

Chapter – II

Review of Literature And Profile of Study Area

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REVIEW OF LITERATURE AND
PROFILE OF STUDY AREA

2.1 Review of Literature :

1) Jayanta Parera : ✓

In his Book examines irrigation development and agrarian development in the lower 'Indus River Basin' over the past 150 years. It argues that state initiated improvements in irrigated agriculture in Sindh has served to strengthen rather than weaker feudal production relation. It demonstrates, using historical and field data, that although large scale irrigation scheme have increased the area of irrigated land and improvement agriculture production, most farmers have seen only small improvement in income and remained socially and politically marginalized.

One major obstacle to develop a sustainable irrigated agriculture in 'Sindh' is water logging and salinity on cultivated land. If affected the crop production and productivity. So there is need to use water property and avoid water logging and water salinity. It means there is need of environment protection for agriculture development.

2) N.S. Lohar , R.R. Mane, S.N.Patil and M.B. Nichit :

Studied that lift irrigation schemes are playing an important role in the economy of the cultivators in Kolhapur district. Most of the lift irrigation schemes are installed on the river banks during last 40 years. About 500 lift are in operation in this district. There are three types of lift irrigation schemes, i.e. co-operatives lift, sugar factory lift and private

lifts. The study was undertaken with the following objects ; 1) To study the management of co-operatives factory and private lift irrigation schemes, 2) to study the co-operative investment made in these lift and 3) to study the comparative economics of the lift irrigation schemes run by co-operative irrigation societies, co-operative sugar factories and private individual. Four lift irrigation schemes operated by the sugar factories and four schemes operated by private individuals were selected for the present study. Those lift irrigation scheme which were established before 10 to 15 years were selected. The total data were collected from the selected irrigation schemes during the year 2004-05. In the case of management of sugar factory operated lift irrigation schemes there is a long chain of staff and there fore no quick decision are taken on the other hand in the case of private lifts. There is personal touch in management. The average capital investment worked out to Rs. 20,60,940 Rs. 27,58,685 Rs, 8,29,810 per unit irrigation schemes for co-operative sugar factory and private operated lift irrigation schemes respectively. Among the three types of lift irrigation schemes, the co-operative lift irrigation scheme were most profitable with the benefit cost ratio. These lift irrigation is used for agriculture development.

3) R.S. Poddar, G.K.Hiremath, H. Basavaraja L.B. Hugger and Ashok Dalvi :

They studied small scale irrigation project for sustainable agriculture development. A co-operative organization called Krishna Theera Ryot Sanah (Krishna Basin Farmer's organization) constructed the Chikkapadaslagi irrigation project across Krishna river during 1987-

89. The conception of idea of the project, organization farmers, mobilizing men money and materials management and supervision of the project are unique achievement. The present study was taken up to document the different aspect of this agriculture infrastructure project in terms of financing, construction and maintenance and financial implications and its impact in terms of employment generation and secondary benefits. The economic implication of the project were studied with the help of project appraisal tools such as Benefits- Cost Ratio (BCR), Net Present Value (NPV), Internal Rate of Return (IRR) and pay back period (PBP). Linear programming techniques was used to develop optimum farm plan and assess the impact of the project. In view of the short pay back period, positive BCR, high NPV and high IRR values, it could be concluded that investment in chikkapadasalgi barrage were economically feasible. Per hectare net returns obtained in the various plans in irrigated and unirrigated region brought out the difference in the farm incomes due to influence of irrigation. Agriculture development shows positive growth due to irrigation.

4) A.K. Patil : (2006) ✓

A.K.Patil has studied the role of irrigation in agriculture development and environment protection. Irrigation water is supplied to supplement the water available from rainfall and the contribution to soil moisture from ground water. In many areas of the world the amount and nature of rainfall are not certain to meet the moisture requirement the amount and nature of rainfall are not certain to meet the moisture

requirement of crops, hence irrigation is essential to raise crops so as to meet the needs of food and fiber.

Irrigation generally is defined as the application of water to soil for the purpose of supplying the moisture essential for plant growth. However a broader and more inclusive definition is that irrigation is application of water to the soil for any number of the following six purposes.

1. To add water to soil to supplement the moisture essential for plant growth.
2. To provide crop insurance against short duration drought.
3. To cool the soil atmosphere, thereby making more favorable environment for plant growth.
4. To wash out or dilute salts in the soil.
5. To reduce the hazards of soil piping
6. To soften tillage pond.

5) Nivas Jadhav : (2001) ✓

Studied that co-operative lift irrigation and agriculture development. Co-operative Lift Irrigation Societies (CLSs) have made remarkable development in the district. In the former Kolhapur state, no society of this type was organized. The Government also encouraged the organization of CLISS (Co-operative Lift Irrigation Society) by granting financial and technical aid to the CLISS. There are 541 CLISS in Kolhapur District as in 1999. These CLISS is mostly useful for agriculture development. Due to the irrigation water induced change in cropping pattern, such as inclination towards cash crops (96%) increased

farm yield (87%) and the consequent increased monetary returns from the sale of produce (78%), adoption of agro-ancillary activity (86%) as well as of modern farming techniques (83%) as well as of modern farming techniques (83%) more spare time for other activities (76%) and overall improvement in the standard of living (69%) in Kolhapur District.

6) S.P. Seetharaman and T.K. Jayaraman's : (1982)

“Surface Irrigation Co-operative : A Case Study ” is about the formation and function in of water distribution co-operative society established in September 1978 at Mohani village on Bhestan Minor of the Ukai Kakrapara Irrigation project in Surat District of Gujarat state. It was the first co-operative society of its kind in the country and its formation was facilitated by

- (a) The State Government ready to write- off loss in first three years.
- (b) To meet the administrative cost of the society upto Rs. 26,000 per year in the first two years and
- (c) The irrigation departments willingness to supply water in bulk at 25 paise per 10,000 liter. The society, in turn, undertaken the taks of providing water to the member and non- member farmers at the rates charged by the State Government for different crop within the command area.

After evaluating the society performance against six criteria namely, (I) Assured supply of irrigation water would ensure identical cropping pattern in the entire command area (II) Reliable supply of water would tend to decrease investment on own irrigation arrangement (III) Impact of socio-economic status on access to canal water (IV) Efforts

spent by farmers for routine tasks should be less, (V) Success of the system depends on its adaptability, simplicity and to resolve conflicts, and (VII) Promote optimum use of water and increase revenue, the researchers concluded that two preconditions prior to farming of a water co-operative should be met namely (a) Social cohesiveness (e.g. as reflected in a single village) based on a limited community and (b) effective supervision through appointment of field staff to ensure proper distribution of water is necessary.

The authors further observe that the success of Mohani water co-operative should not be considered only through its achievement against the six- points indicators. One of the biggest achievement is the consciousness created among the members on the use of water. Since the society pays for the water on quantity basis, wastage has been minimized and water logging of the irrigated land is eliminated further, the farmers providing measuring equipment at each form is neither possible for desirable.

7) **Vishnu D. Bhatale : 1989 ‘ Co-operative Irrigation A Case Study’**

He studied that the role of co-operative irrigation in agriculture development. The co-operative water supply society under study has undertaken a step by step by step plan to increase its water supply potential. First one scheme was operated from the river Bhogavati and later another schemes became operative in river Tulshi. This increased the irrigation potential of the society from 359 acres in 1978-80 to 959 acres in 1997-98. Thus water is supplied to member framers as well as non-members of both Kharif and Rabi season.

Increased Sugarcane cultivation with supply of water through the co-operative water supply society has been possible with increased use of chemical fertilizers thus making it a higher cost of cultivation cropping patten. His study also amply reveals that with assured water supply farmers in the village often trend to use more than necessary water for sugarcane farming. Excess use of water leads to water logging in the sugarcane field which along with excess use of chemical fertilizers may lead to problem of soil salinity. Hence farmers suggested to avoid this problem.

8) H. Shivappa :

examiners the role of irrigation in agriculture development with reference to Karanataka. The impact is examined based on primary data from a before/ after study in two talukas across two districts one with canal and one with ground water irrigation. There is shift towards high value crops such as sugarcane and the income across talukas and farm sizes increases by about 350 per cent. The yields and employment also increase sharply and the land price increase by 460 per cent. Thus, a impact is evident from irrigation, development. People increased agriculture production due to irrigation. But when people use over water for the crops there will be create environment problems as like water logging, salinity. So there is need for agriculture development with environment protection

9) R.K.Khatkar, V.K.Singh, A.K. Narang and Kapil :

“ Impact of Bhakra Dam project on Haryana Agriculture Development”

They studied the net area irrigated has increased from 8 lakh ha in 1953-54 to 29 lakh ha. in the year 2001-02 consulting 28.49 percent and 82.90 per cent to net area respectively. Food grains production has increased from 5.39 lakhs tones in 1950-51 to 139.7 lakhs tones during 2001-02. The electricity consumption in agriculture sector has increased at a faster rate from 985.07 lakhs KWH in 1966-67 to 50318.48 lakhs KWH during the year 2002-03 accounting for 22.68 per cent and 42.93 per cent to total power consumption in the state respectively, mainly due to increase in number of tub wells. With the dawn of green revaluation the area under wheat and rice has increased manifold owing to supply of additional irrigation water and power after implementation of Bhakar project while the area under pulses and coarse cereals has declined drastically. The development and dissemination of new input intensive agriculture production technology accompanied by the development and dissemination of new input intensive agriculture production technology accompanied by the development of required infrastructure in terms of irrigation, power, road and market resulted in increase in the productivity of different crops. The water and power supplied by the Bhakra system has changed the life line of the people of Haryana in general and the farmers in particulars.

✓
10) Sitiesh Bhatish :

He examines the impact of dams on the possibility of earthquakes. He finds that dams and reservoirs increase the frequency of earthquakes. The frequency depends on the water level in the dam, the volume of water stored and the proximity to geological faults and earthquake epicenters. B . Sambasiva Rao, B.V. Raghavendar and K.M. Kumar describe the watershed development approach for rural development in India. It indicates the need for a comprehensive and sustainable approach.

2.2 Profile of Study Area :

2.2.1 Introduction :

This chapter deals with profile of study area. There are eight village in the study. Out of total village of study area 6 villages are in Karveer taluka, where as 2 villages are in Panhala taluka.

2.2.2 Kolhapur District :

The district of Kolhapur lies in the South-West of Maharashtra between 15-17 North latitude and 73-74 East longitude. It is bounded on the north by Sangli District, on the west by Ratnagiri and Sindudurg district and in the South- East by Belgum district of Karnataka state. The total area of admeasures, 7685 sq. kms. It covers the 2.64 per cent of the total surface area of Maharashtra.

The district is a part of the deccan table an slopes towards the South-East. The broad physiography of the district comprises densely forest of Sahyadri ranges, along with its western boundary having a mean height of around 900 meters from the sea level. Partly forested plate dissected by numerous stream situated to the east of sahyadri and the river valleys are the most fertile area of the district and are densely populated.

The district has a well- developed drainage pattern. The rivers of the district originate in the west and flow into way of Bengal. The main river of the district are the Warana, Panchgaga, Dudhaganga, Kasari, Kumbhi, Tulsi and Bhogavati.

At a present there are 1158 inhabit village, to towns and 2 cities in Kolhapur District.

2.2.3 Climate and Rainfall of Kolhapur District :

The district has temperature climate. The western part of District proximate to Sahayadri is cooler than the eastern part which is liable to not winds during April and May, Monsoon from June and October and winter from November to February.

The major portion of the district lies in the rain shadow region of sahaydari ranges. Kolhapur receives rain both from the south-west and north-east Monsoons. The quantum of rainfall received decreased rapidly from west to east. The eastern part of district have fertile rainfall. The average annual rainfall varies from 60 m.m in Shirol tahsil, in east, of 6000 m.m in Gaganbavada tahsil in the west. The south-east Monsoon commence by first week of June and last till end of September. By the end of September the south-west Monsoon loses its vigor. The central part of district also gets some rain from about 14 degree Celsius to 16 degree Celsius December and January are the coldest months of the year. In the summer especially in April, daily minimum temperature frequently exceeds 38 degree Celsius. Thunder and storms are common in May and the rainfall in this seasons account for about 10 per cent of the total annual rainfall.

2.2.4 Soil in Kolhapur :

The district has three broad soil zones, that western part is covered with literate soil whereas, the central zone is fertile and is covered with brownish well drained soil. The dry type eastern part has medium black soil.

2.2.5 Rivers in Kolhapur District :

The main rivers of Kolhapur district are the Krishana, Warana, Panchganga, Doodhaganga, Vedganga and Hiranyakeshi. The Panchganga is formed by the four tributaries, namely, the Kasari, Kumbhi, Tulsi, Bhogavati. The Panchganga falls into the Krishna at Narsobawadi in shirol tahsil after covering a distance of approximately 136 kilometer in the district. The following bifurcation can be made as per the water available in the river.

Table No: 2.1
Rivers in Kolhapur District

Particulars	Name of the rivers
Perennial	Krishna, Panchganga, Warana, Dudhganga, Vedganga, Bhogavati
Seasonal	Hiranyakeshi, Gahtprabha , Kumbhi, Kasari, Tulsi, Tillari, Tamyaparni, Chikotra, Dhamani, Markandeya.

Sources : District Census Hand book- Kolhapur.

2.2.6 Irrigation to Kolhapur District :

The sources of irrigation to agricultural lands are either dug well or rivers. No canal irrigation is available until. The total irrigated area in the Kolhapur district is 20.56%. The highest percentage of irrigation is in shirol taluka. It is 30.75% followed by 26.57% in karveer 12.91% in Panhala and the lowest being in Bhudargad block it is 3.5%.

Kolhapur type weires (K.T.weires) have been constructed on various rives. In addition, two medium size dam at Radhanagari on Bhogavati river and Dhamod dam on Tulsi river have been constructed. Similar dams at Patgaon on vedganga river, Jangamhatti on Kasari river, Parali Ninai on Kadvai river and Chitri dam on the river of chikotra are in Process.

2.2.7 Population of Kolhapur District :

The total population of Kolhapur district with Karveer and Panhala tahsil presented in the following table

Table No: 2.2
Population of Kolhapur District : 2001

Particular	Male	% of male	Female	% of female	Total	%
Kolhapur	1807470	(51.30)	1715692	(47.70)	3523162	(100)
Karveer	473090	(52.16)	433776	(47.84)	906866	(25.24)
Panhala	124013	(52.05)	114310	(47.95)	238323	(6.77)

Source : Census Of India 2001, Series 28 Maharashtra Table P.P 132-134

Note : Figures In Parenthesis Shows Percentage To Total.

The above table shows that the male population is higher (51.30) than the household industry workers and other workers. It presented in the following table.

2.2.8 Occupational Distribution of Population :

The population mainly divided in to three categories i.e. main workers, marginal workers and non workers. However main workers again classified into cultivators, agricultural labors, the total population of the main workers cultivators constitute 45.90 per cent and agricultural labors 25.54% per cent.

Table No: 2.3

Occupation Distribution of Population in Kolhapur District.

Sr. No	Particulars	Number	Percentage to total
1	Main workers	1169813	39.13%
	a) Cultivators	537002	
		(49.90)	
	b) Agricultural Labours	298821	
		(25.54)	
	C) Household Industry workers	53996	
		(4.62)	
	d) Other workers	409994	
		(35.04)	
2	Marginal workers	209456	7.00%
3	Non Workers	1610316	53.87%

Sources : Primary Census Abstract – General Population – 2001

Note : Figures In Parenthesis Indicate Percentage To Main Workers.

The table reveals that main workers constitute 39.13 per cent of the total population while the non-workers constitute 53.87 per cent, marginal workers constitute 7.00 per cent of female population (48.70) in Kolhapur district. Karveer and Panhala tahsil also higher male population than female population.

Table No: 2.4
Distribution Of Population According To Working Status In
Kolhapur District 2001

Sr. No.	Working status	Total	Percentage
1	Main Workers	1169813	39.13
2	Marginal workers	209456	7.00
3	Non workers	1610316	53.83
	Total Workers	2989585	100.00

Source : Socio- Economic Survey of Kolhapur District – 2001

The table shows that main workers constitute 39.13 per cent of total population in the District, while the marginal workers constitute 7.00 percentage, non workers constitute 53.87 per cent of the total population.

2.2.9 Production of Foodgrain :

The district performance of agriculture shows that foodgrains production increased in Kolhapur by 1.46% during 1990-2000. Improvement in yield of food grains played significant role in enhancing the level of output. At the crop level output of rice increased by 0.6% in the district and output of wheat reduced by 4.3%.

The following table shows per hectare production total production and area under major crop in the Kolhapur District.

Table No: 2.5

Production And Area Under Major Crops In Kolhapur District

Crop	Production per hectare	Total production	Area under crop (in ha.)
Rice	2320	2409	106422.4
Wheat	1603	101	6300.6
Jawar	1213	319	26298.4
Bajara	396	1	252.5
Maize	893	50	559.9
Ragi	984	243	24698.1
Other cereals	506	42	8300.3
Total cereals	1815	3225	177685.9
Gram	691	67	9696.0
Tur	250	9	3600.0
Blackgram	844	27	3199.0
Greengram	625	10	1600.0
Masura	400	2	500.0
Other Pulses	365	31	8493.1
Total pulses	537	146	27188.0
Ground nut	1669	1043	27188.0
Sugar cane	77239	68125	88199.1
Cotton	170	1	588.2
Seeds	360	2	555.5
Tobacco	2292	110	4799.3
Chili	340	18	5294.1
Turmeric	4000	396	9900.0
Potato	2667	1024	38395.0

Source : Socio-Eco. Survey of Kolhapur District 2001

Note : Per hectare production in Kilogram. Total production in 'oo' tones
Area under crop in hectare

2.2.10 Profile of Dam :

‘The Sangrool co-operative Dam Sangrool’ is situated in Sangrool village. There are eight village coming under this dam area. Out of this six villages are come in Karveer taluka, the name of villages are Koparde, Adur, Bhamate, Kalmbe, Chinchavade and Sangrool reaming come in Panhala tahsil names are Marali and Savarde. This area is situated the west side of Kolhapur district. All the villages of Dam area has situated on Kumbi river. This area has a well developed drainage pattern. The main occupation of these village are Agriculture.

2.2.11 Climate and Rainfall :

The study area has medium temperature climate. These village are near the Sahaydries it is always cooler than the eastern part of Kolhapur district. The year in respect of these villages may be divided into three periods hot weather from March to may, rainy period from June to October and cool weather from November to February.

These village lies in heavy rain region. The average rainfall of Karveer is 905.00 mm and Panhala 1577.20 mm per year. These villages are receiving heavy and assured rain.

The south-west Monsoon commenes by about the first week of June and last till about the end of September with the on set of the south west Monsoon there is a rapid fall in the day temperatures. These village also gets some rain from the north- east Monsoon which is helpful for the rabi sowing and for sugarcane.

2.2.12 Soil of Profile Area :

The soils of these village are mainly derived from trap physiographically these village can be divided into two soil zone. 1) The river valley zone covered with brownish soil and 2) The remain part of hilly zone covered with soil.

In the valley, laterite soils are mixed with trap soils. They vary in color from brown to black, are fairly deep and tentative of moisture sugarcane is main crop of this area.

The laterite soils occur mainly in the highly tracts. On the hill tops which are not covered by forest.

2.2.13 Population of Study Area :

The population of the eight study village are showing in the following table.

Table No: 2.6
Population of Study Area

(As per- 2001 census)

Sr. No.	Village	Male	% of male	Female	% of female	Total	%
1	Koparde	2897	57.36	2153	42.64	5050	(100)
2	Adur	797	51.85	740	48.15	1537	(100)
3	Kalambe	611	52.17	560	47.83	1171	(100)
4	Bhamate	1020	52.93	907	47.07	1927	(100)
5	Chinchvade	912	53.30	799	46.70	1711	(100)
6	Sangrool	4133	52.58	3727	47.42	7860	(100)
7	Marali	915	53.22	804	46.78	1719	(100)
8	Savarde	870	50.14	865	49.86	1735	(100)
	Total	12155	53.52	10555	46.48	22710	(100)

Source – www. Government in. com.

Table shows that total population of command area and ratio of male and female. Male population is higher (53.52) than female population (46.48)

2.2.14 Land Under Main Foodgrain :

Table No: 2.7
Land Under Main Foodgrain In Command Area

(In hectare)

Crop	Koparde	Adur	Kalambe	Bhamte	Chinchavade	Sangarol	Marali	Savarde	Total
Rice	149.10	81.44	14.31	66.38	72.56	105.40	102.40	118.50	710.09
Wheat	-	-	-	-	--	-	5.10	2.0	7.10
Sugarcane	168.81	119.30	61.44	120.54	122.32	461.00	280.10	314.18	1647.69
Groundnut	19.12	15.42	25.32	7.16	13.71	33.00	28.22	30.16	172.11
Total pulses	-	-	-	-	-	-	-	-	-
Cotton	-	-	-	-	-	-	-	-	-

Source : Village Revenue Office And Grampanhayat Of Command Area.

Above table shows that the eight village under 'Sugaraol co-operative Dam' is largely converted sugarcane (1647.69). After the sugarcane rise is important crop of these village. There are very less area under groundnut. There is no land under pulses and cotton.

2.2.15 Land Use Pattern In Study Area :

Land under various sector in study area are showing in following table.

Table No: 2.8
Population of Study Area

Sr. No.		Total land	Land under cultivation	Follow land/ barren	Current follow Land	Pasture land	Other
1	Koparde	504.15	375.53	37.15	13.67	14.4	62.40
2	Adur	302.82	246.63	10.02	22.34	3.10	20.73
3	Kalambe	154.69	116.27	19.10	4.90	3.40	11.02
4	Bhamate	276.47	225.45	10.70	4.15	12.50	23.67
5	Chinchavade	302.35	250.58	12.50	4.15	15.60	19.52
6	Sangrol	892.68	638.74	116.81	13.16	35.39	100.58
7	Marali	502.14	430.60	18.10	5.10	23.32	25.02
8	Savarde	575.73	514.43	12.40	6.12	4.10	38.60
	Total	3511.03	2798.23	236.78	73.59	118.81	301.54

Source – Village Revenue Office.

The table shows that total land area is 3511.03. Out of total land cultivation area is 79.69 per cent. This table also shows that there are no land under forest.

Sangrol is big village and Kalambe is very small village.

2.2.16 Ponds And Wells In Study Area :

The ponds and wells under study area are show in the following table.

Table No: 2.9

Ponds And Wells In Study Area

Sr. No.	Villages	Wells	Ponds
1	Koparde	35	-
2	Adur	43	1
3	Kalambe	26	1
4	Bhmte	39	-
5	Chinchvade	42	-
6	Sangrool	95	1
7	Marali	35	-
8	Savarde	15	-
	Total	327	3

Source : Village Grampanchayat.

Table shows that there are 327 wells and 3 ponds in command area.

2.2.17 Tractor and Lift Irrigation Motors :

Tractor and lift irrigation motors under the study area are shown in the following table.

Table No: 2.10

Tractor and Lift Irrigation Motors

Sr. No.	Villages	Tractor	Diesel Engine		Total Oil Engine	Electric Motors	Engine River	Total Electric Engines
			Well	River				
1	Koparde	15	-	-	-	25	35	60
2	Adur	8	-	-	-	17	20	37
3	Kalambe	11	4	-	4	22	13	35
4	Bhmte	14	10	-	10	37	05	42
5	Chinchvade	12	13	-	13	29	16	45
6	Sangrool	65	5	-	5	15	120	135
7	Marali	14	5	-	5	18	29	4
8	Savarde	11	2	-	2	12	49	61
	Total	150	39	-	39	175	287	462

Source : Karveer Tahsildar Office and Savarde & Marali – Village Revenue Office

Table shows detailed information about electric motor and diesel motors in study area. Each village is having tractor and motor pumps.

2.2.18 Cattle Population :

Animal husbandry is sub occupation of farmers. It is divided in three groups i.e. 1) Buffalos 2) Cow 3) Bullock.

The cattle into the study village are shown in the following table.

Table No: 2.11
Cattle Population

Sr. No.	Villages	Buffalos	Cow	Bullock	Total
1	Koparde	1057	50	21	1028
2	Adur	507	31	68	606
3	Kalambe	429	52	35	516
4	Bhmte	1169	151	116	1436
5	Chinchvade	759	207	167	1133
6	Sangrool	1970	858	825	3653
7	Marali	610	120	30	760
8	Savarde	752	438	26	1216
	Total	7253	1907	1288	10448

Source : ' Veterinary Hospital- Grade1 Sangrool : Ad 1997

Note : Savarde and Marali data get from Co-operative Dairy of Village.

Table shows that the total cattle population of command area is 10448. The number of buffalos (7253) is higher than others. The people have kept cows and bullocks which is happy sign to maintain environmental balance.

2.2.19 Trees in the Study Area :

Trees are very important for to maintain the environment balance .
Various trees under the study area show in the following table.

Table No: 2.12
Trees In The Study Area

	Koparde	Adur	Kalambe	Bhamde	Chindgad	Sanrground	Marali	Savarde
Mange	161	202	84	82	90	1130	212	360
Coconut	140	435	75	42	41	521	168	135
Tamarind	2	11	8	5	5	45	18	22
Jamhul	45	65	15	20	25	110	42	60
Jackfruit	25	35	12	10	18	60	24	48
Lemon	10	15	15	10	15	25	10	8
Chiku	5	5	7	20	10	41	12	14
Other	310	230	225	250	270	1974	216	410
Total	698	1028	441	439	474	3904	702	1057

Source – Karver Tahasildar Office

- Marali And Savarde- Panchayat Office.

The table shows that due to dam, the farmer were able to plant the various type of trees. This is the environmental impact of co-operative dam. Earlier to dam, it was told by the old person, that there were no such type of trees in the area of dam.

2.2.20 Profile Of Co-Operative Society In Command Area :

There are mainly four types Co-operative Society in command area, there are co-operative lift irrigation, co-operative dairy, co-operative credit society and co-operative service society etc. Co-operative irrigation

dam is in Sangrool and also Co-operative Carpenter industry is in Sangrool village. The co-operative societies are show in following table.

Table No: 2.13

Profile Of Co-Operative Society In Command Area

	Co-operative Lift irrigation	Co-operative Dairy	Co-operative credit society	Co-operative Service	Other	Total
Koparde	1	4	2	2	-	9
Adur	2	3	0	3	-	8
Kalambe	2	2	0	2	-	6
Bhmte	1	2	0	1	-	4
Chinchvade	1	2	1	1	-	4
Sangrool	2	5	4	1	-	14
Manali	1	5	1	2	-	9
Savarde	1	3	2	4	-	10
Total	11	26	10	16	2	65

Source : Village Panchayat.

The command area of dam has highest Dairy Co-operative i.e. 26. This is also due to water made available by the co-operative dam.

CONCLUSION :

This chapter gives the review of literature about the role of irrigation in agriculture development and environment protection water is very important for the agriculture development, it is also helped for environment protection except water we can't use the modern tools in agriculture. Co-operative society helps to supply the water to agriculture.

From the above mentioned points it can be calculated that the area has medium temperature climate and heavy rain region. Physiographically these villages can be divided into two broad soil zones: 1) the river valley zone covered with brownish and 2) Remain part of hilly zone covered with late rite soils.

The sugarcane is main crops of this study area, after sugarcane rice is important crop of these villages.

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