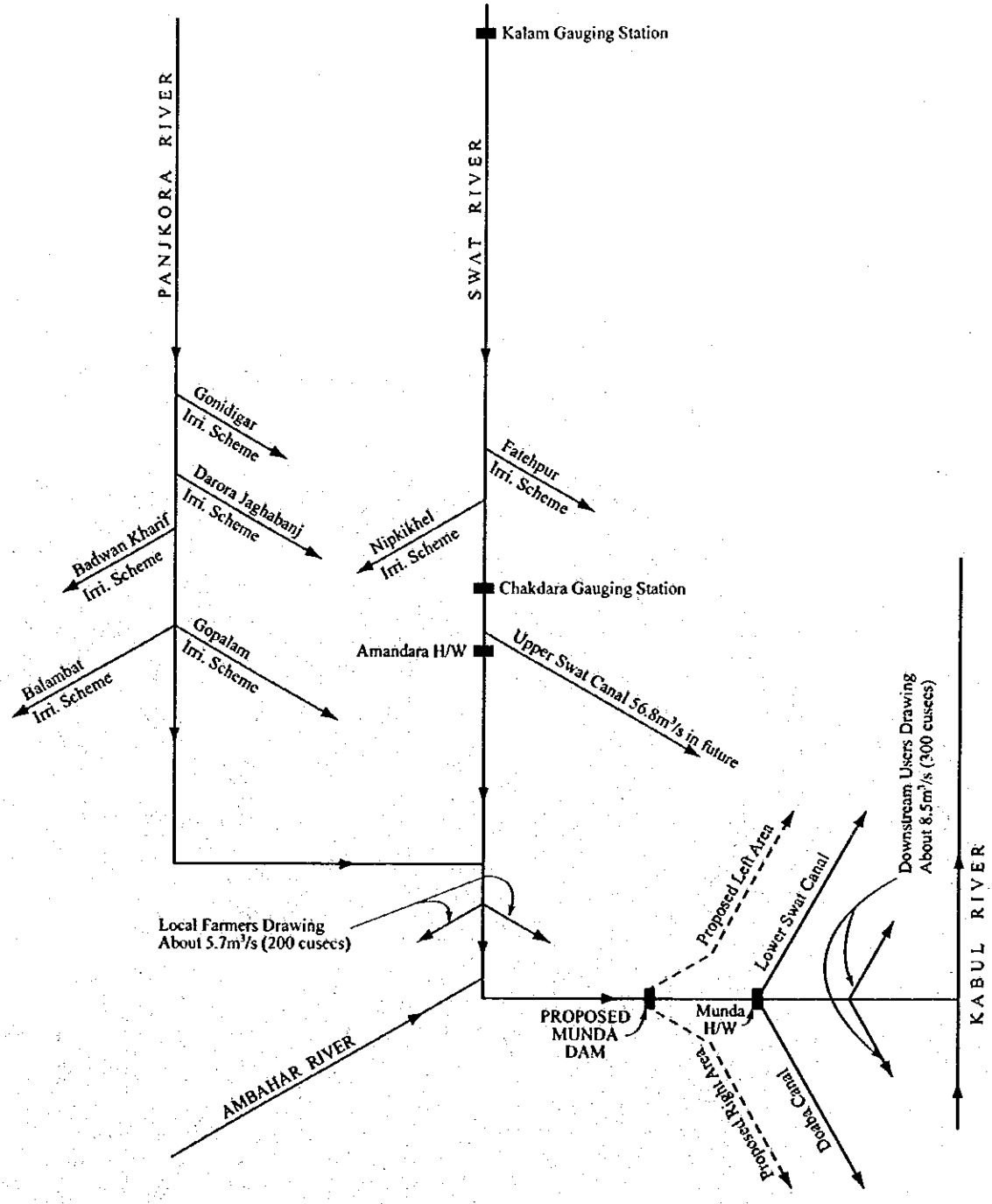
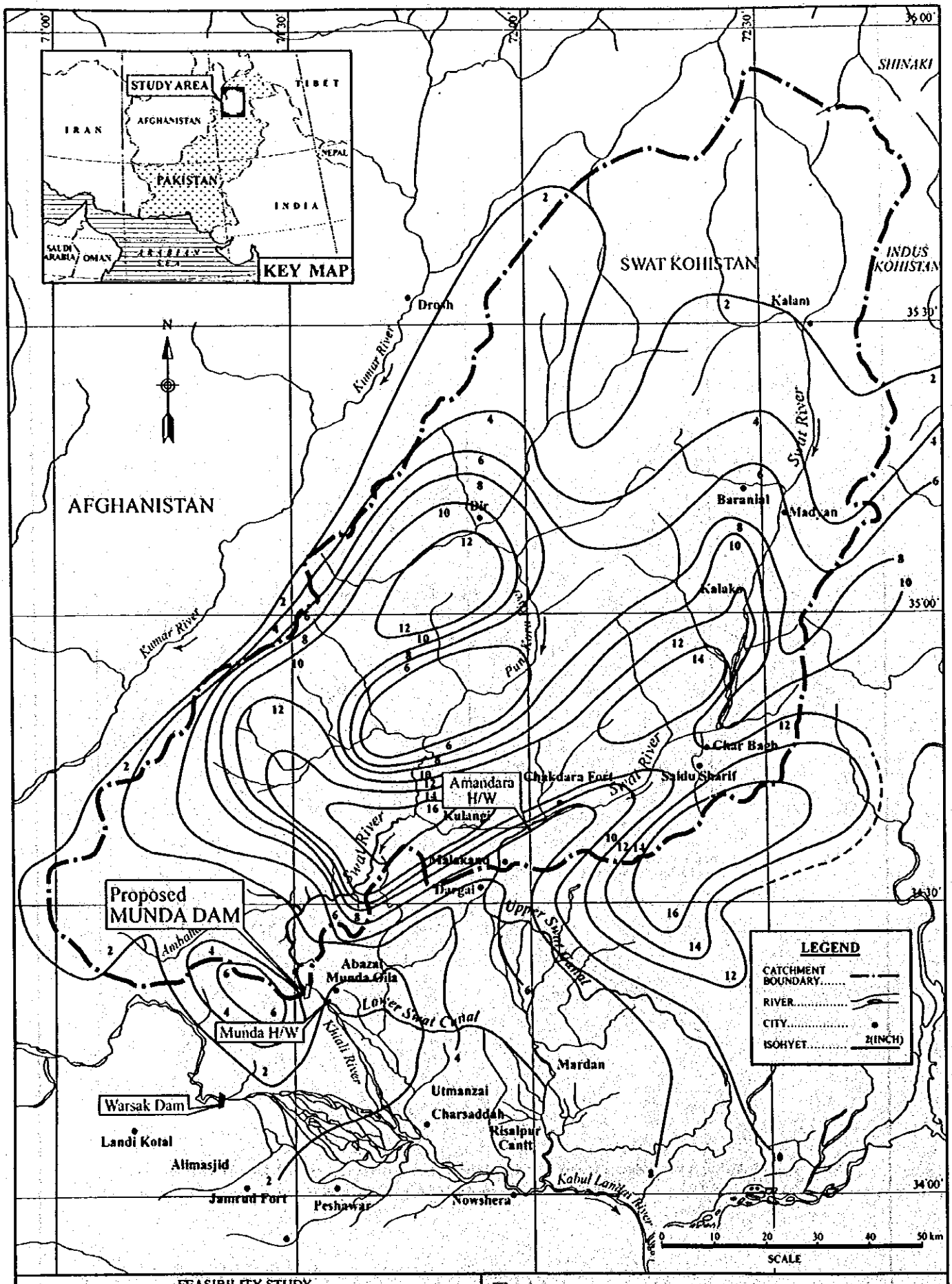
図 3.3.7
ムンダダム流域及び分割流域



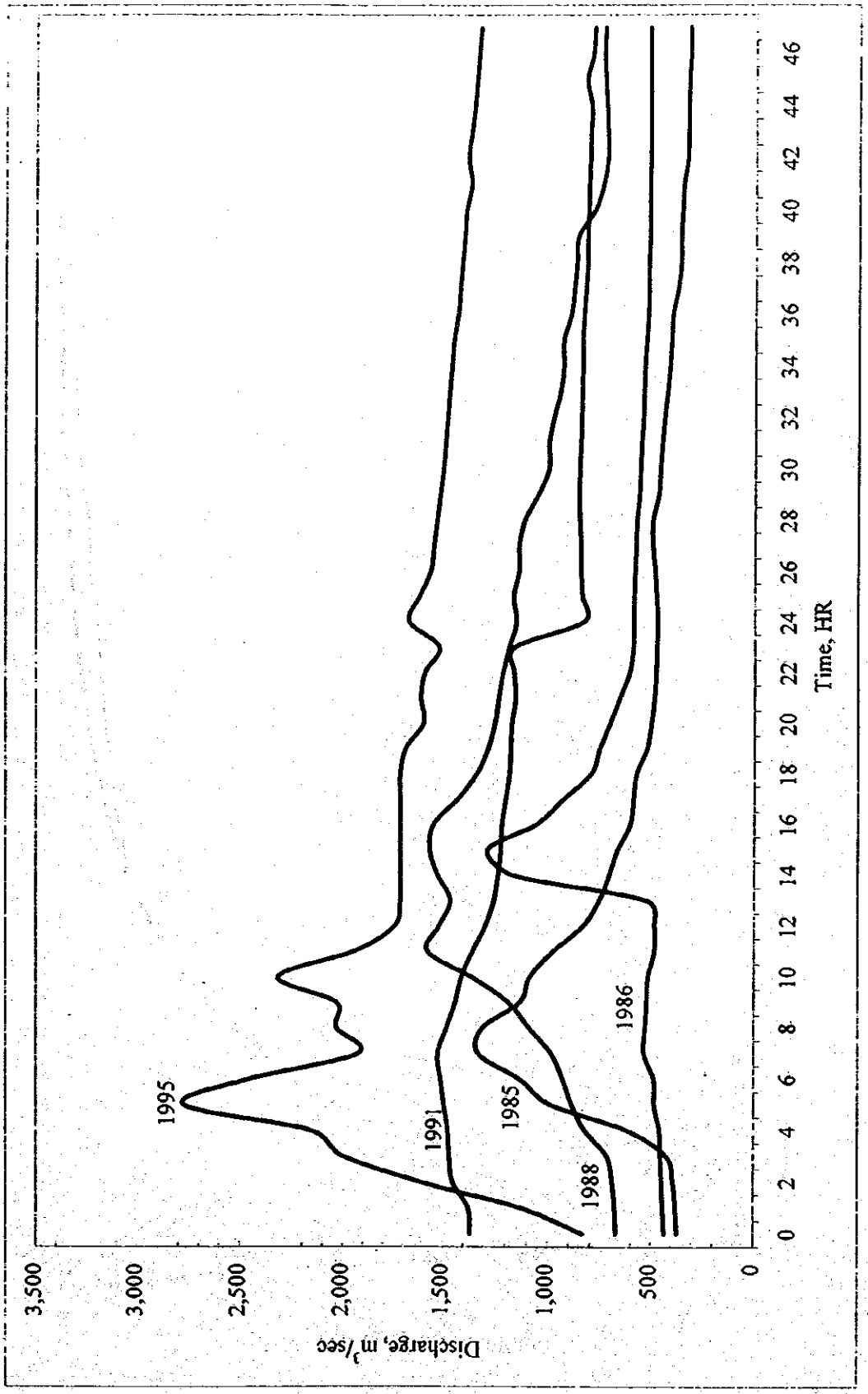
Notes : 1) Intake discharges for the about irrigation schemes and canals are presented in Tables C4.1, C4.4 and C4.6 in Appendix C.
2) Future intake discharge for both of LSC and Doaba canal is 37.4m³/s on annual averaage.

FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.8 スワット川流域の灌漑計画

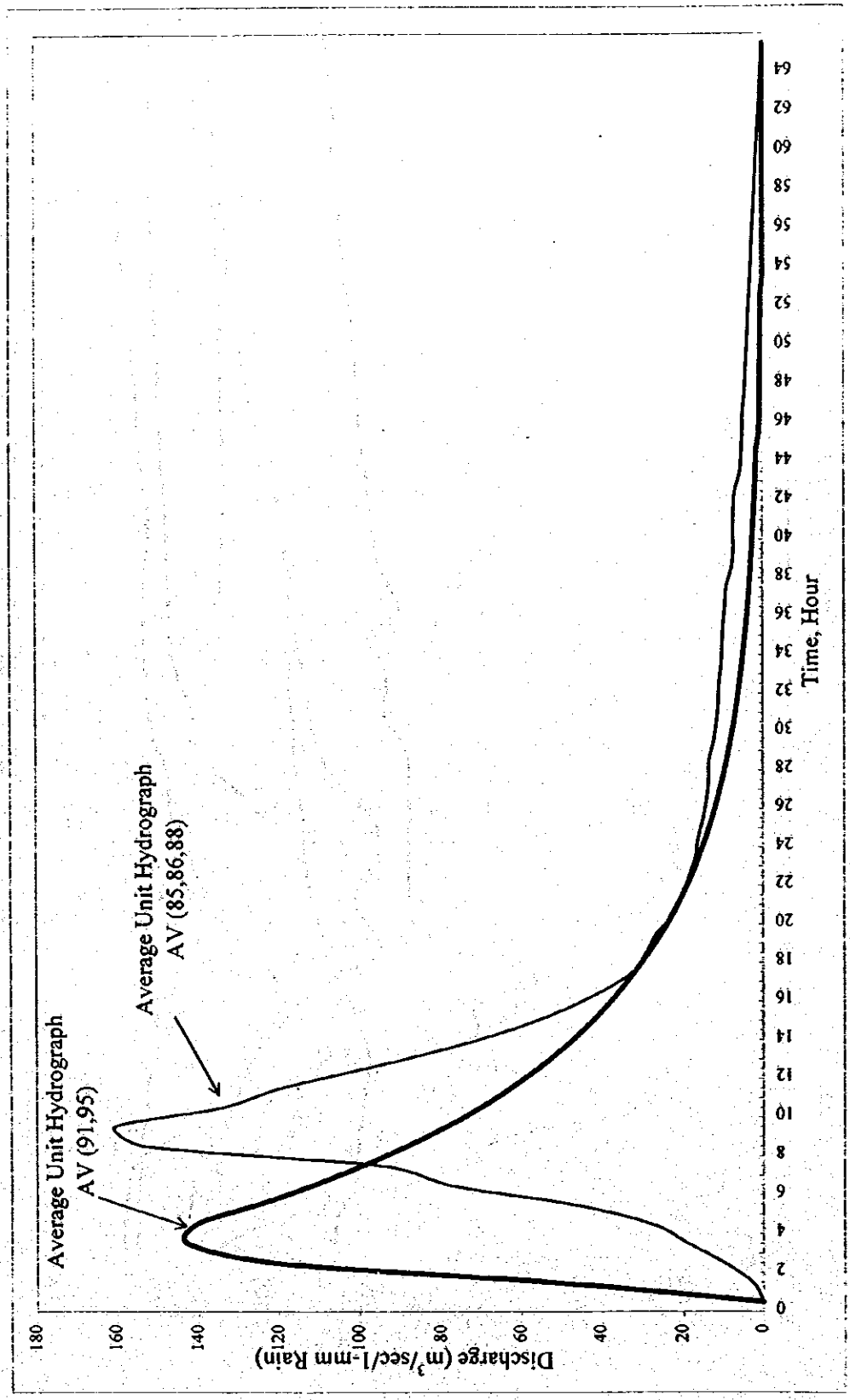


FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
JAPAN INTERNATIONAL COOPERATION AGENCY

図 3.3.9
1929年 8月 26日 - 29日豪雨の等雨量線図(Ref. 1)

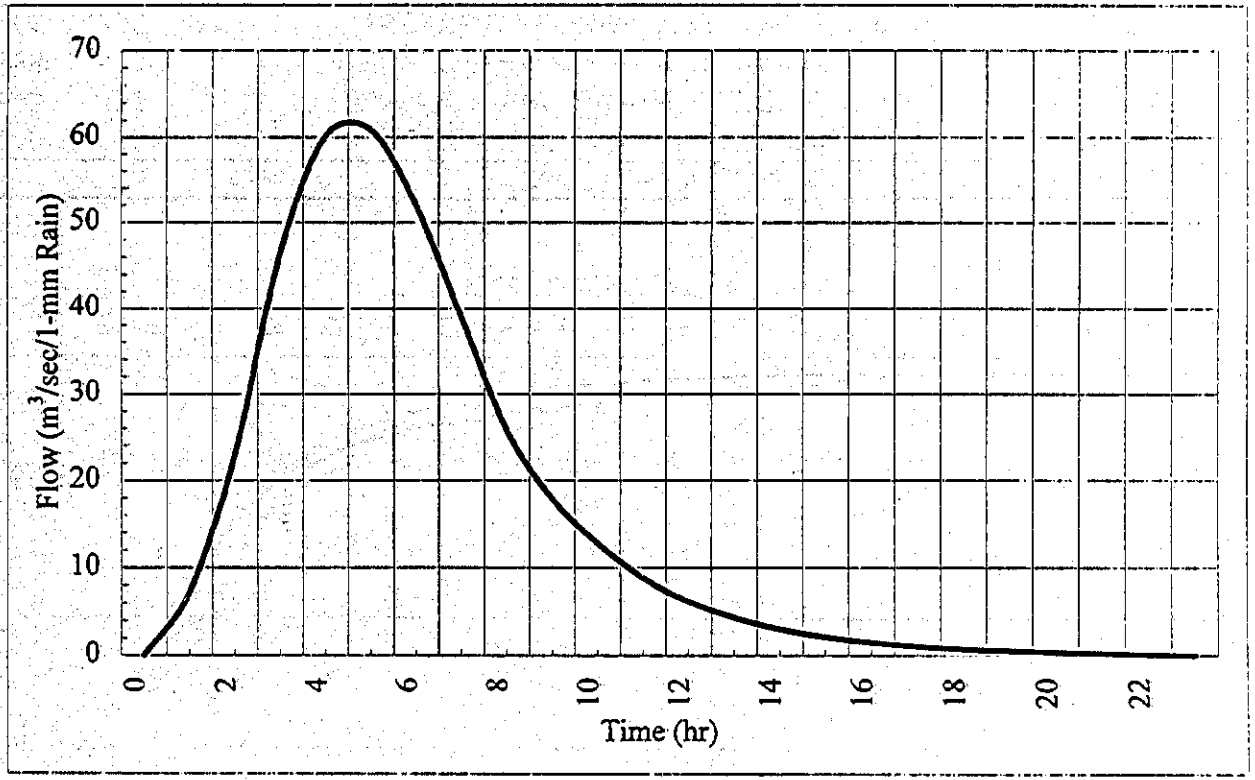


FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.10 チャクダラでの48時間洪水ハイドログラフ



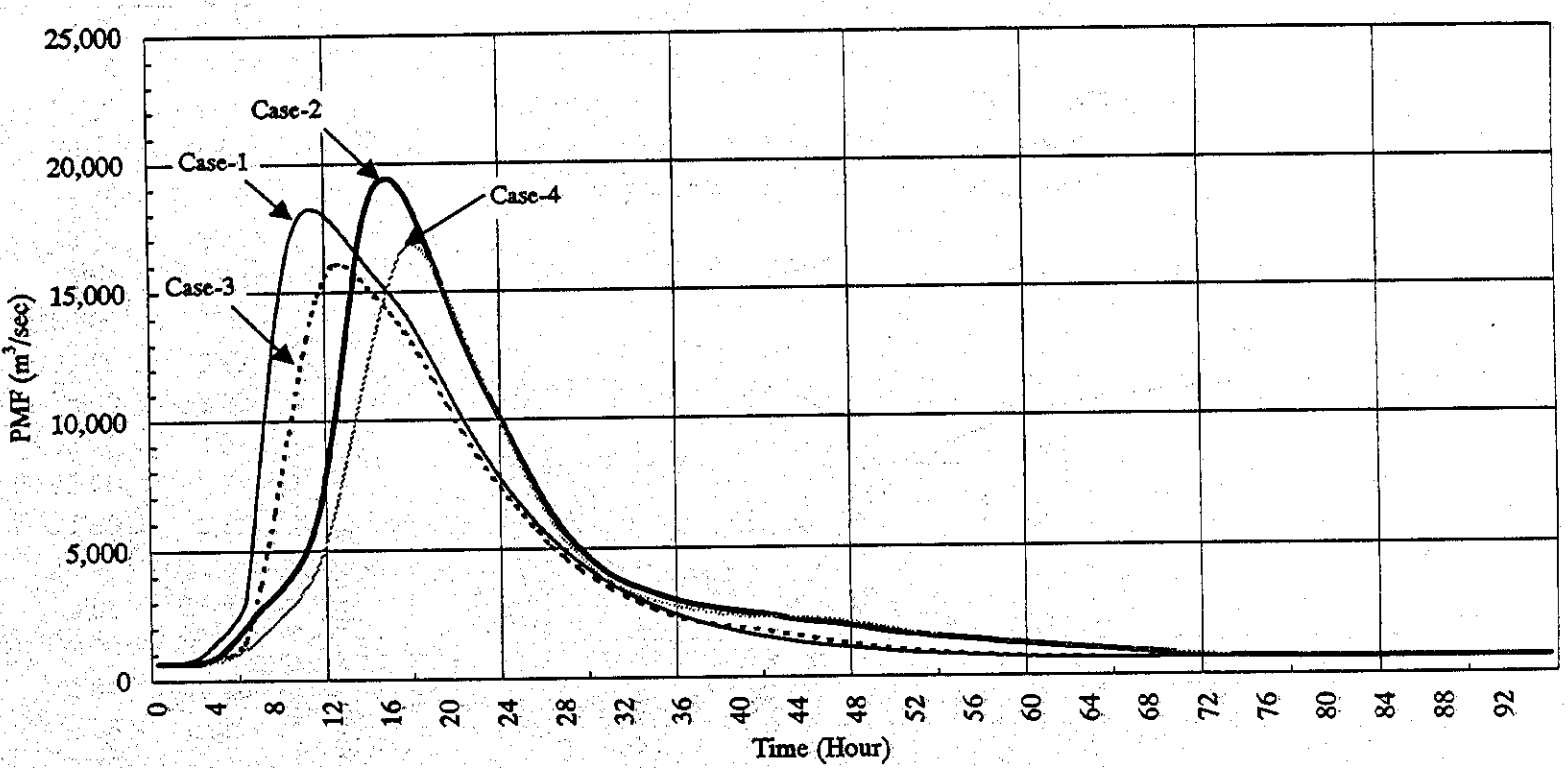
FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.11 採用されたユニットハイドログラフ

TIME	UHAmb
0.00	0
1.00	7.24
2.00	22.95
3.00	46.42
4.00	60.11
5.00	60.88
6.00	51.96
7.00	38.98
8.00	25.78
9.00	17.89
10.00	12.78
11.00	8.82
12.00	6.24
13.00	4.35
14.00	3.03
15.00	2.13
16.00	1.50
17.00	1.04
18.00	0.73
19.00	0.55
20.00	0.38
21.00	0.24
22.00	0.10
23.00	0.00



Time to Concentration	4.05 hour
Time to Peak	4.55 hour
Peak flow	61.67 m^3/sec/1-mm Rain

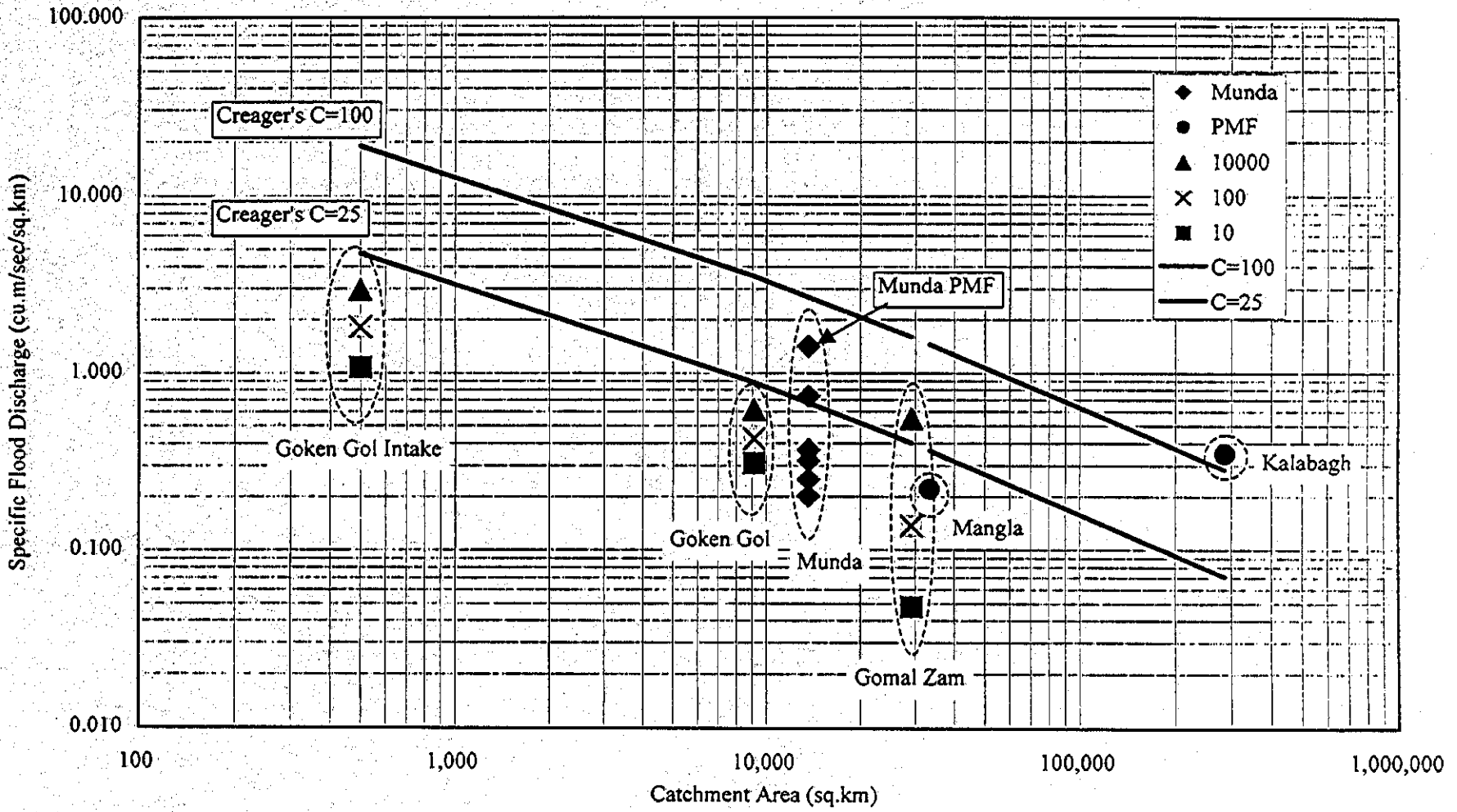
図 3.3.12 アンバハールでの推定ユニットハイドログラフ



Qp	Tp	Case	Unit Hydrograpgh Condition	PMP
18,169	11	1	Average Unit Hydrograph 1991 and 1995	24-PMP
19,393	16	2	Average Unit Hydrograph 1985, 1986 and 1988	24-PMP
15,988	13	3	Average Unit Hydrograph 1991 and 1995	72-PMP
16,706	18	4	Average Unit Hydrograph 1985, 1986 and 1988	72-PMP

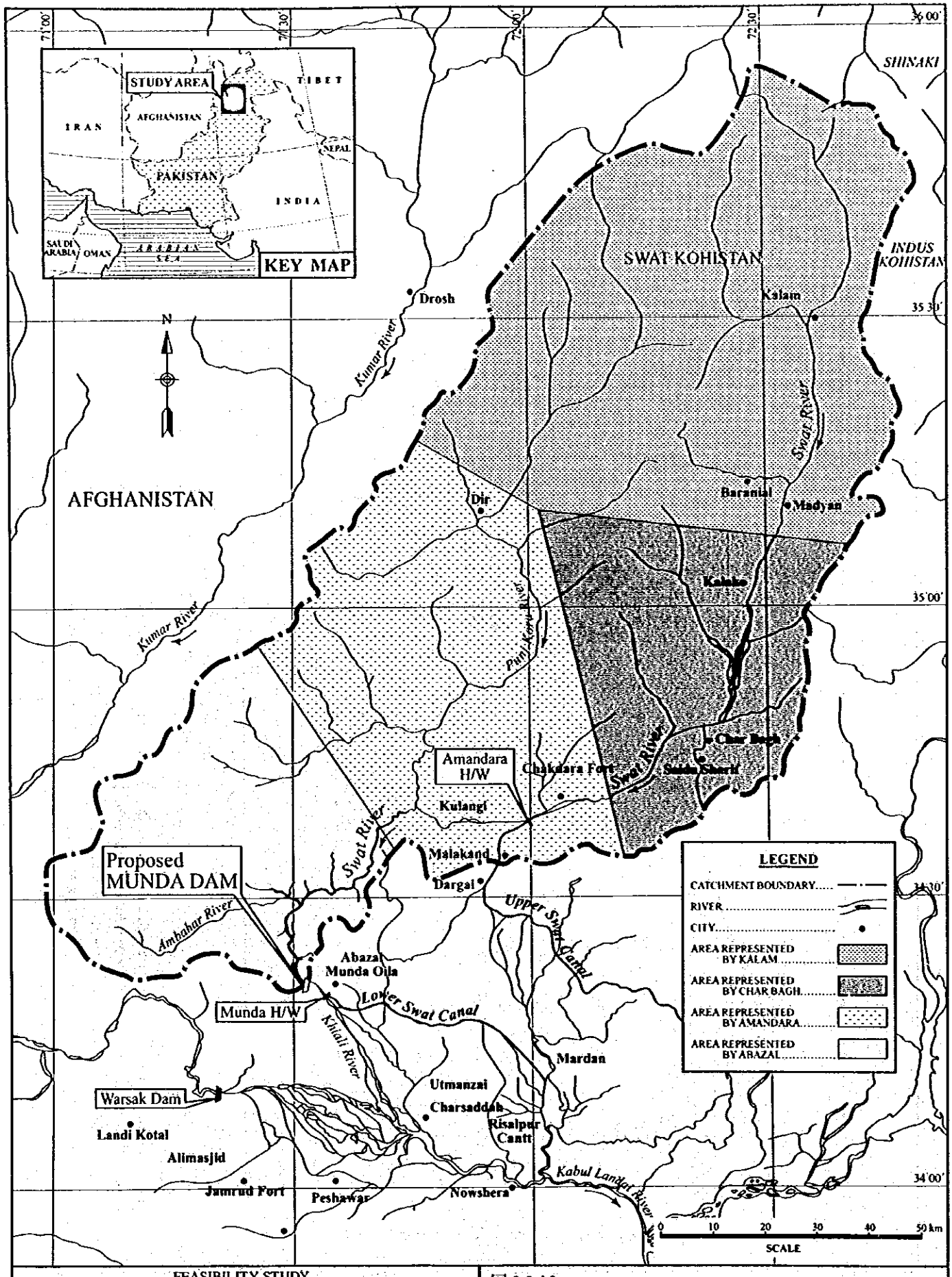
Qp Peak Flow, m^3/sec
Tp Time to Peak, hours

図 3.3.13
ムンダダムサイトでの可能最大洪水



Sources: Project planning report for Kalabagh Dam, Volume IV, Technical morandum 23, 1984
Completion report for Mangla Dam Project, Volume III, 1971
PC-I Proforma, Gomal Zam Dam Project, 1996
Main report of feasibility study (Updated) for Golen Gol project, Volume 2 of 5, 1997

図 3.3.14 洪水比流量図



FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
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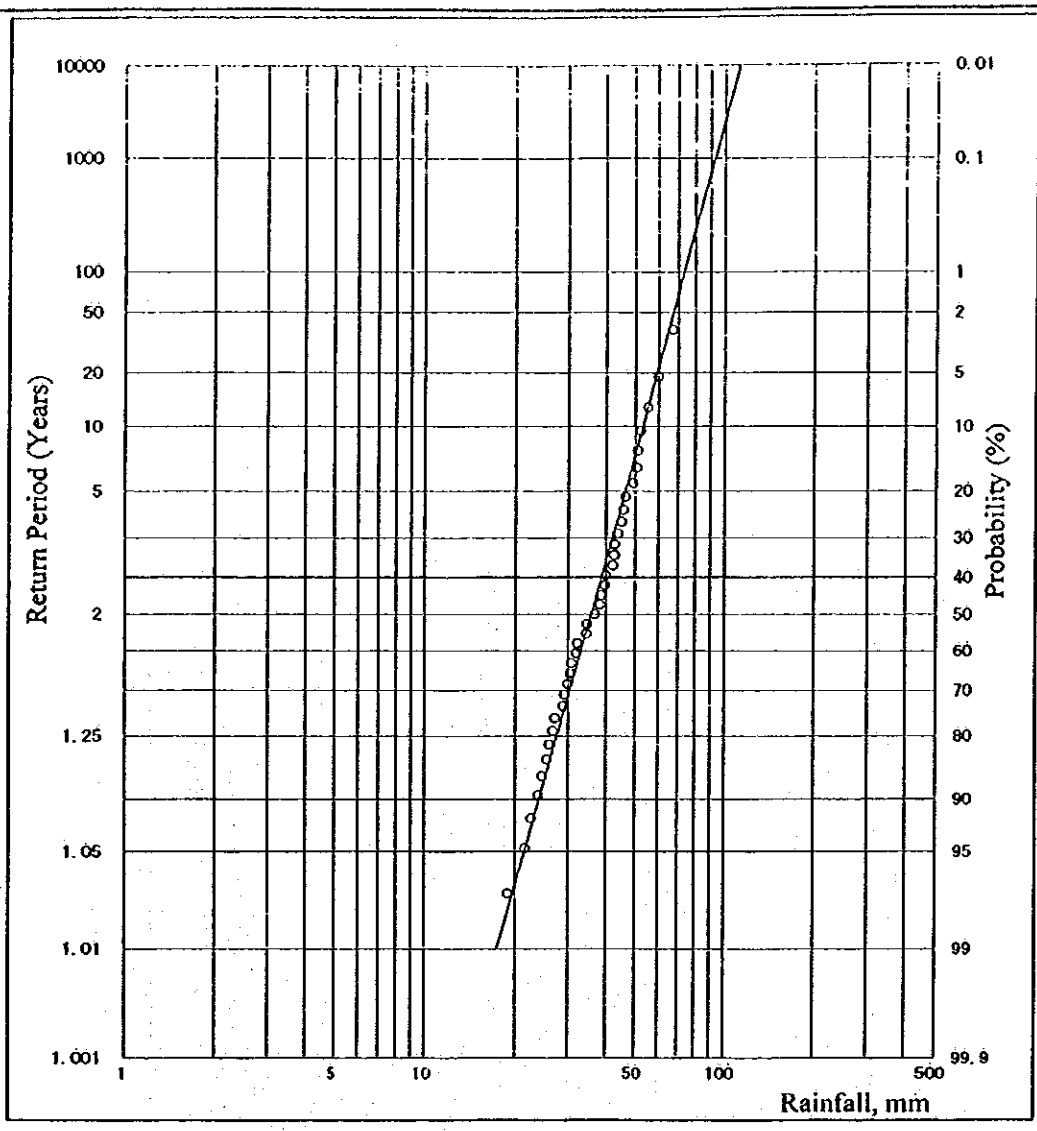
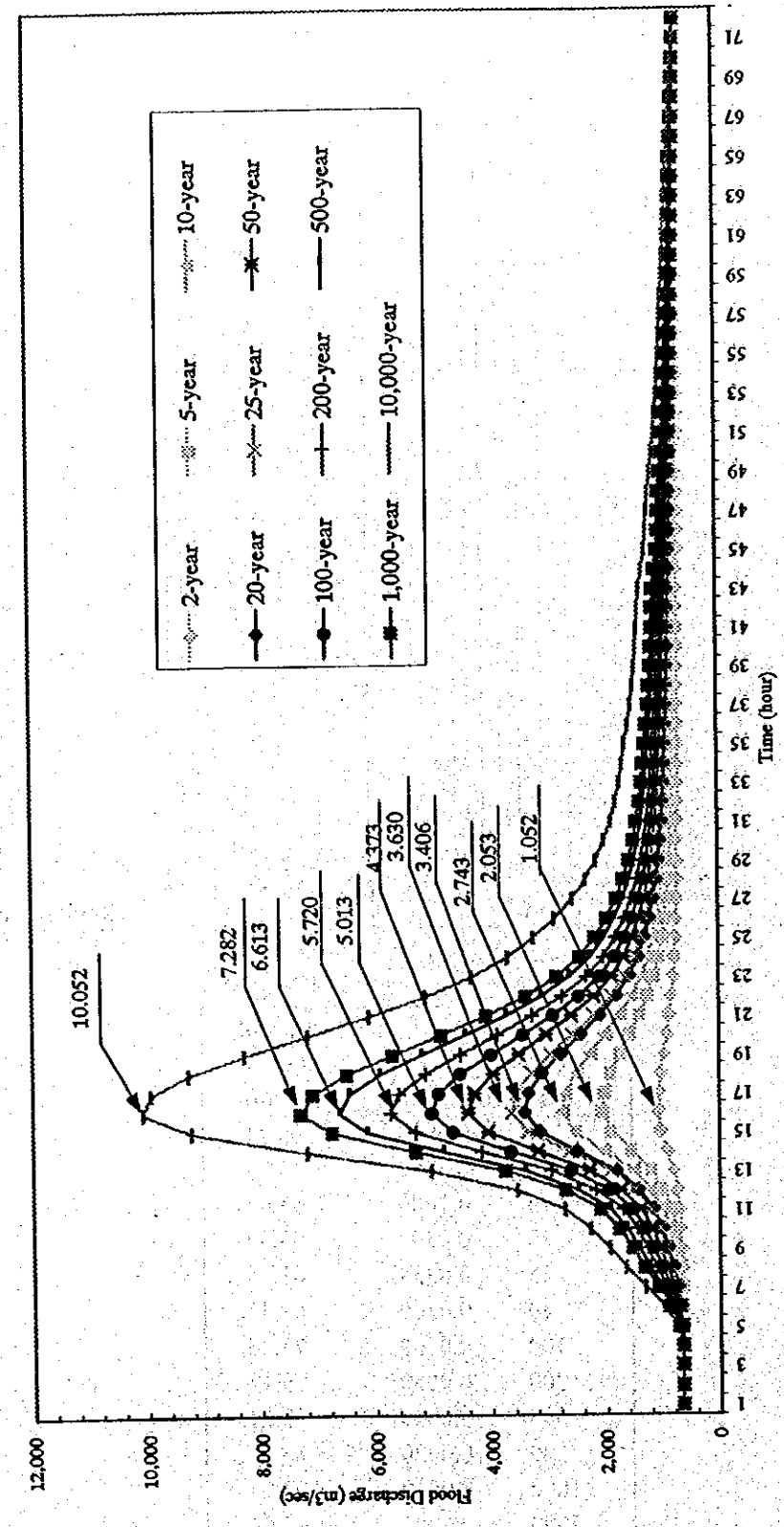
図 3.3.15
流域雨量算定のためのティーセン分割図

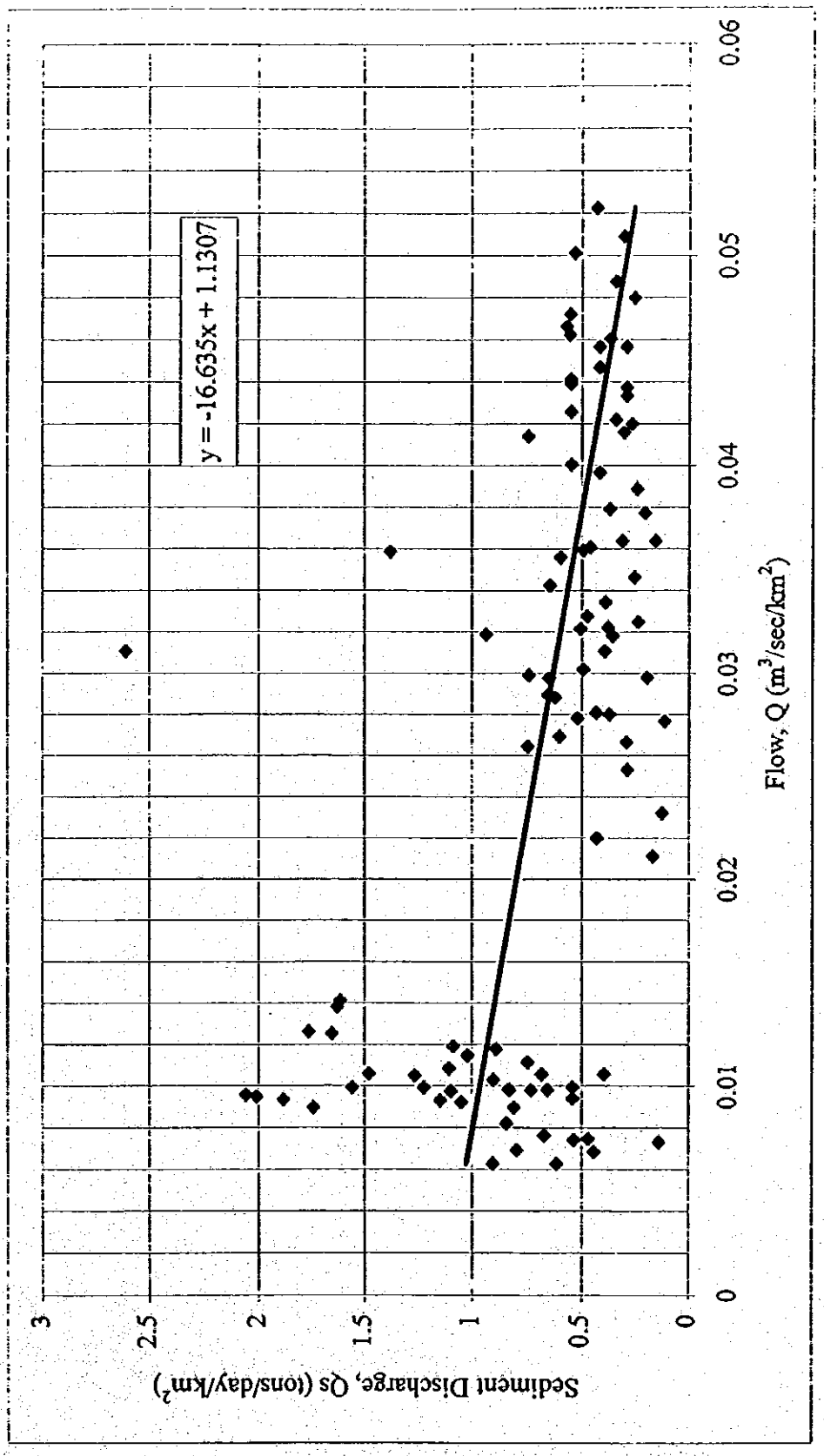


Return Period (Year)	Probability	Probable Rainfall (mm)
2	0.5000	35.74
5	0.2000	46.34
10	0.1000	53.07
20	0.0500	59.37
25	0.0333	61.15
50	0.0200	67.35
100	0.0100	73.26
200	0.0050	79.12
300	0.0033	82.54
500	0.0020	86.85
1000	0.0010	92.73
2000	0.0005	98.64
5000	0.0002	106.53
10000	0.0001	112.58

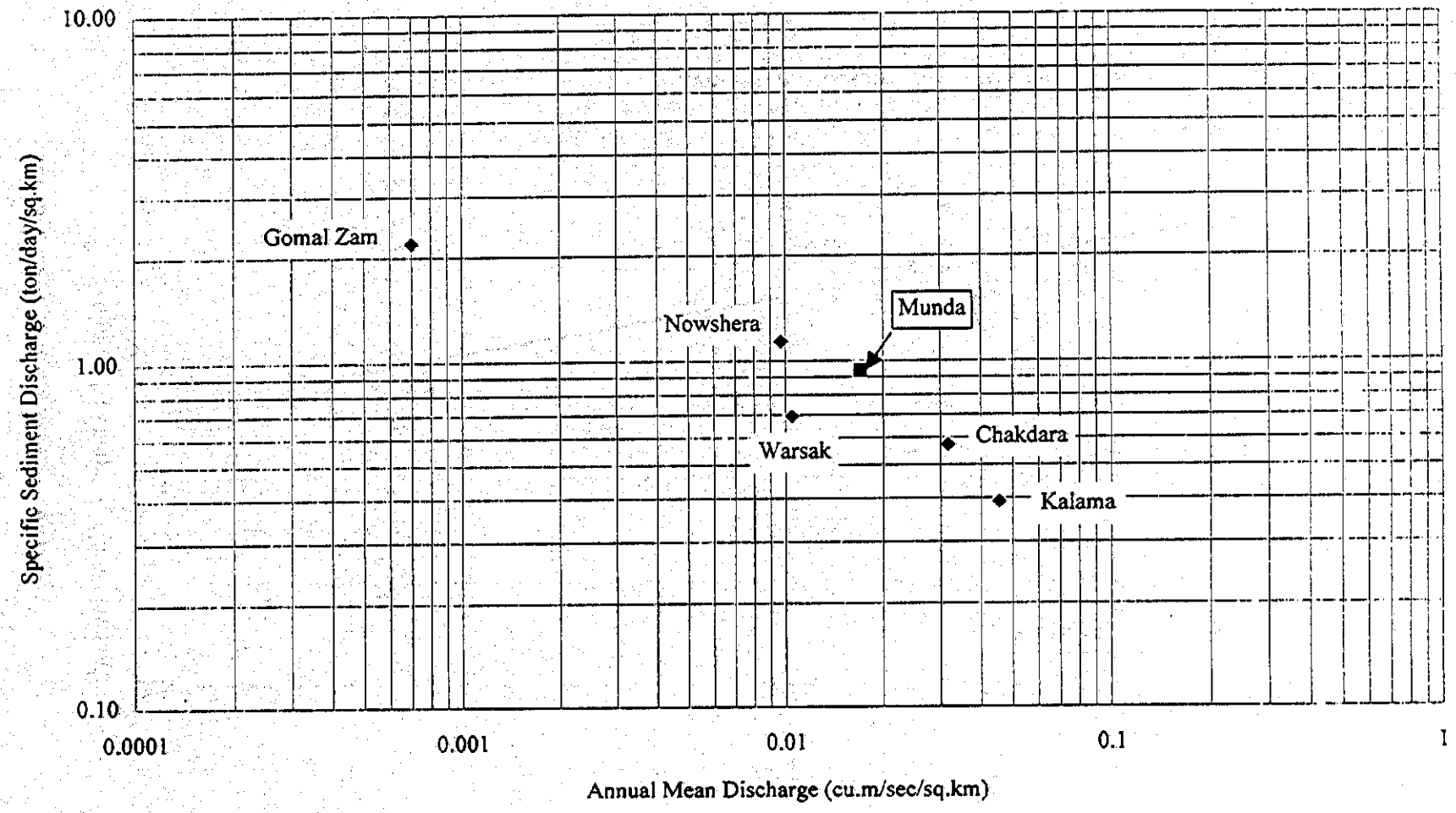
図 3.3.16
24時間年最大流域雨量の超過確率曲線
(Pearson Type III)



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.17 ムンダダム地点での洪水ハイドログラフ



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 3.3.18 流砂量－流量曲線



Sources: Suspended sediment data of at Kalam and Chakdara
Annual sediment loading records for Kalam, Chakdara and Nowshera stations (1961-1990)
Annual sediment loading records for Warsak station (1961-1970)
PC-I Proforma, Gomal Zam Dam Project, 1996

図 3.3.19 比流砂量図

FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
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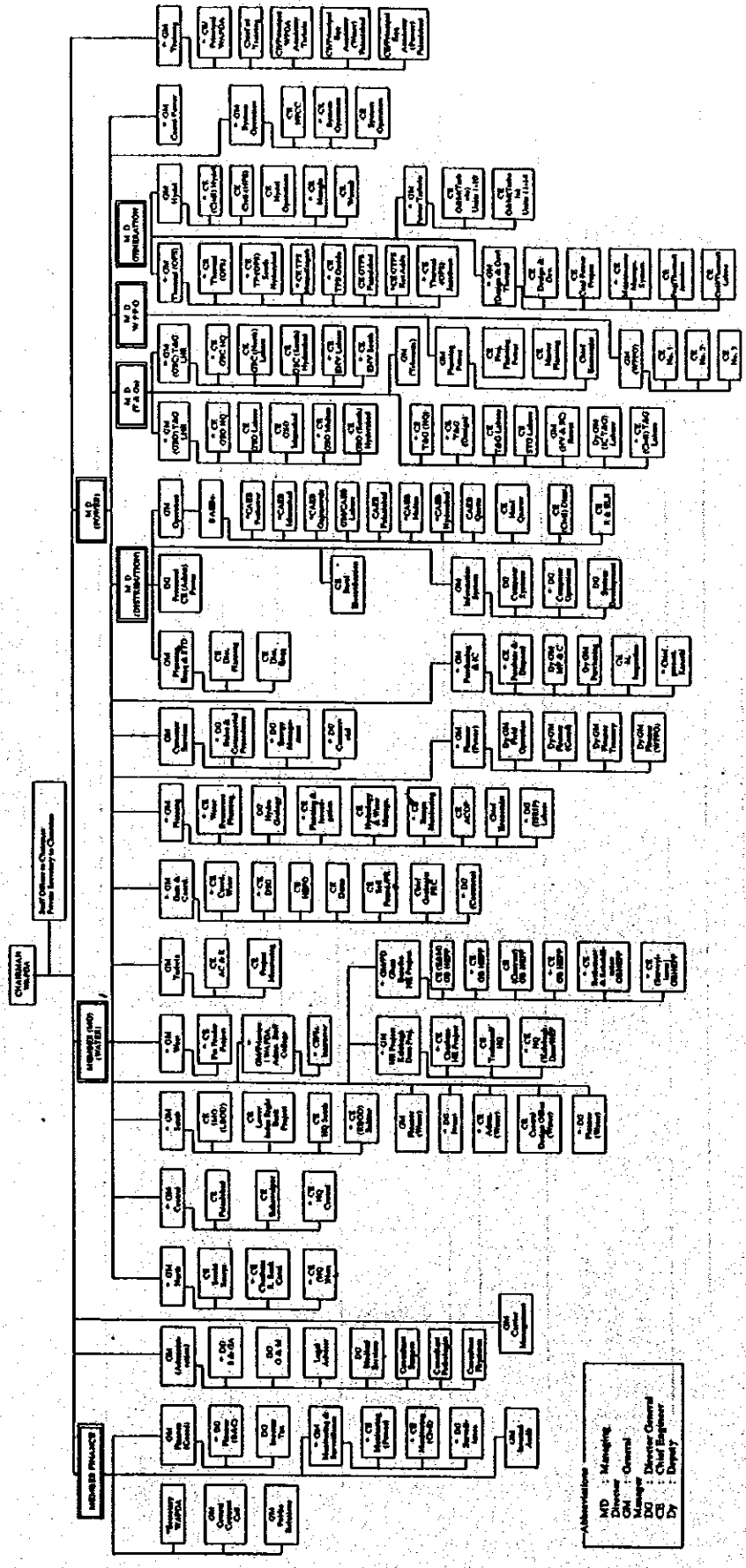
図 4.1.1
政府のエネルギー部門組織図



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 4.1.2 WAPDA 組織概要(電力部門)

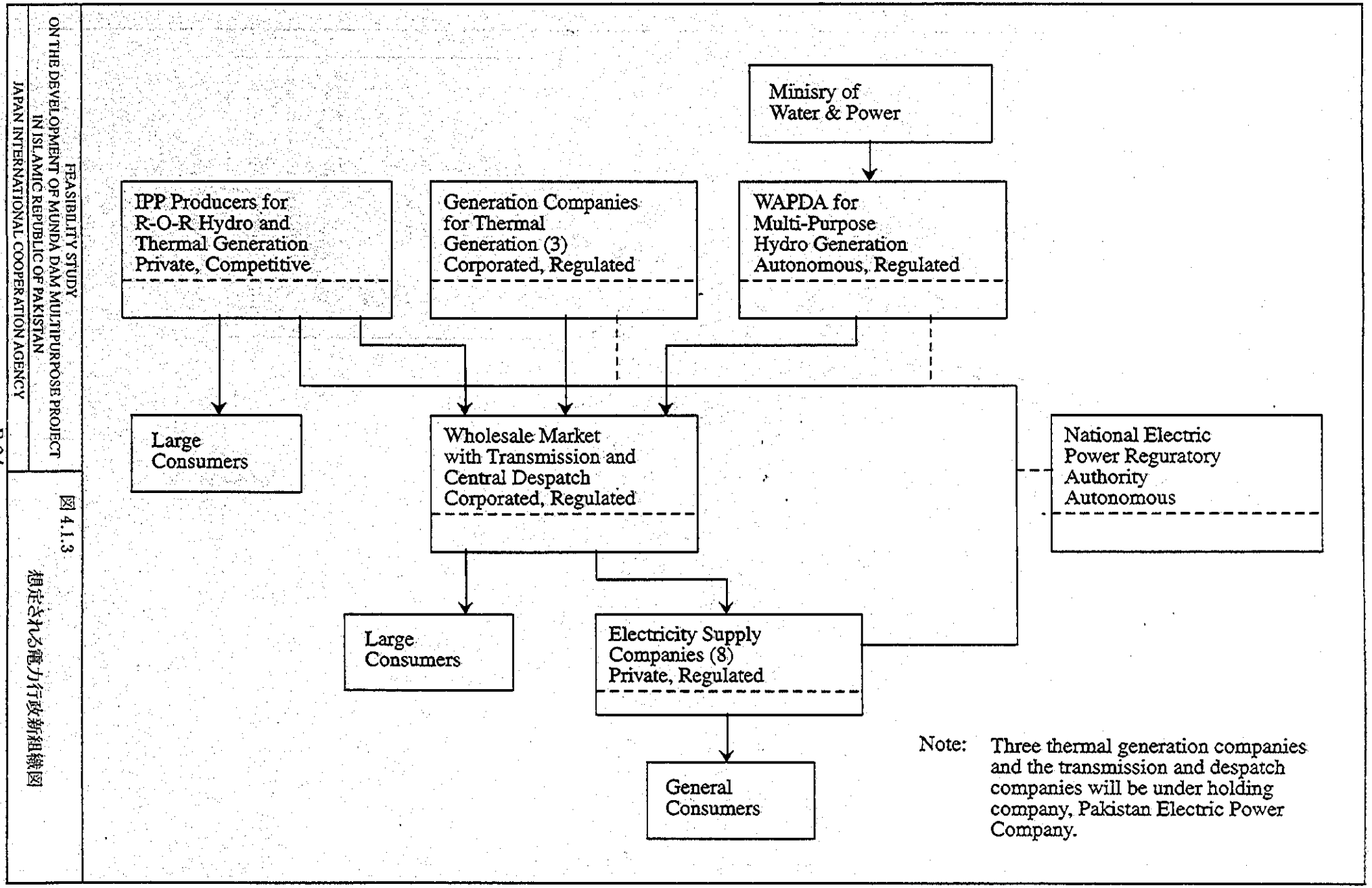
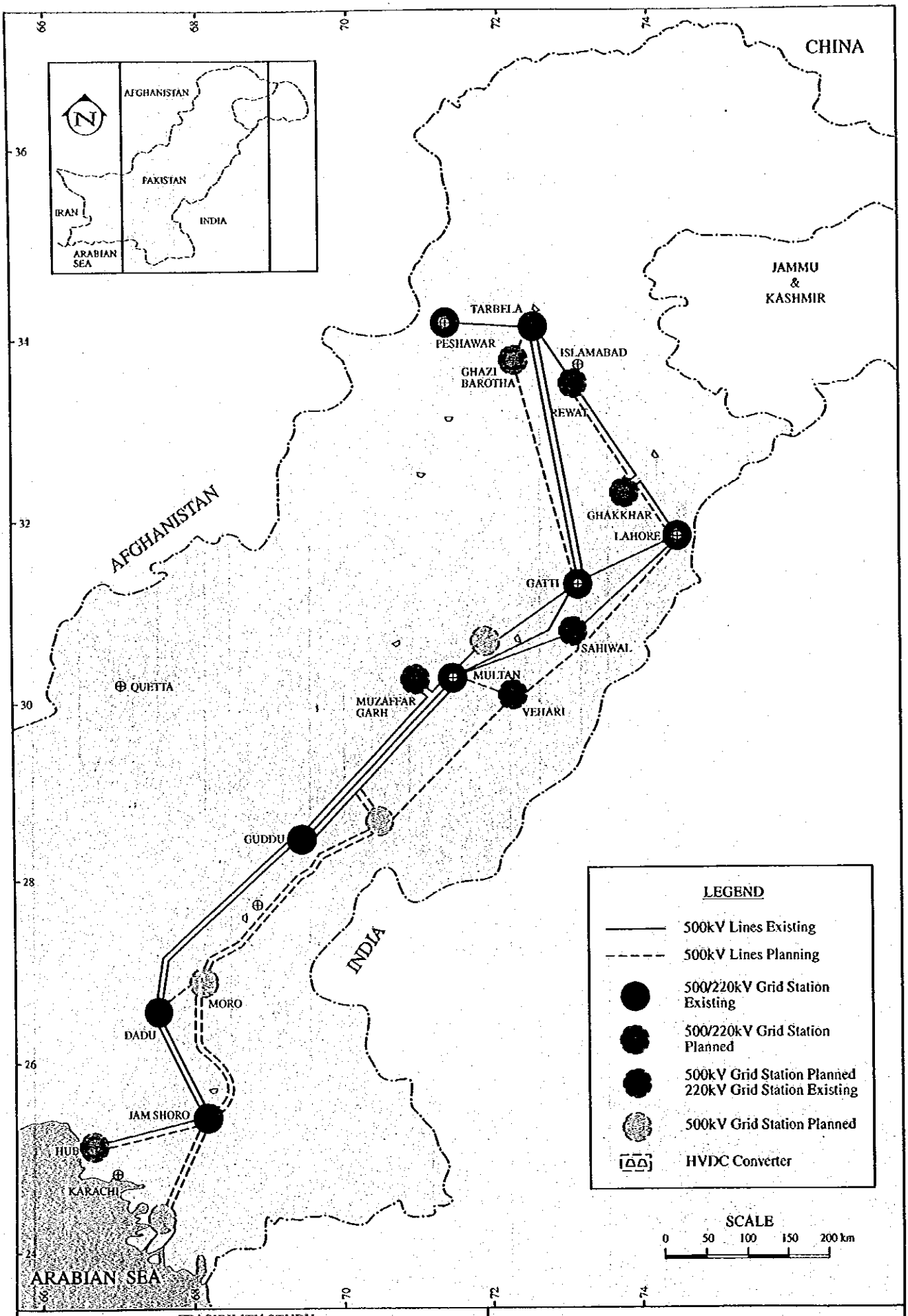


図 4.1.3
想定される電力行政新組織図



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 4.4.1 500kV送電線網

FEASIBILITY STUDY
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IN ISLAMIC REPUBLIC OF PAKISTAN

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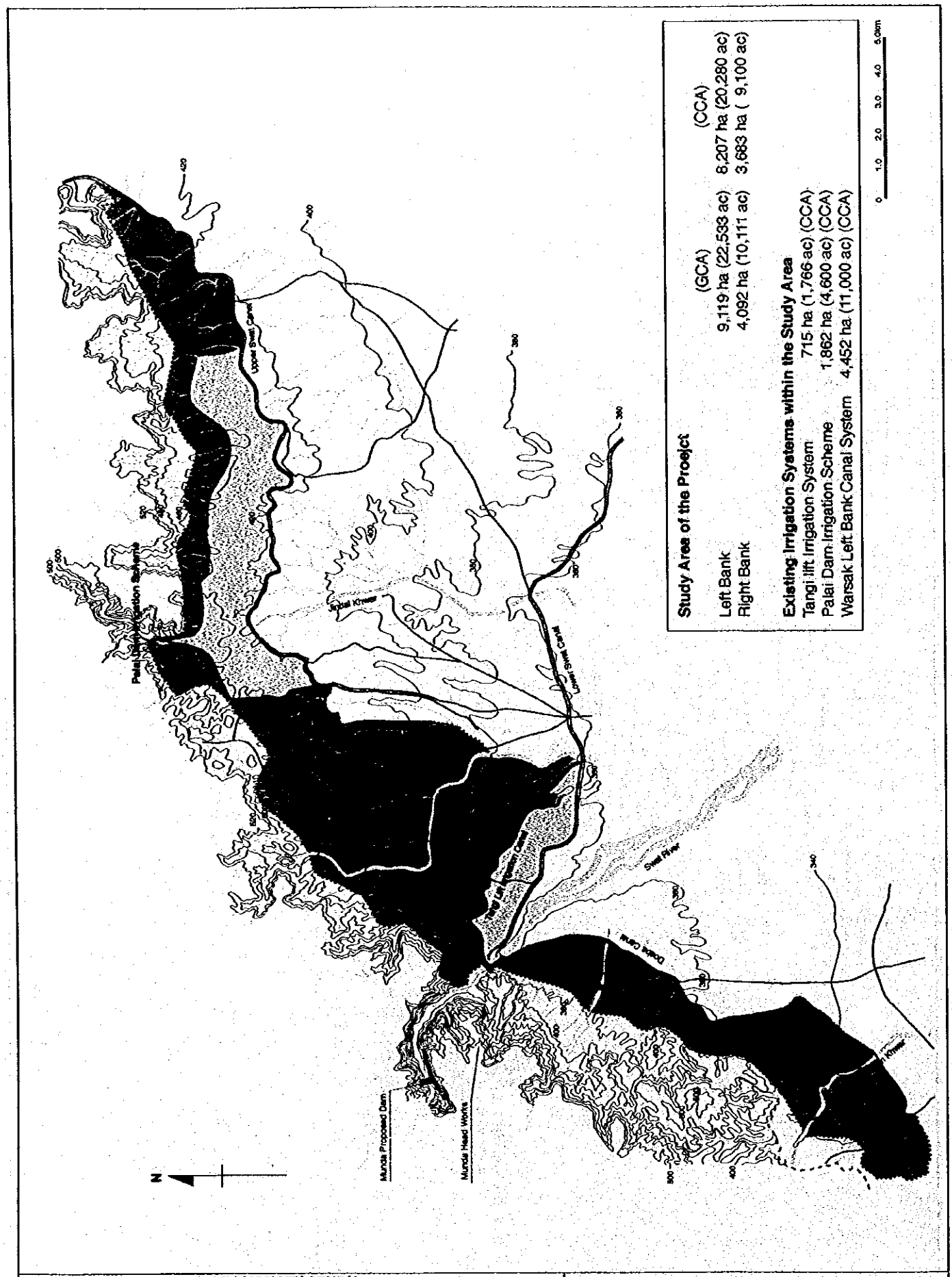
図 5.2.1
灌漑計画調査範囲



FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
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図 5.2.2
灌漑計画調査対象地域

FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
IN ISLAMIC REPUBLIC OF PAKISTAN
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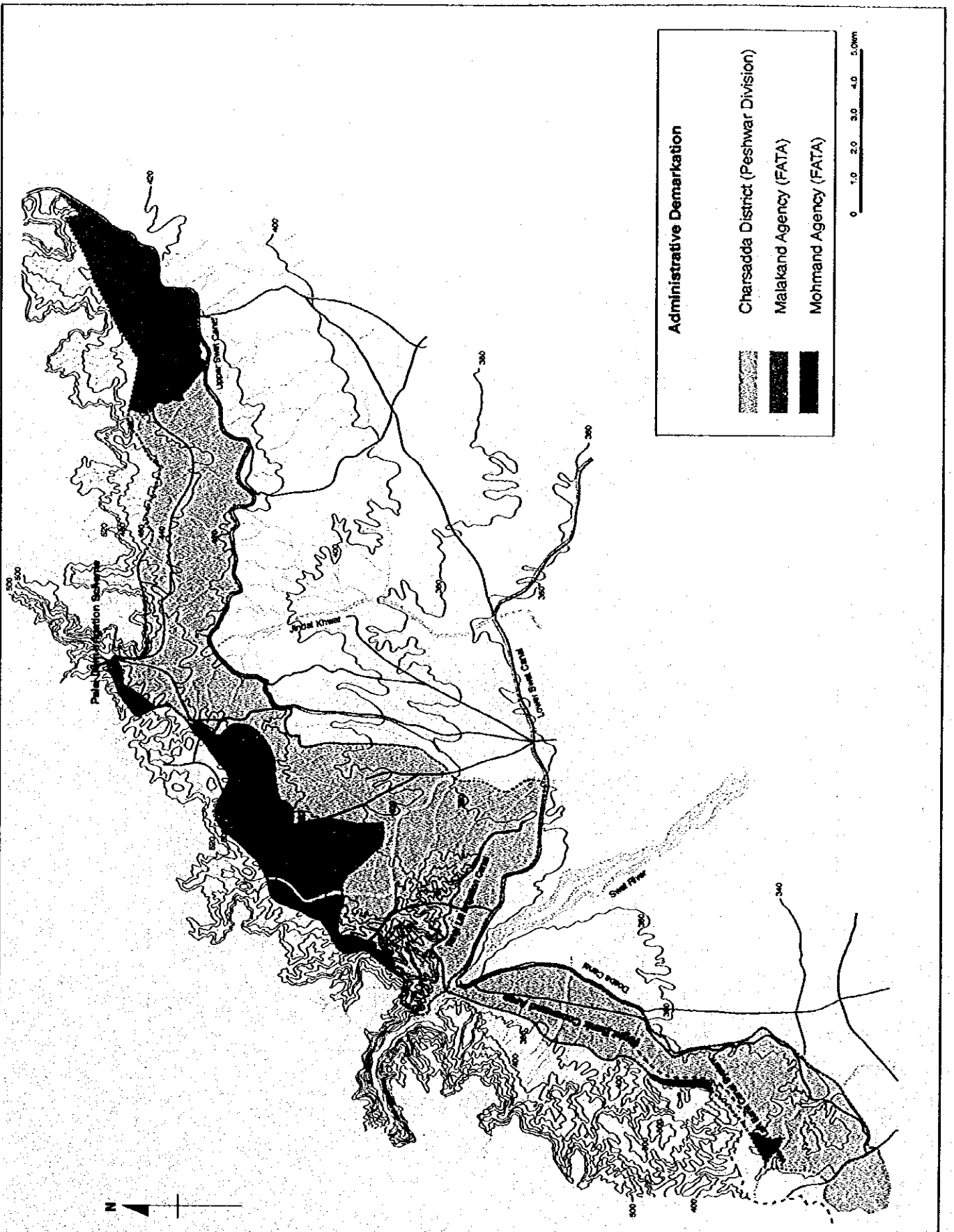
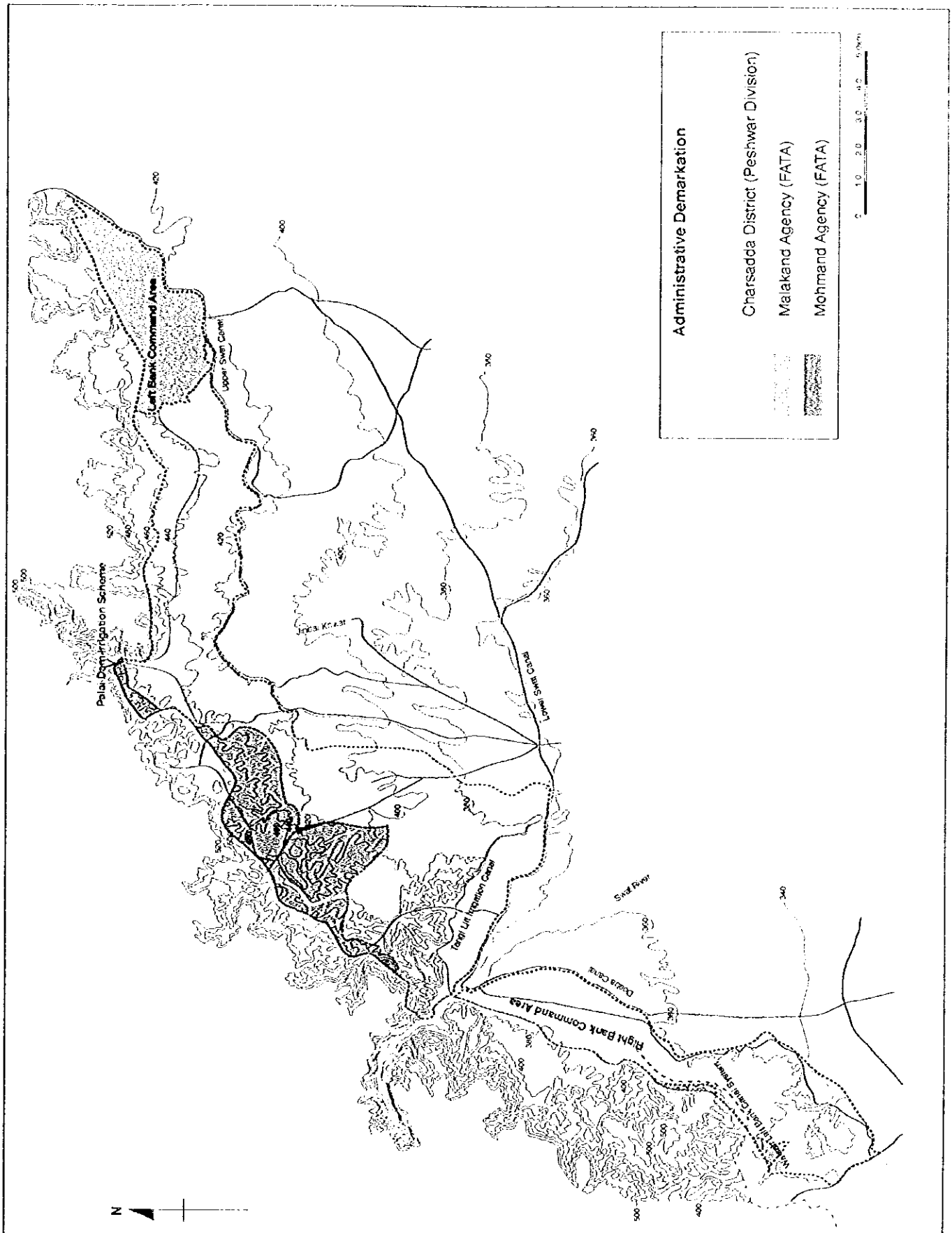
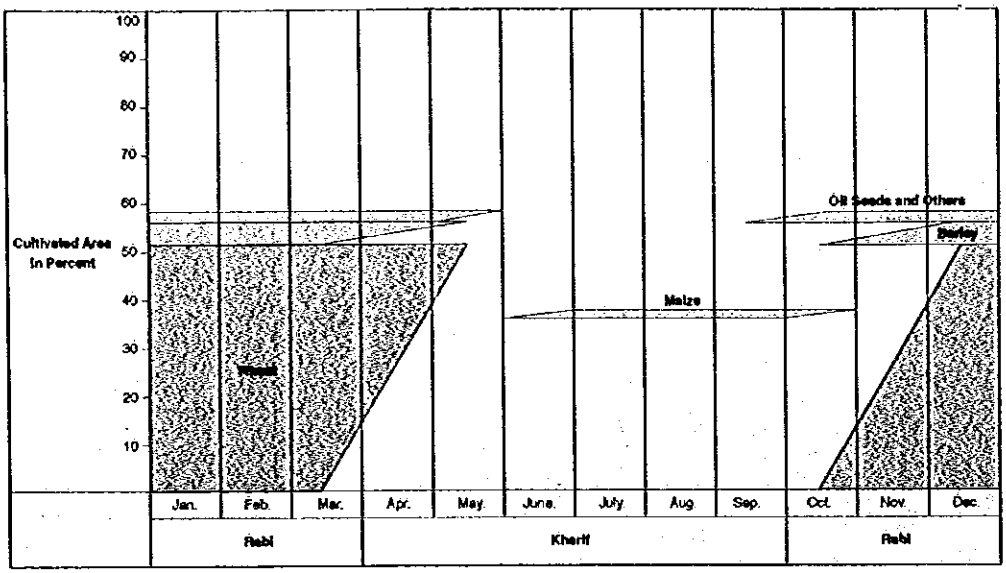
図 5.2.2
灌漑計画調査対象地域



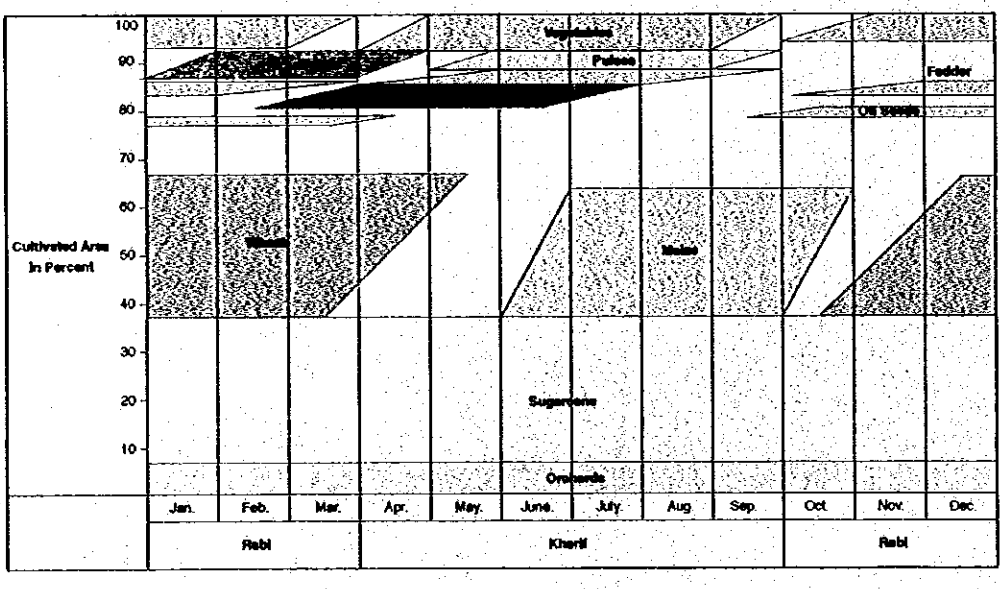
FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 5.2.3 灌漑計画調査対象地域の行政区分



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 5.2.3 灌漑計画調査対象地域の行政区分

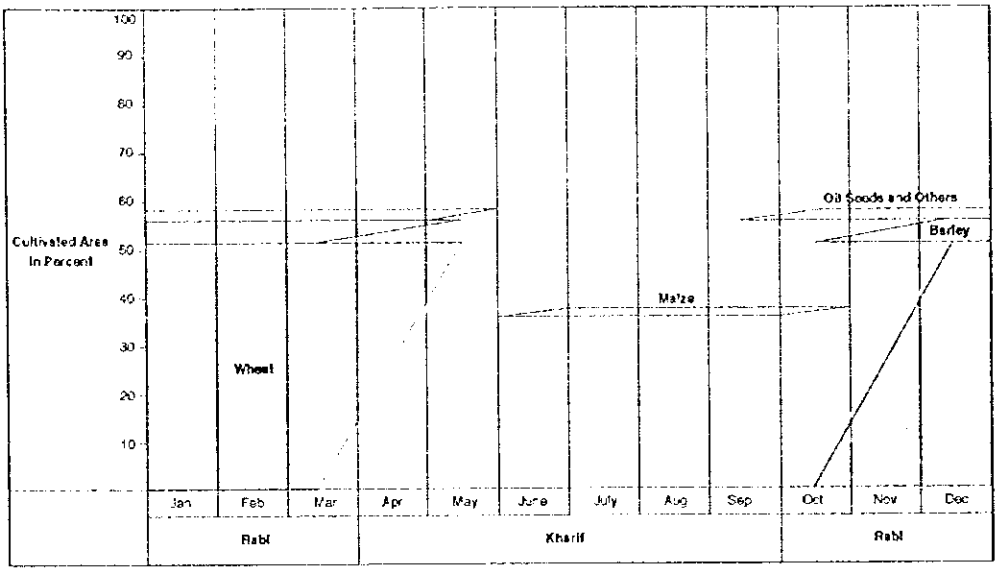


Present Cropping Pattern

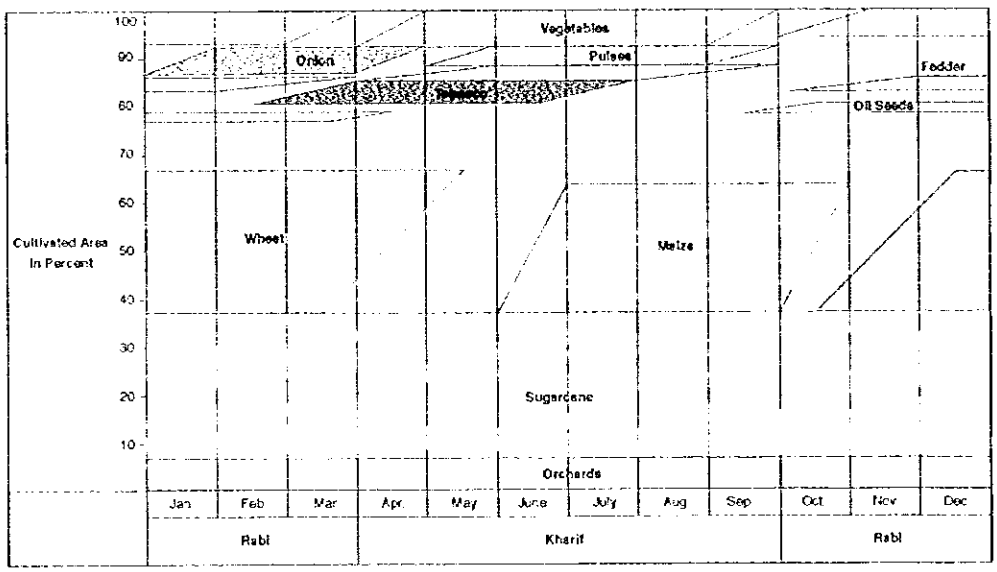


Proposed Cropping Pattern

FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 5.2.4 現況および計画作付け体系

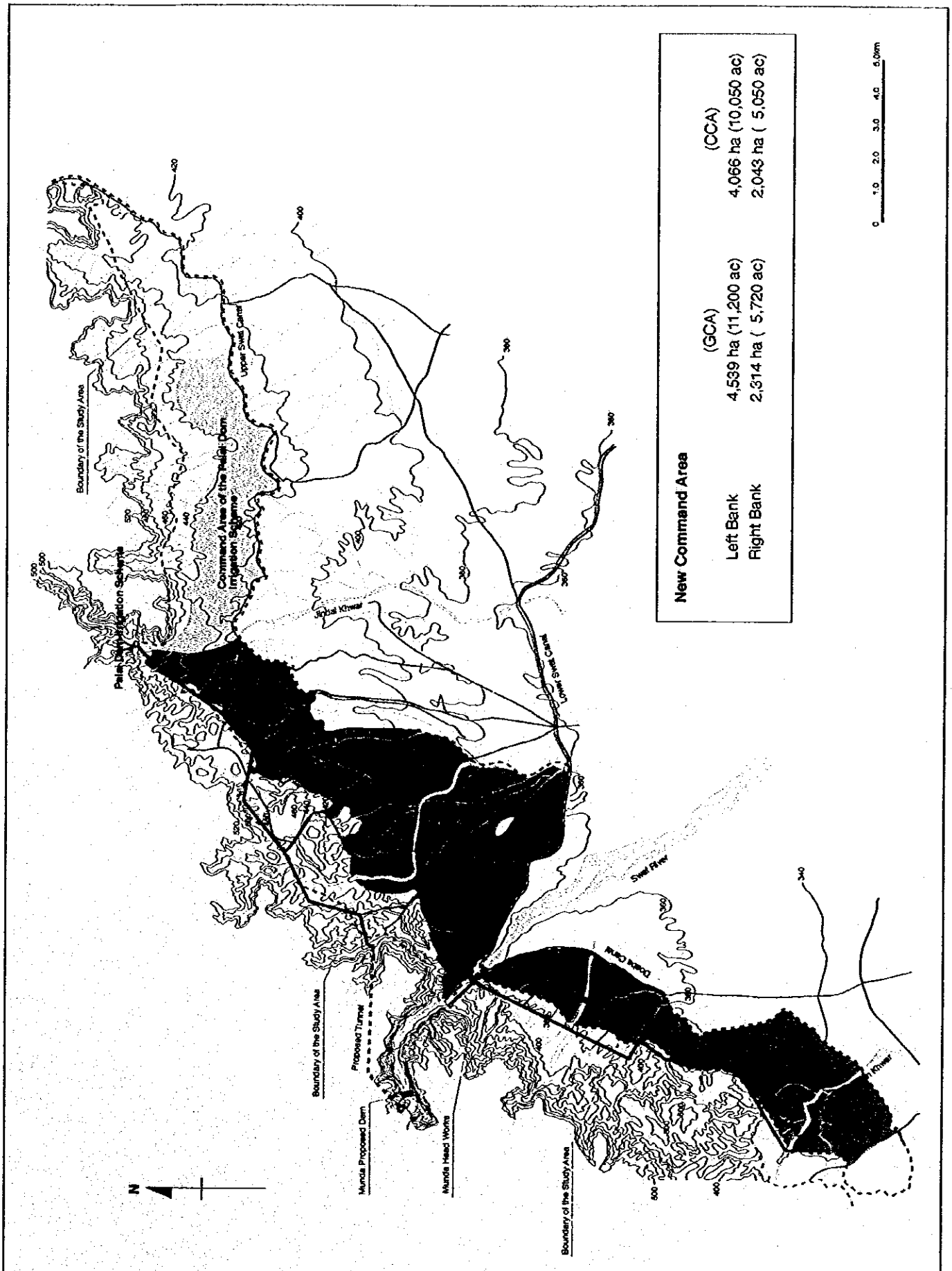


Present Cropping Pattern



Proposed Cropping Pattern

FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 5.2.4 現況および計画作付け体系



FEASIBILITY STUDY
ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT
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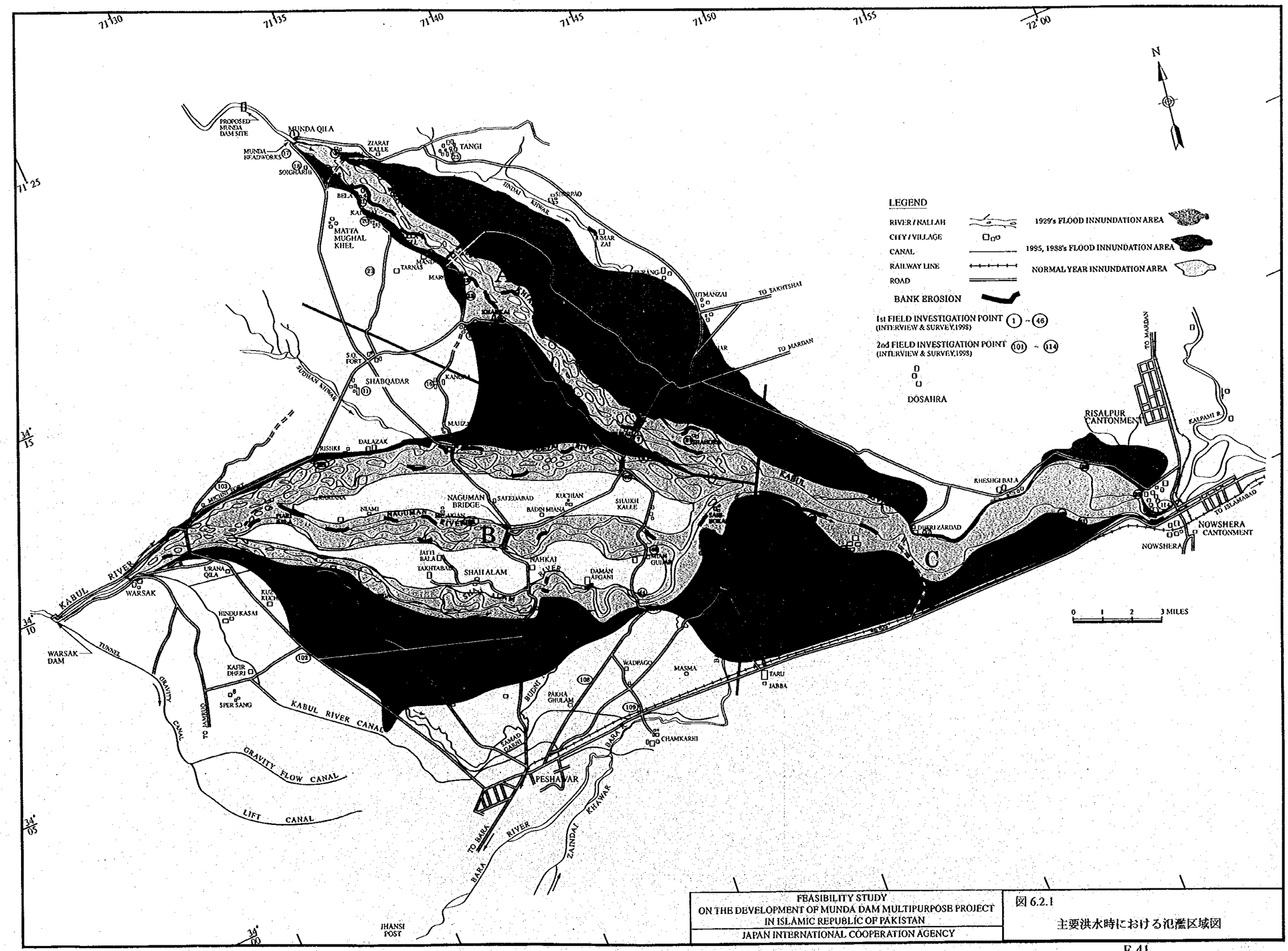
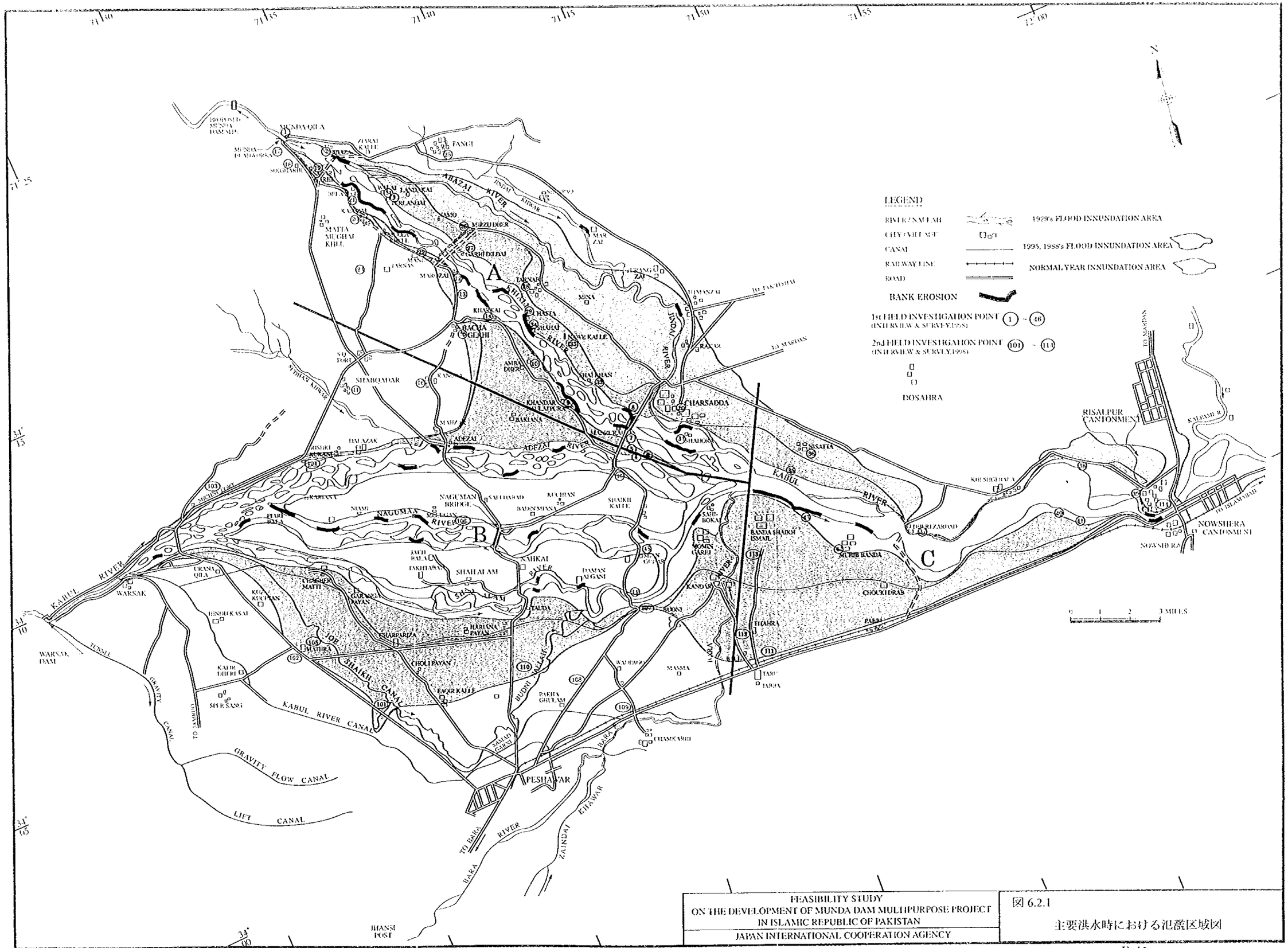
図 5.2.5
本件の灌漑計画対象地区

FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 5.2.5 本件の灌漑計画対象地区



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN JAPAN INTERNATIONAL COOPERATION AGENCY	図 6.2.1 主要洪水時における氾濫区域図



FEASIBILITY STUDY ON THE DEVELOPMENT OF MUNDA DAM MULTIPURPOSE PROJECT IN ISLAMIC REPUBLIC OF PAKISTAN	図 6.2.1 主要洪水時における氾濫区域図
JAPAN INTERNATIONAL COOPERATION AGENCY	