

WATER HARVESTING & MANAGEMENT PROJECT

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SWACH

SANITATION WATER & COMMUNITY HEALTH PROJECT

25, ALKAPURI, UDAIPUR, RAJASTHAN (INDIA)

PHONE NO. (91) (294) 529603, 529607 FAX NO. (91) (294) (529603)

1. **PROJECT TITLE**

Water Management and Rain Water Harvesting

2. **TOTAL PROJECT COST**

Rs. 415.50 Crores.

3. **APPLICANT INFORMATION**

The project will be executed through SWACH and other agencies / NGO's in the Udaipur Tribal Sub Plan Area.

Sanitation Water & Community Health Project
25, Alkapuri, UDAIPUR (RAJASTHAN)

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Contact Person : Shri C.M.Meena

I.A.S.
Divisional Commissioner,
: Tribal Area Development &
Chairman SWACH

Nature of Organization : Non Government Organization

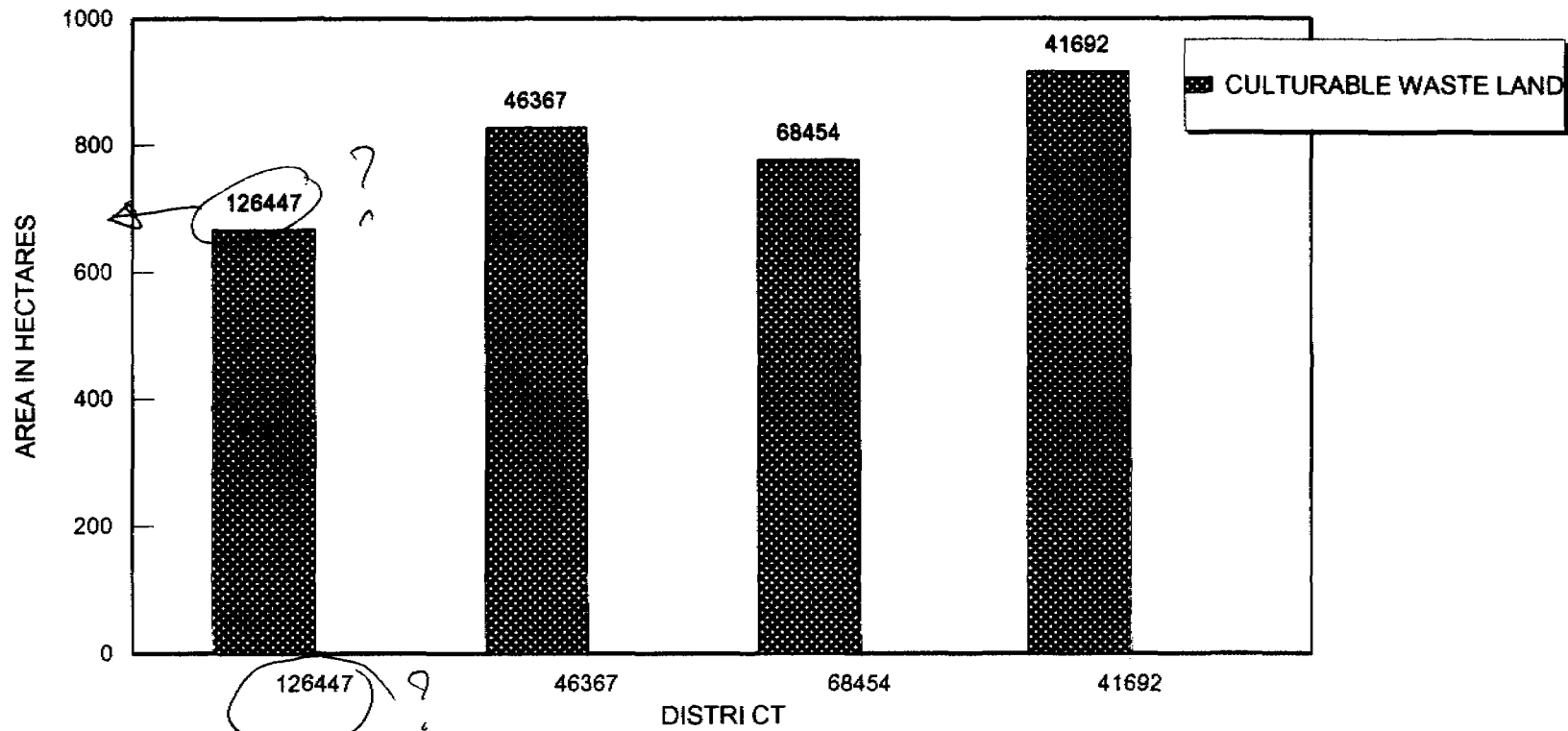
PROJECT DESCRIPTION

4. **GOAL OF THE PROJECT**

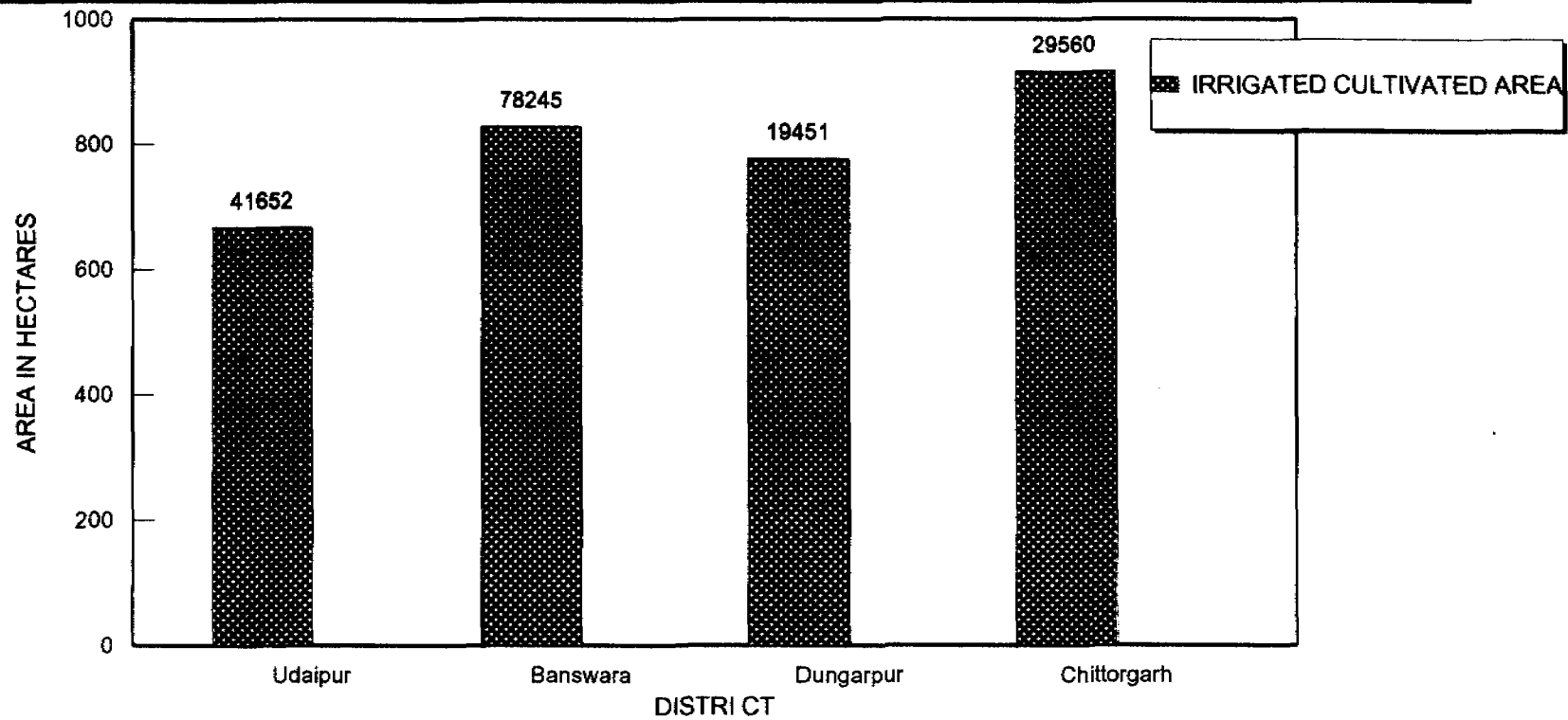
goal { The objective of this project is to tap surface run-off and to utilise it in the creation of irrigation potential. A major portion of the surface run off is unutilized en in areas where other traditional irrigation facilities are not available for the benefit of the economically backward communities inhabiting the Tribal Sub Plan Area in the districts of Udaipur, Banswara, Dungarpur, Chittorgarh and Sirohi of Rajasthan state.

defn target

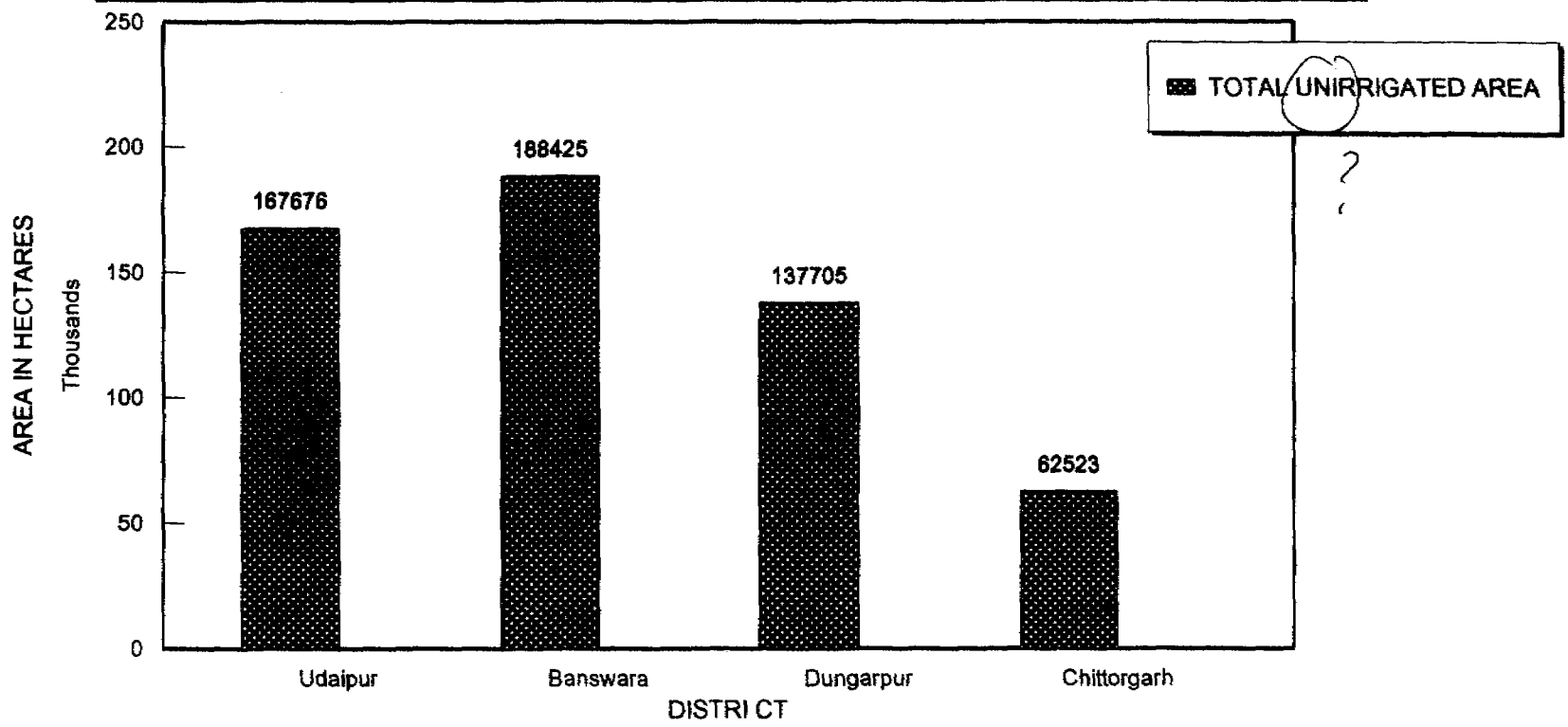
CULTURABLE WASTE LAND OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN HECTARES)



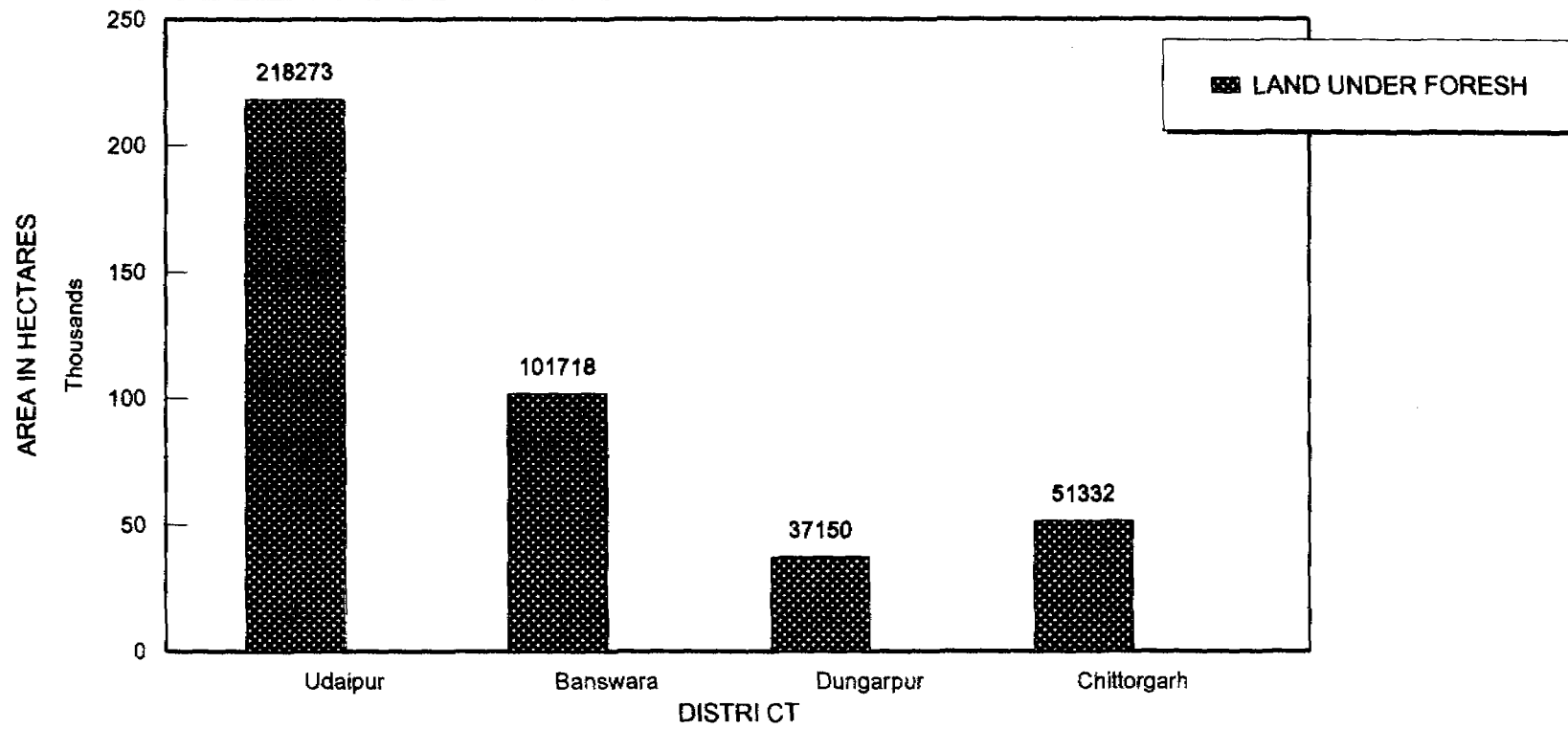
TOTAL IRRIGATED CULTIVATED AREA OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN HECTARES)



UN?
TOTAL IRRIGATED AREA OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN HECTARES)



LAND UNDER FOREST OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN HECTARES)



irrigation project
77

PURPOSE OF THE PROJECT

Problem

Conception, planning & construction of small water harvesting structures in the Tribal Sub Plan Area where rain fall is quite sufficient and above average and most of the runoff is going unutilised. With the construction of small water harvesting structures & their proper utilisation the irrigation potential will increase in the area which will raise the living standards of the rural tribal community.

5. **PROBLEM**

Poor productivity due to lack of irrigation and modern water management leading to less availability of water for irrigation and the consequent poverty is the problem in the project area.

6. **STRATEGY**

*STRATEGY
THIS NEEDS
ATTENTION*

To provide better & improved irrigation facilities by tapping surface run-off and its utilisation in the project area by series of check dams/ tanks which will be constructed on rivers and streams existing in the project area to store the runoff. The stored water resource will be made available by flow irrigation in the lower areas adjoining the reservoirs and by commissioning lift irrigation schemes in higher areas and these schemes shall be maintained and operated by groups of beneficiaries.

7. RATIONALE OF THE PROJECT

The topography of the project area is undulating having good rainfall with high intensity and a small number of rainy days which results in heavy rainfall in a short period and causes erosion of arable lands. The physiography of the area is such that construction of large storage structures is not possible and hence the imperative need to conserve this run-off by means of a series of small structures like check dams, anicuts and tanks.

The work of construction of small structures as surface water reservoirs as water sources for lift irrigation schemes is continuing in the project area by the state irrigation department and the DRDAs through the user groups.

8. GEOGRAPHICAL AREA OF FOCUS OF THE PROJECT PROPOSAL

District : Dungarpur

A large portion of the district consists of undulating hills and sparsely wooded valleys. The forests have largely disappeared from the plains due to illicit felling and cutting of trees. Only Mahuwa and Mango trees are found in agriculture fields. Two perennial rivers Mahi and Som flow through the district. The highest hill feature located in the extreme north west of the district is approximately 572 meters above mean sea level. In the north and east the landscape is rugged and wild.

Climate

The average annual rainfall varies from 701 mm to 825 mm at different rain gauge stations in the district and on an average there are 35 rainy days with an average daily rainfall of 2.5 mm or more.

Cropping Pattern

Two main cropping seasons are Kharif when crops sown are rice, maize, jawar, bajra and pulses while wheat, barley and gram are sown as Rabi crops.

District Banswara

The Eastern part of the district is occupied by flattopped hills of the Deccan trap. The plains are covered mostly by black and loamy soils. There are scattered ranges of Aravallis in the Eastern half of the district. The highest range in the south is about 610 meters, in the north 440 meters and in the east 510 meters. The average level of the district is 350 meters above Mean Sea Level.

Climate

The district is identified as a drought prone region of Southern Rajasthan. The maximum temperature goes up to 46°C. The climate of this area is influenced by the rain bearing South West winds which give an average annual rainfall of 828 mm.

Cropping Pattern

Kharif is the main cropping season of the district. The important crops sown in the district in order of their importance are maize, rice, gram and wheat, the first two in Kharif and later two in Rabi.

District : Udaipur

Physiography

A large portion of the district is composed of undulating hills with sparse valleys. The district is encircled by Aravali ranges from north to south. The northern part of the district consists of an elevated plateau while the eastern part has vast stretches of fertile plains. The southern part is covered with rocks, hills and dense forests whereas the western portion has the hilly tracts of Mewar which are also a part of the Aravalli range.

All the rivers in this district are seasonal and usually flow from the Monsoon period to March or April in summer. The river Banas and its tributaries flow through the eastern part of the district. Other rivers in the district include Som, Jakham, Wakal, Sei, Sabarmati and Berach.

Climate

The average rainfall of the district is 638 mm while annual rainfall varies from 528 mm to 830 mm at various locations in the district. It is generally observed from the available

records that the rainfall decreases from the south-west to north-east. About 96% of the annual rainfall is received during the monsoon season with July being the month of maximum rainfall. On an average there are 31 rainy days in a year whereas only 15-20 rainfall events produce runoff which have a rainfall of more than 10 mm. The average minimum and maximum temperatures recorded at the Udaipur weather station during the year 1995 were 5.3⁰C and 39⁰C in January and June respectively.

Cropping Pattern

Kharif (rainy season) and Rabi (Winter season) are the two main cropping seasons practiced in the district. However Kharif remains the main cropping season in the district because of limited irrigation facilities. The major Kharif crops sown are paddy, maize, jawar, bajra, black gram or urad, green gram or moong, tuar or pigeon pea while wheat, barley, gram and oilseeds are the major Rabi crops. Vegetables are also grown in river beds or low lying areas during summer where water is available.

District : Chittorgarh

Physiography and Drainage

A large portion of the study area is composed of undulating hills with varying slopes. The forest has almost disappeared from the plains due to illicit felling and cutting of trees. On an average the district is 183 m above mean sea level. The main rivers in the district are Gambhiri, Badach, Banas,

Chambal, Gunjal, Kadmati, Wagan and Shivna.

Climate

The average rainfall of the district is 850 mm while annual rainfall for the year 1996 is 946 mm and 675 mm at Pratapgarh and Arnaud rain gauging locations respectively. From the available rainfall data the average rainfall is 916 mm for the region considered under this study. It is generally observed from the available records that the south-eastern regions have more rainfall and it decreases from south-east to north-east. About 95% to 96% of the annual rainfall is received during the monsoon season with July being the month of maximum rainfall. On an average, there are a total of 45 rainy days in this tribal region whereas only 20-25 rainfall events produce runoff which have a rainfall of more than 10 mm.

Cropping Pattern

Kharif and Rabi are the two main cropping seasons practiced in the district. However, Kharif remains the main cropping season in the district because of limited irrigation facilities. The major Kharif crops sown are paddy, maize, jawar, bajra, black gram or urad, green gram or moong, tuar or pigeon pea while wheat, barely, gram and oilseed crops are the major Rabi crops. Vegetables are also grown in river beds or low lying area during summer where water is available.

9. TARGET GROUP AND PROJECT BENEFICIARIES

The target group of the project is the tribal inhabitants of

the Tribal Sub Plan Area who possess small lands holdings having crucible sloppy un-productive land and are entirely dependent on the mercy of the rain goods for their agricultural production

Land use for agriculture is predominated by Kharif crops in most parts of the district as people are dependent on rainfall for subsistence farming particularly in tribal areas and unirrigated areas. The total area of the tribal tehsils, under study is 20.73% (2,14,668 ha.) of the area of the district out of which 24.00% is forest land and 43.00% of is culturable land while 10.63% of total area is irrigated by different sources. Culturable waste constitutes 19.00% and 9.00% area is not available for cultivation and 5% of it is waste land.

Comparative land use profile of the districts is as tabulated below:

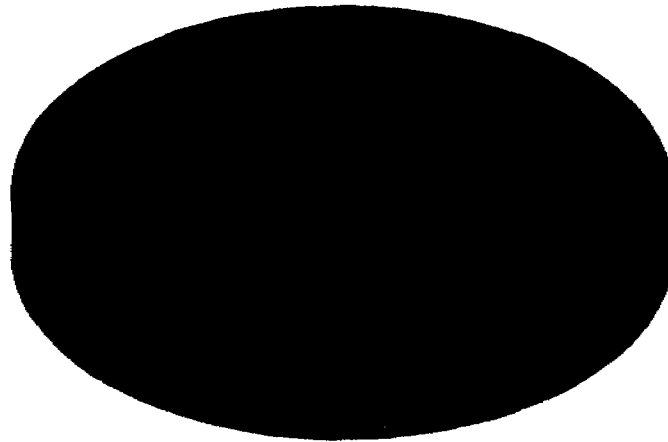
Comperative Land Use Profile of Districts

(Area in Hectare)

S.No.	Particular	Udaipur	Banswara	Dungarpur	Chittor	Total Area
1	Total Geographical Area	822301	505140	353808	214668	1895917
2	Irrigated Cultivated Area	41652	78245	19451	29560	49011
3	Unirrigated Cultivated Area	167676	188425	137705	62523	200228
4	Land Under Forest	218273	101718	37150	51332	408473
5	Culturable Waste Land	126447	46367	68454	41692	282960
6	Area Not Available For Cultivation	267563	90387	91047	29560	478557

SCHEDULE TRIBE POPULATION OF TRIBAL SUB PLAN AREA OF RAJASTHAN

3073170 (56.1%) NON TRIBAL SUB PLAN AREA

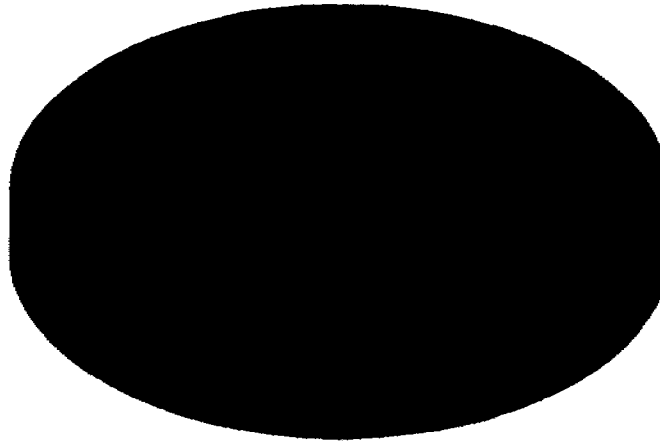


2401711 (43.9%) TRIBAL SUB PLAN AREA

*Prishtawar
?/?*

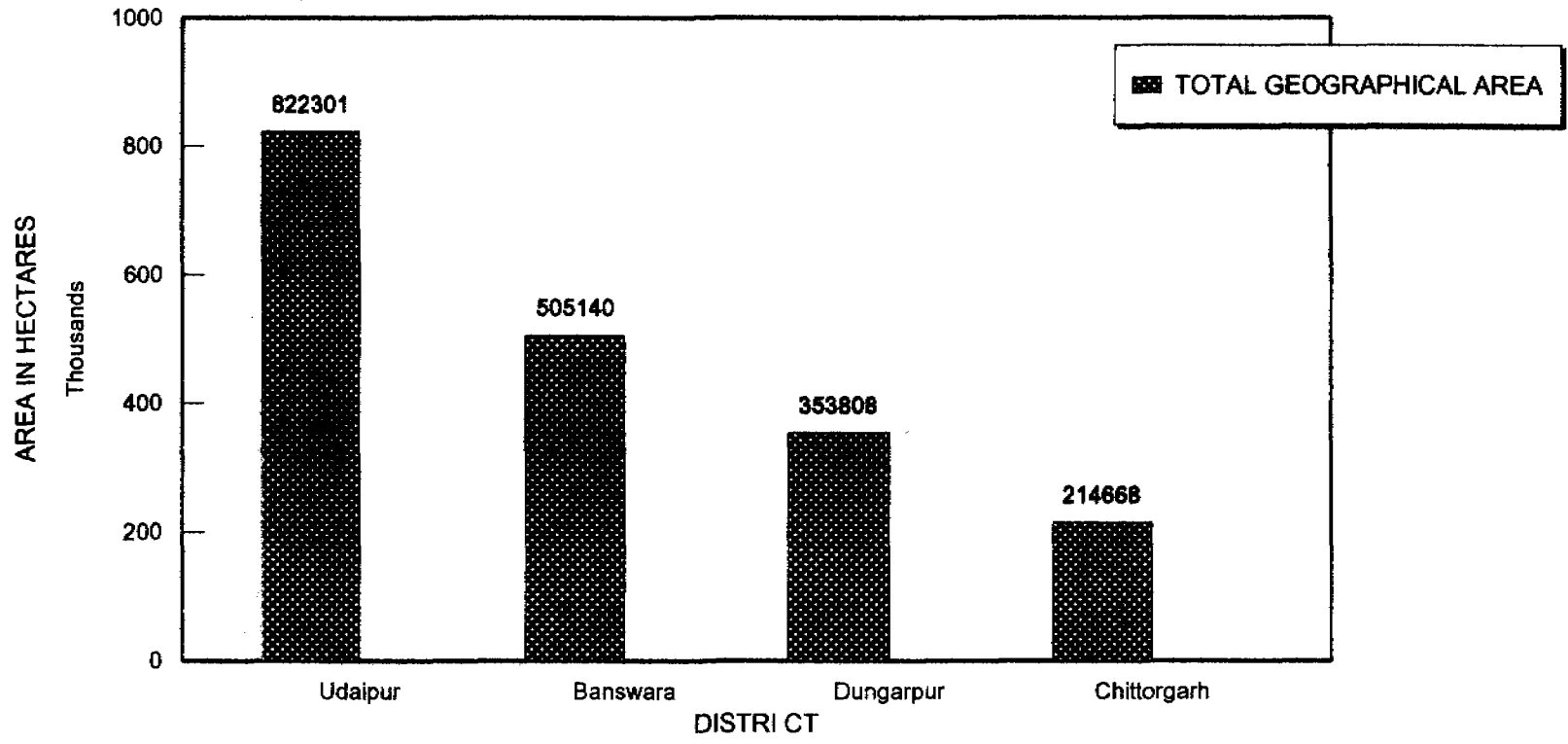
TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN SQ. KM.)

322731 (94.3%) NON TRIBAL SUB PLAN AREA

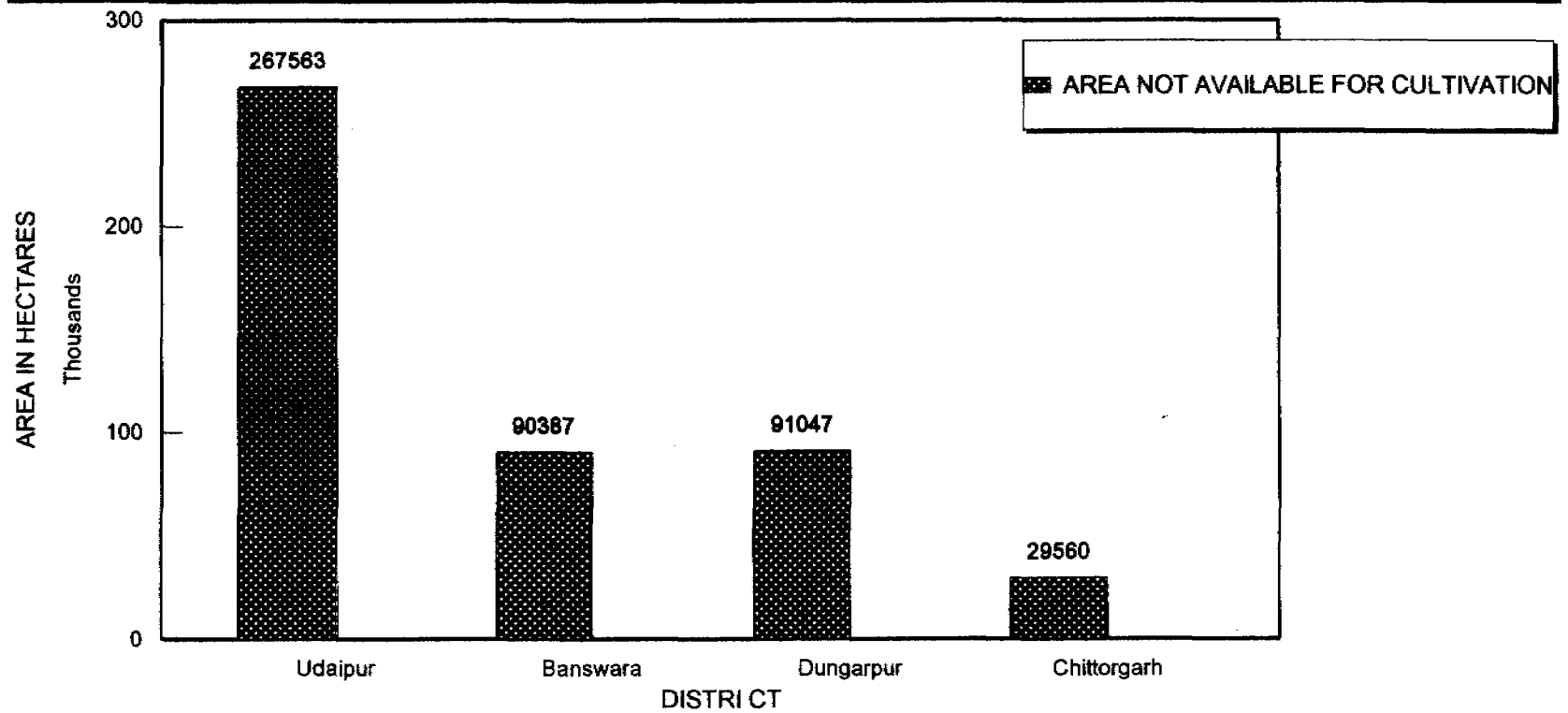


19508 (5.7%) TRIBAL SUB PLAN AREA

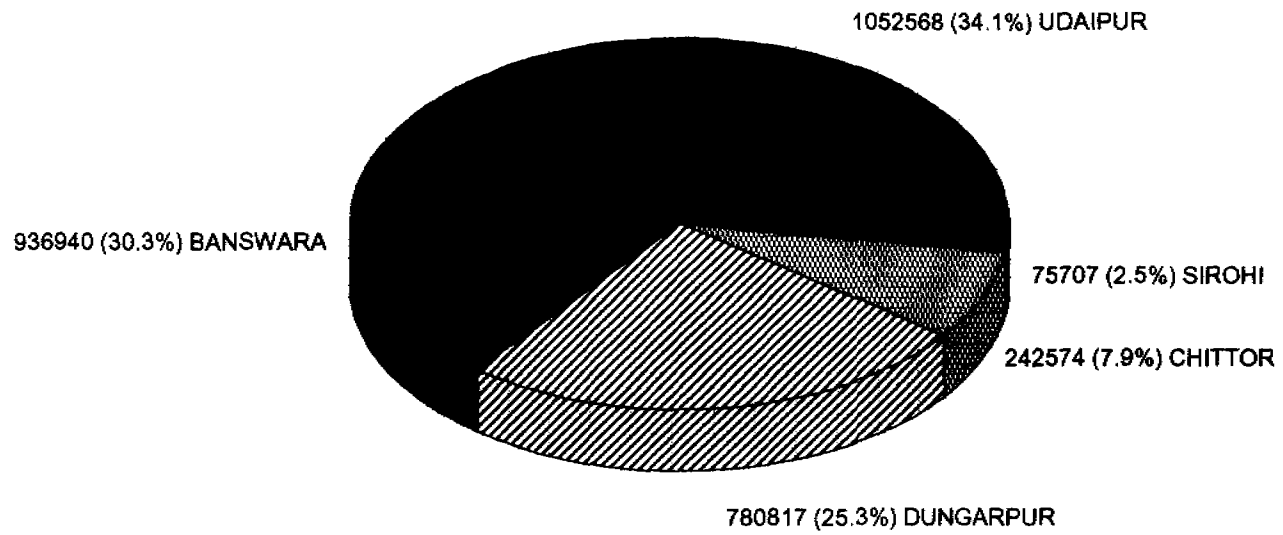
TOTAL GEOGRAPHICAL AREA OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN HECTARES)



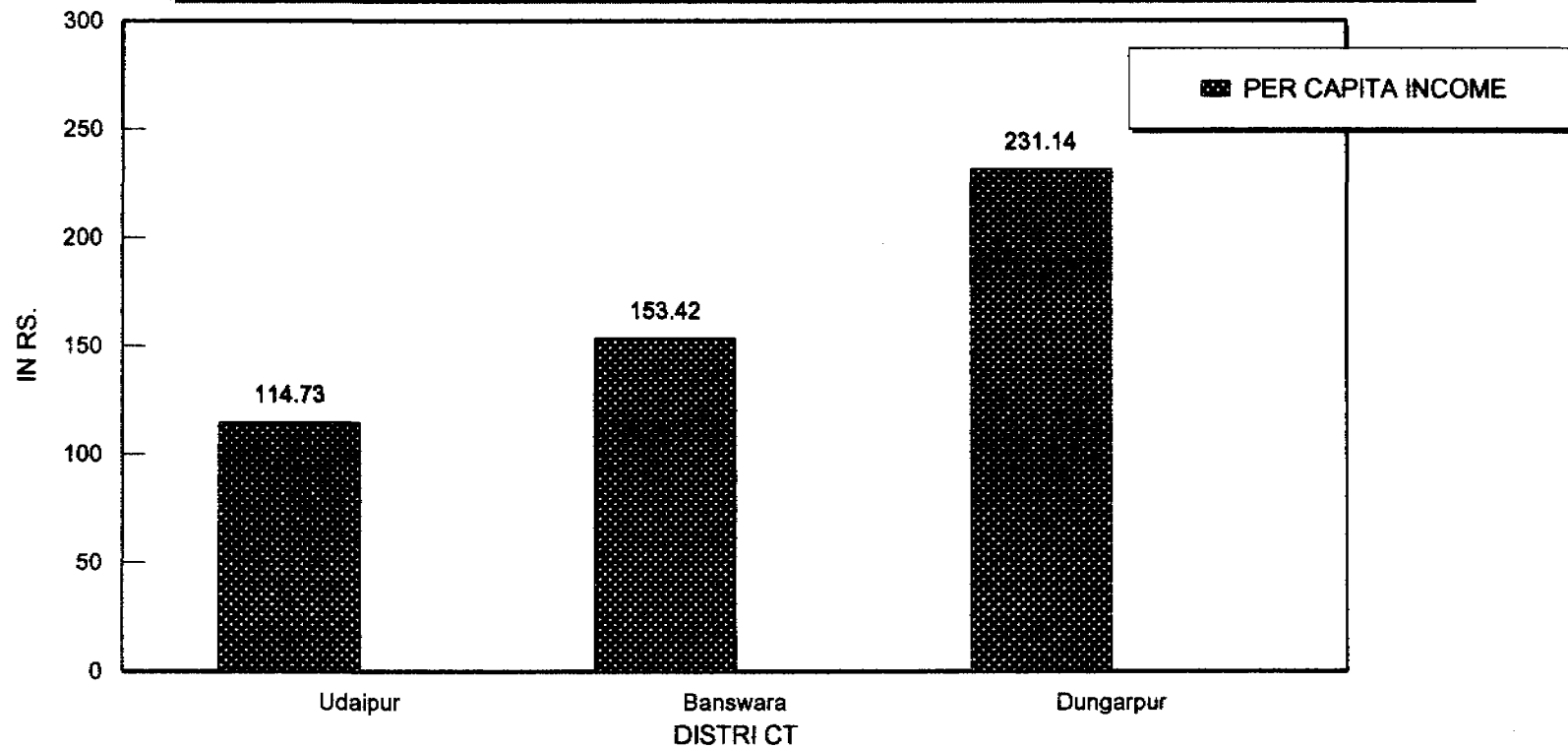
AREA NOT AVAILABLE FOR CULTIVATION OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(AREA IN HECTARES)



SCHEDULE TRIBE POPULATION IN TRIBAL SUB PLAN AREA OF RAJASTHAN



PER CAPITA INCOME OF TRIBAL SUB PLAN AREA OF RAJASTHAN
(IN RS.)



*diminish
explain*

The project has been designed in such a way so that its benefit are distributed to a number of beneficiaries in 2944 sites and in 19 blocks which have been proposed for small water harvesting structures.

10. RELATIONSHIP TO ICEF MANDATE AND FUNDING PRIORITIES

The ICEF endeavours to promote and deliver sustainable development programmes related to environment and the management of energy, land and water resources through community participation. The project under consideration aims to improve the management, use and conservation of water in the Tribal Sub Plan Area of the Udaipur division and water management is also one of the main priority areas of ICEF. The environment is a function of water management and it cannot be better than the water management practices in use in the area. Water is a resource which is available in great measure in the Tribal Sub Plan Area of Udaipur and it is a classic example of shortages amidst plenty. Infact water saved is energy saved and energy saved is quantifiable not only in monetary terms but in addition it has unquantifiable benefits in environment management and prevention of its degradation.

Impact mitigation and management issue

As the adverse effects on environment of this project are remote there are not many related management issues except for some dislocation of families due to the catchment area of water harvesting structures. However, by careful planning only such water harvesting structures with proper planning

could be taken up which mitigate the need of any physical dislocation of any people in the area.

11. **PROJECT COMPONENTS AND ACTIVITIES & RESULTS**

The annual break down of the major works has been done which is enclosed at Annexure I & II. The overall objective of the planning measures is to increase the production of the existing cultivable area and also the addition of new area. The detailed planning schedule of activities has been suggested at annexure III.

12. **OUTPUTS AND RESULTS**

Outputs

By means of water management and rain water harvesting it is aimed to create and increase the irrigation potential in the 97545 hectares of arable land possessed by poor tribes of the small and marginal category in this area.

The main output of the project will be an additional agricultural production worth Rs. 20972 lacs per annum in Rabi which is over and above the normal production. This additional gain will improve the socio-economic conditions of the beneficiary families. Besides the main output as described above the other likely benefits from the implementation of this project are as below:

- a. Supplemental irrigation can be provided to Kharif crops to avoid a moisture stress situation due to low and untimely rainfall.

- b. Cash crop cultivation like pulses, seeds and vegetables can be taken up with assured sources of irrigation.
- c. Trees of different species as per the local needs and suitability to climatic conditions can be planted on waste lands, field boundaries, community land and private lands which will fulfill local needs.
- d. Cattle wealth of the area will be improve due to increased availability of green grass and fodder and with good cattle wealth the biogas programme will ultimately improve the environment and ecology of the area.
- e. Assured irrigation facility will diminish the occurrence of drought in the area and also reduce the migration of tribal labour to near by states and this would stabilise the literacy of the tribals.
- f. Land price of the irrigated land will go up atleast 10 times and this appreciation of immovable property will definitely improve the socio-economic status of the tribal population.

Results

There will be less migration from the villages in search of jobs when irrigation potential has been created in the villages by the construction of small water harvesting structures. The area will become drought proof and with the improvement of the financial status of beneficiaries there will be an improvement in the education, health and nutritional status etc.

For the purpose of the project the benefit cost ratio is broadly worked out as follows. This working is based on an

indepth knowledge of the area, its preirrigation productivity, estimated post irrigation productivity, etc.

	Area to be irrigated (ICA in Hectares)	Net benefit per Hectare (Rs.)	Total net benefit on total area (Rs.)	Total benefit @ 75% of area	Benefit on 50% of the area
LI Scheme	52388	21500	11263.42	8447.57	5631.47
Check dams	45157	21500	9708.75	7281.56	4857.38
	97545	21500	20972.17	15729.13	10486.09

Cost Component

	Total Cost (Rs.)	Interest on Capital Cost	Depreciation @ 5% (Rs.)	Total
LI Scheme	13320	1598.40	666.00	2264.40
Check dams	18145	2177.40	907.25	3084.65

Benefit Cost Ratio

	on 100%	on 75%	on 50%
LI Scheme	4.97	3.70	2.49
Check dams	3.15	2.36	1.33
Total	4.06	3.03	1.91

It is an universal fact that no two persons will have an agreement on the B/C Ratio Analysis on any issue. Therefore, considering the overlapping of the command between the L.I. scheme and check dams we are taking into account the most conservative achievement of only 50% of command.

Benefit of small land holders

Based on the knowledge of the local conditions it is assumed that at on an average one hectare of the land of each beneficiary (each household) will benefit from irrigation under the proposed project. The table ahead gives the gross and net income from one hectare of land before and after the implementation of the irrigation scheme.

Additional Agricultural Earnings on the Hectare On Implementation of the project

<i>Season</i>	<i>Before the project</i>	<i>After the project (estimated)</i>	<i>Incremental benefits</i>
<i>Kharif</i>	4493	9174	4681
<i>Rabi</i>	1636	14059	12423
<i>Summer</i>	-	4150	4150
	6129	27383	21254

The above table suggests that a below poverty line household on getting irrigation on one Hectare will have estimated net earning of more than Rs. 21000/- per annum. Even with one hectare of irrigated land a household will have a substantial increase in its income.

In addition if the cropping pattern is changed by opting for vegetables and/or horticulture on only 20% of this irrigated land the results would be still better. It is a well known fact that vegetables can be cultivated on half an acre

yielding more than Rs. 10000/- in one season. Taking into account two crops on the same half an acre the beneficiary would simply cross the poverty line even by the most conservative estimates if he opts for vegetables as crops.

The benefit cost ratio of tanks is not worked out as most of the tanks will be percolation tanks giving indirect benefit in the form of the recharging of adjacent wells and the downstream check dams.

OTHER SIGNIFICANT IMPACT

In addition to the direct and tangible impact of the suggested programme as described above there are many other significant benefits which would follow on the execution of the project which are stated here below.

DROUGHT PROOFING

The availability of adequate irrigation is a sure measure for drought proofing. This has been demonstrated in this region under various lift irrigation projects executed so far, particularly when the irrigation projects have been integrated with agro forestry / farm forestry it has become complete drought proofing.

REDUCTION IN MIGRATION

Migration is a very serious problem in the project area with the migration rate ranging from 50% to 75% in the vulnerable villages. With the availability of irrigation additional

earning will be available to the beneficiaries and their lives will get stabilised reducing the migration rate substantially. Various studies have shown that on the availability of irrigation in the region the migration rates get reduced by as much as 80%.

APPRECIATION OF LAND VALUE

The most significant impact of getting irrigation facilities is that the land prices which are about Rs. 3000/- per acre before irrigation go up to as much as Rs. 30,000/- per acre after irrigation which is an exceptionally high appreciation of the property. The implication of such an appreciation of land price is that a small land holder of two acres suddenly becomes an owner of land worth Rs. 60,000/- to Rs. 80,000. Consequently the socio-economic status of even a small land holder goes up and he becomes a respectable person in society and also in the eyes of other people including financial institutions which would be willing to give him substantial finance on account of enhancement of the credit worthiness of such a small land holder. One can easily imagine the appreciated value of land as it would get covered under irrigation in the project.

SCHOOL ATTENDANCE

With their lives getting stabilised in their own villages, the parents would afford to send their children for schooling. It is clearly noticed that after community irrigation systems were installed villages the school attendance went up by 200% to 300%. There are several other benefits such as :

- a. improvement in health
- b. improvement in nutrition status
- c. improvement in clothing
- d. improvement in housing

In short the availability of irrigation opens the doors of development which is tangible and not so tangible. In fact it sets into motion many developmental processes which are self sustaining.

To conclude when a poor family comes out of poverty it is a remarkable turn in the right direction for such a family which not only brings the family out of poverty but we have an altogether different, confident and an empowered family which can assert itself and take initiatives in its further development. The fact that improvement in the economic conditions of the poor brings empowerment to them is a reality. Since almost all the beneficiaries of this project will be tribals and small farmers any improvement in their lives has a special significance.

13. **INSTITUTIONAL QUALIFICATION**

Organizational Structure

The organization structure is at annexure - IV.

Current Annual Budget

At present the annual budget on expenditure in the tribal area is 34 crores.

Current Staff and Qualifications

Administrative	Chairman I.A.S Commissioner Tribal Area Development Udaipur Division
	Director I.A.S B.E., MBA, LLB
Professional	6 persons working on deputation from the education department.
Technical	3 Persons having degrees in agricultural engineering are working on deputation from the Watershed & Soil Conservation department.
Financial	A senior accounts officer retired from GOI, 2 Jr. Accountants on deputation from GOR and one Jr Accountant is working in the project.

Facilities and equipment available

At present the SWACH has adequate infrastructural facilities to run the project.

Capabilities & Management System with the applicant organization

SWACH is a Non Governmental Organization with the Divisional Commissioner, Udaipur as the Chairman of the Board of Governors & the Director 'SWACH' as Member Secretary of the Board. The present Divisional Commissioner, Udaipur & the Chairman of SWACH is Mr. K.S. Money who has 22 years of experience in the Indian Administrative service in various field & secretarial assignments in the Govt. of Rajasthan,

Govt. of India & Govt. of Kerala. The Director 'SWACH' is Mr. Madhukar Gupta who has put in 11 years of service in the Indian Administrative service & has worked in Govt. of Rajasthan, Govt. of India & also Govt. of Tamil Nadu in different positions.

Record of managing and completing major projects

SWACH has successfully implemented the project on Water, Sanitation, health & the eradication of guineaworm from 1986 to 1995. In 1986 about 10,000 cases of guineaworm were reported and these have been progressively brought down to almost nil with an expenditure of Rs. 482.30 million. This project had the financial assistance of SIDA / Unicef. A success story on this project published by SIDA is enclosed herewith.

The auditing of accounts takes place every year by a Chartered Accountant and the Audited Accounts are sent to the concerned agencies.

Additional requirement

Staff

The technical staff will be taken on deputation or on contract as per the requirements.

Equipment & Facilities

The details enclosed at Annexure-VI.

Additional capability which would accrue to the organization

The project on water management and rain water harvesting, would enhance the capability of all the Organisations which

shall be involved in this project in the area of environment management and protection. This additional capability motivate these Organisations to take up more Projects in the optimum use of land and energy and at the same time prevent environmental degradation and improve the ecology in the region.

**Existing and proposed linkages with other organizations:
Canadian, other external, government, non government & community**

Presently SWACH is implementing a project on fluorosis in Dungarpur with the assistance of UNICEF. Other projects in health are being implemented with funding by the Tribal Area Development Authority. The SWACH is also the nodal agency in executing the Swasthya Karmi Yojna by the other NGO's in this area and it has grassroots level workers in the villages and has good linkages with the beneficiaries.

The proposed linkages with other organizations is very vividly brought out in the illustration on the implementation structure.

14. **ENVIRONMENTAL IMPACTS**

Current status of biophysical conditions affected by the project

The current state of the bio physical conditions in the project area leave much to be desired due to very heavy soil erosion on the few rainy days and low water retention in the grounds and the non availability of water even with the high incidence of rain fall.

Current State of energy, land or water resource management practices

At present the irrigated area is only 22.4 percent which is very low and the runoff in this area is very high due to the undulating and hilly terrain only 33.22% of the total runoff is presently being stored in village tanks, percolation tanks and irrigation reservoirs and lakes.

Environmental and development problems of the project and solutions as perceived by the local community (if known)

Due to few rainy days and high runoff there is moisture stress in the remaining part of the year so the biomass production is low. There is a general demand from the cultivators for water harvesting structures so that field crops and vegetation in the area is grown to the maximum extent.

Identification of key environmental components to be addressed

A large portion of the land is degraded and unculturable and it is only suitable for forestry plantation rather than agriculture and as such forestry programmes have to be taken up on degraded forest land, waste land as well as on private land which have been seriously eroded and degraded.

Proposed strategy for ensuring environmentally sound development

A massive programme is under implementation on the Aravalli with the assistance of Japanese Government as is called as Greening of Aravalli for afforestations and this is expected to improve the environment.

Any potential negative environmental effects or risk from direct interventions or project operations

No negative effects really on environment which can be conceived of right away.

Impact mitigation and management issues

Linkage between poverty and environmental degradation

As there is environmental degradation i.e. the forests have been degraded, most of the tribals have income from the produce of plantations and due to degradation of forests the people have very less opportunities of income generation.

Anticipated direct contribution of the project to improved environmental quality and management

With the implementation of water harvesting structures in the area moisture will be available for good growth of forest. This will help in the improve of environmental quality with the increase in the irrigation potential and also the tribals' will not be driven to harvest the forest for their lively hood.

15. TECHNICAL FEASIBILITY

Description of technical inputs required

For this project the technical inputs required are available and also locally available material shall be used for construction.

Are there any technical aspects of an experimental nature

There are no technical aspects of an experimental nature which can be envisaged at this stage.

Proven in-house experience - evidence that the applicant can successfully implement the project

SWACH has implemented a number of projects successfully so far. This project will also be implemented successfully as it has has the experts on soil & water conservation. Also wherever necessary other Non Government Organizations and other agencies shall be involved in the projects as shown in the implementation structure.

Experience of other institutions that can be of value

The experience of N.M. Sadguru Water and Development Foundation, Dahod, Panchmahals, Gujrat will also be utilised. Also the experience of other Non Government Organizations's working in this area and that of the Tribal Development Authority shall be utilised in the best possible manner.

Assessment of practical constraints and risks from technical perspective

The only constraint for the lift irrigation scheme is the short availability of electricity in Rajasthan which will be overcome soon.

Plan to overcome constraints

The Rajasthan State Electricity Board has launched various power projects in the private sector and it would be possible to ensure at least 12 hours of electricity every day to lift irrigation schemes during the main season of irrigation i.e. Rabi very soon.

16. GENDER AND SOCIO CULTURAL ANALYSIS

Description of the population in the project area, including number, ethnic, tribal and class composition and economic activities

The rural population of 19 blocks of 4 districts is 31.11 lacs. Out of them 1.63 lacs are scheduled castes i.e. 5.23% and 23.55 lacs are scheduled tribes i.e. 75.70%. The scheduled tribes are Bhils, Meenas, Damors, Dhankas, Garasiyas, Kathodis, Kokanas, Kolis etc. In this area 81.20 percent of the workers are engaged in agricultural activities as cultivators and agricultural labourers & others are labourers in factories / mines etc. The main economic activity is agriculture in the area followed by mining of marble, stone and other minerals.

Structures of the local community, existing leadership and extent of its influence on the population

The local community is settled in hamlets in the forest or on the hills. There are a good number of leaders from the tribes who have a fair amount of influence on the population.

Local systems governing the access to and control of natural resources - water, land, energy, forest resources etc.

The gram panchyat / users groups have to be made responsible for the control of natural resources.

Current social and cultural conditions affected by the project

The tribes are located mostly in the hills and forests and by means of this project they could be brought to the same level as the non tribals.

POPULATION FIGURES AT A GLANCE

S.NO.	DESCRIPTION	RAJASTHAN	TSP AREA	% OF TSP TO RAJ.
1	Area in Sq. K.M.	342239	19508	5.70
2	Total Population	44005990	3519311	8.00
3	Population Below age 7 years	6959492	707486	7.99
4	S.C. Population	7607820	159427	2.10
5	S.T. Population	5474881	2401711	43.87
6	Literates No. & (%) Total	13549088 (30.55)	732643 (26.06)	5.41
	Males	10129693 54.99	556983 39.11	5.50
	Females	3419395 (20.44)	175660 (12.65)	5.14
7	Growth Rate (%)	+28.44	+27.64	
8	Sex ratio (Females per 1000 male)	910	974	107.03
9	Density of population	129	180	139.53
10	Inhabited & uninhabited village	39810	4487	11.15
11	No. of House hold	7289639	693067	9.51
12	Total Workers	17104372 (38.86)	1809276 (45.73)	9.41
13	Main Workers & %	13915071 (31.62)	1132417 (32.18)	8.14
14	Marginal workers & %	3189301 (7.24)	476859 (13.55)	14.95
15	Non workers & %	26901618 (61.14)	1910035 (54.27)	7.10

STATEMENT SHOWING POPULATION

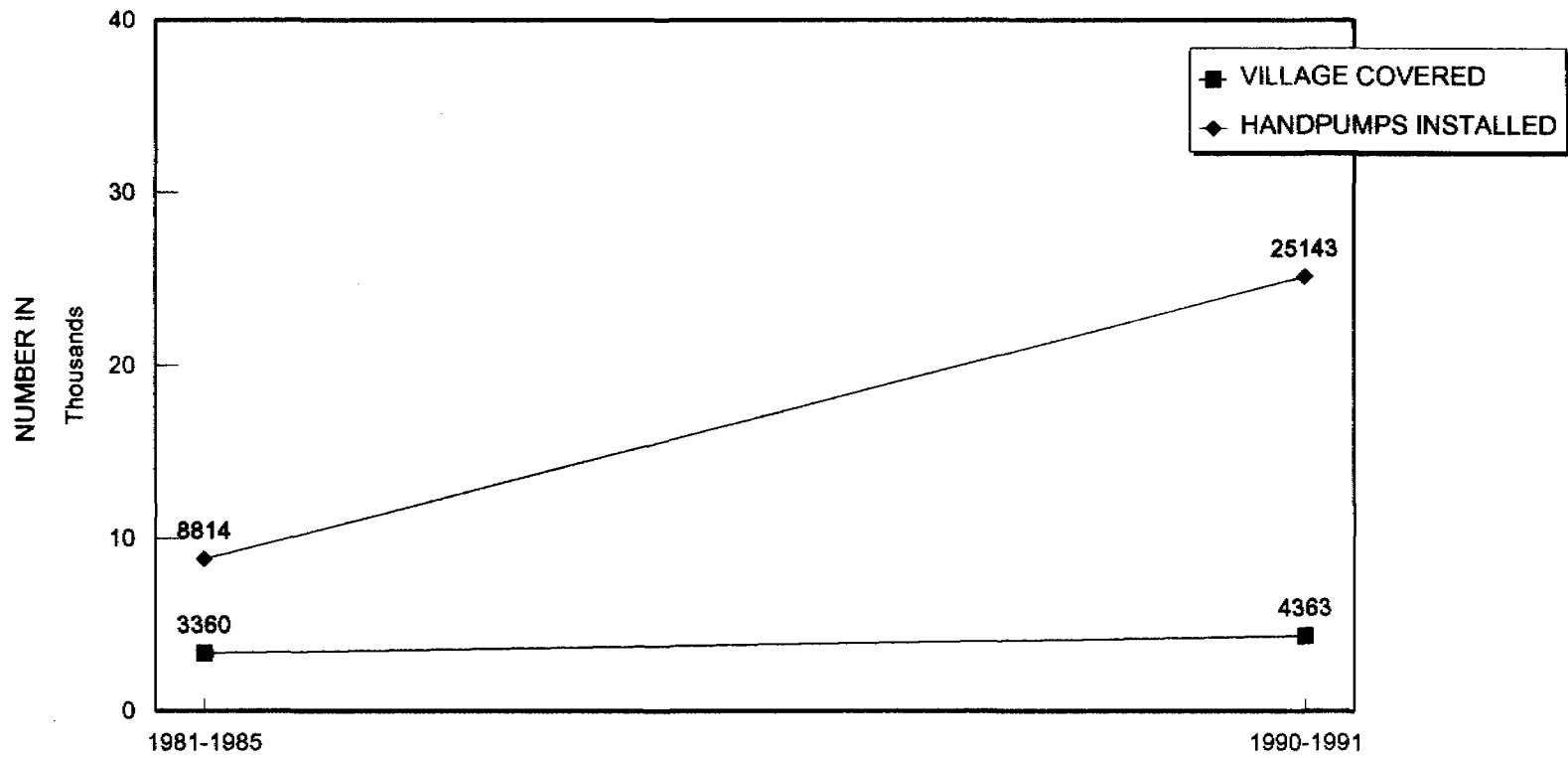
S. NO.	NAME OF DISTRICT	NAME OF PANCHYAT SAMITI	AREA IN SQ. KM.	DENSITY OF POPULATION PER SQ.KM.	VILLAGES	
					INHABITED	UNINHABITED
1	UDAIPUR (RURAL)	1 SALUMBER	924.81	174.77	291	
		2 KHERWARA	1076.69	191.79	241	
		3 DHARIYAWAD	1177.99	123.01	246	
		4 SARADA	1079.19	172.04	154	
		5 KOTRA	1192.24	109.42	302	
		6 JHADOL	1428.93	102.95	256	
		7 GIRWA (B)	975.48	121.54	81	
			7853.13	139.37	1511	
2	BANSWARA	1 TALWARA	771.04	217.75	214	
		2 GARHI	708.06	152.35	164	
		3 GHATOL	783.27	224.69	218	
		4 ANANDPURI	515.54	164.69	123	
		5 SAJJANGARH	402.51	256.32	184	
		6 PEEPAL KHOONT	912.82	121.18	187	
		7 KUSHALGARH	641.92	158.74	208	
		8 BAGIDORA	341.79	401.62	137	
			5076.95	194.93	1435	
3	DUNGARPUR	1 DUNGARPUR	585.35	227.58	158	
		2 BICHIWARA	745.90	242.40	174	
		3 ASPUR	691.72	211.80	142	
		4 SIMALWARA	923.65	211.68	219	
		5 SAGWARA	618.72	259.54	154	
			3565.34	229.05	847	
4	CHITTORGARH	1 PARTAPGARH	1452.37	109.62	322	
		2 ARNOD	701.53	130.30	171	
			2153.90	116.35	493	
5	SIROHI	1 ABU-ROAD	859.11	93.83	78	
			859.11	93.83	78	

RELATION FIGURES OF TSP AREA

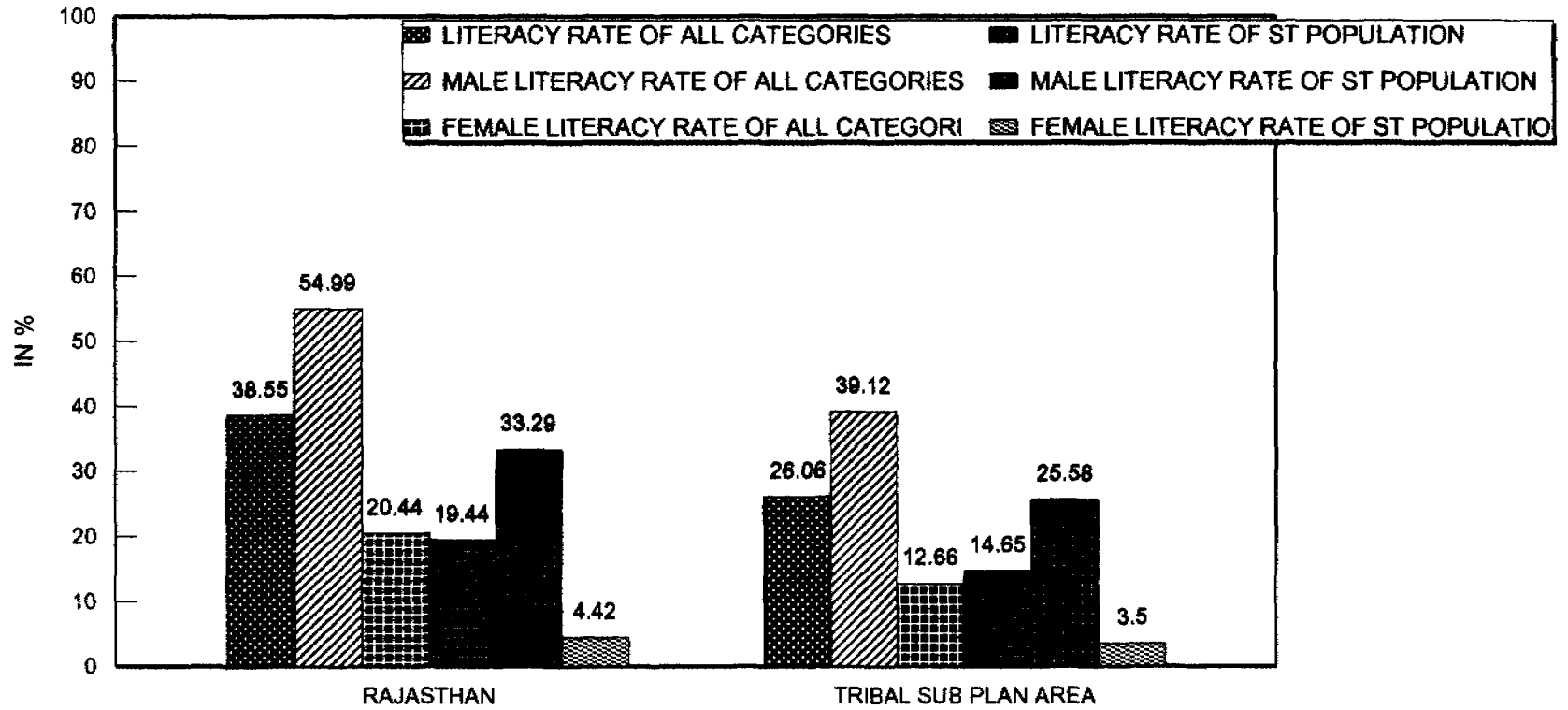
Population Census 1991

INHA- ITED	TOTAL	HOUSEHOLDS		GROWTH RATE ON 81-91		POPULATION		
		RURAL	URBAN	TOTAL POP.	S.T. POP.	MALES	FEMALES	TOTAL
2	233	31074	2663	22.95	27.32	80796	80894	161630
1	242	34837		22.52	29.90	102345	104149	206494
0	246	29572		21.91	32.90	84182	60654	144836
1	155	32404		13.09	24.04	92935	92562	185497
2	304	23050		28.07	31.69	66743	63706	130449
0	256	28227		26.56	33.04	75228	71816	147044
0	81	22946		29.54	39.96	62825	55738	118563
6	1517	202110	2663	164.64	218.85	564994	529519	1094513
7	221	29377	12295	24.83	32.12	84715	83181	167896
2	166	33946		30.15	31.68	10288	97588	107876
4	222	31792		30.16	31.22	88626	87365	175991
0	123	14348		34.16	34.40	43249	41656	84905
2	186	16875		35.94	35.80	52713	50499	103172
10	197	19587		21.44	23.00	56255	54362	110617
2	210	16692		37.97	39.27	51818	50082	101900
0	137	23209		30.07	31.93	69642	67628	137270
27	1462	185826	12295	244.72	259.42	457308	532321	989627
0	158	23796	6934	28.41	21.68	65893	67319	133212
0	174	30847		30.77	33.19	91481	89324	180805
2	144	28517		20.09	20.67	71377	75130	146507
1	220	33744		34.09	37.12	99446	96073	195519
0	154	28529	4032	24.67	27.55	79459	81126	160585
3	850	145433	10966	138.03	140.21	407656	408972	816628
31	353	28918	5364	20.21	10.53	81501	77705	159206
3	174	16866		22.10	29.95	46438	44970	91408
34	527	45784	5364	42.31	40.48	127939	122675	250614
3	81	15048		25.49	24.21	41533	39078	80611
3	81	15048	0	25.49	24.11	41533	39078	80611

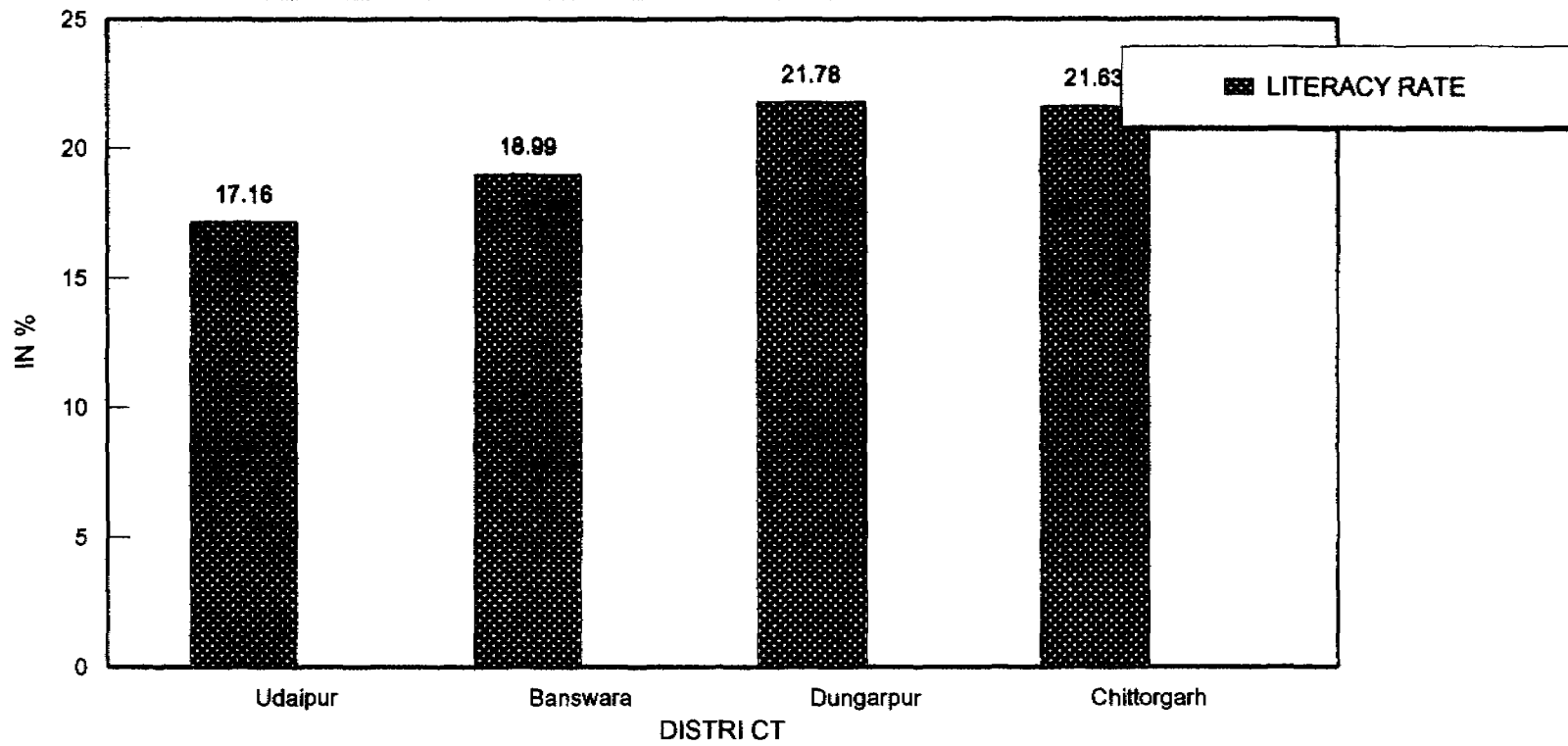
DRINKING WATER FACILITY IN TRIBAL SUB PLAN AREA OF RAJASTHAN



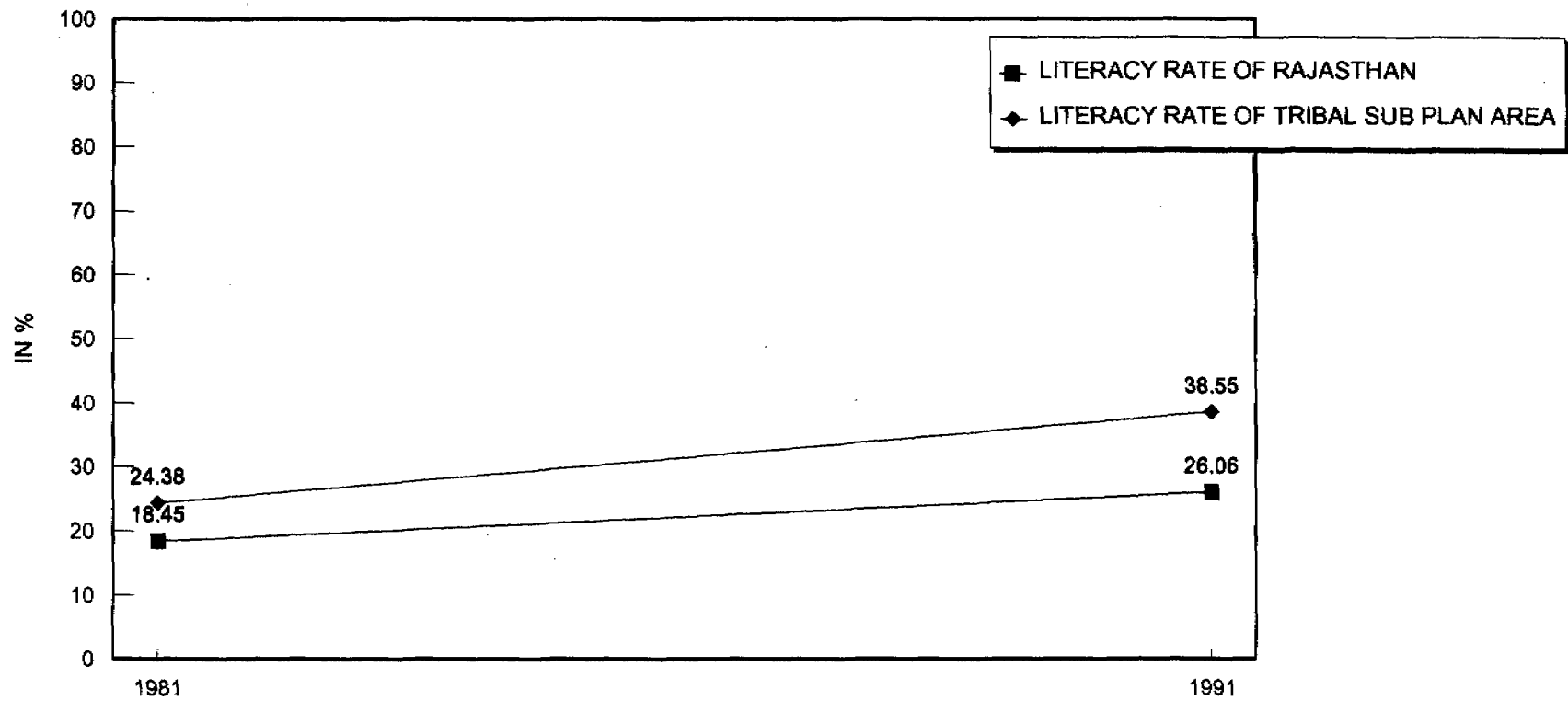
SEX WISE LITERACY RATE OF TRIBAL SUB PLAN AREA OF RAJASTHAN



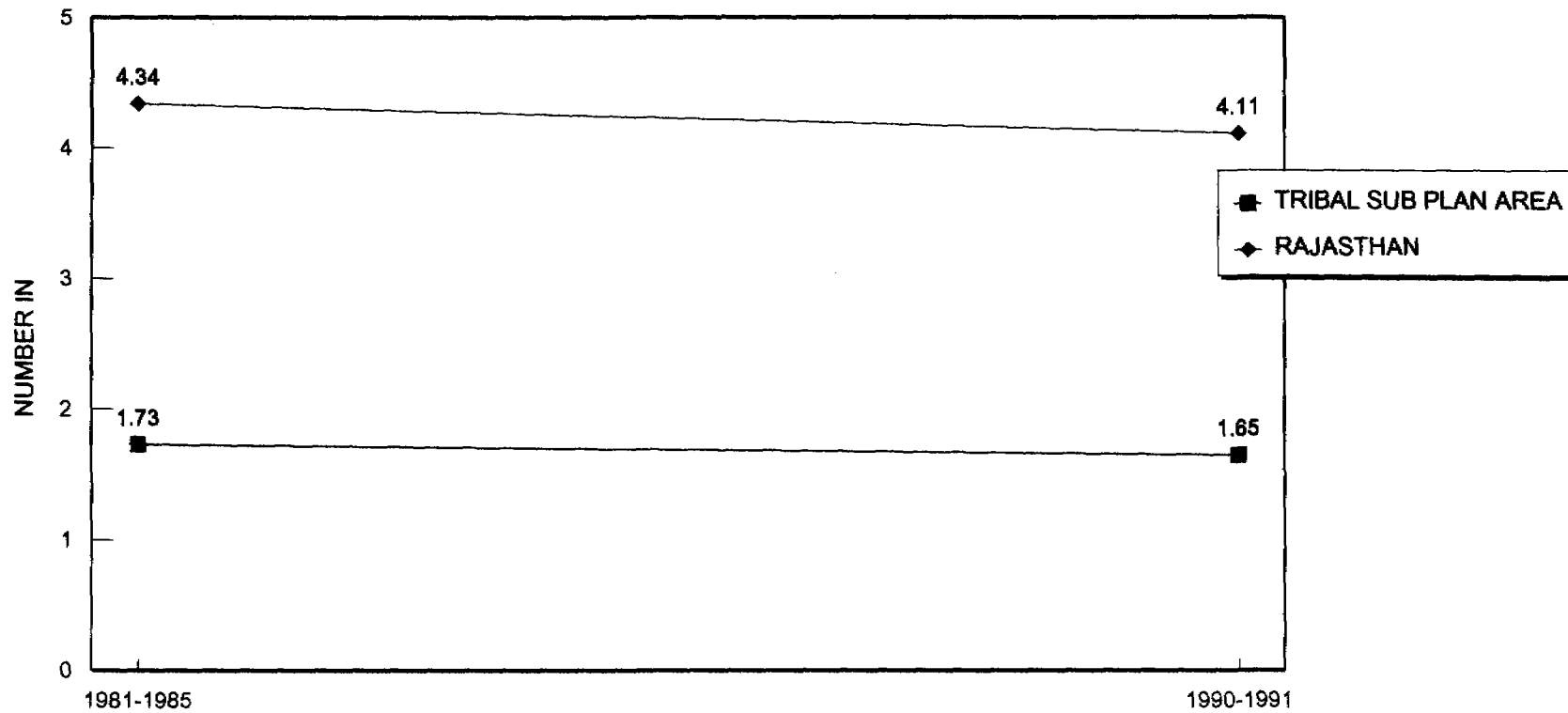
LITERACY RATE OF TRIBAL SUB PLAN AREA OF RAJASTHAN



TRENDS OF LITERACY RATES IN RAJASTHAN & TRIBAL SUB PLAN AREA



TRENDS OF AVERAGE SIZE HOLDINGS OF TRIBAL SUB PLAN AREA OF RAJASTHAN



Proposed social-cultural strategy, including Participation and Community Based Management

People shall be involved from the planning exercise to the successful management of resources by the community. Lift irrigation co-operatives are to be involved from the planning & construction phase and to the maintenance stage of the system.

17. **ECONOMICS AND FINANCIAL FEASIBILITY**

Income and expenditure forecasts

The total expenditure forecasts for the works are Rs. 375.79 lacs for constructing 2994 small water harvesting structures. From this construction above 97545 hectare will get irrigation only from check dams & lift irrigation schemes. If we consider only 50% of the area benefited the income generated will be Rs. 10486.09 lacs annually.

Financial uncertainties and potential need for recurrent financing

If there are financial uncertainties and delay in availability of funds then the cost of construction will rise and there could be a need for subsequent financing.

Contingency plans for cost overruns

On the basis of water resource development projects and the possible command area the approximate cost has been worked out for small, medium & big schemes & then brought around to an average cost. We may expect 25% variation in the average cost after the detailed survey of the individual projects due to variation in site conditions, price fluctuations in the market, actual command which has not been incorporated in the

projections. There may be a fluctuation of 20-25% which could be considered for the contingency plans.

Potential local economic benefit (Impact on resource user: direct / indirect, employment and income, expenditure etc)

The impact on the resource user is that he has an assured means of livelihood, he has not to depend entirely on rainfall which occurs mainly during the Monsoon season with July being the month of maximum rainfall. If he has an assured means of livelihood the migration of people for earning their bread & butter will also reduce and the users will live in their villages and improve their monetary conditions.

The local people / beneficiaries shall get employment in constructing check dams / lift irrigation schemes / percolation tanks in their own or nearby villages.

If the end beneficiary has an assured livelihood he can take the risk of changing the cropping pattern in his land holding by a very small additional expenditure. The improvement in status like sending children for education, better health etc will also be there.

Estimated benefits of enhanced resource production or reduced cost of environmental degradation

The estimated benefits are measurable in terms of increased production of crops and also higher returns due to crop rotation and growing of more remunerative cash crops due to the increased availability of water. The reduced cost of environment degradation is measurable in terms of the reduction in soil erosion and the removal of top soil cover every year with the incidence of heavy rainfall and

productivity of the soil and degradation of environment.

Potential national economic benefits

When there is more yield of crops & forest plants due to assured means of irrigation there will definitely be economic benefits to the individual and consequently there will be benefit to the national economy.

Economic feasibility: analysis of project costs relative alternative means of achieving objectives (Cost effectiveness) and social benefit - cost analysis

The project on water management and rain water harvesting structures by means of creation of small checkdams, lift irrigation schemes, anicuts etc. would easily be the most cost effective method of increasing irrigation ability and the income levels of a very large population spread over a large area thus mentioned in the earlier paras. In fact the cost effectiveness of this project for the optimum utilisation of water is its most interesting feature. The social benefit cost analysis has been stated in the previous paras. The increased availability of irrigation has various spin off benefits in the social sectors like increased stability of population, high attendance in schools, poverty alleviation and increased savings and the like.

Statement and conditions of on lending

These conditions could be discussed and finalized at the time of the financial approval of the project.

18. PROJECT SUSTAINABILITY

Mechanisms and assurances of sustainability of institutional

capacity

The SWACH has been working in this area from 1986 and has already implemented very successfully one of the prestigious projects on water, sanitation, health and the eradication of the guineaworm costing Rs. 482.3 million with the assistance of SIDA / Unicef from 1986 to 1995. SWACH is now a Non Governmental Organization with the Divisional Commissioner, Udaipur as the Chairman of the Board of Governors & the Director 'SWACH' as Member Secretary of the Board. Six very senior officers from the government and five public representatives are the members of Board of Governors. In addition the Divisional Commissioner, Udaipur could enlist the assistance of other agencies and NGO's in the implementation of this project depending on the ground realities.

Mechanisms and assurances of sustainability of project activities

Community participation will be there right from the planning stage and the formation of village level institutions to run these projects will be an integral part of this project which will help in the capacity building of the community run institutions to manage their own resources. The necessary training and follow up for the institutional capacity building viz. a viz. the people, beneficiaries, village functionaries etc. shall evolve during the programme implementation and the post project management stage.

Replicability of the project

When the beneficiaries / villagers start getting the benefits and with the institutional capacity building the replicability of this project is there automatically.

Financial uncertainties and potential need for recurrent funding

In case of delays in the project implementation there could be increase in costs and the consequent need for further financial support could be there if the implementation is not carried out as envisaged. Also, when the villagers see the benefits accruing to them there could be an increased demand for taking up more of such projects to cover a larger area and also for its more intensive coverage. The resources in that situation would have to be raised by the state government or locally through the participation of the private sector / social development institutions / NGO's etc. Also with increased incomes because of improved irrigation facilities would make the sustainability of further projects much easier due to the availability of finances at the local level which is really the end objective - to raise the income levels through better water management and increased water for irrigation to sustain further development and income generation and increased employment.

19. REQUIREMENTS FROM OTHER ORGANIZATIONS / INSTITUTIONS

SWACH which shall be the nodal agency has already been registered with Ministry of Home affairs, Government of India New Delhi under foreign contribution (registration) Act 1976 with 125690052 registration Number. The SWACH has also registered itself on a Non Government Organization under the Rajasthan institutional Registration Act 1958 with the registration No. 65/Udaipur/96-96 date 1-7-96 and it is already working as a Nodal institution for NGO's in this

tribal area for quite a few schemes.

To make a success of this project NGO's like the N M Sadguru Water & Development Foundation, Sewa Mandir, Sahyog, Vidya Bhawan, Ubeshwar Vikas Mandal, Pahal to name a few could be involved to implement this project with support from SWACH and the Commissioner Tribal Area Development could enlist the support of any of the other governmental institutions and organizations working in this area.

20. **BUDGET**

The total budget for project be Rs. 441.46 crores. The state shall be requested to provide 10% of the works cost i.e. Rs.44.146 crores from its contribution to Tribal Area Development under various schemes to this project.

Year wise breakdown of budget

The year wise breakdown has been provided at annexure V.

Details of how the project budget was established

The project cost is based on studies which have been carried out for the following claims

- (i) To assess the surface water resource potential of the tribal region of the Udaipur division.
- (ii) To survey & investigate the potential of small scale water resource development projects.
- (iii) Professional planning for water harvesting and utilization of the available water resource potential with special emphasis on community participation.

On the basis of the study small projects were established for tribal area development and on the basis of their experience a project on a larger scale is being formulated for a more extensive coverage through this funding agency.

How will the funds be administrated

The funds could be transferred to the Commissioner, Tribal Area Development whereafter these could be directed to the executing agencies through SWACH which will provide the audited accounts to the funding agency every year.

21. **PROJECT MANAGEMENT PLAN**

How does the applicant propose to manage the project ?

The project shall be managed by a team with the Commissioner Tribal Area Development as the team leader and SWACH as the nodal administrative implementing agency. The other reputed NGO's, Additional Commissioner Tribal Area Development, Project Directors of the DRDA's of the five districts, the Joint Director Watershed and Soil Conservation department other regional directors of other concerned departments shall be involved. It shall involve the village communities / institutions at the grassroots level from the planning to the implementation and post project management stage.

Proposed project implementation structure (chart)

The present structure is given at annexure IV. The staff for execution will be taken on deputation / contract as per the requirements of the project.

If more than one agency is involved or linkages with organizations are anticipated, detail the respective roles & responsibilities

The reputed NGOs already working in this area shall be involved and SWACH which is already working as nodal agency will assist them technically and financially. Other government agencies shall be involved as illustrated in annexure IV depending on the needs of the project and the available expertise. This would also introduce an element of competition which shall raise the quality levels of project implementation.

22. **PROJECT MONITORING AND EVALUATION FRAME WORK**

Staff & organization of internal monitoring unit

The internal monitoring shall be carried out by the SWACH / Tribal Area Development staff having engineers and accounts staff on deputation from the government departments / or on contract for specific assignments.

Proposed monitoring & reporting procedures

The administrative agency will monitor on a monthwise basis each water harvesting structure which is sanctioned for implementation. The programme shall be put on the computer and the reporting done on a monthly basis for each structure.

Base line survey

The preliminary baseline survey has already been done and the detailed survey shall be done for each & every water harvesting structure on finalisation of the project.

An outline of potential evaluation indicators

The potential evaluation indicators would be the selection of site, increase in the irrigated area, community participation, maintenance of the water harvesting structures, increase in crop production, change in cropping pattern, increase in income levels, increase in savings etc.

Proposed external monitoring and evaluation procedures

Independent & competent agencies shall be engaged for proper implementation validation of the progress of various water harvesting and management scheme. These agencies shall also be recommended by the funding agency to the implementing agency.

23. POTENTIAL POLICY IMPACT

Opportunities for shaping policy : potential policy targets

The experiences in the implementation of these water management and harvesting structures with micro level planning and active involvement of NGO's shall certainly have its impact on the minds of the policy makers. The future policy guidelines could be genuine micro level planning with active involvement of the village communities and NGO's in addition to the government departments. The policy makers would be made to take note of the process of planning & implementation of water management projects which are basically need based and as per the perceptions of the village community. Also they would realize that water management is the most important need of the village communities compared to any thing else.

Linkage with government / policy makers

For this objective a high level steering committee shall be

constituted under the chairmanship of the Chief Secretary, Govt. of Rajasthan with other members being the secretaries of the concerned departments, reputed NGO's and public representatives and policy makers. This would provide a forum of assessing, reviewing and guiding the work taken up in the project. At the same time this committee could take note of the success stories and have them incorporated for planning future projects for development to take place on a sustained basis.

Impact / benefit of revised policies

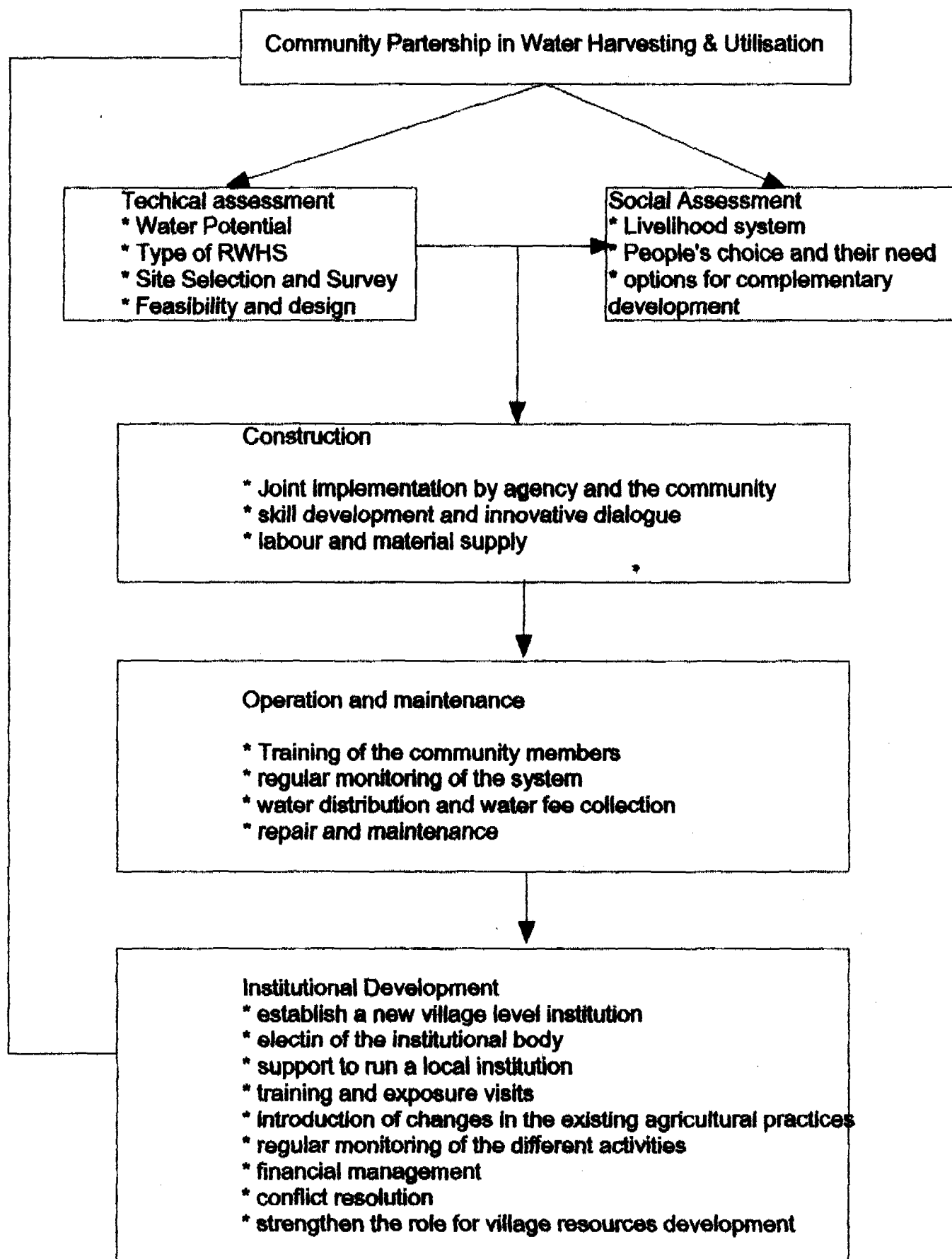
The revised policy would benefit a much larger section of village communities with respect to the prioritization and the conception, planning and implementation of water management structures at the village levels based on community perception, participation and utilisation. This process of development shall not be forced on the village community but on the contrary shall flow out of their collective wisdom and experience which shall then be implemented using the best methods and practices and by the best available implementing agencies. The impact of this project would be found in a much larger area by means of relevant policies and programs based on the experiences of this project.

YEARWISE PHASING OF M.I. WORKS (FINANCIAL) (Rs.in Lacs.)

S.No.	Districts	Item	Year					Total
			1997-98	1998-99	1999-2000	2000-01	2000-02	
1.	Udaipur	Checkdams	410.00	2122.50	2122.50	2122.50	2122.50	8900.00
		LIS	658.00	658.00	673.00	658.00	658.00	3305.00
		Tanks	270.00	450.00	450.00	450.00	450.00	2070.00
			1338.00	3230.50	3245.50	3230.50	3230.50	14275.00
2.	Dungarpur	Checkdams	494.00	633.00	633.00	633.00	633.00	3026.00
		LIS	444.00	462.75	462.75	462.75	462.75	2295.00
		Tanks	130.00	150.00	150.00	150.00	150.00	730.00
			1068.00	1245.75	1245.75	1245.75	1245.75	6051.00
3.	Banswara	Checkdams	497.00	953.00	953.00	953.00	953.00	4309.00
		LIS	1055.00	1480.00	1480.00	1480.00	1480.00	6975.00
		Tanks	124.00	280.00	280.00	280.00	280.00	1244.00
			1676.00	2713.00	2713.00	2713.00	2713.00	12528.00
4.	Chittorgarh	Checkdams	296.00	403.50	403.50	403.50	403.50	1910.00
		LIS	121.00	156.00	156.00	156.00	156.00	745.00
		Tanks	30.00	60.00	60.00	60.00	60.00	270.00
			447.00	619.50	619.50	619.50	619.50	2925.00
TOTAL			4529.00	7808.75	7823.75	7808.75	7808.75	35779.00

YEARWISE PHASING OF M.I. WORKS (PHYSICAL)

S.No.	Districts	Item	Year					Total
			1997-98	1998-99	1999-2000	2000-01	2000-02	
1.	Udaipur	Checkdams	29	150	150	150	150	629
		LIS	37	37	38	37	37	186
		Tanks	45	75	75	75	75	345
			111	262	263	262	262	1160
2.	Dungarpur	Checkdams	39	50	50	50	50	239
		LIS	24	25	25	25	25	124
		Tanks	26	30	30	30	30	146
			89	105	105	105	105	509
3.	Banswara	Checkdams	47	90	90	90	90	407
		LIS	57	80	80	80	80	377
		Tanks	31	70	70	70	70	311
			135	240	240	240	240	1095
4.	Chittorgarh	Dams	22	30	30	30	30	142
		LIS	7	9	9	9	9	43
		Tanks	5	10	10	10	10	45
			34	49	49	49	49	230



Selection of suitable catchment areas

- topography
- land use pattern

Hydrology of catchment area

- watershed delineation
- drainage network and channel length
- determination of slope
- net size of catchment area

Rain water harvesting potential

- calculation of runoff volume
- observation of runoff volume

Planning of rain water harvesting structure

- suitability to local conditions
- peoples requests and their participation
- community benefits

Design of water harvesting system

- technical design
- benefit cost analysis

Construction of water harvesting system

- during dry season
- use locally available material & labour
- training and skill development

Community Involvement

- formation of local institution
- operation & maintenance
- training of farmers in irrigation techniques

Modifications

- corresponding to long term water availability
- other landuse scenario

Selection of suitable cultivable area

- soil formation
- land use

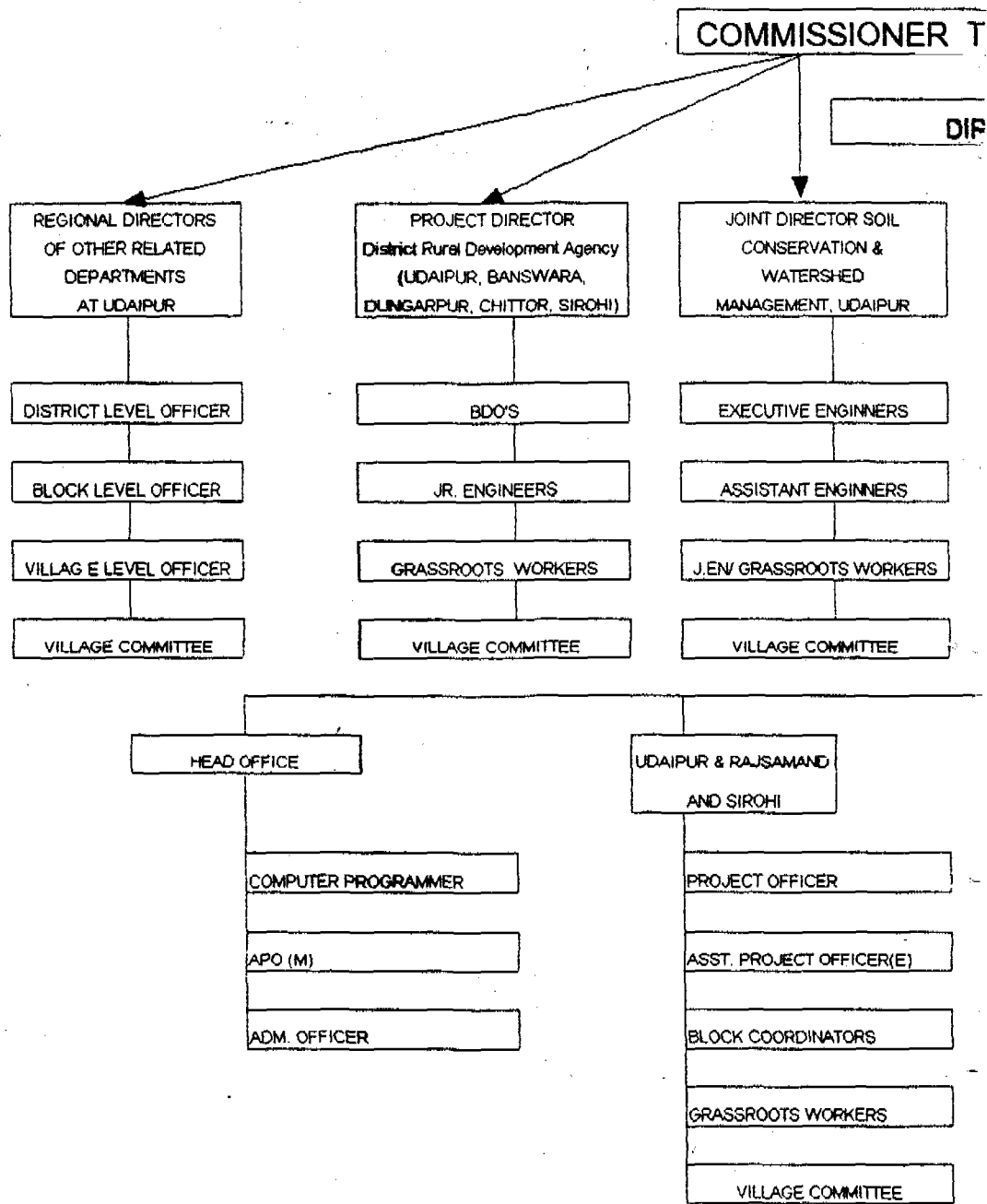
Selection of crops

- traditional crops
- other adopted crops
- water requirement
- socio cultural needs

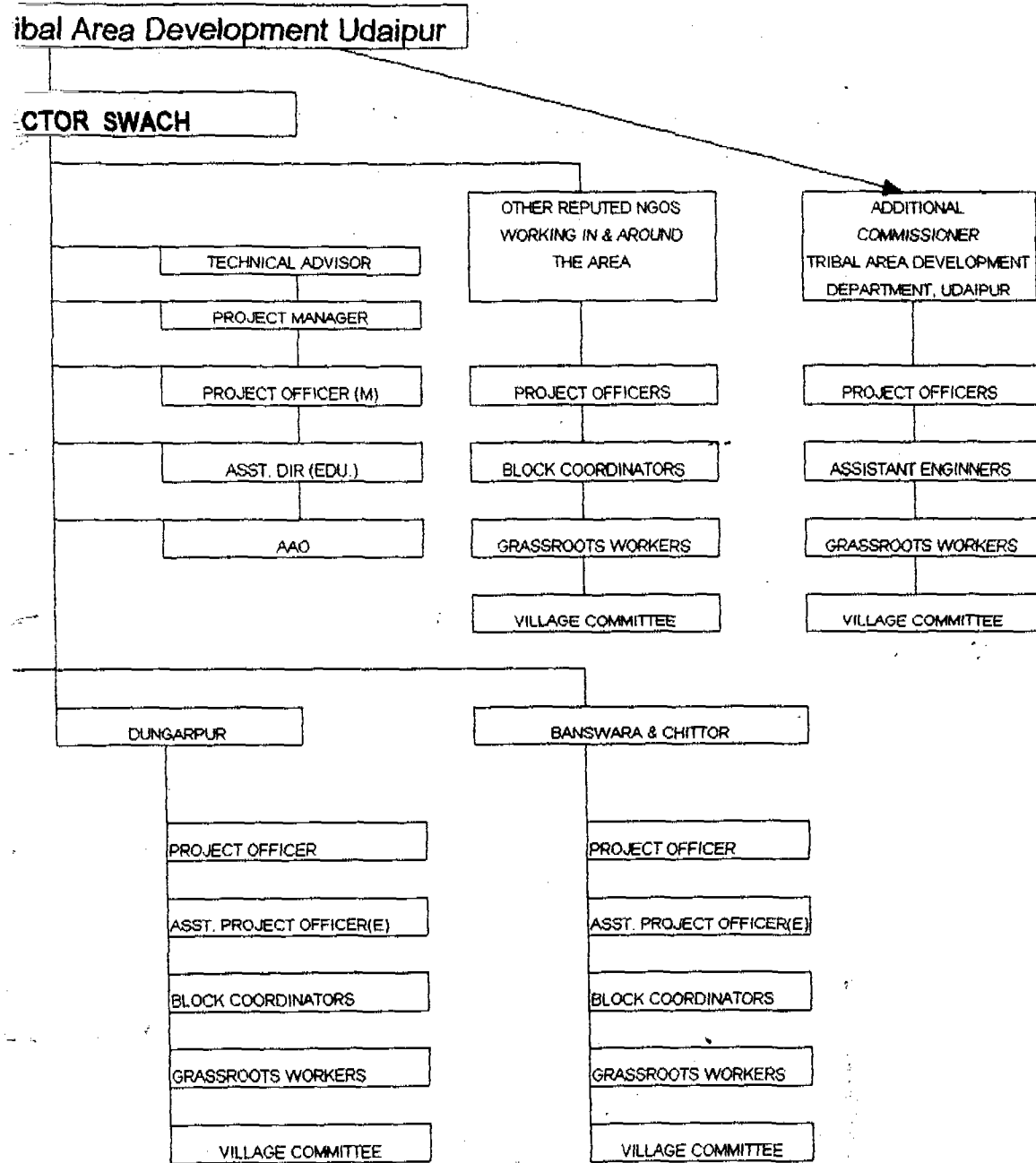
Supportive measures

- * in situ soil & water conservation
- * afforestation and biogas
- * farm yard manure (FYM)
- * storage of harvested crops
- * health care and training
- * women income generation

PROJECT IMPLEMENTATION



ORGANIZATION STRUCTURE



THE YEARWISE REQUIREMENT OF FUNDS

S.No.		Year					Total
		1997-98	1998-99	1999-2000	2000-01	2000-02	
1.	Works Cost	4529.00	7808.75	7823.75	7808.75	7808.75	35779.00
2.	Base line survey, @ 5% Audit, Evaluation etc.	226.45	390.44	391.19	390.44	390.44	1788.96
3.	Human & Institutional Resource Development	11.75	12.75	12.75	12.75	11.75	61.75
4.	Purchase of equipments & their maintanance	9.50	0.00	0.00	0.00	0.00	9.50
5.	Establishment	55.00	60.00	62.00	64.00	65.00	306.00
6.	Transportation	20.10	1.50	1.50	1.50	1.50	26.10
7.	Monitoring & Evaluation Exp. @ 10%	452.90	780.88	782.38	780.88	780.88	3577.92
		5208.35	8980.07	8997.32	8980.07	8980.07	41549.23

Say Rs. 41550 Lacs.