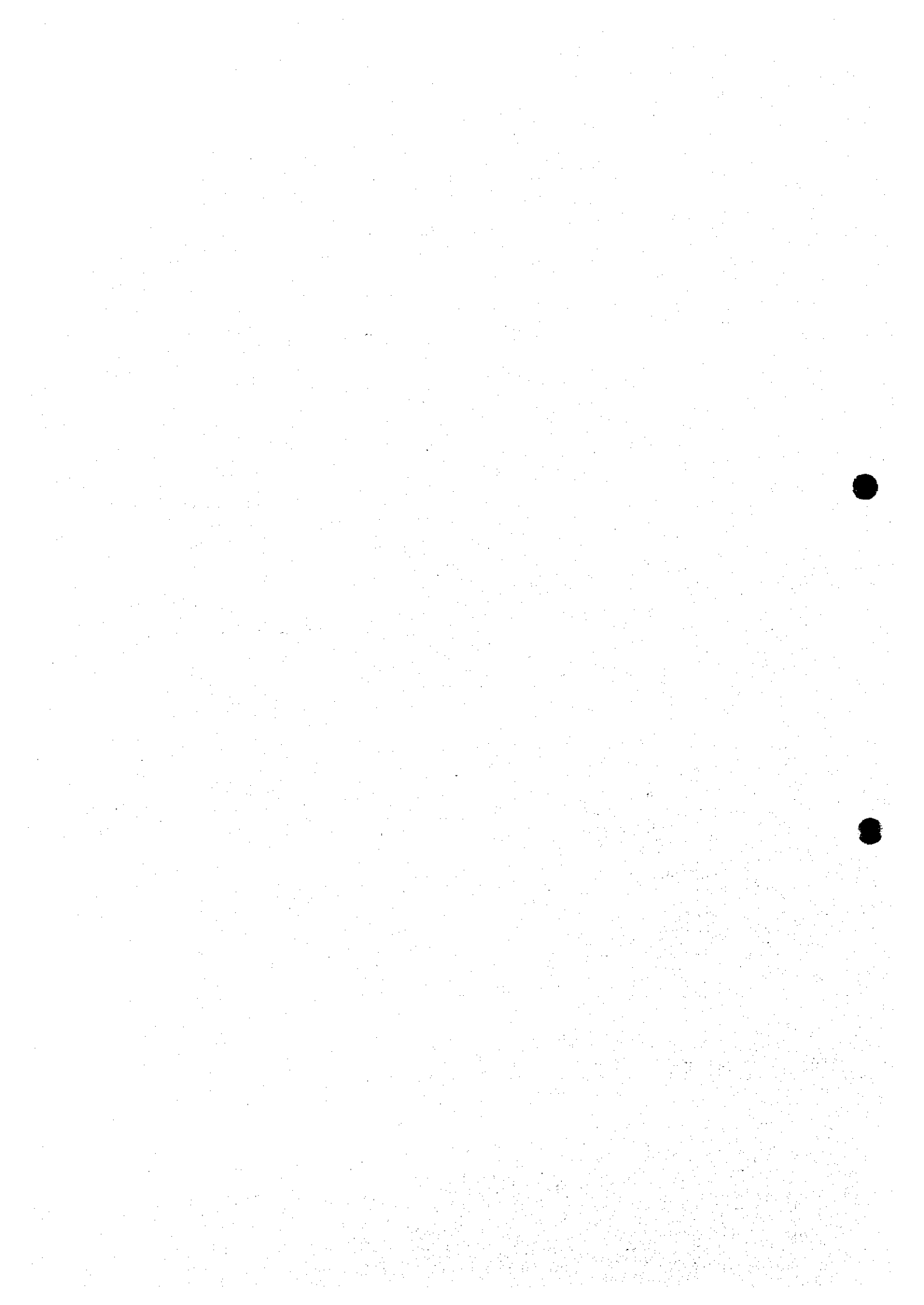


ATTACHMENT



Attachment A: Form of Questionnaire for Social Environment Survey



The Study on the Rehabilitation of Minor Irrigation Tanks in Tamil Nadu

Questionnaire for Government Officers in the Study Area
(For Village Administrative Officer, Village President or Influential Persons of Each Village)

PART I: GENERAL

1. Name of Village:
2. Name of Interviewee:
3. Name of Taluk:
4. Name of Panchayat Union/Block:
5. Name of District:
6. Name of Tank:
7. Location of Tank:

<Please paste the 1:50,000 topographic map here to indicate the location of the tank.>

8. Name of Interviewer:

PART II: RURAL COMMUNITY

A. Institution and customs

1. Present situation in land tenure and land use

1) Area of each land use and land tenure

Land Use	Total Area	Value	Public Area	Land Tenure in Private Area				
				State Property	Private Property			Common
					Industrial	Company	Institution	
1. Forest:								
2. Barren & non-cultivable land:								
3. Land put on non-agri. use (buildings, roads, play ground, etc.):								
4. Cultivable Waste:								
5. Permanent pasture & after grazing land:								
6. Land under misc. tree crops including groves (horticulture):								
7. Current fallow:								
8. After fallow:								
9. Net area sown:								
10. Total geological area:								
11. Area sown more than one:								
12. Total cropped area:								

5) Acreage of farm land and number of households by types of land ownership in each village

	Below 1 ha	1 - 2 ha	Above 2 ha	Landless Farming	
				Tenant	Agri. Labour
No. of Household					
Area (ha)					

2. Assets position of the villagers (other than lands)

Type	No.	Current Value	Type	No.	Current Value
Buildings			Animals:		
Machineries				
Tractors				
Power tiller				
Sprayer				
Wells and pump sets			Others:		
Bullock cart				
				

2. Farming practices

1) Direct sowing or transplanting of paddy?

Please tick. → Direct sowing Transplanting

2) Rice varieties, growing period, sharing rate of each variety

Varieties				
Share Rate				
Growing Period				

3) General cropping calendar (by bar chart)

Crops	Crop	Area	Variety	Duration	No. of Irri.		Cost of Well Irri.	Cost of Cultivation	Yield	Price
					Tank	Well				
Tank Season										
Non-tank Season										

4) Duration of tank water supply (Please tick)

1 month 2 months 3 months 4 months 5 months 6 months

5) Land preparation by man power, draft animals or machinery? (Please tick.)

Man Power Draft Animals Machinery Others (.....)

6) Role of women in farming activities

(1) (2)

(3) (4)

7) Use of fertilizer and chemicals (general method)

Name of Fertilizer and Chemicals	Purpose	Application (Season, Quantity, etc.)

- 8) How to thresh paddy? (Please tick.)
 Manual threshing Power thresher Automatic fed thresher
 Others (.....)
- 9) How to store paddy? (Please tick.)
 Storehouse without control Controlled storehouse No storage facility
 Others (.....)
- 10) To whom to sell paddy surplus?
 Local Market Government agency Others (.....)
- 11) Yield constraints of rice production (Please enter the yield constraints in order of importance.)
 Water shortage Ill drainage
 Weeds Uneveled land surface
 Disease (.....) Pest (.....)
 Problem soil (.....) Poor cultural technology
 Financial constraints to buy inputs Others (.....)

4. The rights of the use of water and manner of water distribution

- 1) Who has the right to use water and how is the priority of usage among farmers?
.....
.....
- 2) Is there any condition to use the water? Yes no
If yes, what is the condition?
.....
.....
- 3) Please explain the manners and procedures of water distribution.
.....
.....

5. Leadership of water management

- 1) Who takes the leadership in water management?
- 2) What kind matters are determined under his leadership?
(1)(2)
(3)(4)
- 3) Please explain how these matters are determined?
.....
.....

6. The fishing rights in the pond (tank reservoir)

- 1) Who has the right to fish in the pond?
.....

2) Is there any condition to get fishing rights? Please tick. yes no

If yes, what is the condition?
.....
.....

7. The rights of community land use

1) How is the community land used?
.....
.....

2) Who has the right to use such lands?
.....

3) Is there any condition to get the rights to use common lands? Please tick. yes no

If yes, what is the condition?
.....
.....

8. Present situation of employment in the village

Rate of unemployed persons for working population %

9. Organization of the village administrative office (Present administrative and sociological constraints encountered in your village)

1) Are there any conflicts among the tribes, religions or classes of caste in your village?

yes no

If yes, what kind of conflicts are taken place?

(1) (2)
(3) (4)

2) Other constraints, if any?

(1)
(2)

3) Who and how to solves such constraints and conflicts if any?

(1) Who:
(2) How:

4) If these constraints and conflicts could not be solved by the chairman, whom do you contact?

(1) (2)
(3) (4)

5) What is the socio-administrative matter that the chairman has severely got into trouble at present?
.....
.....

10. Maintenance of irrigation facilities

1) Who has the responsibility for maintenance of irrigation facilities?

2) Who takes the leadership in maintenance of facilities?

3) Who participate in such maintenance works?

4) How often such maintenance works are carried out?

Type of Works	Frequency	Type of Works	Frequency

B. Social condition of village

1. Rural infrastructures (Please lay down in a map as required)

- 1) Roads (road system, width, pavement, traffic, etc.)
- 2) Facilities of transport and marketing of agricultural products, e.g. processing facilities, cereal storehouse, markets, etc.
- 3) Post offices, telegraph and telephone offices; number of telephone sets and telephone circuits, telephone charges (..... Rs/min)
- 4) Electric supply
 - (1) How many percent of households has the electric supply in the village?
 - (2) What is the agency to supply electricity in the village?
 - (3) Electric fees
 - (4) How much do the average farmer pay for electric supply? Rs

5) Domestic water supply

Source of Water	Piped Supply System	Shallow Well	Deep Well	River Water	Others (.....)
Percentage					
Supply Capacity					
Water Quality					
Property (Please tick.)	<input type="checkbox"/> Communal <input type="checkbox"/> Private	<input type="checkbox"/> Communal <input type="checkbox"/> Private	<input type="checkbox"/> Communal <input type="checkbox"/> Private	<input type="checkbox"/> Communal <input type="checkbox"/> Private	<input type="checkbox"/> Communal <input type="checkbox"/> Private

6) Medical institutions (public and private) including primary health care center and Ayurveda

Institutions	No. of beds	No. of Doctors	No. of Other Staff

7) Number of dumps for refuse:

8) Number of stores by type

Type of Stores	Available Number

9) Name of nearest urban place and distance: km from

(Map of the village indicating infrastructures)

2. Farmers' housing situation

	Own House		Relatives' or Parents' House without Payment	Tenant with Payment to Owner	Others (.....)
	Touched	Tiled			
No. of Households					

3. Support activities for farmers

1) What kind of agricultural credits are available for farmers?

Name of Credit	Kind	Terms for Borrowing	Results in 1996	Remarks

2) What kind of agricultural extension works are available for farmers? (kinds of extension activities, organization of extension works)

Name of Activity	Kind	Organization	Remarks

3) Government subsidy for farming and farmers, e.g. for buying farm machinery, farm land and farming materials, for building granary, processing facilities and market and for livelihood improvement

Name of Government's Subsidy	Purpose

4. Present state of rural community in village

1) Official and customary methods of communication from village to villagers and methods of reflecting the villagers' opinions to the village

- (1) Village to villagers
- (2) Villagers to village

2) Races and caste groups in village (including the minority races) and religions of villagers

Races or Cast Groups	Population (%)	Religions	Races or Cast Groups	Population (%)	Religions

3) Standard of education in village

Education	Share Enrollment (%)
Not received primary education	
Receiving or received primary education	
Receiving or received higher education	

4) Habitual mutual aids in rural community

(1) Obligations to maintain the social conditions in village, e.g. repairing roads, labor services to irrigation canals, obligations to traditional festivals and religious ceremonies

.....

.....

(2) Mutual aids of villagers, e.g. in case of building houses, funeral, marriage, childbirth, no cash to buy something and food and meals, etc.

.....

.....

5. Family size and standard of living

1) Number of households by family size in village

Family Size	Below 2	2 - 4	5 - 10	Above 10
No. of Household				

2) Number of farm households by family size in village

Family Size	Below 2	2 - 4	5 - 10	Above 10
No. of Household				

3) Gender

(1) Role of women in the typical farm household.

(a) (b)

(c) (d)

(2) Wages for women

Type of Work	Wages	Type of Work	Wages

(3) Inheritance of property (Please tick)

Equal division Eldest son Others (.....)

4) % of farm households having farming successors: %

5) Daily working hours in farming in each season by sexes

Season			
Men			
Women			

6) Eating habits in village (Please tick.)

Breakfast Lunch Supper

7) Standard of living in village

(1) % of food and drink expenses for whole living expenditure %

(2) Spread rate of radios, black-and- white televisions, color televisions, electric washing machines, electric refrigerators, air conditioners, motorcycles, trucks and motorcars in village

Item	Rate (%)	Items	Rate (%)
Radios		Motorcycles	
Black and white televisions		Trucks	
Color televisions		Motorcars	
Electric washing machine			
Electric refrigerators			
Air conditioners			

(3) Decision-maker in typical family (Property management and inheritance, domestic account, occupations of family members, school attendance, attendance to village's meeting, mutual aids in community and divorce)

.....

.....

8) Energy sources in typical farm households (lighting, cooking, heating and air conditioning)

Type	Energy Source	Type	Energy Source
Lighting		Air conditioning	
Cooking			
Heating			

9) Source of drinking water in farm households

- (1) Tap water Deep well Shallow well River Others (.....)
- (2) Quality and quantity of drinking water in each source
-
-

10) Type of toilets in farm households

Type of Toilet	Flush toilet	Toilet dipping up night soil	Toilet dug only a hole in the ground	Others (.....)
Spread Rate (%)				

11) Illness attacked seriously villagers and problems of the medical facilities in village

- (1)(Year:) (2)(Year:)
- (3)(Year:) (4)(Year:)

6. Population

1) Population by age and caste and working population by industries in village

Age	Below 5	5 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	Above 60
Population								

Caste	Others	BC	MBC	SC	ST
Population (%)					

Category	Agriculture	Industry	Commercial	Others
Population				

2) Number of Humlets in village and population of each Humlet

Name of Humlets	Population

3) Number of farm households and working population

Type of Household	Full-time Farm Households	Part-time Farm Household		Tenant Farmers	Others (.....)
		Mainly Engaging in Farm	Engaging in Other Jobs than Farming		
No. of Household					
Population					

7. Frequency of conflicts and settlement

Type of Conflicts	Frequency	Settlement

C. Present social problems and administrative action

1. Present administrative and social constraints encountered in village

- 1) 2)
 3) 4)

2. Projects and programs to activate agriculture and rural community

1) Projects and programs being proceeded and planed

Name of Project/Program	Categories of Project/Program (Tick please)		
	<input type="checkbox"/> On-going	<input type="checkbox"/> Scheduled	<input type="checkbox"/> Long-term
	<input type="checkbox"/> On-going	<input type="checkbox"/> Scheduled	<input type="checkbox"/> Long-term
	<input type="checkbox"/> On-going	<input type="checkbox"/> Scheduled	<input type="checkbox"/> Long-term
	<input type="checkbox"/> On-going	<input type="checkbox"/> Scheduled	<input type="checkbox"/> Long-term
	<input type="checkbox"/> On-going	<input type="checkbox"/> Scheduled	<input type="checkbox"/> Long-term

2) How do you think the influence of construction of irrigation facilities by this project on rural community?

(1) Influence for social life

a. For farmers' life

.....

b. For population in the project area

.....

c. Change of farmers' economical activities

.....

d. Change of system and customs in rural community

.....

(2) Influence on health and sanitation of farmers in the project area

a. Increase of quantity of farm chemicals used and accumulation of residual toxicity

.....

b. Spreading endemic diseases and diseases by irrigation

.....

c. Spreading infectious diseases

.....

d. Influence on quality and quantity of drinking water

.....

e. Accelerating pollution with excrement of livestock for groundwater by irrigation

.....

f. Increase of wastes and residues with farming production and disposal measures of them

.....

3. What is the expectation from the government?

.....

.....

PART III: FARMERS' ORGANIZATION

1. Farmers Organization

1) How many farmers' organizations are available in the area including formal and informal organizations?

Type of Organization	Name of Organization	Activities	Number of Members

2. Water Users' Association

1) Number of members, and requirement of membership

Holding Agricultural Area	Number of Members	Holding Agricultural Area	Number of Members
below 1.0 ha		4.0 - 10.0 ha	
1.0 to 2.0 ha		10.0 ha above	
2.0 to 4.0 ha		Total	

Requirement of membership → yes no

If yes, what is the condition?

2) Organizational structure (Please draw the organization chart below.)

3) Staffing (total number, number of each section and their training system)

Section					
No. of Staff					

4) Responsibilities and duties of the president

- 1) 2)
 3) 4)

5) How to elect the president?

- Election among members Appointment by village leader Others (.....)

6) Annual budget Rs.

7) Present administrative and sociological constraints encountered in your village.

(1) Are there any conflicts among the tribes, religions or classes of caste in your village?

↳ yes no

If yes, what kind of conflicts are taken place?

(a) (b)
(c) (d)

(2) Other constraints if any?

(a)
(b)

(3) Who and how to solves such constraints and conflicts?

.....
.....

(4) If these constraints and conflicts could not be solved by the president, whom do you contact?

.....
.....

(5) What is the socio-administrative matter that the president has severely got into trouble at present?

(a)
(b)

8) Water management

(1) The period when the tank water is available: From to

(2) Availability of water management rule → yes no

(3) How/who decides time and order to start irrigation water delivery?

.....
.....

(4) How/who operates the main gate at the main canal?

.....
.....

(5) How/who operates turnouts?

.....
.....

(6) Irrigation rotational system

.....
.....

(7) Overflooding irrigation method? → yes no

(8) Maintenance of canals (desilting, weeding, canal shaping, some repairs, etc.)

.....
.....

(9) How to maintain canals by farmers' themselves, if some farmers do not attend to go to field for maintenance, how to compensate for this work by those farmers?

.....
.....

(10) Is there any troubles with irrigation water supply among the farmers ?

↳ yes no

(11) In which year could all the command area be irrigated by tank? Year of

3. Agricultural Cooperatives

1) Organizational structure (Please draw the organization chart below)

2) Number of members, requirements for membership

Holding Agricultural Area	Number of Members	Holding Agricultural Area	Number of Members
below 1.0 ha		4.0 - 10.0 ha	
1.0 to 2.0 ha		10.0 ha above	
2.0 to 4.0 ha		Total	

Requirement of membership → yes no

If yes, what is the condition?

3) Activities/Services made in 1995-96

Activities/Services	Quantities	Beneficiaries	Amount

4) Staffing (total number, number of each section)

Section					
No. of Staff					

5) Responsibilities and duties of the president

- 1) 2)
 3) 4)

6) How to elect the president?

- Election among members Appointment by village leader Others (.....)

7) Annual budget and government subsidies Rs.

8) Present administrative and sociological constraints encountered in operation.

(1) Are there any conflicts among the tribes, religions or classes of caste in your village?

☞ yes no

If yes, what kind of conflicts are taken place?

(a) (b)
 (c) (d)

(2) Other constraints if any?

(a)
 (b)

(3) Who and how to solve such constraints and conflicts if any ?

.....

(4) If these constraints and conflicts could not be solved by the president, whom do you contact ?

.....

(5) What is the socio-administrative matter that the president has severely got into trouble at present ?

(a)
 (b)

4. Other Organizations

1) Organizational structure (Please draw the organization chart below.)

2) Number of members, requirements for membership

Holding Agricultural Area	Number of Members	Holding Agricultural Area	Number of Members
below 1.0 ha		4.0 - 10.0 ha	
1.0 to 2.0 ha		10.0 ha above	
2.0 to 4.0 ha		Total	

Requirement of membership → yes no

If yes, what is the condition?

3) Activities/Services made in 1995-96

Activities/Services	Quantities	Beneficiaries	Amount

4) Staffing (total number, number of each section)

Section					
No. of Staff					

5) Responsibilities and duties of the president

- (1)(2)
 (3)(4)

6) How to elect the president?

- Election among members Appointment by village leader Others (.....)

7) Annual budget and government subsidies Rs.

8) Present administrative and sociological constraints encountered in operation.

(1) Are there any conflicts among the tribes, religions or classes of caste in your village?

↳ yes no

If yes, what kind of conflicts are taken place?

- (a) (b)
 (c) (d)

(2) Other constraints if any?

- (a)
 (b)

(3) Who and how solves such constraints and conflicts if any ?

.....

(4) If these constraints and conflicts could not be solved by the president, whom do you contact ?

.....

(5) What is the socio-administrative matter that the president has severely got into trouble at present ?

- (a)
 (b)

5. What government's support services do you think necessary for present farming?

Please tick.

- Development/improvement of irrigation facilities
 Development/improvement of on-farm road
 Technology extension
 Farming funds
 Development of market
 Subsidy of input materials
 Others (.....)

END



Questionnaire for Farmers in the Study Area
(For Selected 5 Marginal Farmers - Up to 1 ha)

1. Your name:

2. Your address:

3. Present situation of your family

1) Ownership of your farm land

Paddy fieldha
 Upland fieldha
 Othersha
:ha
:ha
:ha
 Totalha

2) Number of raising livestock

Dairy cattle	..... heads	Others:	..... heads
Beef cattle	..... heads	.....	..... heads
Draught animals	..... heads	.....	..... heads
Goats and sheep	..... heads	.....	..... heads
Birds	..... heads	.....	..... heads

3) Family members

Name of Family Members	Sex	Age	Occupation				Income	
			Main job	Period Engaged	Sub-job	Period Engaged	Annual	Monthly
.....
.....
.....
.....
.....
.....
.....
.....
.....

4) Community assets

(1) What assets does your community have (Kindly tick from the followings)?

- | | | |
|---|--|--------------------------------------|
| <input type="checkbox"/> Community hall | <input type="checkbox"/> Ponds/tanks | <input type="checkbox"/> Animals |
| <input type="checkbox"/> TV-set | <input type="checkbox"/> Library | <input type="checkbox"/> Machineries |
| <input type="checkbox"/> Village land | <input type="checkbox"/> Any other (.....) | |

(2) How does the community benefit from these?

.....

- (3) Who manages these?
.....
- (4) Have you any suggestion to make in this area?
.....
.....
- 5) Expenditure a year in your family
- | | | |
|--|-------|--------|
| (1) Expenditure for farming:
including purchase of seeds, farm materials, payment of wages to casual laborers, etc. | | Rupees |
| (2) Expenditure required to earn non-agricultural income: | ..... | Rupees |
| (3) Living expenditure a year | | |
| Foods and drinks expenses | ..... | Rupees |
| Other expenses | ..... | Rupees |
| Taxes and obligations | ..... | Rupees |
| Deposits and saving | ..... | Rupees |
| Total outgo a year | ..... | Rupees |
- (4) Please enter the insufficient things in your living and reasons of their shortage.
- (a)
- (b)
- (c)
- (d)

4. Farmer's intention

- 1) How do you think your present level of living?
 High level Average level Low level
- 2) How much is your expecting annual income? Rupees
- 3) Do you have any intention to keep up farming or not? Yes no
If yes, why?
.....
.....
- 4) Can you keep the successors of farming? Yes no
- 5) Are labors engaged farming in your household short or enough? Yes no
- 6) How do you improve your farm management to increase income?
.....
.....
- 7) If you intend increase non-agricultural income, what is the jobs?
(1) (2)
(3) (4)
- 8) After improvement of irrigation facilities, you will get more income than now. How do you intend to change your livelihood?
.....
.....

5. Health status

- 1) What are the common illnesses in your family (kindly tick from the followings)?
 Diarrhoea Rheumatic complaints Fever Typhoid
 Any other (.....)
- 2) Where do you go when you are sick (kindly tick from the followings)?
 PHC Government hospital Private doctor/private dispensary
 (Kindly tick)
- 3) Has there been any deaths in your family in the last five years? yes no
 If yes, what was the cause?
- 4) Has any children in your family died within a week of being born? yes no
 before completing one year? yes no
 before completing five year? yes no
 If yes, what was the cause?

6. Extension service

- 1) Do you go to the block officer? yes no (Kindly tick)
 If yes how often?

 Why do you go?

- 2) What kind of services do you get from the followings?

Officers	Information	Loans	Seeds	Manure	Any other
BDO					
RWO					
EOS					

- 5) What is your suggestion about these services?

7. Please tick the constraints encountered in your family

- 1) Constraints in farming
- | | | |
|--|---|--|
| <input type="checkbox"/> High input costs | <input type="checkbox"/> Water scarcity | <input type="checkbox"/> Water certainty |
| <input type="checkbox"/> Labor scarcity | <input type="checkbox"/> High wage rate | <input type="checkbox"/> Lack of bull cart |
| <input type="checkbox"/> Lack of seedlings/seeds in time | <input type="checkbox"/> Pest and disease | <input type="checkbox"/> Low yield |
| <input type="checkbox"/> Lack of market facilities | <input type="checkbox"/> Lack of money | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2) Constraints in living

- | | | |
|---|---|--|
| <input type="checkbox"/> High costs of food materials | <input type="checkbox"/> Indebtedness | <input type="checkbox"/> Unemployment |
| <input type="checkbox"/> High education costs | <input type="checkbox"/> Poor health facilities | <input type="checkbox"/> Lack of housing |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

8. Woman (Participation in farm economy)

1) Types of work

- (1) (2)
- (3) (4)

2) Wages

.....

.....

9. Please enter your expectation for the Government in the order of importance

- () Rehabilitate the tank in time
- () Increase the water storage from other sources such as rivers/canals
- () Provide good link roads
- () Rights to fish and raise forestry in the tank foreshore
- () Community wells
- () More O&M budget to tank
- () Others (.....)

10. Expectation for this project

1) If you have demand for the irrigation facility, please tick the following.

- | | | |
|---|--|--|
| <input type="checkbox"/> More catchment treatment | <input type="checkbox"/> Desilting | <input type="checkbox"/> Community wells |
| <input type="checkbox"/> Canal lining | <input type="checkbox"/> On-farm development | <input type="checkbox"/> Sluice re-structuring |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2) Do you have intention to contribute positively the water charge and to participate the maintenance and management of irrigation facilities through the water use association?

☞ yes no

If no, what is the reason?

.....

.....

3) Other expectation?

- | | | |
|--|--|--|
| <input type="checkbox"/> Increase output price | <input type="checkbox"/> Deduction of fertilizer price | <input type="checkbox"/> Invest to system tank |
| <input type="checkbox"/> Regular O&M budget | <input type="checkbox"/> | <input type="checkbox"/> |

END



Attachment B Form of Questionnaire for Farm Household Economy

**QUESTIONNAIRE
FOR
FARM HOUSEHOLD ECONOMY SURVEY**

"The Study on The Rehabilitation of Minor Irrigation Tanks
for Rural Development in Tamil Nadu"

by
Japan International Cooperation Agency (JICA)

QUESTIONNAIRE - CONTENTS

1. Household Characteristics
2. Life and Production in the Area
3. Land Ownership
4. Irrigation Situation
5. Agricultural Production
6. Other Economic Activities
7. Farmers' Attitudes

SAMPLE No _____ CODE : _____ Survey Date _____, 1997
 Surveyor _____ Group-Chief: _____
 District: _____ Village: _____ Family-Level: H , M , L

1. HOUSEHOLD CHARACTERISTICS:

1.1 Respondent's relationship to Head of Household: Age:
 Head of Household: Man / Woman
 Category of Farmer: Large / Medium / Small / Marginal / Agricultural labor
 Caste: Other caste / Backward Caste / Most Backward Caste / Scheduled Caste
 Religion: Hindu / Muslim / Buddhist / Christian / Other (.....)

1.2 Family Structure:

No.	Family-Position	Age	Health	Education	Profession	Special Remarks
1
2
3
4
5
6
7
8

1.3 How long have you lived in this place? Years
 What main professions during this period?
 1. (..... Years)
 2. (..... Years)
 3. (..... Years)

1.4 How your living conditions?
 Previously: Very well / Well / Medium / Poor / Very Poor
 Recently: Very well / Well / Medium / Poor / Very Poor

- 1.5 What are the main constraints in living conditions?
 1. Insufficient income 2. Severe climatic conditions 3. Bad social environment
 4. Unequal administration treatments 5. Improper infrastructure

- 1.6 What are the main constraints in farming?
 1. Insufficient finance 2. Lack of agricultural inputs 3. Lack of Labor
 4. Lack of irrigation 5. Improper marketing 6. Improper infrastructure

- 1.7 Does your family continue to live in this place? Yes / No
 Reasons: 1.
 2.
 3.

2. LIFE AND PRODUCTION IN THE AREA

- 2.1 What kind of construction is your house? Brick / Wood/ Mortar / Light Material / Thatch
 How long? Years Constructed (Owned) by:

- 2.2 Is the house space sufficient for all family members? Yes / No (.....m²)
 Comments:

- 2.3 In your house, do you have Electricity? Yes / No
 City Water? Yes / No
 Well? Yes / No
 Toilet? Yes / No
 Bathroom? Yes / No

- 2.4 Are there any problems to access from your house to Farm? No / Yes. Problem:
 Hospital? No / Yes. Problem:
 Market? No / Yes. Problem:
 School? No / Yes. Problem:
 City? No / Yes. Problem:

- 2.5 Problems in daily life according to seasons in a year:
 Problems in dry season: 1. 2. 3.
 Problems in wet season: 1. 2. 3.

- 2.6 How about your living expenditures in a year?

1	Food:	Rs.	(%)
2	Clothes:	Rs.	(%)
3	Education:	Rs.	(%)
4	Medicaments:	Rs.	(%)
5	Transports:	Rs.	(%)
6	Ceremonies:	Rs.	(%)
7	Housing Miscellaneous	Rs.	(%)
Total		Rs.	(100 %)

2.7 What are your financial sources for these expenditures?

1.	(.....)	/year)
2.	(.....)	/year)
3.	(.....)	/year)
4.	(.....)	/year)
5.	(.....)	/year)
Total	(.....)	/year)

2.8 Can you save some money in a year? No / Yes Amount: Rs/Year

2.9 Do you borrow money for living expenditures? No / Yes Amount:Rs/Year
Borrowing Sources:

2.10 Do you sell some of your farm products? No / Yes
1. Product: (..... Rs/Year) Unit Price:
2. Product: (..... Rs/Year) Unit Price:
3. Product: (..... Rs/Year) Unit Price:

2.11 Do you store farm products and foodstuffs for family consumption? No / Yes
1. Product:..... (.....Kg)
2. Product:..... (..... Kg)
3. Product:..... (..... Kg)

2.12 Is the food situation sufficient in your family? Yes / No
Insufficient Items: 1. 2. 3.
Reasons:

2.13 From your general view, how about the present living conditions in the area?
Very well / Well / Medium / Bad / Very Bad
Comments:

2.14 How about the present farming conditions in the area?
Very well / Well / Medium / Bad / Very Bad
Comments:

2.15 What crops are you planting in a year?
1. (..... ha) 2. (..... ha) 3. (..... ha)

2.16 Do you practice double-crop in a year? No / Yes Crop: (..... ha)
Comments:

2.17 Do you have sufficient labor force for agricultural production? Yes / No
Comments:

2.18 How about the labor force distribution in your farm in a year?
Dry season: persons (.....)
Wet season: persons (.....)

2.19 Are some of your family members work as labor in other places? No / Yes
If yes, persons in season (Wage: Rs. / day or season)

2.20 Do you continue to do farming in this place? Yes / No
Comments:

3. LAND OWNERSHIP

- 3.1 The present status of your residential land (house and garden)? Total area: m²
Private: m²; Rent: m²; Public: m²
- 3.2 The present status of your land? Total area: ha
Private: ha; Tenant: ha; Rent: ha; Other: ha
- 3.3 If private, the obtaining procedure: How long, so far? Years
If tenancy, the tenant conditions: How long, so far? Years
If renting, the rental conditions: How long, so far? Years
If other, utilization conditions: How long, so far? Years
- 3.4 What is your land utilization patterns in a year?
Dry season: 1. (.... ha) 2. (....ha) 3. (.... ha)
Rainy season: 1. (.... ha) 2. (....ha) 3. (.... ha)
- 3.5 Is your land suitable for farming? Yes / No Comments:
1. 2. 3.
- 3.6 Improvement works for land to be good for farming:
1. 2. 3.
- 3.7 Any land problems facing by you in future? Yes / No
Residential land:
Farm land:
- 3.8 The succession system of your present land;
Residential land:
Farm land:

4. IRRIGATION SITUATION

- 4.1 Do you have irrigation in Rainy Season: No/Yes (Source:)
Dry Season: No/Yes (Source:)
- 4.2 Are you member of water user association? No / Yes (Group: Years:)
Comments;
- 4.3 Is there any irrigation system in your area? No / Yes (Irrigation System:)
Comments;
- 4.4 If yes, do you participate in the O.M. and pay for this irrigation system?
Participation-Items: Remarks:
Payment: Comments:
- 4.5 If belonging to an irrigation association in your area, what are your obligations?
Obligations:
Comments:
- 4.6 How many ha of your land are subjected to irrigation? ha (....%)
Irrigation-type: Pump / Other
- 4.7 Crops subjected to irrigation: 1. (.... ha) 2. (.... ha) 3. (.... ha)
Irrigation periods:

4.8 Water-sources for irrigation: 1. 2. 3.

4.9 Are the water sources sufficient for irrigation in your farm land? Yes / No

Wet season: ha (.....%) Crops:

Dry season: ha (.....%) Crops:

4.10 How many ha of your land are under rainfed cultivation?

Crops: 1. (.... ha) 2. (.... ha) 3. (.... ha)

4.11 What is your total cost for irrigation in a year? Total: Rs/Year

Breakdown Items: 1. Rs/Year 2. Rs/Year 3. Rs/Year

Comments:

4.12 Do you have problems for this payment? Yes / No

Comments:

4.13 Do you want more irrigation water? Yes / No

If yes, for what crops and what seasons? 1. Crop: Season: (..... ha)

2. Crop: Season: (..... ha)

3. Crop: Season: (..... ha)

4.14 For your additional irrigation, what kind of irrigation system do you expect?

Irrigation System:

Comments:

4.15 From your idea, do you want to pay for irrigation? No / Yes

Reasons:

If yes, what amount of payment can you afford:

If no, what financial sources to cover this cost:

4.16 How do you think about tank irrigation?

1. Very helpful:

2. Helpful:

3. Sometime helpful:

4.17 Necessities in improvement of structures in priority:

1. Repairmen of sluice gates

2. Consolidation works of tank embankments

3. Desiltation of tank bed

4. Lining of existing canal system

5. Consolidation works for catchment area

6. Construction of new canal system

7. Others;.....

4.18 Necessities in improvement of management system in priority:

1. Reorganization of water management system

2. Making a new management organization

3. Total participation of small, marginal and landless farmers in O.M. works

4.19 With these improvements, what changes in farming do you expect:

1.

2.

3.

4.20 Items you can participate for these improvement works:

1.
2.
3.

4.21 Your idea for the management of the irrigation tank:

.....

4.22 Your idea for the O.M. works for tank irrigation:

.....

5. AGRICULTURAL PRODUCTION (in 1995-96)

5.1 Your farming system: Crop only / Crop + Livestock / Crop + Livestock + Fisheries /
 Crop + Others (.....)

5.2 Your cropping application:

Rainy season Crops	1. (... ha)	2. (... ha)	3. (... ha)
Dry season Crops:	1. (... ha)	2. (... ha)	3. (... ha)
Perennial Crops:	1. (... ha)	2. (... ha)	3. (... ha)

5.3 How many persons participate in cultivation works ?

Name of Crop	(Man-days/ha/Annum)				
	Crop 1	Crop 2	Crop 3	Crop 4	Crop 5
1 Land Preparation
2 Sowing
3 Planting
4 Irrigation
5 Weeding
6 Plant protection
7 Harvesting
8 Miscellaneous
Total

5.4 Your irrigation application:

(a) : Tank

Crops	Area (ha)	Date of Irrigation		No. of Days irrigated (days)	Cost of rrigation (Rs/hour)	Method (Continue/ Rotation)
		(from	to)			
1.						
2.						
3.						
4.						
5.						
6.						
7.						

(b) : Well

Crops	Area (ha)	Date of Irrigation		No. of Days irrigated (days)	Cost of rrigation (Rs/hour)	Method (Continue/ Rotation)
		(from	to)			
1.						
2.						
3.						
4.						
5.						
6.						
7.						

5.5 Your cultivation cost :

Item	Name of Crop	(Rs. / ha)				
		1	2	3	4	5
1	Land Preparation					
2	Raising of seedling					
3	Seeding					
4	Transplanting					
5	Fertilizers					
6	Pesticides					
7	Weeding					
8	Water management					
9	Harvesting					
10	Miscellaneous					
Total						

5.6 Your fertilizer utilization

Name of crop	1	2	3	4	5
Fertilizer					
Basal					
N (kg/ha)					
P ₂ O ₅ (kg/ha)					
K ₂ O (kg/ha)					
Top-1					
Date (days a.s/a.t)					
N (kg/ha)					
P ₂ O ₅ (kg/ha)					
K ₂ O (kg/ha)					
Top-2					
Date (days a.s/a.t)					
N (kg/ha)					
P ₂ O ₅ (kg/ha)					
K ₂ O (kg/ha)					

days a.s/a.t : Number of days after sowing / after transplanting

5.7 Your pesticide utilization :

Name of Crop	1	2	3	4	5
(kg/ha)					
Pesticide					

5.8 Your crop production:

Name of Crop	1	2	3	4	5
Area sown (ha)					
Area harvest (ha)					
Production (kg)					
Yield (kg/ha)					
Date sown					
Date harvested					
Remarks					

5.9 Your annual consumption of agricultural products:

Name of Crop	1	2	3	4	5	6	7
Consumption(kg)							
Remarks							

5.10 Your annual sales of agricultural products:

Name of Product	1	2	3	4	5	6	7
Amount(kg)							
Remarks							

5.11 Your selling channels, amounts and prices:

Item sold	Dealing at farm		Selling at local market	
	Amount (kg)	Unit Price (Rs / Kg)	Amount (kg)	Unit Price (Rs / kg)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

5.12 Your labor utilization:

Name of Crop	(Man-day/ha/Annum)				
	1	2	3	4	5
	Man/Woma	Man/Woma	Man/Woma	Man/Woma	Man/Woma
Land Preparation					
Seeding					
Transplanting					
Irrigation					
Weeding					
Caring					
Harvesting					
Transport to storage					
Miscellaneous					

5.13 Market prices and supply sources of fertilizers and pesticides:

Name	Fertilizer				Disease & Pesticide			
	1	2	3	4	1	2	3	4
Market price								
Supply Source								
Unit								

5.14 Your livestock and poultry production (on 1.Jan. and on 31.Dec.1996):

Item	Cattle	Goat	Sheep	Poultry
1. Number of heads				
on 1.Jan.'96				
on 31.Dec.'96				
2. Number of heads				
Born in '96				
Dead in '96				
Sold in '96				
Purchased in '96				
3. Production in '96				
Milk (liters)				
Eggs (pieces)				
4. Unit price sold				
Body (Rs/head)				
Milk (Rs/liter)				
Egg (Rs/piece)				
5. Breeding cost				
Feed cost				
Labor cost				
Other cost				

5.15 Your possession of draft animals, farm tools and farm machinery:

Draft animals (Units)		Farm tools (Units)		Farm machinery (Units)	
Kind	Unit	Kind	Unit	Kind	Unit
1.		1.		1.	
2.		2.		2.	
3.		3.		3.	
4.		4.		4.	

5.16 Conditions of your draft animals, farm tools and farm machinery:

Item	Kind	Good	Not so good	Unusable
Draft Animal	1			
	2			
	3			
Farm tool	1			
	2			
	3			
Farm machinery	1			
	2			
	3			

5.17 Do you practice fisheries? No / Yes Reasons.....
 If yes, the scale of fisheries(Area of water surface): m²
 Persons engaged in fisheries: Annual period engaged Days
 Kind of fish breeding:

5.18 Annual Incomes from Fisheries:

Gross Income: Rs., Input Cost: Rs., Net Income: Rs.

5.19 Your problems in practicing Livestock and Fisheries(in priority)

Livestock	Fisheries
Breeding technology	Breeding technology
Feed stuff arrangement	Feed stuff
Disease and Pest	Disease and Pest
Funds	Funds
Marketing	Marketing

5.20 Evaluation of your farm management: Very good / Good / Medium / Bad / Very bad

5.21 Improvements needed for your farm management (in priority)

- () New crops / Quality seeds, () Cultural technology, () Intensive land use
 () Irrigation system, () Efficient use of labor, () Marketing

6. OTHER ECONOMIC ACTIVITIES:

6.1 Do you (your family) have other off-farm economic activities? Yes / No

Reasons:.....

6.2 Your Annual Off-Farm Income Sources and Amounts:

Source	Amounts(Rs.)	Remarks
1
2
3

6.3 Your ideas for making higher Off-Farm Incomes:

1.
 2.
 3.

7. FARMER'S ATTITUDES

7.1 Do you know about The Project of Rehabilitation of Irrigation Tanks in the area?

Yes / No

If yes, by what means:

7.2 How do you think about this Project? Very necessary / Necessary / Not necessary

Reasons;.....

7.3 For this irrigation project, what works should be done in priority/

- 1 Reason:.....
 2 Reason:.....
 3 Reason:.....

7.4 For improving rural living conditions, what works should be done in priority?

- 1..... Reason:.....
- 2..... Reason:.....
- 3..... Reason:.....

7.5 Your ideas / suggestions on the execution procedure for this project:

- 1.....
- 2.....
- 3.....

7.6 What is the constraint factors for your farming in priority?

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....

7.7 How the tank will be managed after rehabilitation(rank priorities)

- 1. Need turn over to farmers' association
- 2. Form association and will manage
- 3. Contribute labor / money for management
- 4. Need more waterman (Neerkattis) for management
- 5. Rotation management of sluices
- 6. Desilting be allowed
- 7. Catchment management be done regulally
- 8. Need more O & M budget from Government

Attachment C: Database and Geographical Information System (GIS)

(1) General

In the Study on the Rehabilitation of Minor Irrigation Tanks for Rural Development in Tamil Nadu, 2,428 rainfed tanks having more than 40 ha of command area each one and which are operated by PWD, were provided in the PWDs' tank inventory list. For the master plan, 2,093 rainfed tanks were selected by a screening processing.

A database system named Tank Database System, was formulated for prioritization of rehabilitation of selected tanks in order to proceed with their rehabilitation. In addition, due to the tanks' highly densely-distributed locations, Geographical Information System was jointly provided with Tank Database System for identification of the selected tanks.

(2) Objectives and Utilization of the Database on the Guideline

Guideline is formulated for the tank irrigation system consisting of both engineering and social aspects such as characteristics of ayacut (command area), catchment area, tank facilities and farmers' organization, agricultural status.

Tank Database System provides several data concerning the tank irrigation system.

For pre-formulation of the rehabilitation plan, Tank Database System is used for the selection of the tanks using screening of developmental methods included in the Master Plan. Required basic data included in the Tank Database System is immediately provided when required for field inspection and design. Especially, information of both location and accessibility is easily obtained by this system which is supported by the Geographical Information System (GIS).

The old tanks' data will be replaced by the latest data provided by the implementation of the rehabilitation activities, the new data will be utilized Operation and Maintenance stage for the tank irrigation system.

Tank Database System is considered to be useful for the dissemination of developmental concepts in other parts of Tamil Nadu.

(3) Design Concept of the Tank Database System with GIS

1) Consideration

Formulation for the database, under the present conditions surrounding the Minor Irrigation Tanks varies as on-going project for EC program, and jurisdictions for district, Panchayat and Taluk.

As the rehabilitation plan for the Minor Irrigation Tank will be disseminated through the whole state in the future, the Tank Database System requires an efficient utilization and updating of the data.

i) Database of EC Tank Modernization Project

In the EC Tank Modernization project, several database systems are formulated using Tank Information System (TIS), Management Information System (MIS), Geographic Information System (GIS), Feasibility Report Generator (FRG).

For the Minor Irrigation Tank, the Tank Database System was considered to be useful for both TIS and GIS. Hence, the establishment of the system was made considering the above programs; following items were selected as the application software programs.

- Database soft: Microsoft Access ver.7.0 for windows 95
- Geographical Information System (GIS): MapInfo Professional ver. 4.1 for windows 95.

ii) Administrative Jurisdictions for District, Taluk and Panchayat

Administrative jurisdictions for Minor irrigation Tanks are often redefined due to political reasons. The changes affect boundaries and denominations such as district, Taluk and Panchayat.

The above mentioned constraints must be taken into account when selecting the tanks.

2) Design Concept of the Database

i) Organization and Layout of the Field (Table)

Data of the tank provided by the Inventory List is classified into 13 categories which consist of 62 fields. However, in the Tank Database System, the number of categories are 14 which consist of 83 fields, as shown in Table C.1.

Tank Database System can flexibly deal with the above mentioned conditions; the fields are organized into 13 tables classified by data type as shown in the Table C.2.

Relationship among the tables for the Tank Database System is shown in Fig. C.1.

ii) Use of the Displayed Menu (Main Menu, Sub Menu)

Menu of the Tank Database System are setup in a way to facilitate its operation, and for preventing mistakes. The menu displayed in the monitor provides each categories depending on the type of the inquiry (engineering or social aspects).

Use of the menu is shown in Fig. C.2.

iii) Mapping Concept on the Geographical Information System (GIS)

The aim of the GIS is to provide a mechanism for easy verification of selected tanks on the Monitor. It shows the mapping and classification of selected tanks depending on the type of the inquiry (engineering and social aspects).

This GIS system is linked to the Tank Database System using the "ODBC table. The data organization is made through the Tank Database System using the MS Access in order to unify the operation.

(4) Recommendation

In accordance with the requirements, the Tank Database System provides basic data on both engineering and social aspects for selected tanks. However, this system established based on the PWDs' Tank Inventory List, has some problems such as follows:

- Regarding the data, especially engineering aspects, both metric and feet-pound systems are mixed and remarkably confused concerning application items, catchment area, ayacut and tank dimensions.
- Name spelling of the tank and villages/Panchayat vary from one data source to another due to the use of the alphabet-based Tamil language.
- Except for the 10 tanks which are selected in the study of *The Rehabilitation of Minor Irrigation Tanks for Rural Development in Tamil Nadu.*, data for the GIS (longitude and latitude) is unavailable or the data is misallocated in the data formats. It is necessary to confirm the tanks locations and the drawings from scanned base map, tank by tank, using the GIS system.
- District boundary of Tamil Nadu State vary from one map to another map, especially Taluk maps. Also, the boundaries are subject to renaming. Hence, it must be necessary to replace the old base map with the latest one by using the scanner within GIS system framework.

The above mentioned problems concerning data for the tanks must be urgently solved through the data provided by the PWDs' survey. This will contribute an appropriate formulation of a rehabilitation plan and towards for having a broader unified database which covers the whole state.

(5) Operation of the Database and GIS (Tank Database System)

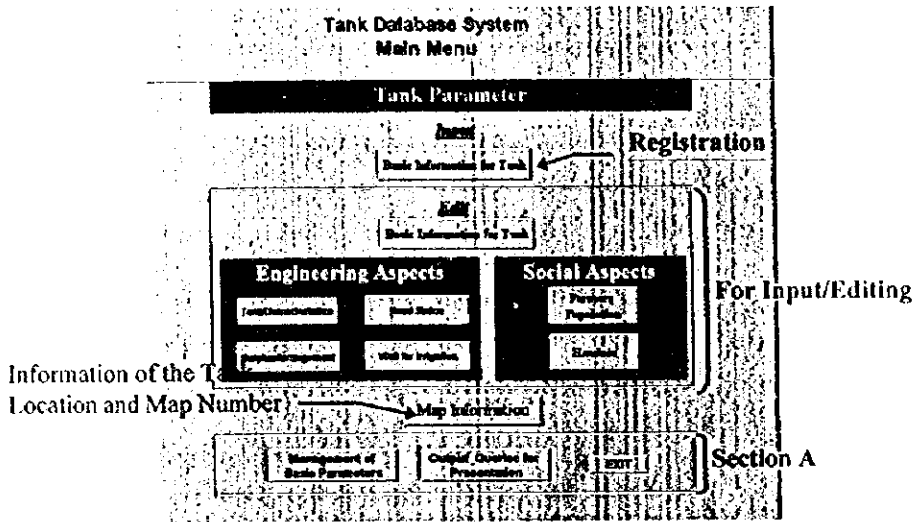
Due to many number of the fields, menu for the input form is divided as main/sub menu. This form is important in the database utilization. Operation of the Tank Database System is explained in both of main and sub menu.

1) Main Menu

As shown in Fig. C.2, menu of Tank Database System is classified into main/sub menu depending on the type of the data. The changing of the menu can

be operated easily using the command button provided below Main Menu (section A).

Buttons for input, editing and registration are provided in the Main Menu. Considering the efficient operation and preventing mistakes, registration and input/editing are divided as shown in the Figure.



i) Registration and Input/Editing for the Tank

Forms of registration and input/editing are shown in the Figure. Registration side is necessary to input name of the tank, and input/editing side is necessary to select the code using combo box (section B) as shown in the following figures.

This screenshot shows the registration form. At the top, it says 'Select Division and Ongoing Project of the Tank by Code'. There are dropdown menus for 'District Code' and 'Ongoing Project Code'. Below this is a 'Location' section with a 'Tank Code (Number)' dropdown and a 'District Code' dropdown. A label 'Selection of Administrative Jurisdictions using Combo Box.' points to the 'Tank Code' dropdown. The 'Registration of the Tank Name' section has a text input field for 'Name of Tank'. Below that is a 'Coordinate' section with input fields for 'Latitude' and 'Longitude' (each with 'Deg', 'Min', 'Sec' sub-fields) and 'Altitude' and 'Bank Name'. At the bottom, there are 'Add Record' and 'Delete' buttons, and page navigation buttons for 'Page 1', 'Page 2', and 'Page 3'.

This screenshot shows the input/editing form. At the top, it says 'Filter Tank by Code' and 'Selection of the tank using the Tank Code'. There are dropdown menus for 'Tank Code' and 'Ongoing Project Code'. Below this is a 'Location' section with dropdown menus for 'District Code' and 'Tank Code'. A label 'Section B' points to the 'Tank Code' dropdown. The 'Name of Tank' is 'Ayaraku Seal'. Below that is a 'Coordinate' section with dropdown menus for 'Latitude' and 'Longitude' (each with 'Deg', 'Min', 'Sec' sub-fields) and 'Altitude' and 'Bank Name'. At the bottom, there are 'Go to Previous Record' and 'Go to Next Record' buttons, and page navigation buttons for 'Page 1', 'Page 2', and 'Page 3'.

ii) Formats of the Input of Tanks' Data

Input of the tanks' data include administrative jurisdictions, engineering and social aspects. As an example of the input/editing, head sluice of engineering aspect and Hamlets for social aspect are compared. Both formats are shown in the Figure. Both formats require the Tank Code before inputting the tanks' data.

The figure consists of two side-by-side screenshots of a data entry form titled 'Find Tank by Code'. Both screenshots have a 'Tank Code' field containing the value '2'. The 'Name of Tank' field contains 'A N Rupp'.

Left Screenshot: Social Aspects

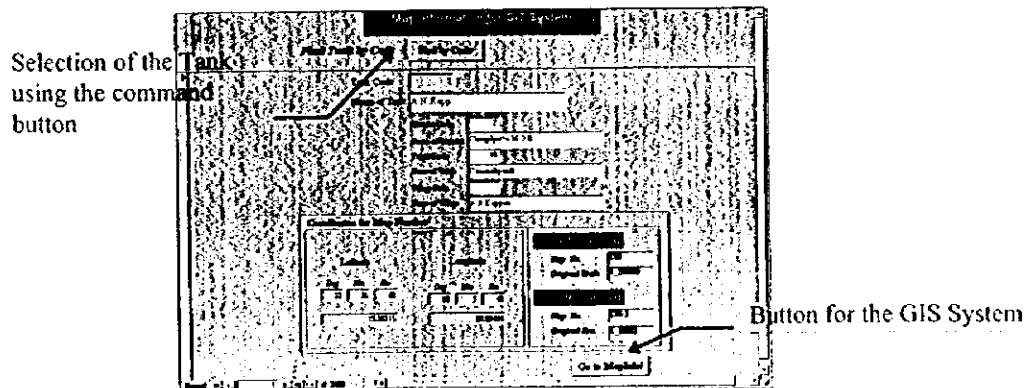
No.	Name of Hamlet	No. of House	No. of Population	No. of Children	Age
1	75	40	400	50	

Right Screenshot: Sluice Dimensions

Sluice No.	Sluice Len	Sluice Width	Sluice Area	Sluice Perim
1	11.45			
2	11.85			

iii) Use of the GIS

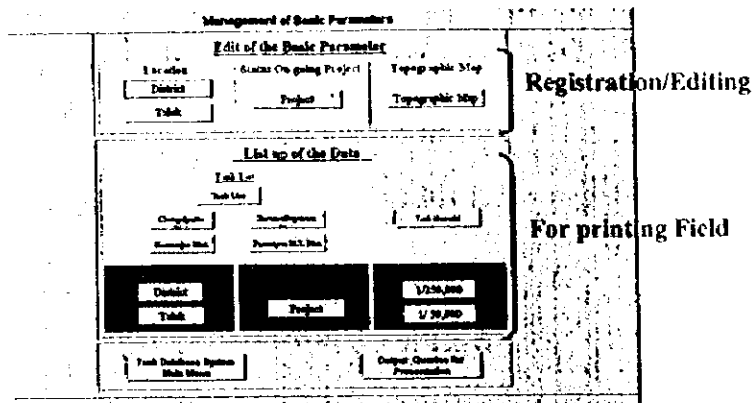
Map Information Button is used to mapping the tanks' location, and provides the Map Number. Based on the Map Number, selected tank is located on the topographic map in the monitor using GIS system.



2) Sub-menu

Basic data such as administrative jurisdictions, on-going project and topographic map, are safely managed in Management of Basic Parameters of sub-menu.

The basic data will be changed after printing out the list of these data. The modification of these data is same as the case of engineering and social aspects in the Main Menu.



3) Making Query in accordance with requirement

Query can be made using the function for graphical user interface of Microsoft Access in the Tank Data Base. Tank Database System shows the result against the inquiries using the "query" which are made by combing the tables. Besides, due to linking among the software, GIS system utilizes Tank Database Systems' query, and shows mapping analyzed on the monitor. Query is made to combining the table of the database, and sample of the query is shown in the Figure.

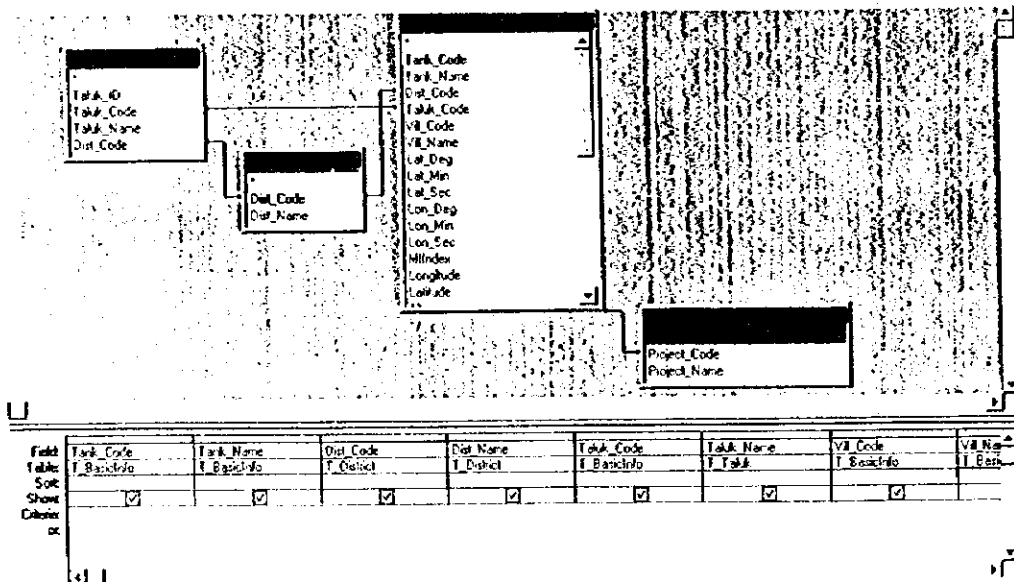


Table C.1 Abbreviations for the Database Field

Category	Fields of Inventory List	Abbreviation for the Fields	Unit	Relation	
Location	1) S/N	1 Tank_Code	Auto-No		
	2) Name of Tank	2 Tank_Name	Name		
	No. of District	3 Dist_Code	Number		
	Name of District	4 Dist_Name	Name		
	Identification for Database	5 Tank_ID	Auto-No		
	No. of Taluk	6 Taluk_Code	Number		
	Name of Taluk	7 Taluk_Name	Name		
	3) No. of Village	8 Vill_Code	Number		
	4) Name of Village	9 Vill_Name	Name		
	Coordinates	Degree for Latitude	10 Lat_Deg	degree	
Minutes for Latitude		11 Lat_Min	degree		
Second for Latitude		12 Lat_Sec	degree		
5) Latitude		13 Latitude	Number		
Degree for Longitude		14 Lon_Deg	degree		
Minutes for Longitude		15 Lon_Min	degree		
Second for Longitude		16 Lon_Sec	degree		
6) Longitude		17 Longitude	degree		
Index for MapInfo		18 MIIndex	-		
7) Altitude		19 Alt_m	m		
8) River Basin	20 Basin_Name	Name			
Hydrology	9) Free	21 Free_Catch	km ²		
	10) Intercepted	22 Inter_Catch	km ²		
	11) Total	23 Tot_Catch	km ²		
	12) Equivalent	24 Equi_Catch	km ²	9)*10)5	
	13) Type	25 Catch_Type	*G/A/P		
	14) Dependable Yield	26 Depen_Yield	Mm/km ²		
	15) Tank only	27 Tank_InrCA	ha		
	16) Tank & Well	28 Well_Tank_InrCA	ha		
	17) Registered Ayacut	29 R_Ayacut	ha		
	Average Cultivated Area	30 Ave_Cult_Area	ha		
18) Other Cultivated Area	31 O_Cult_Area	ha			
19) Permanent Gap	32 Per_Gap	ha			
Tank Characteristics	20) Full Tank Level	33 FullTank_L	m		
	21) Maximum Water Level	34 MaxWater_L	m		
	22) Top Bund Level	35 TopBund_L	m		
	23) Length of Bund	36 Bund_Length	m		
	24) Top Width of Bund	37 Bund_Width	m		
	25) Side Slope (Front, Rear)	38 BundSlope_F	Text		
		39 BundSlope_R			
	26) No. of Fillings	40 No_Fillings	No		
	27) Live Storage Capacity	41 Live_Store	Mm ³		
	28) Maximum Depth of Storage	42 Max_Depth	m		
Surplus Arrangement	29) B.C. Canigula Weir	43 BC_Length	m		
	30) Sand Weir	44 Sand_Length	m		
	31) H.C. Weir	45 HC_Length	m		
	32) Total	46 Tot_WeirLength	m	29)+30)+31)	
	33) Crest Level	47 Crest_Level	m		
	34) Maximum Flood Discharge	48 Max_Disch	Mm ³		
	35) Designed Flood Discharge	49 Design_Disch	Mm ³		
	36) Flood Lift	50 Flood_Lift	m		
	37) Chaining	51 Chaining	m		
	38) Sill Level	52 Sill_Lev	m		
Head Sluice (for each sluice)	39) Discharge	53 Disch	Mm ³		
	40) Regulating Arrangement Type	54 Reg_ArrayType	*S/P		
	41) Ayacut Served	55 Ser_Aya	ha		
	Socio-Economics	42) Common use	56 E_WellCom	Number	
		43) Individual use	57 E_WellIndi	Number	
		44) Common use	58 NE_WellCom	Number	
		45) Individual use	59 NE_WellIndi	Number	(42)+(43)+(44)+45)
		46) Total			
		47) Below 1ha	60 Small_Farm	Number	
	48) Between 1-2ha	61 Medium_Farm	Number		
49) Above 2ha	62 Large_Farm	Number			
50) Total		Number	(47)+(48)+49)		
51) Average Size		Number	17)/50)		
No. of Persons Concerned	52) Farmers Size	63 Farm_Pop	Number		
	53) Farm Labours Family	64 FarmLab_Pop	Number		
Hamlets (for each Hamlets)	54) Name	65 HamletName	Name		
	55) No. of Farmers	66 No_Farm	Number		
	56) Male Adult (Work Age)	67 No_Males	Number		
	57) Female Adult	68 No_Females	Number		
	58) Children	69 No_Children	Number		
59) Age	70 Age	Number			
W.U.A	60) Name	71 WUA_Name	Name		
	61) Registered Date	72 WUA_Date	Date		
Topographic Maps for GIS System	No. of Project	73 Project_Code	No		
	Status of On-going Project	74 Project_Name	Name		
	Memo	75 Project_Note	Text		
		76 Map_ID	Auto-No		
		77 TopoMap_Code	Number		
No. of Topographic Map	78 TopoMap_No	No			
Minimum Longitude	79 Lon_min	Number			
Maximum Longitude	80 Lon_max	Number			
Minimum Latitude	81 Lat_min	Number			
Maximum Latitude	82 Lat_max	Number			
Scale of Topographic Map	83 TopoMap_Scale	No			

Note: *G/A/P - Good / Average / Poor
 *S / P - Shutters / Plug rod

Table C.2 Organization of the Tables within the Tank Database System (1/2)

Category		Field of the Database	Unit	T_District	T_Taluk	T_BasicInfo	T_TankCharac	T_HeadSluice	T_WeirDetail	T_WeirLength	T_Well	
Location		1 Tank Code	Auto-No			0	0	0	0	0	0	
		2 Tank Name	Name			0						
		3 Dist Code	Number	0	0	0						
		4 Dist Name	Name	0								
		5 Taluk ID	Auto-No		0							
		6 Taluk Code	Number		0	0						
		7 Taluk Name	Name		0							
		8 Vill Code	Number			0						
		9 Vill Name	Name			0						
Coordinates		10 Lat Deg	degree			0						
		11 Lat Min	degree			0						
		12 Lat Sec	degree			0						
		13 Longitude	Number			0						
		14 Lon Deg	degree			0						
		15 Lon Min	degree			0						
		16 Lon Sec	degree			0						
		17 Longitude	degree			0						
		18 MInDev				0						
		19 Alt_m	m			0						
		20 Basin Name	Name			0						
Hydrology	Catchment	21 Free Catch	km ²			0						
		22 Inter Catch	km ²			0						
		23 Tot Catch	km ²			0						
		24 Equi Catch	km ²			0						
		25 Catch Type	G/A/P			0						
		26 Depon Yield	Mm ³ /km ²			0						
Ayscut (Command Area)		27 Tank IrrA	ha			0						
		28 Well/Tank IrrA	ha			0						
		29 R_Ayicut	ha			0						
		30 Ave_Cult_Area	ha			0						
		31 O_Cult Area	ha			0						
	32 Per_Gap	ha			0							
Tank Characteristics		33 Full Tank L	m				0					
		34 Max Water L	m				0					
		35 Top Bund L	m				0					
		36 Bund Length	m				0					
		37 Bund Width	m				0					
		38 Bund Slope F	Text				0					
		39 Bund Slope R					0					
		40 No Fillings	No				0					
Surplus Arrangement		41 Edge Store	Mm ³				0					
		42 Max Depth	m				0					
		43 BC Length	m					0				
		44 Sand Length	m					0				
		45 HC Length	m					0				
		46 Tot Wire Length	m						0			
		47 Crest Level	m						0			
		48 Max Disch	Mm ³						0			
		49 Design Disch	Mm ³						0			
		50 Flood Lvl	m						0			
Head Sluice (for each sluice)		51 Chanage	m					0				
		52 Silt Lev	m					0				
		53 Disch	Mm ³					0				
		54 Reg Array Type	RS/P					0				
		55 Ser_Aya	ha					0				
Socio-Economics	No. of Well for Irrigation	56 E_WellCom	Number								0	
		57 E_WellInd	Number								0	
		58 NE_WellCom	Number								0	
	No. of Farmers Size	59 NE_WellInd	Number								0	
		60 Small Farm	Number									
		61 Medium Farm	Number									
	No. of Persons Concerned	62 Large Farm	Number									
		63 Farm Pop	Number									
		64 FarmLab Pop	Number									
	Hamlets (for each Hamlets)	65 Hamlet Name	Name									
		66 No Fam	Number									
		67 No Males	Number									
		68 No Females	Number									
WUA	69 No Children	Number										
	70 Age	Number										
	71 WUA Name	Name			0							
Topographic Maps for GIS System		72 WUA Date	Date			0						
		73 Project Code	No			0						
		74 Project Name	Name									
		75 Project Note	Text			0						
		76 Map ID	Auto-No									
		77 TopoMap Code	Number									
		78 TopoMap No	No									
	79 Lon_min	Number										
	80 Lon_max	Number										
	81 Lat_min	Number										
	82 Lat_max	Number										
	83 TopoMap Scale	No										

Table C.2 Organization of the Tables within the Tank Database System (2/2)

Category		Field of the Database	Unit	T_Socio_Farmers Pop	T_Socio_Hamlets	T_Project	T_TopoMap	T_TopoMap1st	Remarks	
Location		1 Tank_Code	Auto-No	0	0					
		2 Tank_Name	Name							
		3 Dist_Code	Number							
		4 Dist_Name	Name							
		5 Taluk_ID	Auto-No							
		6 Taluk_Code	Number							
		7 Taluk_Name	Name							
		8 Vill_Code	Number							
		9 Vill_Name	Name							
Coordinates		10 Lat_Deg	degree							
		11 Lat_Min	degree							
		12 Lat_Sec	degree							
		13 Latitude	Number							
		14 Lon_Deg	degree							
		15 Lon_Min	degree							
		16 Lon_Sec	degree							
		17 Longitude	degree							
		18 AltIndex	.							
		19 Alt_m	m							
Hydrology	Catchment	20 Basin_Name	Name							
		21 Free_Catch	km ²							
		22 Inter_Catch	km ²							
		23 Tot_Catch	km ²							
		24 Equi_Catch	km ²							
		25 Catch_Type	*G/A/P							
		26 Dejen_Yield	Mm ³ /km ²							
Ayarut (Command Area)		27 Tank_IriA	ha							
		28 Well+Tank_IriA	ha							
		29 R_AyacuI	ha							
		30 Ave_Cult_Area	ha							
		31 O_TuL_Area	ha							
		32 Per_Cap	ha							
Tank Characteristics		33 FullTank_L	m							
		34 MaxWater_L	m							
		35 TopBund_L	m							
		36 Bund_Length	m							
		37 Bund_Width	m							
		38 BundSlope_F	Text							
		39 BundSlope_R								
		40 No_Fillings	No.							
		41 Live_Store	Mm ³							
		42 MaxT_Depth	m							
Surplus Arrangement		43 BC_Length	m							
		44 Sand_Length	m							
		45 HC_Length	m							
		46 Tot_WireLength	m							
		47 Crest_Level	m							
		48 Max_Disch	Mm ³							
		49 Design_Disch	Mm ³							
		50 Flood_Lih	m							
Head Shuice (for each sluice)		51 Channage	m							
		52 Silt_Lev	m							
		53 Disch	Mm ³							
		54 Reg_AntzType	*S/P							
		55 Ser_Aya	ha							
Socio-Economics	No. of Wells for Irrigation	Energized	Number							
		Non Energized	Number							
			Number							
	No. of Farmers Size	60 Small_Farm	Number	0						
		61 Medium_Farm	Number	0						
		62 Large_Farm	Number	0						
	No. of Persons Concerned	63 Farm_Pop	Number	0						
		64 Farmab_Pop	Number	0						
	Hamlets (for each Hamlets)	65 HamletName	Name		0					
		66 No_Farm	Number		0					
		67 No_Males	Number		0					
		68 No_Females	Number		0					
		69 No_Children	Number		0					
WUA	70 Age	Number		0						
	71 WUA_Name	Name								
Topographic Maps for GIS System	72 WUA_Date	Date								
	73 Project_Code	No			0					
	74 Project_Name	Name			0					
	75 Project_Note	Text								
	76 Map_ID	Auto-No					0			
	77 TopoMap_Code	Number				0	0			
	78 TopoMap_No	No				0				
	79 Lon_min	Number				0				
	80 Lon_max	Number				0				
	81 Lat_min	Number				0				
	82 Lat_max	Number				0				
	83 TopoMap_Scale	No					0			

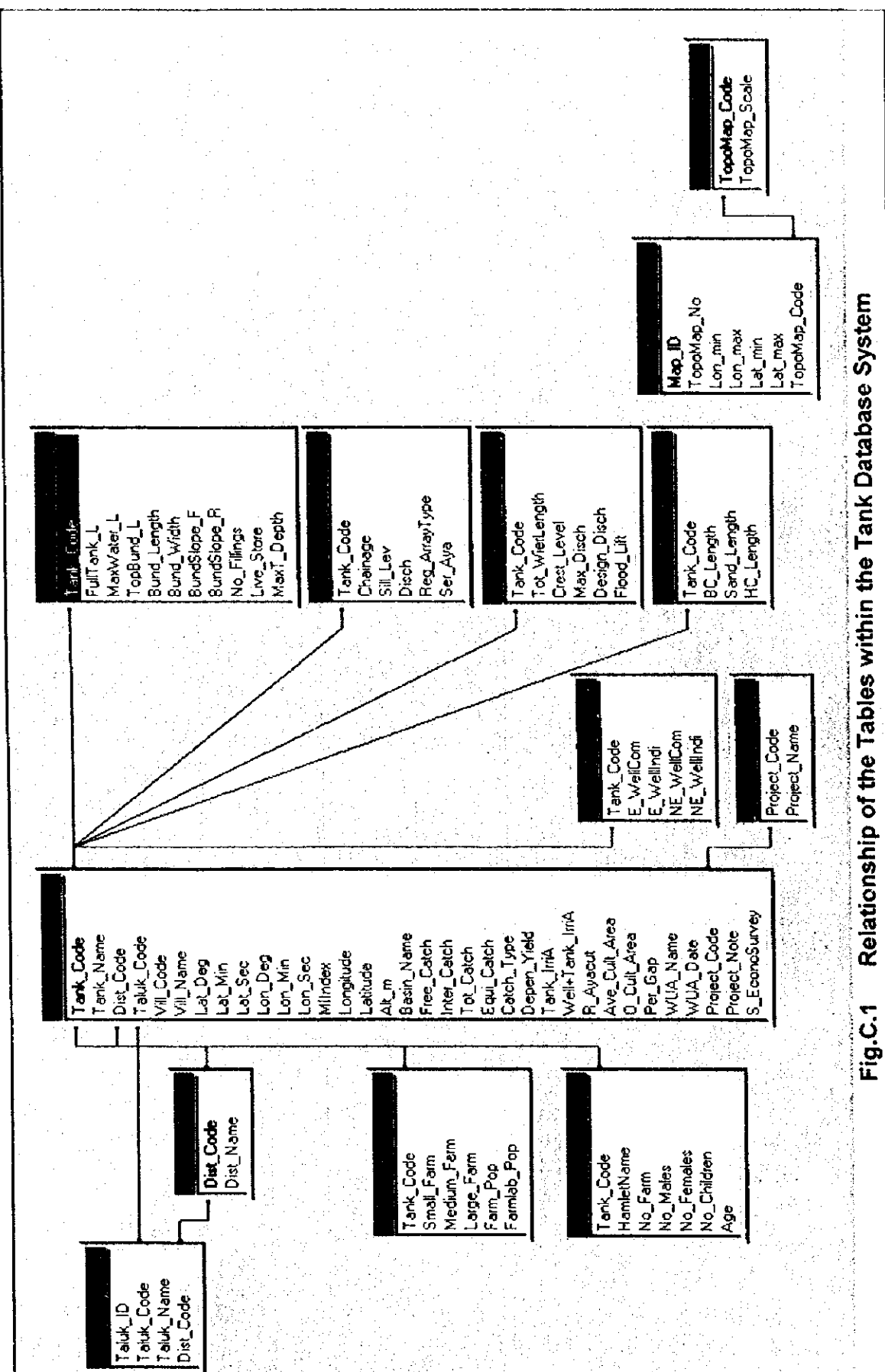
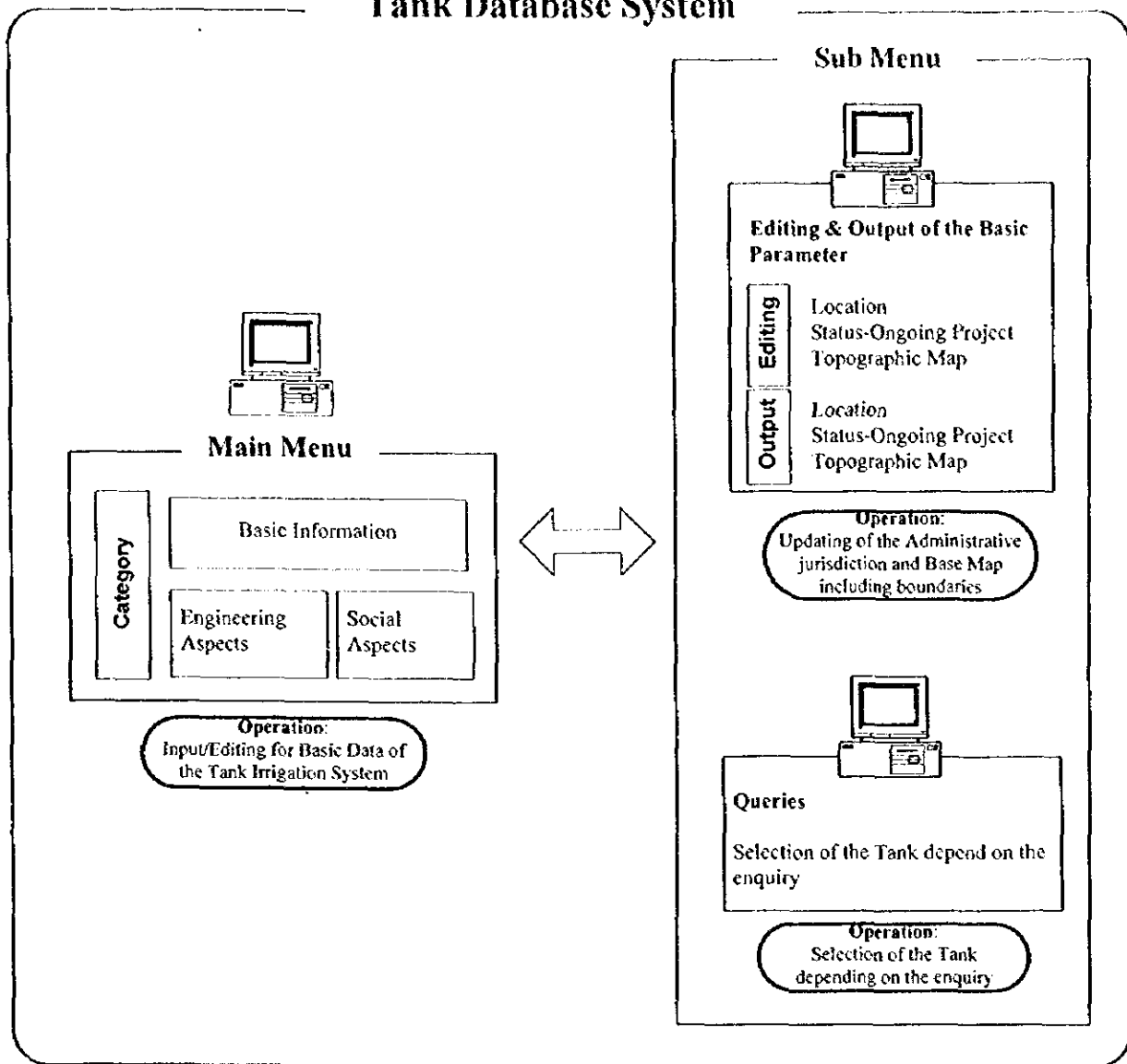


Fig.C.1 Relationship of the Tables within the Tank Database System

Tank Database System



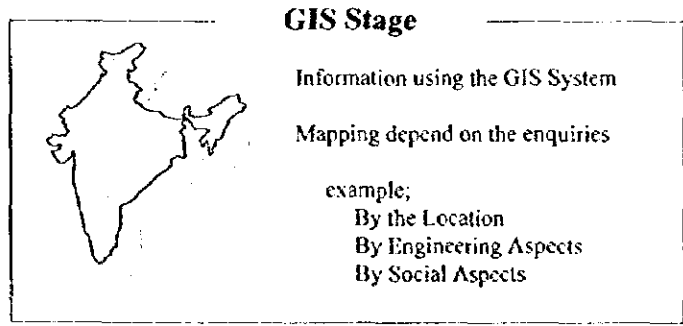
Operation:
Input/Editing for Basic Data of the Tank Irrigation System

Operation:
Updating of the Administrative jurisdiction and Base Map including boundaries

Operation:
Selection of the Tank depending on the enquiry



Information by the GIS



Operation:
Mapping the Tank Location and Classification

Fig. C.2 Flow of Tank Database System and GIS







1950

1951