
9. CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

Significant development plan of delay action dams targeted to promote implementation and improve groundwater use condition, was formulated through this Study, owing to good cooperation of the Irrigation Department, Government of Balochistan.

Through the field survey, present situation of the Study Area was recognized to be having vivid social life and active agricultural activities under the severe natural condition, which is definitely based upon groundwater use. Groundwater is restricted in use by physical potentiality of the area. As present groundwater extraction is far exceeding the limit, the groundwater use should be made stable and sound by means of applying artificial measures and adopting adequate regularity, for sustainable living and productive activities. Delay action dam is expected to be the most effective way of groundwater improvement.

Delay action dam was expected to be an effective facility as is evident from recharge effects of existing delay action dams in the Study Area. At the same time, some constraints to be improved in the fields of planning, designing, constructing, and maintenance were found. In order to solve these problems, a technical guideline for delay action dam was prepared.

Development plans were formulated for thirteen (13) proposed areas which consisted of fourteen (14) number of delay action dam schemes. The plans were evaluated from technical, economical, social and environmental view point. Ten (10) proposed delay action dams selected through pre-feasibility study among the 14 dams by reason of economic soundness were chosen for feasibility study and evaluated. The remaining four (4) dams were appraised by the development plans in the pre-feasibility study. The most feasible scheme of them shows proper economic indicator of EIRR at around 20 %, and some schemes follow it with around 10 % EIRR which is also judged to be feasible economic level. Some of them indicate low EIRR values, but have significant social impacts. Consequently, the entire delay action dam schemes are identified to be sound and feasible from view point of environmental, and farm economy.

An implementation plan has been formulated in accordance with the result of feasibility evaluation. On formulating the implementation plan, a policy was adopted that execution decision of each dam scheme should be considered by reason of not only proper economy but also sound social impacts, environmental and local people's opinion. In the Study, stagewise implementation was proposed grouping fourteen (14) proposed delay action dams schemes into three categories as follows:

Group I of proposed DADs; These are to be constructed unconditionally and urgently due to sound feasibility. Apportionment of the dams in area is considered so as to allocate evenly each concerned district.

Group II of proposed DADs; These are to be constructed on the scope of middle term development, which have proper feasibility as following the group I.

Group III of proposed DADs; These are effective on groundwater basin conservation while having inferior economy. These are to be considered for implementation as long term development.

Stagewise implementation plan consisting of 3 stages corresponding with above 3 groups of dams has been established. The implementation of Stage I is recommended to be implemented urgently and unconditionally. The remaining two stages are suggested to be decided by the Government of Balochistan depending upon the groundwater use and social requirements.

Further, institutional issues on groundwater use have been investigated in the Study in order to seek appropriate institutional system for sound and sustainable groundwater use. As a result of the investigation, a new organization on groundwater use management has been proposed in agreement with previous feasibility studies.

9.2 Recommendations

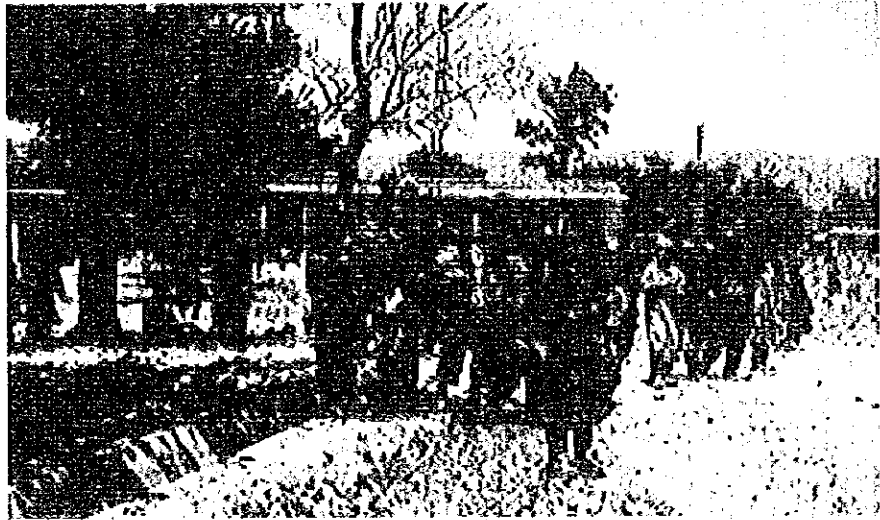
In pursuance of the results of the Study, the following recommendations are made.

- 1) The Stage I program of the proposed implementation plan is recommended to be implemented urgently and unconditionally due to superior feasibility considering availability of foreign country's assistance. The remaining two stages are suggested for consideration of the Government of Balochistan either to construct continuously or later on as the situation demands. These may be compared with other dams not included in this Study.

- 2) The Study Area especially Pishin-Lora basin is under severe situation in groundwater use. It is recommended that the Irrigation Department of Balochistan may launch a program of construction of delay action dams at proper sites in this valley instead of individual dams.
- 3) It is recommended that the Irrigation Department should hold construction equipment with proper number and adequate types which will be required for construction improved and effective operation. Considering present inventory of machinery to be insufficient, prompt procurement of equipment is strongly recommended taking into account the availability of foreign country's assistance.
- 4) For the future implementation of delay action dams, it is recommended that the Irrigation Department may strictly follow the technical guideline prepared in the Study.
- 5) It is suggested that some existing dams including those investigated in the Study having serious problems may be repaired consulting the technical guidelines.
- 6) Watershed conservation work should be done as an important component of the project implementation, which is necessary for keeping recharge function and improving natural environment of concerned area.
- 7) Constraints on irrigation and agriculture pointed out in the Study should be resolved by the concerned agencies. The existing irrigation systems need to be made more efficient by supportive action such as On-Farm Water Management Project conducted by the Department of Agriculture.
- 8) Establishment of new organization for groundwater management and regulation having necessary power and effective function is recommended with full cooperation of all the agencies concerned.

- 9) Additional and accurate monitoring data for the analysis of recharging effect of delay action dams are required. It is recommended to continuously monitor groundwater level at points adjacent to the dam, reservoir level, overflow discharge from dam, and so on.
- 10) Practical simulation method should be introduced for proper and sustainable groundwater management. Establishment of mathematical model for simulation of groundwater basins by the Water Bureau of Irrigation Department is recommended.
- 11) The four delay action dams included in the Study for which feasibility study has not been conducted should be studied in accordance with the guidelines given in this Report before construction.

Attachment



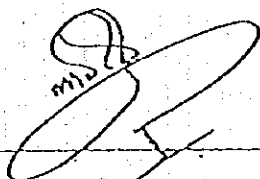
1. **Scope of Work for the Feasibility Study**
2. **Minutes of Meetings on Inception Report**
3. **Minutes of Meetings on Progress Report (I)**
4. **Minutes of Meetings on Interim Report**
5. **Minutes of Meetings on Progress Report (II)**
6. **Minutes of Meetings on Draft Final Report**

Attachment-1 Scope of Work for the Feasibility Study

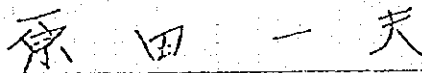
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN
THE ISLAMIC REPUBLIC OF PAKISTAN

AGREED UPON BETWEEN
THE GOVERNMENT OF BALOCHISTAN
IN
THE ISLAMIC REPUBLIC OF PAKISTAN
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Quetta, 20, December, 1995



M. Azam Baloch
Secretary,
Irrigation and Power Department
Government of Balochistan



Kazuo HARADA
Leader,
Preparatory Study Team
Japan International Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Islamic Republic of Pakistan (hereinafter referred to as "GOP"), the Government of Japan has decided to conduct the Feasibility Study on the Irrigation Water Resources Development With Delay Action Dams Project in Balochistan in the Islamic Republic of Pakistan (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of GOP and the Government of Balochistan (hereinafter referred to as "GOB")

The present document sets forth the Scope of Work with regard to the Study mentioned above.

II. OBJECTIVES OF THE STUDY

The objectives of the study are :

1. To develop ground water resource for irrigation by delay action dams, thus contribute to improvement of the quality of life of farmers.
2. To make a feasibility study report on the irrigation water resources development with delay action dams project in Balochistan (hereinafter referred to as "the Project"), and
3. To carry out technology transfer to Balochistani counterpart personnel through on-the-job training in the course of the Study.

III. Study Area


The Study covers construction sites of the proposed delay action dams and their benefited area in Balochistan.

Those proposed delay action dams are shown in the Minutes of Meeting.

IV. Scope of the Study

Phase I

1. Collection of Data, Information and Field survey
 - (1) Natural condition
 - a. Meteorology


20/11

- b. Hydrology
- c. Geology
- d. Soil
- e. Topography
- f. Others

(2) Agriculture

- a. Land use and tenure
- b. Cropping pattern and yield
- c. Agro-economy and institution
- d. Agricultural supporting system
- e. Others

(3) Agricultural infrastructure

- a. Irrigation and drainage facilities
- b. Wells
- c. Others

(4) Socio-economic condition

- a. Population
- b. Household and farmers
- c. Regional socio-economy and household economy
- d. Social and farmers organizations
- e. Historical right/customs regarding irrigational water usage
- f. Others

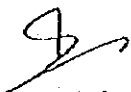
(5) Other information related to the Project

- a. Administrative organizations related to the Project
- b. Others

2. Review of other relevant projects and related projects
3. Evaluation of completed delay action dams
4. Initial Environmental Examination
5. Evaluation of the proposed delay action dams and selection of the priority delay action dams for the feasibility study in Phase II

Phase II

1. Collection of supplementary data and information on the priority delay action dams through additional field survey


25/11


2. Environmental Impact Assessment on the priority delay action dams.
3. Formulation of the development plan on the priority delay action dams including following components.
 - (1) Agriculture
 - (2) Irrigation and drainage
 - (3) Agricultural infrastructure
 - (4) Delay action dams
 - (5) Environmental preservation
 - (6) Preliminary design of major structures
 - (7) Operation and maintenance
 - (8) Implementation schedule
 - (9) Estimation of the Project cost and benefit
 - (10) Evaluation of the Project

V. STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative work schedule as ANNEX I.

VI. REPORTS

- JICA shall prepare and submit the following reports in English to GOB.
1. Inception Report
Thirty(30)copies in English at the commencement of the Phase I study.
 2. Progress Report(1)
Thirty(30)copies in English at the end of the field work of Phase I study.
 3. Interim Report
Thirty(30)copies in English at the commencement of the Phase II study.
 4. Progress Report(2)
Thirty(30)copies in English at the end of the field work of the Phase II study.
 5. Draft Final Report
Thirty(30)copies in English at the end of the Second home office work. The Pakistani side provides JICA with its comments on the Draft Final Report within one(1) month after receipt of the Draft Final Report.
 6. Final Report
Fifty(50) copies in English within one(1) month after receiving Pakistan's


20/11

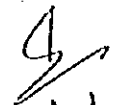
VII. UNDERTAKING OF GOP

To facilitate the smooth conduct of the Study, GOP shall take necessary measures:

1. To secure the safety of the Japanese study team.
2. To permit the members of the Japanese study team to enter, leave and sojourn in the Islamic Republic of Pakistan for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees.
3. To exempt the members of the Japanese study team from taxes, duties and other charges on equipment, machinery and other materials brought into and out of the Islamic Republic of Pakistan for the conduct of the Study.
4. To exempt the members of the Japanese study team from income taxes and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study.
5. To provide the necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into the Islamic Republic of Pakistan from Japan in connection with the implementation of the Study.
6. To secure permission for entry into private properties and other areas for the conduct of the study when necessity arises.
7. To secure permission for the Japanese study team to take copies of all data and documents including photographs and maps, (excluding restricted material) related to the Study out of the Islamic Republic of Pakistan to Japan.
8. To provide medical services as needed and its expenses will be chargeable on the members of the Japanese study team.

VIII. UNDERTAKING OF GOB

1. GOB shall bear claims, if any arises against the members of the Japanese study team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.


25/11

2. GOB has all responsibilities for the implementation of the Study and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
Irrigation and Power Department, GOB shall act as counterpart agency to the Japanese study team
3. GOB shall, at its own expense, provide the Japanese study team with the followings, in cooperation with other relevant organizations:
 - (1) Available data and information related to the Study,
 - (2) Counterpart personnel,
 - (3) Credentials or identification cards, and
 - (4) Suitable office space with necessary equipment in Quetta and project sites.

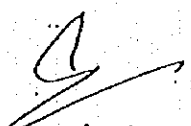
IX. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

1. To dispatch, at its own expense, the Japanese study team to Balochistan in the Islamic Republic of Pakistan.
2. To perform technology transfer to the Balochistani counterpart personnel in the course of the Study.

X. CONSULTATION

JICA and GOB shall consult with each other in respect of any matter that may arise from or in connection with the Study.


20/11

TENTATIVE WORK SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Work in Balochistan (Field Work)																	
Home office work in Japan																	
Phase																	
Report	△ Ic/R						△ P/R(1)	△ Ic/R						△ P/R(2)	△ D/R	△ F/R	

(Remarks)

- Ic/R : Inception Report
- P/R(1) : Progress Report(1)
- Ic/R : Interim Report
- P/R(2) : Progress Report(2)
- D/R : Draft Final Report
- F/R : Final Report
- ◎ : Comments on D/R by the Balochistan side

S
25/11

MINUTES OF MEETING
ON
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN
THE ISLAMIC REPUBLIC OF PAKISTAN

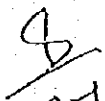
The Preparatory Study Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Kazuo HARADA, visited the Islamic Republic of Pakistan from December 9th to 22nd, 1995 for the purpose of discussing and confirming the Scope of Work for the Study on the Irrigation Water Resources Development with Delay Action Dams Project in Balochistan in the Islamic Republic of Pakistan (hereinafter referred to as "the Study").

The Team had a series of discussions with the officers concerned of Irrigation and Power Department, the Government of Balochistan (hereinafter referred to as "IPD") and other organizations concerned. The list of participants in the meeting is attached in the Annex I.

As a result of the discussions, IPD and the Team agreed on the Scope of Work for the Study.

The following are the main issues discussed and agreed upon by both sides in relation to the Scope of Work for the Study.

1. Both sides agreed that the Study would cover proposed delay action dams located


20/2/96



in Quetta, Pishin, Qila Abdullah, Mastung and Kalat districts:

(1) The Study covers, for the following reasons, the proposed delay action dams which are located in the five districts:

A. An appropriate planning for the priority delay action dams requires time consuming scrutiny of the completed delay action dams in terms of technical and other related aspect. However, as time allowed for the Study is limited, it is advisable, for an efficient implementation of the Study, that the proposed delay action dams should concentrate in a certain area.

B. It is desirable, in order to efficiently collect necessary information such as hydrological and geological data, that the proposed delay action dams should concentrate in a certain area.

C. The concentration of the proposed delay action dams in a certain area will facilitate an effective technical transfer, which is one of the most significant objectives of the Study

(2) Quetta, Pishin, Qila Abdullah, Mastung and Kalat districts have been experiencing a considerable decline in groundwater level.

(3) The priority delay action dams will significantly contribute to expanding arable land in Quetta, Pishin, Qila Abdullah, Mastung and Kalat districts, which are principal horticultural areas in the province.

2. Both sides agreed that the study would cover the following proposed delay action dams;

No.	Name of delay action dam	District	Round number of beneficiaries	Round effective area (acre)
(1)	Brewary	Quetta	5,000	2,000
(2)	Ghutai Shela	Quetta	2,000	500
(3)	Wali Dad	Quetta	1,000	500
(4)	Dara	Quetta	2,000	800
(5)	Mughli Kotal	Quetta	1,000	400
(6)	Kach	Quetta	400	500
(7)	Jigda	Pishin	1,000	250
(8)	Sanzali	Pishin	500	300
(9)	Arambi	Qila Abdullah	3,000	1,000
(10)	Sakhol	Mastung	1,500	2,000
(11)	Mangi	Mastung	300	200

9/20/11

21.

(12) Kad Kocha	Mastung	400	300
(13) Iskalkoo	Kalat	300	200

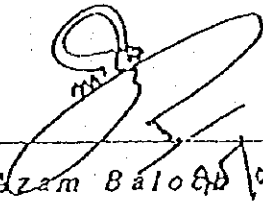
3. All the proposed delay action dams mentioned above will be studied and the priority delay action dams will be subsequently selected in the Phase I. The priority delay action dams will be further studied in the Phase II.
4. Both sides agreed that the requested delay action dams which had not been included in the Study would be studied, by applying the result of the Study, by the GOB.
5. Both sides agreed that the Study would conduct a thorough survey on the existing participatory operation/maintenance system of irrigation facilities, and recommend an improvement plan.
6. Both sides agreed that the Study would take account of the following principal aspects in the delay action dam project.
 - (1) Planning and design for cost-effective delay action dam
 - (2) Siltation and other related problems
 - (3) Adverse impact on actual flood irrigation and its benefit areas
7. GOB promised to provide the Study Team with a topographical map on the scale of 1:50,000, which is essential to the Study.
8. GOB promised to maintain, at its own expense, access roads to the proposed delay action dams.
9. GOB promised to provide the Study Team with relevant information concerned with the planning and design of both existing and proposed delay action dams.
10. The Study Team shall exclude a part of the study area from the study, wherever security problems arise.
11. Security guards will be provided in field survey by GOB at its own expense.
12. IPD requested equipments and vehicle(s) for the Study be arranged by JICA. The Team promised to convey its request to the Government of Japan.

J
20/11

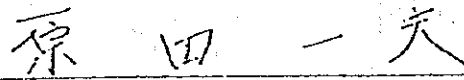
JK

13. Office space at least one room with telephone and necessary furniture for the Study Team will be provided by IPD at its own expense.
14. IPD requested the counterpart training in Japan. The Team promised to convey its request to the Government of Japan.
15. IPD requested that the Study period should be reduced to 12 months and the Team promised to convey its request to the Government of Japan.

Quetta, 20, December, 1995



M. Azam Baloch
Secretary,
Irrigation and Power Department,
Government of Balochistan



KAZUO HARADA
Leader,
Preparatory Study Team
Japan International Cooperation Agency

ANNEX I

LIST OF PARTICIPANTS

Irrigation and Power Department

<i>Mr. Abdul Humid Khan Achakzai</i>	Minister
<i>Mr. M. Azam Baloch</i>	Secretary
<i>Mr. Abdus Salam Khan</i>	Chief Engineer
<i>Mr. Sher Zaman Khan</i>	Executive Engineer (Quetta)
<i>Mr. Imran Durrani</i>	Executive Engineer (Pishin)
<i>Mr. Ahmed Khan Dehpal</i>	Executive Engineer (Mastung)
<i>Mr. Ittikhar Mir</i>	Executive Engineer (PD&P)

Planning and Development Department

<i>Mr. Ata M. Isfaw</i>	Additional chief secretary (Development) P&D
<i>Mr. Anwarul Haq Badar</i>	Chief of section of water P&D

The Team

<i>Mr. Kazuo HARADA</i>	Leader
<i>Mr. Ken FUJIWARA</i>	Member
<i>Mr. Kouichiro EGUCHI</i>	Member
<i>Mr. Nobuyuki BIZEN</i>	Member
<i>Mr. Masaki OGA</i>	Member/Coordinator
<i>Ms. Minako SATO</i>	Member

AS
25/11

AK

Attachment-2 Minutes of Meetings on Inception Report

MINUTES OF MEETINGS
ON
INCEPTION REPORT

FOR

THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN THE ISLAMIC REPUBLIC OF PAKISTAN

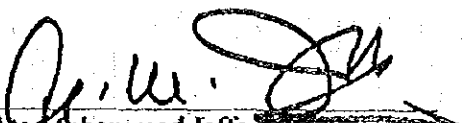
AGREED UPON BETWEEN

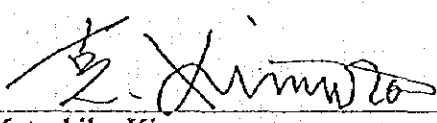
THE GOVERNMENT OF BALOCHISTAN
THE ISLAMIC REPUBLIC OF PAKISTAN

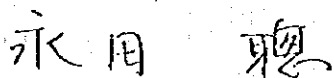
AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Quetta, April 14, 1996


Ais Muhammad Jaffar
Additional Chief Secretary
Planning and Development Department
Government of Balochistan


Katsuhiko Kimura
Team Leader
JICA Feasibility Study Team


Satoshi Nagata
Advisory Committee for the Study
Japan International Cooperation Agency

MINUTES OF MEETINGS ON THE INCEPTION REPORT

Date and Place : April 11, 1996 (9:00 - 10:00), at Irrigation and Power Department,
: April 11, 1996 (15:00 - 16:30), at Planning and Development Department,
Government of Balochistan
Attendants: See attached list

In accordance with the Scope of Work for the Feasibility Study on the Irrigation Water Resources Development with Delay Action Dams Project (hereinafter referred to as "the Study"), signed on December 20th, 1995 between the Japan International Cooperation Agency (hereinafter referred to as "the JICA") and the Irrigation and Power Department (hereinafter referred to as "the IPD") of the Government of Balochistan, the JICA Feasibility Study Team prepared and submitted the Inception Report to the IPD on April 11th, 1996 prior to the commencement of the Study.

The meetings were held between the Study Team and the Government of Balochistan (hereinafter referred to as "the GOB") on April 11th, 1996 for the discussion on the Inception Report (see Annex-1). Both parties have mutually confirmed the followings:

1. The Study Team submitted 35 copies of the Inception Report to the GOB. After explanation and discussion, the Inception Report of the Study was accepted by the GOB. Therefore, the contents of the Inception Report were generally agreed by both parties.
2. The GOB agreed that the Study should be confined in the five (5) districts of Quetta, Pishin, Qila Abdullah, Mastung and Kalat according to the Scope of Work, in case desires other areas also to be studied, a separate request will be necessary for the technical assistance.
3. In response to the request by the Environmental Protection Agency (EPA) to conduct the Environmental Impacts Assessment (EIA) on the Study, the Study Team explained that the EIA would be conducted in Phase II if required, on the basis of the result of the Initial Environmental Examination (IEE) conducted in Phase I.
4. The Study Team requested the GOB to provide the available data related to the Study. The request was agreed to by the GOB.
5. The IPD nominated counterparts listed in the Annex-2 from the related agencies, and will nominate the rest of the counterparts requested by the Study Team in a few days.
6. The Minutes of Meetings is signed by the Additional Chief Secretary of the Planning and Development Department who chaired the major meeting on April 11th held at the Planning and Development Department instead of the IPD. However, the responsibility of the IPD is maintained in accordance with the Scope of Work.

Annex-1 List of Attendants

Name	Position and Department
(Pakistan side)	
Ata Mohammad Jaffar	Additional Chief Secretary Planning and Development Department
Muhammad Azam Baloch	Secretary Irrigation & Power Department
Sardar Sharif	Secretary Agriculture & Cooperative Department
Abdus Salam Khan	Chief Engineer, Irrigation Irrigation Department
Muhammad Hanif Khan	Chief Engineer Communication & Works Department
Sardar Munir Ahmad	Chief Engineer Public Health Engineering Department
Zulfiqar Ali Khan	Director General, Agriculture Agriculture Department
S. H. A. Durrani	Director General, Environment Planning & Development Department
Fida Muhammad	Project Director, Hydrogeology Water and Power Development Authority
Muhammad Rafiq	Director General Environmental Protection Agency
Arshed Zahoor	Director Research Livestock & Dairy Development Department
Wassey Durrani	Director Population Welfare Programme
M. Amin Lashari	Director Education Department
Mohammad Anwar	Director Local Government Department
Sher Zaman Khan	Executive Engineer Irrigation Division Quetta
Noor Ahmad Naz	Deputy Director Education Department
Anwar-ul-Haq Badar	Chief Water Planning & Development Department
(Japanese side)	
JICA	
Satoshi Nagata	Member of Advisory Committee for the Study
Shiro Nabeya	Agriculture, Forestry and Fisheries Development Study Department
<u>JICA Feasibility Study Team</u>	
Katsuhiko Kimura	Team Leader/Water Management
Makoto Suga	Groundwater
Shuichi Matsushima	Irrigation & Drainage/O&M
Kunihiko Ohno	Sociology/Farmers' Organization
Takahiro Kato	Dam Design
Akira Koto	Agriculture/Supporting System
Keiichiro Kobayashi	Coordination

Annex-2 Names and Background of Counterparts

Background	Name of Counterpart/Department
Chief Counterpart/ Water Management	Irrigation and Power Department Mr. Noor Ahmed Baloch
Groundwater	Irrigation and Power Department Mr. Abdul Qadir
Irrigation Drainage/Civil Engineering/Dam Engineering	Irrigation and Power Department Mr. Imran Durrani (Pishin and Qila Abdullah Districts) Mr. Sher Zaman Khan (Quetta District) Mr. Ahmed Khan Dehpal (Mastung and Kalat Districts)
Sociology	Planning and Development Department
Agriculture	Agriculture and Cooperative Department
Agro-economy	Planning and Development Department/ Agriculture and Cooperative Department
Environment	Planning and Development Department/ Environment Protection Agency

Remarks: The IPD appropriately nominates counterpart personnel from the district offices of the related agencies for the Study as the Study Team requested.

Attachment-3 Minutes of Meetings on Progress Report (I)

**MINUTES OF MEETINGS
ON
PROGRESS REPORT (I)**

FOR

**THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN THE ISLAMIC REPUBLIC OF PAKISTAN**

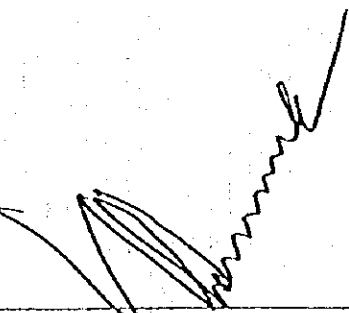
AGREED UPON BETWEEN

**THE GOVERNMENT OF BALOCHISTAN
THE ISLAMIC REPUBLIC OF PAKISTAN**

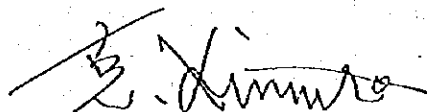
AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Quetta, June 24, 1996



**Abdul Salam Khan
Chief Engineer
Irrigation Department
Government of Balochistan**



**Katsuhiko Kimura
Team Leader
JICA Feasibility Study Team**

MINUTES OF MEETINGS ON THE PROGRESS REPORT (1)
for
the Feasibility Study on the Irrigation Water Resources Development
with Delay Action Dams Project in Balochistan

1. Date and Place : June 16, 1996, at Conference room of Irrigation Department
: June 24, 1996, at Office of Chief Engineer, Irrigation Department,
Government of Balochistan

2. Attendants : See attached list

3. Summary of Discussions:

The JICA Study Team submitted the Progress Report (1) to the Irrigation Department, Government of Balochistan on June 24, 1996. Prior to the submission of the Progress Report (1), the First meeting was held on June 16, 1996 between the JICA Study Team and Irrigation Department at the Conference room of the Irrigation Department together with the representatives from concerned counterpart agencies, and the Second meeting was held on June 24, 1996 between the JICA Study Team and the Irrigation Department at the Office of Chief Engineer of the Irrigation Department. Various discussions were made during those meetings and following were confirmed:

- (1) Thirty five (35) copies of the Progress Report (1) were submitted and accepted by the Irrigation Department and other counterpart agencies.
- (2) It was mutually agreed that the manuals of the dam planning and design shall be prepared through sufficient discussions between both parties in conformity to the purpose of application. Especially, fundamental issues, e.g. estimates of the design flood discharge and storage capacity allocation comprising of the capacities of the sediment and run-off for recharge, shall be deliberated to agree with an actual conditions of the project areas.
- (3) The JICA Study Team expressed to continuously research effective methods for maintaining recharge function by the delay action dams in further study.
- (4) The JICA Study Team explained the Irrigation Department that about eight (8) delay action dam sites amongst thirteen (13) proposed sites will be prioritized for the further feasibility study in Phase 2 during the continual study in Japan.



Annex List of Attendants

Name	Position	Department
(Pakistan side)		
Abdul Salam Khan	Chief Engineer	Irrigation Department
Mian Basir Ahmed	Chief Planning	Water Resources Bureau Irrigation Department
Mohammed Basir Khawaja	Superintending Engineer Irrigation	Irrigation Department, Kalat
Sheerin Khan Luni	Superintending Engineer Irrigation	Irrigation Department, Loralai
Fazal Din Khan	Superintending Engineer Irrigation	Irrigation Department, Sibi
Munawar Khan Mandokhail	Superintending Engineer Irrigation	Irrigation Department, Quetta
Saifullah Khan	Superintending Engineer Planning, Development & Design	Irrigation Department
Noor Ahmed Baloch	Deputy Director Design (Chief Counterpart)	Irrigation Department
Ahasan Iddait	Executive Engineer Technical	Irrigation Department
Imran Durrani Khan	Executive Engineer Irrigation	Irrigation Department, Pishin
Sher Zaman Khan	Executive Engineer Irrigation	Irrigation Department, Quetta
Ahmed Khan Dehpal	Executive Engineer Irrigation	Irrigation Department, Mastung
Abdul Qadir	Hydro-geologist	Irrigation Department
Khuad Khan Kbajak	System Analyst	Irrigation Department
Shoaib Ahmed	Sub Divisional Officer Irrigation	Irrigation Department, Chaman
Muhammad Tariq	Extra Assistant Director	Agricultural Department
Abdul Nasir	Assistant Agronomist	Agricultural Department
(JICA Feasibility Study Team)		
Katsuhiko Kimura	Team Leader/Water Management	
Makoto Suga	Groundwater	
Shuichi Matsushima	Irrigation & Drainage/O&M	
Kunihiko Ohno	Sociology/Farmers' Organization	
Takahiro Kato	Dam Design	
Akira Koto	Agriculture/Supporting System	
Jiro Yabe	Structure Design/Cost Estimate	
Mitsuo Nishiya	Agro-economy/Project Evaluation	

Attachment-4 Minutes of Meetings on Interim Report

MINUTES OF MEETING
ON
INTERIM REPORT
FOR
THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN THE ISLAMIC REPUBLIC OF PAKISTAN

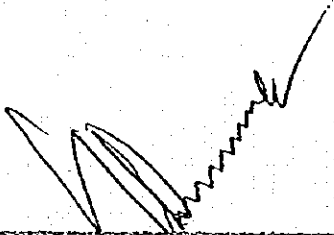
AGREED UPON BETWEEN

THE GOVERNMENT OF BALOCHISTAN
THE ISLAMIC REPUBLIC OF PAKISTAN

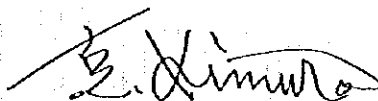
AND

JAPAN INTERNATIONAL COOPERATION AGENCY

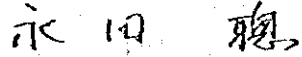
Quetta, October 13, 1996



Abdus Salam Khan
Chief Engineer
Irrigation Department
Government of Balochistan



Katsuhiko Kimura
Team Leader
JICA Feasibility Study Team



Satoshi Nagata
The Member of the
Advisory Committee, JICA

MINUTES OF MEETING ON THE INTERIM REPORT
for
the Feasibility Study on the Irrigation Water Resources Development
with Delay Action Dams Project in Balochistan

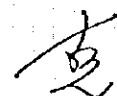
1. **Date and Place** : October 13 1996, at the office of Chief Engineer of Irrigation Development, Government of Balochistan

2. **Attendants** : See attached list

3. **Summary of Discussions:**

The JICA Study Team submitted the Interim Report to the Irrigation Department, Government of Balochistan on October 9, 1996. The meeting regarding the Interim Report was held on October 13, 1996 between the JICA Study Team and the Irrigation Department at the Office of the Chief Engineer, Irrigation Department. A series of discussions were made during the meeting and the following were confirmed.

- (1) Twenty three (23) copies of the Interim Report were submitted, and accepted by the Irrigation Department and other counterpart agencies concerned.
- (2) Both parties mutually agreed to continue technical discussions in order to finalize the preparatory guideline of Delay Action Dams proposed in the Interim Report during this field survey.
- (3) Both parties agreed that substantial comments on the Interim Report proposed by the Pakistan party should be reflected to the Draft Final Report which would be prepared at the termination of Phase II study.



Annex List of Attendants

Name	Position	Department
(Pakistan Side)		
Abdus Salam Khan	Chief Engineer	Irrigation Department
Ghulam Usman Babai	Superintending Engineer Planning, Progress and Design	Irrigation Department, Quetta
Noor Ahmed Baloch	Deputy Director Design (Chief Counterpart)	Irrigation Department
Sher Zaman Khan	Executive Engineer, Irrigation	Irrigation Department, Quetta
(Japan Side)		
JICA		
Makoto Kitanaka	Agriculture, Forestry and Fisheries Development Study Department Japan International Cooperation Agency	
Satoshi Nagata	Member of Advisory Committee for the study Ministry of Agriculture, Forestry and Fisheries	
JICA Feasibility Study Team		
Katsuhiko Kimura	Team Leader/Water Management	
Makoto Suga	Groundwater	
Shuichi Matsushima	Irrigation & Drainage/O&M	
Kunihiko Ohno	Sociology/ Farmers' Organization	
Takahiro Kato	Dam Design	
Akira Koto	Agriculture/Supporting System	
Keiichiro Kobayashi	Coordination	

Attachment-5 Minutes of Meetings on Progress Report (II)

MINUTES OF MEETING
ON
PROGRESS REPORT (II)
FOR
THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN THE ISLAMIC REPUBLIC OF PAKISTAN

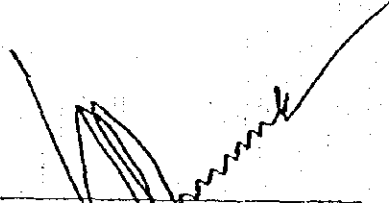
AGREED UPON BETWEEN

THE GOVERNMENT OF BALOCHISTAN
THE ISLAMIC REPUBLIC OF PAKISTAN

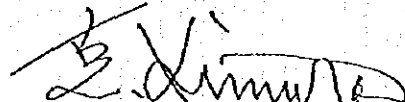
AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Quetta, December 29, 1996



Abdus Salam Khan
Chief Engineer
Irrigation Department
Government of Balochistan



Katsuhiko Kimura
Team Leader
JICA Feasibility Study Team

MINUTES OF MEETING ON THE PROGRESS REPORT (II)
for
the Feasibility Study on the Irrigation Water Resources Development
with Delay Action Dams Project in Balochistan

1. Date and Place : December 29 1996, at the office of Chief Engineer of Irrigation Development, Government of Balochistan

2. Summary of Discussions:

The JICA Study Team submitted the Progress Report (II) to the Irrigation Department, Government of Balochistan (GOB) on December 28, 1996. The meeting regarding the Progress Report (II) was held on December 29, 1996 between the Chief Engineer of the Irrigation Department of GOB, and the JICA Study Team. A discussion was made and the following were confirmed.

- 1) The JICA Study Team submitted thirty five (35) copies of Progress Report (II) to the Government of Balochistan. The Report was received by the GOB.
- 2) The JICA Study Team suggested that the GOB could inquire and comment on the Report by mail or fax for the address of Tokyo Office of Nippon Giken Inc. in order to reflect Draft Final Report during home office work in Japan. The comments should be reached the JICA Study Team within one month.
- 3) The GOB requested the JICA Study Team to inform the arrival date and schedule of the Team visiting Pakistan for explanation of Draft Final Report before more than two weeks of the arrival date.

Attachment-6 Minutes of Meetings on Draft Final Report

**MINUTES OF MEETING
ON
DRAFT FINAL REPORT
FOR
THE FEASIBILITY STUDY
ON
THE IRRIGATION WATER RESOURCES DEVELOPMENT
WITH
DELAY ACTION DAMS PROJECT
IN
BALOCHISTAN
IN THE ISLAMIC REPUBLIC OF PAKISTAN**

AGREED UPON BETWEEN

**THE GOVERNMENT OF BALOCHISTAN
THE ISLAMIC REPUBLIC OF PAKISTAN**

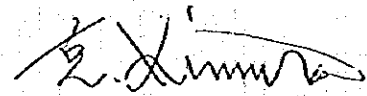
AND

JAPAN INTERNATIONAL COOPERATION AGENCY

Quetta, March 24, 1997



**Abdus Salam Khan
Chief Engineer
Irrigation Department
Government of Balochistan**



**Katsuhiko Kimura
Team Leader
JICA Feasibility Study Team**

Witness:

吉田 和洋
Kazuhiro Yoshida
Agricultural Development Study Division,
Agriculture, Forestry and Fisheries
Development Study Department, JICA

MINUTES OF MEETING ON DRAFT FINAL REPORT
for
**the Feasibility Study on the Irrigation Water Resources Development
with Delay Action Dams Project in Balochistan**

1. Date and Place: March 22, 1997, at the office of Secretary of Irrigation and Power Development, and the office of Chief Engineer of Irrigation Department, Government of Balochistan

2. Summary of Discussions:

Based upon the results of field survey and home office work, the Study Team submitted officially thirty (30) copies of the Draft Final Report on the Study (hereinafter referred as "the Report") and explained its contents to the Irrigation Department, Government of Balochistan in the meeting held on March 22, 1997, of which the list of participants is attached in ANNEX.

As a result of the explanation and exchange of opinions on the Report, the following points were agreed upon by the Pakistan side (hereinafter referred as "GOB/GOP") and the Japanese side (hereinafter referred as "GOJ").

- 1) The GOB/GOP basically accepted the contents of the Report, with strong desire to urgently implement the proposed Stage-I delay action dam scheme.
- 2) The detailed review on the Report will be made by the GOB/GOP and the comments will be sent to the JICA Pakistan Office by April 22, 1997, if any.
- 3) The GOB/GOP agreed that the Final Report would be available to any person who have technical interest in the Study.
- 4) The GOB/GOP basically agreed ^{with} the recommendations of the Report and to consider taking necessary actions.
- 5) The GOJ promised that Final Report should be compiled reflecting the expected comments of the GOB/GOP within one month after receiving it, and the final Report should be sent to the GOB/GOP immediately.

List of Participants

(Pakistan side)

Mr. Muhammad Azam Baloch Secretary Irrigation and Power Department

Mr. Abdus Salam Khan Chief Engineer Irrigation Department

(Japanese side)

JICA

Mr. Kazuhiro Yoshida Agriculture, Forestry and Fisheries Development
Study Department, JICA

JICA Study Team

Mr. Katsuhiko Kimura Team Leader/Water Management

Dr. Shuichi Matsushima Irrigation & Drainage/O & M

Mr. Takahiro Kato Dam Design

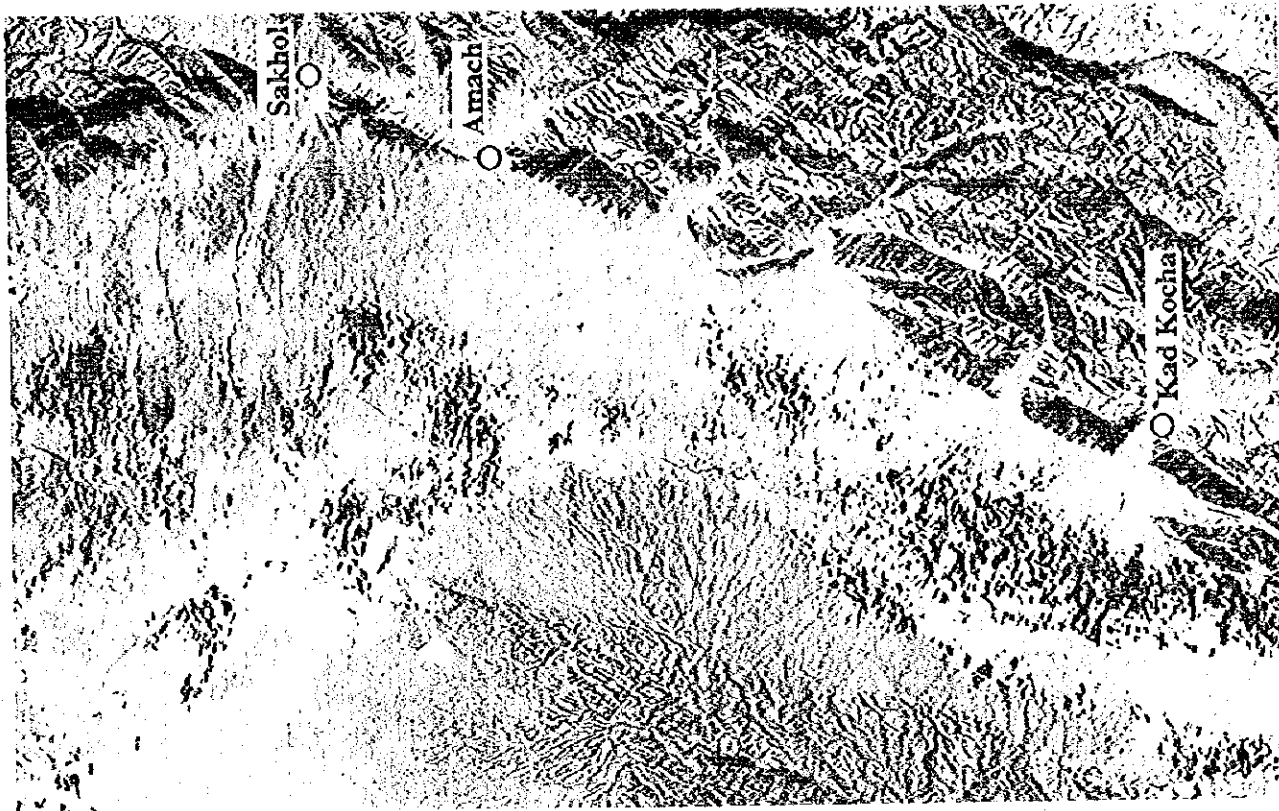
Observers

Mr. Abdul Rahim Mahsud Director Operation Nippon Giken Inc.

Mr. M. Qasim Saeed Project Engineer Nippon Giken Inc.

Satellite Images and General Layouts of Proposed Dam Sites





Satellite Image II (Mastung) 0 5km

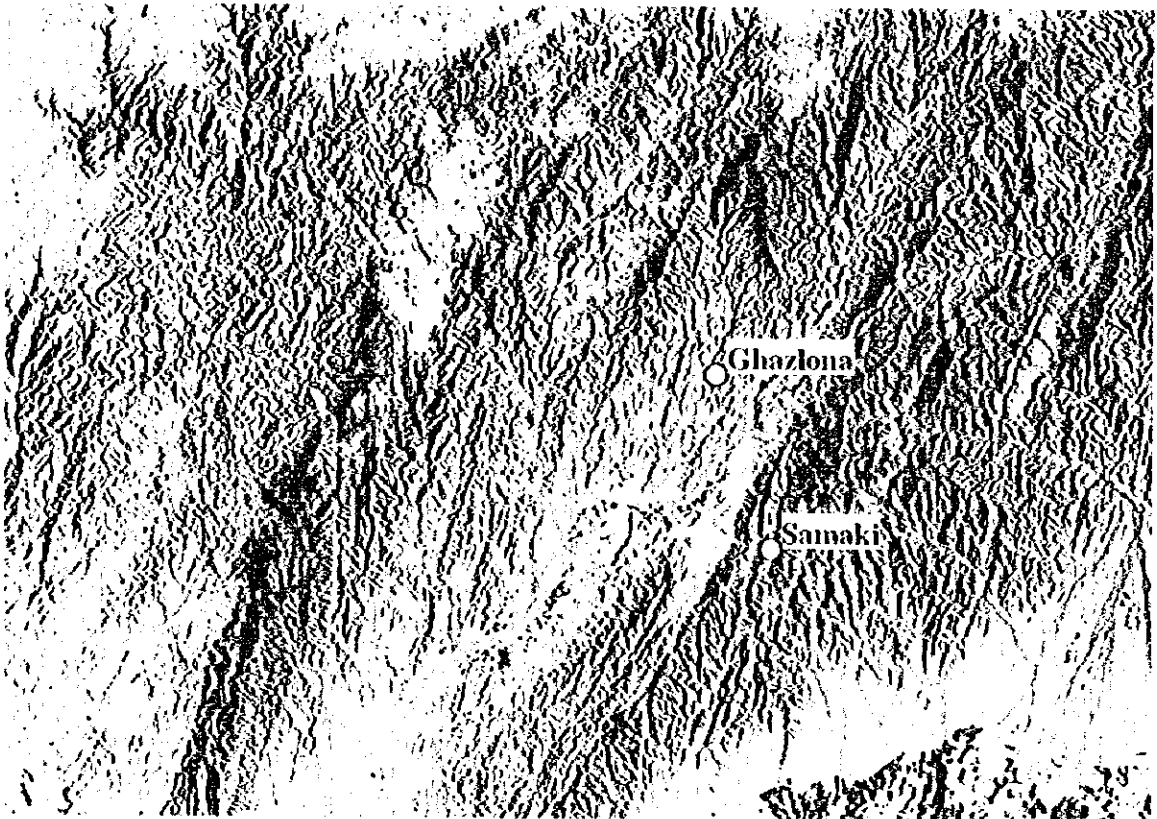


Satellite Image I (Quetta) 0 5km



Satellite Image III (Pishin)

0 5km



Satellite Image IV (Arambi)

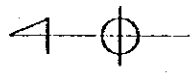
0 5km



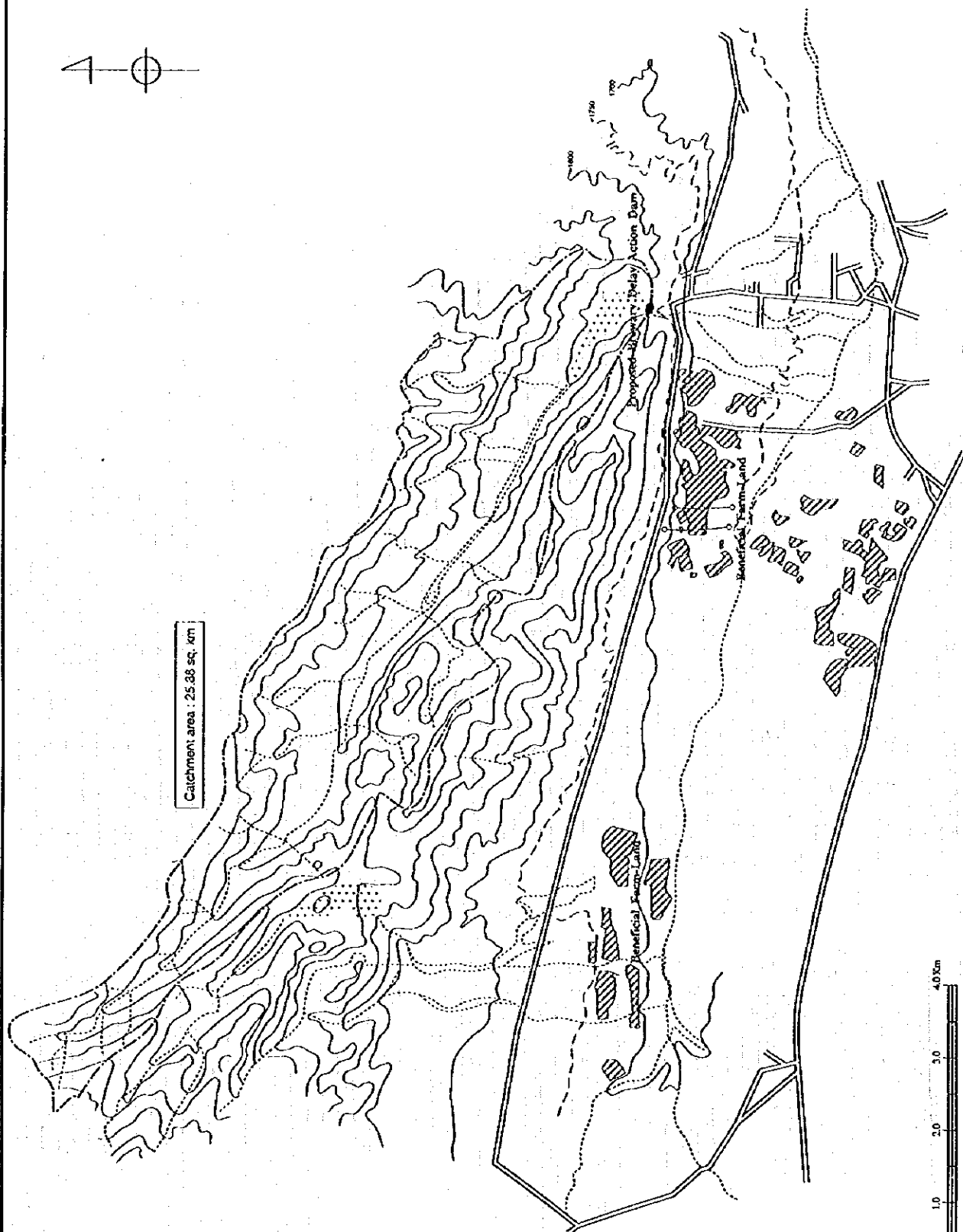
Satellite Image VI (Kalat)



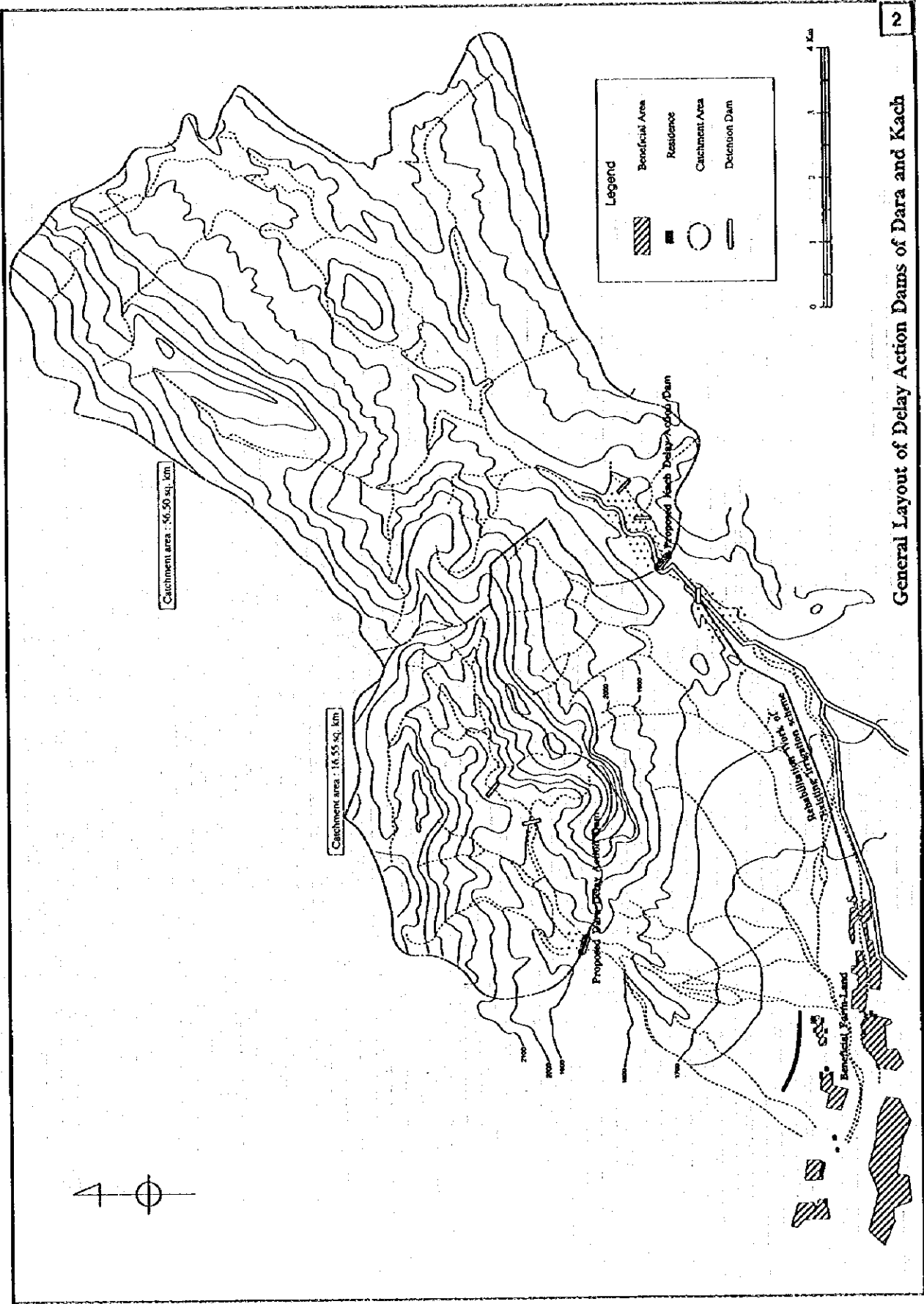
Satellite Image V (Mangi)



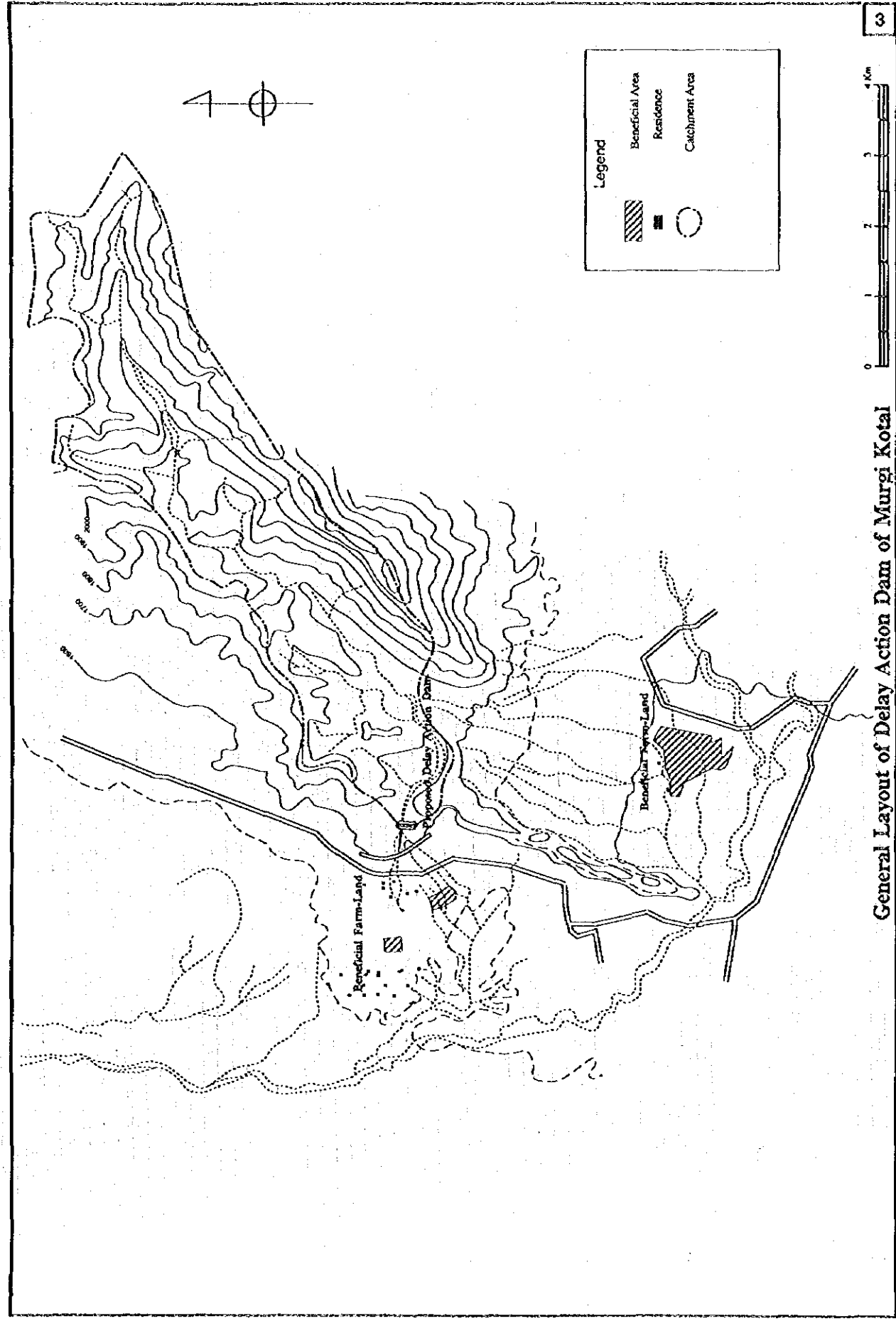
Catchment area : 25.38 sq. km



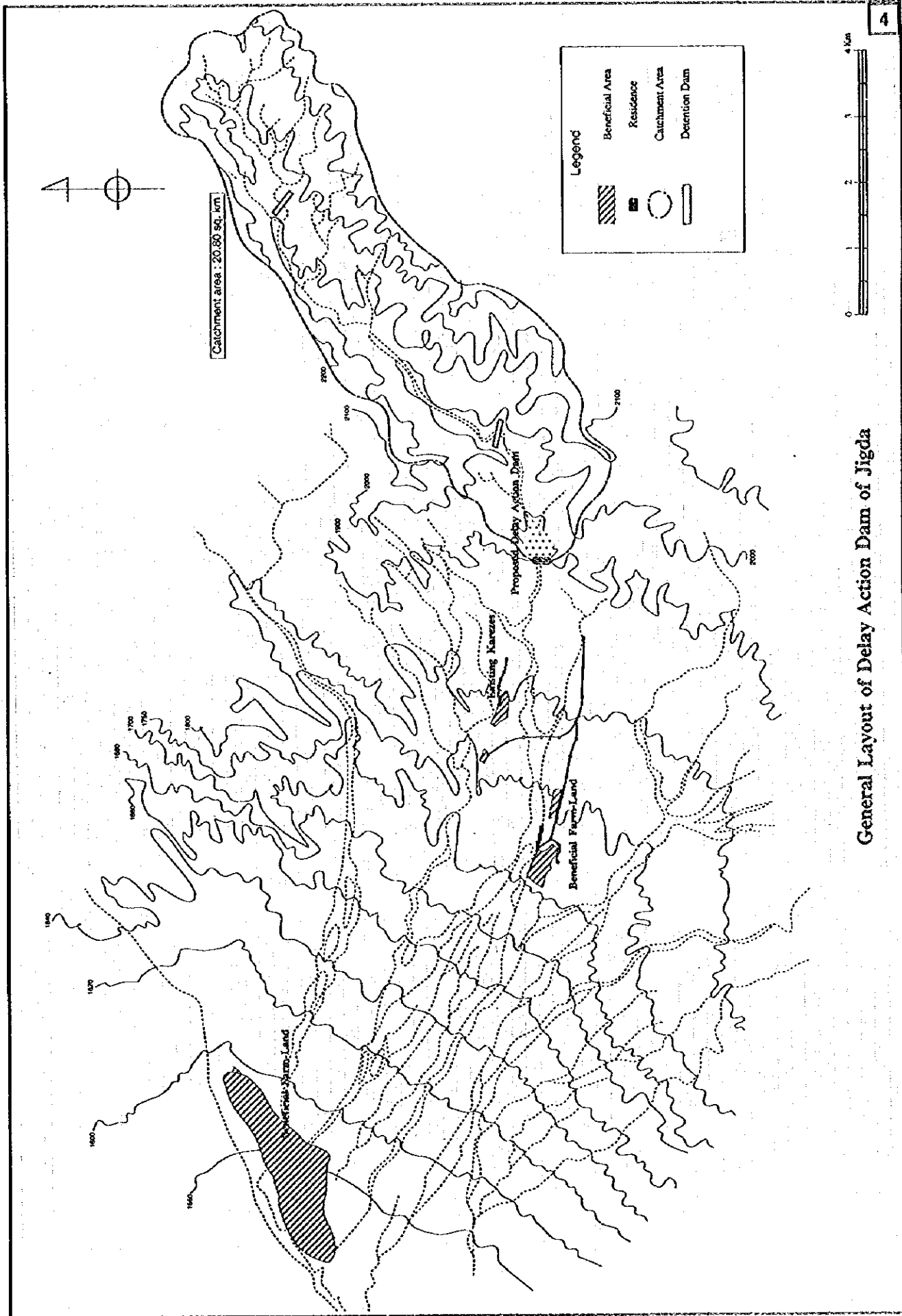
General Layout of Delay Action Dam of Brewery



General Layout of Delay Action Dams of Dara and Kach



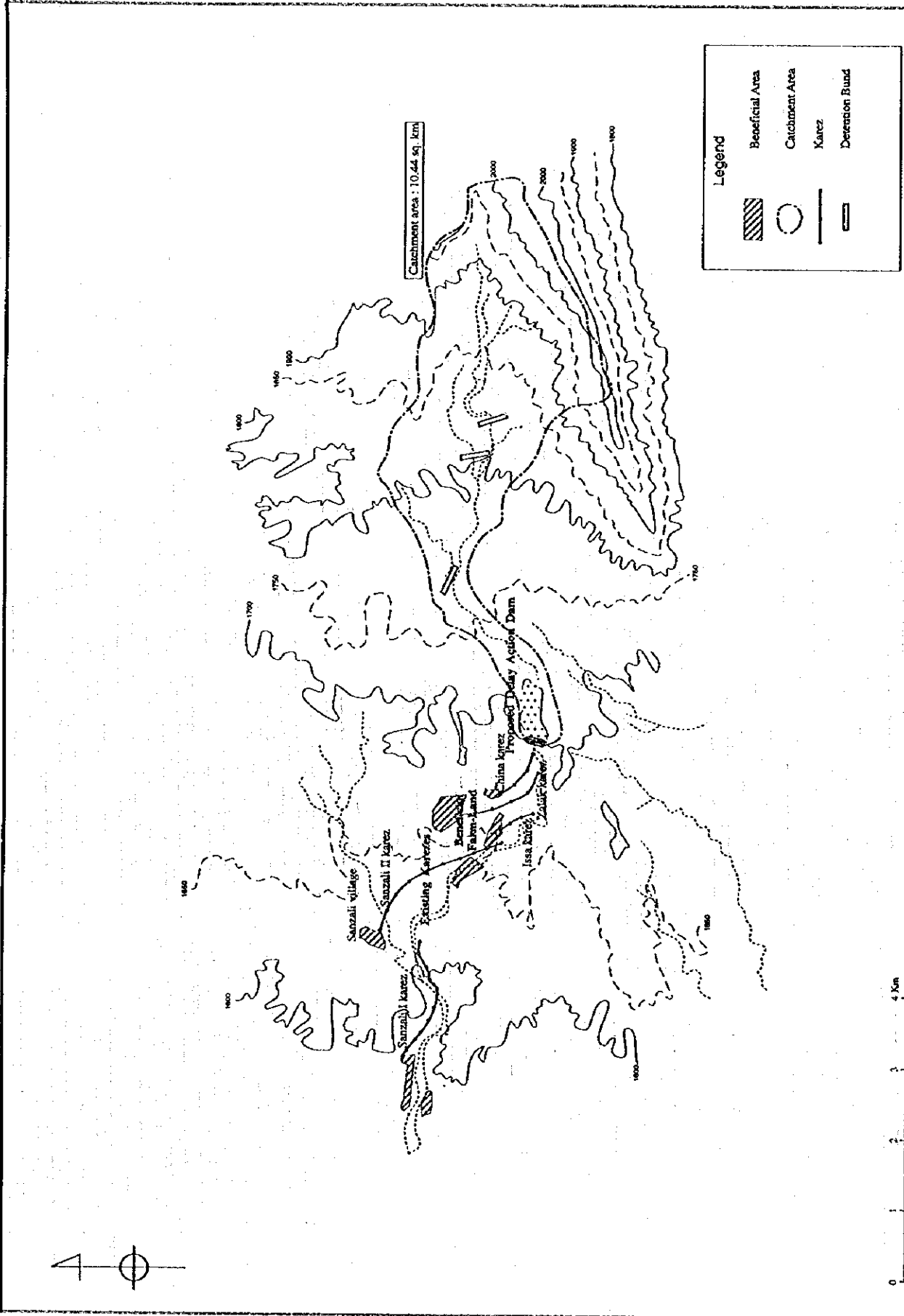
General Layout of Delay Action Dam of Murgi Kotal



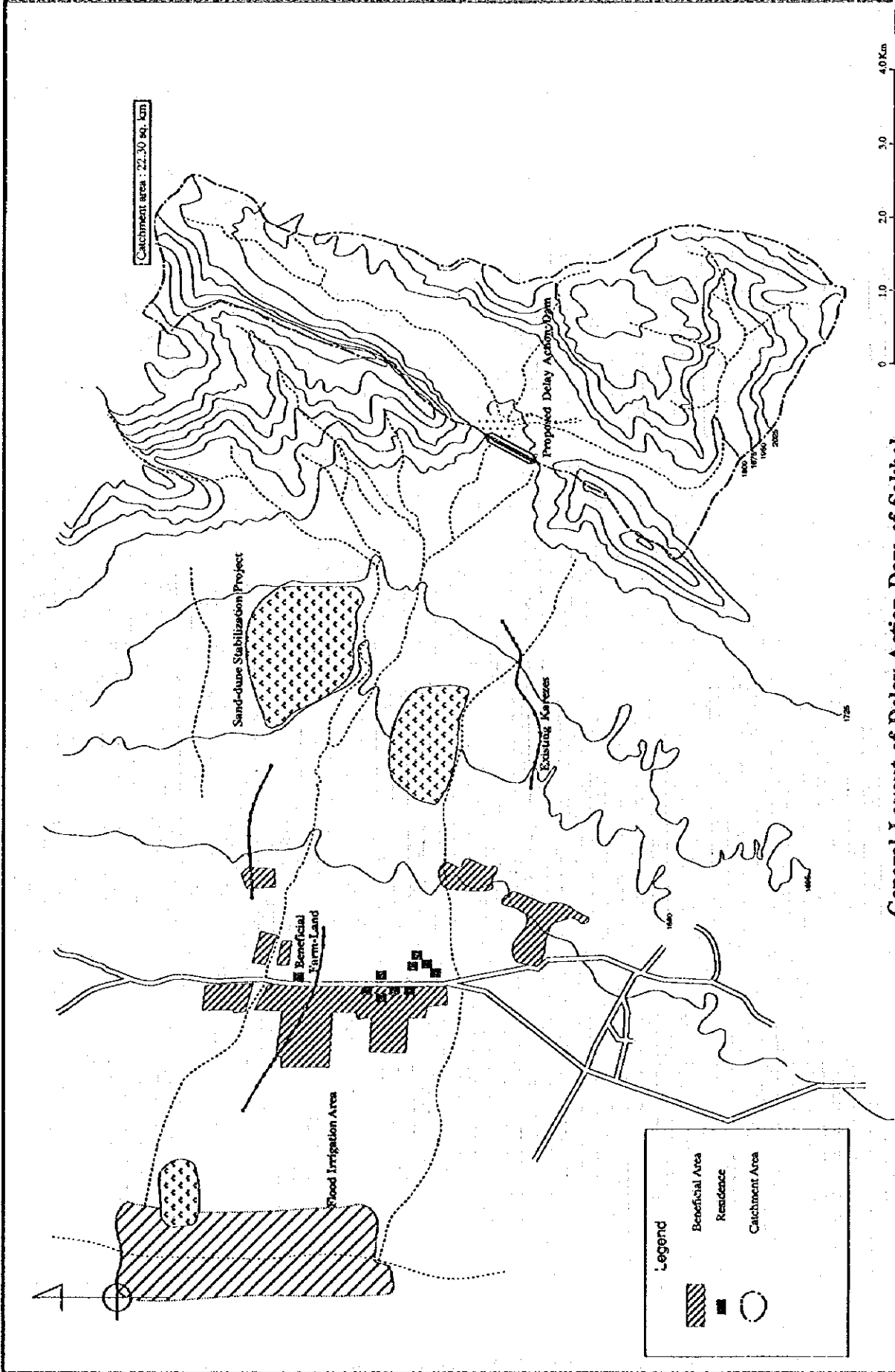
Legend

	Beneficial Area
	Residence
	Catchment Area
	Detention Dam

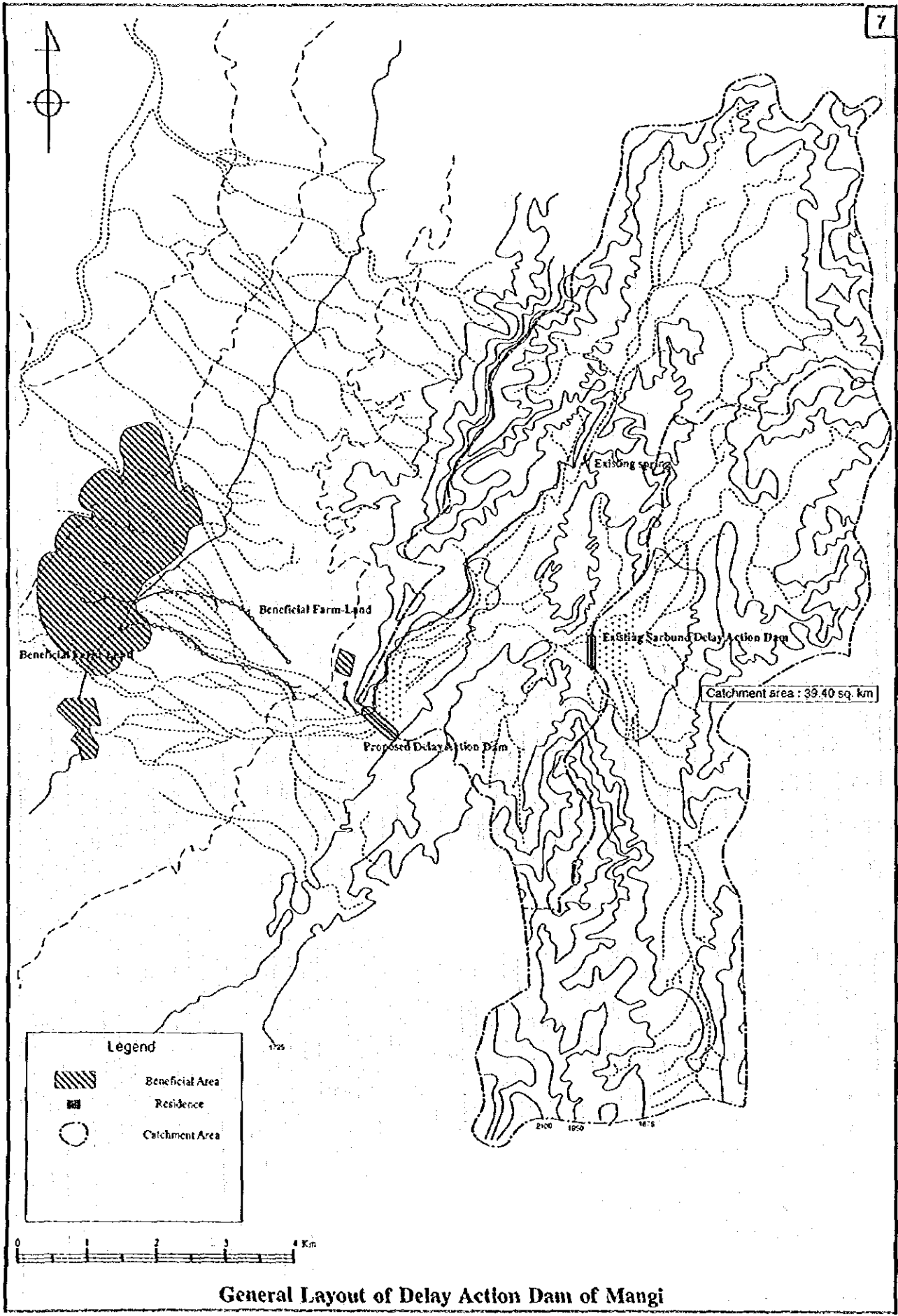
General Layout of Delay Action Dam of Jigda



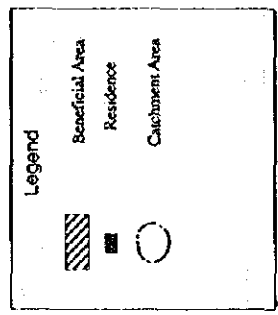
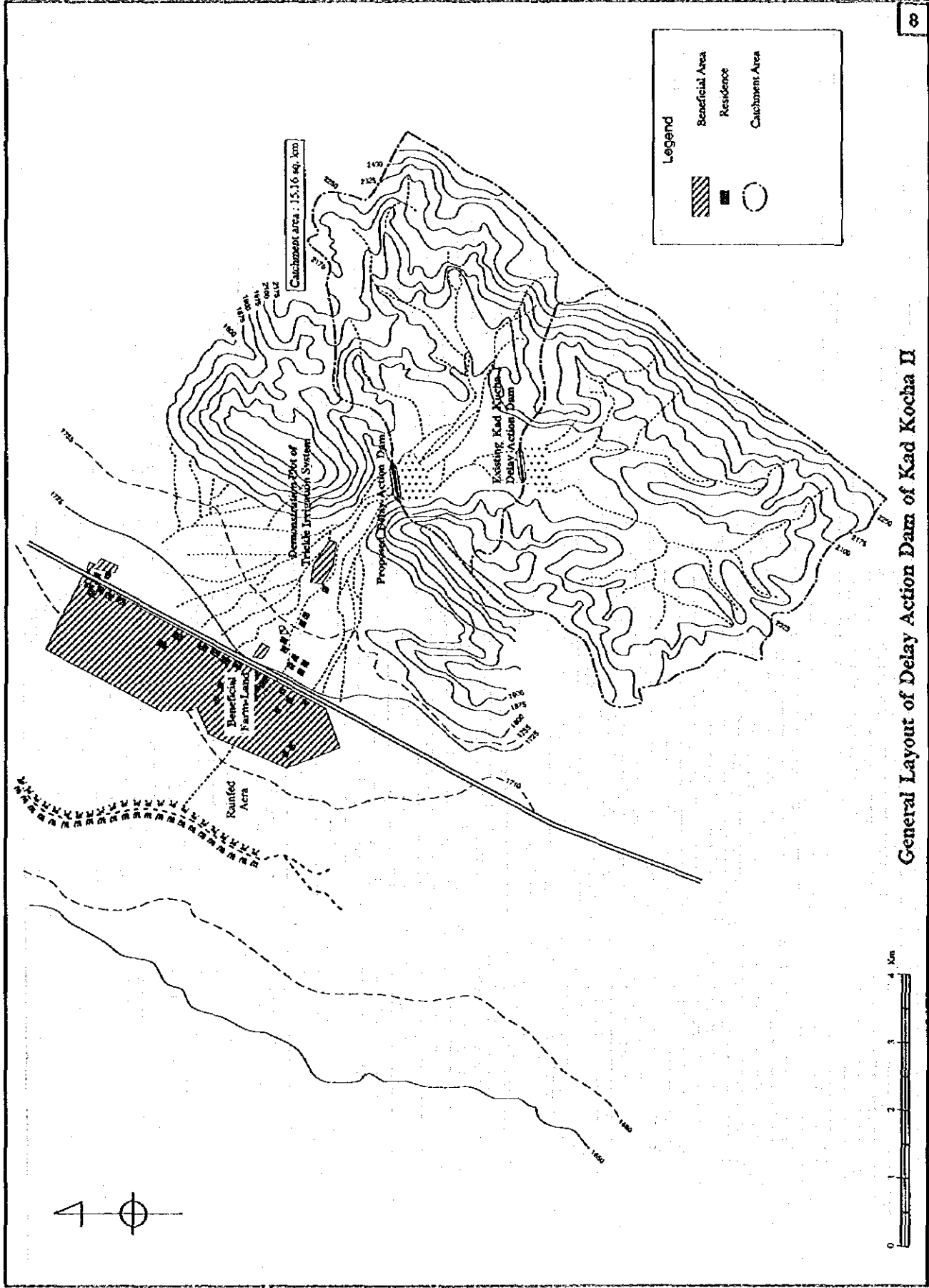
General Layout of Delay Action Dam of Sanzali



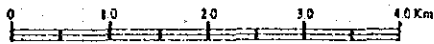
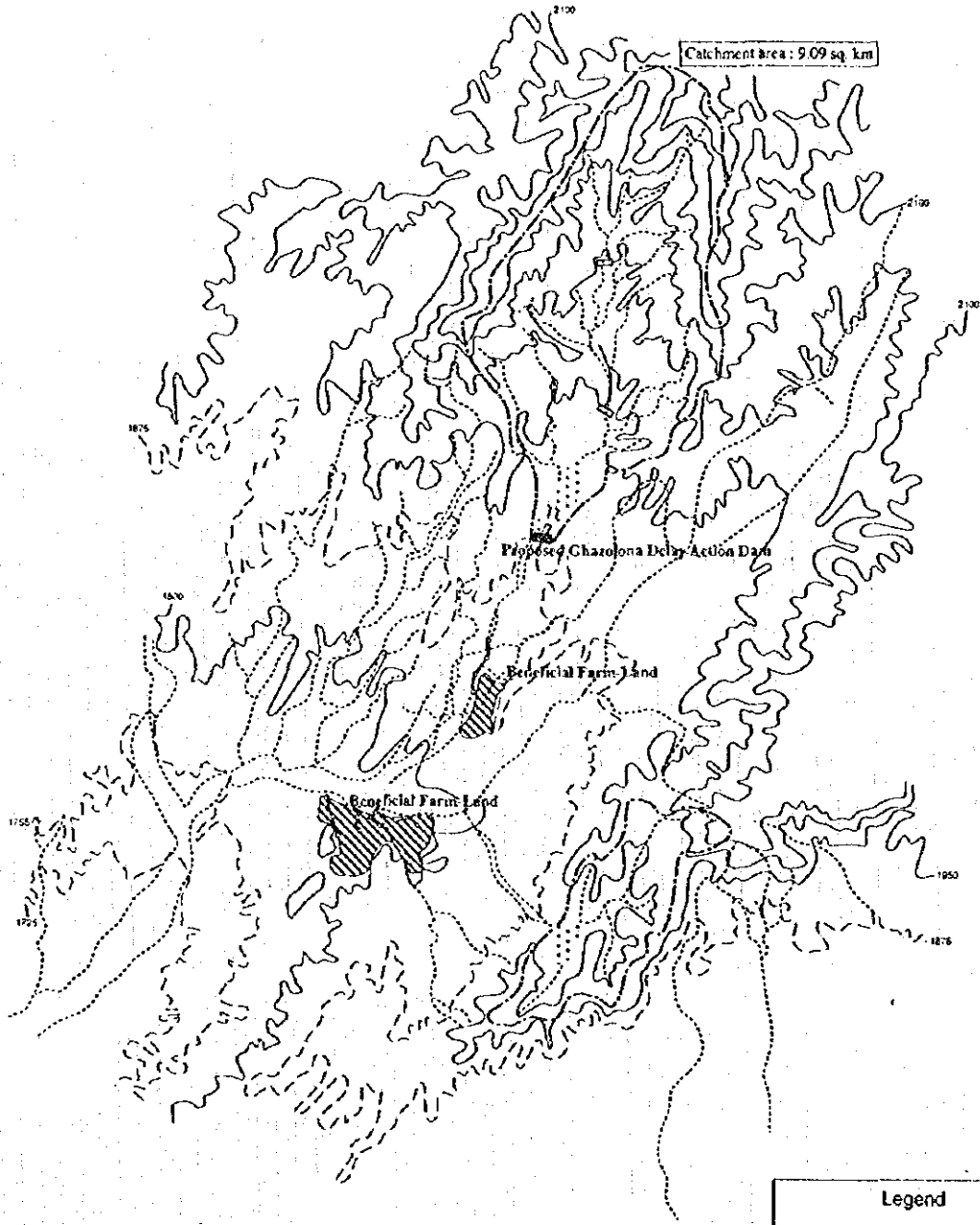
General Layout of Delay Action Dam of Sakhol



General Layout of Delay Action Dam of Mangi



General Layout of Delay Action Dam of Kad Kocha II



Legend	
	Beneficial Area
	Residence
	Catchment Area
	Detention Dam

General Layout of Delay Action Dam of Ghazlona

JICA