Vol 2 Issue 2 March 2012

ISSN No : 2230-7850

International Multidisciplinary Research Journal

Indian Streams Research Journal

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RNI MAHMUL/2011/38595 **ISSN No.2230-7850**

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial board.Readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

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Indian Streams Reserach Journal
Vol.2,Issue.II/March ; 12pp.1-4
Amol Ramesh Kajale
ISSN:-2230-7850

Research Papers

Importance of Bhima (Ujjani) for Agriculture of Solapur District

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Abstract

Solapur District at a Glance :-

The presiding deity of Maharashtra, lord vitthal is at Pandharpur in this district. Swami Samarth has followers from all walls of life. Solapur is famous as a textile town, especially owing to its weavers' Community. Its great strides in the fields of education, literature and cultural prospect brought by the Co-operation movement have made Solapur district an important in modern Maharashtra. The supreme sacrifice by the revolutionaries of Solapur has made it important so that the Martyrs' Memorial here is saluted daily by thousands of visitors.

District. -- Solapur
1.Area -- 14886 sq.kms -- km2
2. Sub-divisions - Solapur,Madha (Kurduwadi), Pandharpur
3.Talukas -- Solapur, Barshi, Akkalkot, South Solapur North solapur, Mohol, Mangalwedha, Pandharpur, Sangola, Karmala, Madha,.
5. Distance from Mumbai -- 450 kms
6. Means of Transport -- Railway Station – Solapur, Mohol, Kurduwadi and ST Buses (M.S. R. T. C.)
7. Population -- Total - 38, 55,383
Male - 19, 90,661
Female - 18, 64,722
8. Literacy -- Per cent – 71.50
Total – 23, 65, 053
Male – 14, 00, 379
Female – 9, 64, 674
9. Area under Irrigation -- 4, 83, 915 hectares
10. Irrigation Projects -- Major – 1
Medium – 2
Minor – 69
Imp. Projects – 1
Bhima (Ujjani)
11. Industries -- Big – 98
Small – 8986
12.Languages/Dialects– Marathi, Telgu, Kannada, Urdu
13. Folk – Arts - Lavani, Gondhal, Dhangirl, Aradhi and Bhalari songs
14. Weather -- Temperature
Max. – 34.10 Deg. C
Min. – 21.7 Deg. C
Rainfall – 759.80 mm (Average)
15. Main Crops -- Jawar, Wheat, Sugarcane
16. Area under Horticulture -- 60000 hectares
17. Health Infrastructure -- PHCs – 67
Rural Hosp. – 14
Dist. Hosp. – 1
Big Hosp. – 30
18. Tourist Places -- Kudalsangam, Pandharpur, Akkalkot, Barshi, Karmala, Nanaj (North Solapur taluka)
19. Educational Institutions -- Solapur University, Solapur

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Colleges – 30
Primary Schools – 2838
Secondary Schools – 637

20 . Geographical Information of Solapur District.

Geographically Solapur is located between 17.10 to 18.32 degrees north longitude and 74.42 to 76.15 degrees east longitude. The district is on the south east fringe of Maharashtra State and lies entirely in the Bhima and Seena basins. Whole of the district is drain either by Bhima river or its tributaries.

The district is bounded on the north by Ahmednager and Osmanabad district, on the east by Osmanabad and Gulbarga (Karnataka State) districts, on the south by Sangli and Bijapur (Karnataka State) and on the west by Satara and Pune districts. There is no important hill system in the district. Only in the north of Barshi Taluka several spurs of Balaghat range pass south for a few kilometers. There are also a few scattered hills in Karmala, Madha and Malshiras Talukas. The district in general has flat or undulating terrain. The low table land small separate hills in karmala and Madha Talukas act as a Watershed between Bhima and Sina rivers. The district covers geographical area of 14844.6 sq.kms. This is 4.82% of the total area of Maharashtra state. Out of the total area district 338.8 sq.kms (2.28%) is urban area whereas remaining 14505.8 sq.kms. (97.72%) is rural area. Area-wise karmala Taluka is biggest covering an area of 1609.7 sq.kms and North Solapur is smallest covering an area of 736.3.sq.kms.

TABLE No. 4.1
The Taluka-wise Number of villages and its Area (in Sq.Kms.)

Sr No	Name of Talukas	No of villages	Area in Sq. Kms
1	North Solapur	53	736.3
2	South Solapur	89	1195.3
3	Akkalkot	135	1390.3
4	Barshi	135	1483.1
5	Mangalwedha	81	1140.9
6	Pandharpur	94	1303.6
7	Sangola	101	1549.9
8	Malshiras	110	1522.2
9	Mohol	102	1408.4
10	Madha	116	1544.9
11	Karmala	118	1609.7

Source: Special Articles – Government of Maharashtra, 2004

`The soils of the district can broadly be classified into three types.
• Black
• Coarse Gray
• Reddish

According to topography the districts is divided in three natural zones.

• **Eastern Zone:** This comprises of Barshi, North Solapur, South Solapur and Akkalkot Talukas. The soil is medium to deep black and of rich quality. Jawar, Bajra and pulses are the main crops of this zone.

•**Central or Tansitional Zone:** Mohol, Mangalweda, eastern part of Pandharpur and Madha Taluka are covered by this zone. Like to moderate soil and uncertain rainfall marks this zone Both Kharif and Rabbi Crops are grown in this part.

• **Western Zone:** Karmala, Sangola, and Malshiras Talukas and western parts of Pandharpur come under this zone. Shallow and poor types of soil, not retentive of moisture marks this part Scanty and uncertain rainfall. Rabbi crops mainly grown in Karmala, Pandharpur and Madha Talkas while Kharif crops like Bajra and Groundnut are grown in Sangola and parts of Malshiras talukas.

LAND USE PATTERN:

• Agricultural Area : 11480 sq.kms
• Cultivable not in use : 380 sq.kms
•Non-agricultural : 690 sq.kms
• Grass Lands and Herbs : 720 sq.kms
• Forest Cover : 350 sq.kms
• Wastelands : 1260 sq.kms
•Drought prone area (All eleven talukas): 14884.6 sq.kms

Agro-climatically entire district come under rain shadow area. Rainfall is uncertain and scanty. The monsoon period is from second fortnight of June to end of September bringing rains from south- west monsoon. The average rainfall for the district is 545.4 mms.

TABLE No. 4.2
Talukawise Average Rainfall (in mms.) in Solapur District.

Sr No	Name of Talukas	Rainfall (in mms.)
1	North Solapur	617.3
2	South Solapur	617.3
3	Akkalkot	643.6
4	Barshi	594.8
5	Mangalwedha	519.8
6	Pandharpur	523.0
7	Sangola	462.4
8	Malshiras	422.8
9	Mohol	573.9
10	Madha	519.0
11	Karmala	506.0

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Source : Special Articles Government of Maharashtra year 2004

4.2 PROFILE OF BHIMA (UJJANI) PROJECT

Bhima project envisages construction of composite dam across river Bhima, a tributary of Krishna in Solapur district of Maharashtra and two canals.

Main feature of the Project :

a) Bhima Project envisages construction of composite dam 2467 M. long and 50.40M. high across Bhima river, a tributary of river Krishna near village Ujjani in Solapur district of Maharshtra for important gross storage of 3140 MM3 of water for annual utilisation of 1943 MM3.
b) Ujjani Left Bank Canal (126 Km.) having head discharge of 109 m3. With 4 branches canal namely, Begampur branch canal (34 Km.), Kurul branch canal (27 Km.), Mohol-karamba branch (49 Km.) and branch canal to irrigate a total ICA of 68845 ha.
c) Ujjani right bank canal (112 Km.) having head discharge of 42.5 cms. to irrigate a total of ICA of 44100 ha.
d) Lift irrigation scheme on the fringe of Ujjani reservoir to irrigate a total ICA of 8500 ha.

Status /Revised Estimates.

The project was approved by planning commission in the year 1965 for amount of Rs. 42.58 crores. The revised estimated cost of the project is Rs. 354.66 crores .Change in Scope:
I. Since some of the command area is lost due to cut off land and river bank, Begampur Branch canal (Ex. Ujjani IBC) has been extended to cover an additional area of 4436 ha.
II. The quantum of Life irrigation on the fringe of Ujjani reservoir has also been increased to 20.284 ha. Against 8500 ha. Provided in the original estimate .
III. The Government of Maharashtra has also changed the cropping pattern provided in the original estimate.
IV. Earlier the out lets on distributary system were to be constructed for 20 ha. Blocks. Subsequently, it has been decided to extend the channels upto 5-8 ha. Block.
V. Original projects estimates provided for lining of channels upto 2.83 cumecs. (100 cusecs) only but now it has been decided to extend the lining of channels serving upto 5-8 ha. Blocks.

Physical Status:

The progress of the main components of the project upto March,1989 is briefly as under :

Dam/Barrage:

I. Construction of dam and erection of 42 radial gates has been completely in 1980 and water was impounded upto FRL 496.80 Mtr. In mansoon of 1984.
II. Ujjani hydro-electric project: The work of the excavation of the circular power house is almost completed and the concreting also has been started. The excavation for extension of down stream weir which war started in the year 1985 is in progress.

Canals :Ujjani Left Bank Canal:

I)km.0+000 to 40+000: Main canal and distribution work is completed and potential of 4095 ha. has been created.
ii) Km. 40+000 to 76+000: Main canal and distribution work is completed and potential of 3800 ha. has been created.
iii) Km. 76+000 to 78+260: Earth work and lining completed.
iv) Km. 78+260 to 88+000: Earth work, structures and lining completed. In distribution system earthwork, structures and lining completed and an irrigation potential of 7112 ha. has been created.
v) Km. 89.000 to 90+000 (Pandharpur cut): Earth work, structures and lining completed.
vi) Km. 90+000 to 126+000: Main canal and distribution work completed and an irrigation potential of 21522 ha. has been created.

Ujjani Right Bank Canal (0+00 to 118+000 km.) :

I) Reach (0+00 to 2+00 km.) : Earthwork, structures and lining completed in all respects.
ii) Reach (2+00 to 112+00 km) :
a) The earthwork 55 km. is completed. Remaining earthwork is in progress.
a) Lining work in 26 km. is completed and remaining work is on progress.
b) Out of total 229 structures 117 nos. are completed and 28 nos. are in progress and 84 are yet to be taken up.

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Branch Canals:

I) Begampur Branch (km. 0+000 to 34 +000): Earthwork, structures and lining work completed.

ii) Mohol-Karamba Canal (0 to 49 km.) : Mohal Branch (0+00 to 25+000 km.): Earthwork and structures and lining is nearly completed. Out of 38 structures 35 nos. completed and 2 nos. are in progress. Karamba Branch canal (38 km.) : Earthwork for 3 km. completed and 12 km. are in progress. Out of 71 nos. of structures 11 nos. are completed and 15 nos. are in progress.

iii) Kurul Branch (65 km.) : Earthwork and lining and structures in progress. Earth work in 1 to 27 km. is completed and 20 km. in progress, out of 108 structures 64 completed and 8 nos. are in progress.

iv) Branch canal No. 1 : Earthwork, structures and lining completed. Earthwork, structures and lining of distribution system is also completed and in irrigation potential of 4784 ha. also has been created.

Table No. 4.5
Taluka-wise Irrigated Area of the Bhima (Ujjani) Project
(A) Canal (Flow) Irrigation (B) Lift Irrigation

Name of the Taluka	Irrigated Area (In Hectares)	Name of the Taluka	Irrigated Area (In Hectares)
Madha	3280	Madha	4884
Pandharpur	34454	Karmala	13604
Mohol	38663	Indapur	12900
Mangalwedha	25912	Daund	1395
Malshiras	7054	Shrigonda	698
North Solapur	10985	Karjat	1402
South Solapur	18412	South Solapur	-
Akkalkot	9040	Akkalkot	-
Total Canal (Flow) Irrigation	**1,47,800**	**Total Lift Irrigation**	**34,883**

Source: - CADA Irrigation Department Solapur year 2004.

The following table Shows the Canal wise irrigated area

Table No 4.6
Canal -wise Irrigated Area of the Bhima (Ujjani) Projcet

Name of the Canal	As per 12 months crop pattern		As per 08 months crop Pattern	
	Length in km	Area- in Hectare	Length in km	Area in Hectare
Ujjani left Bank canal	126	29830	126	29830
Ujjani right Bank canal	112	44100	132	51800
Begampur Branch canal	34	10135	55	17695
Kurul Branch canal	38	8190	65	14890
Mohol Karamba Branch canal	65	20685	170	33585
Total	**375**	**112940**	**548**	**147800**

Source- CADA Irrigation Department Solapur year 2004.

Ujjani Left Bank Canal (126 km) having head discharge of 109 Cum. With 4-branch canal namely – Begampur Branch canal (34 km), Kural Branch canal (38 km), Mohal Karamba Branch canal (65 km), and Branch canal No.1to irrigated a total ICA of 68845 ha.

Ujjani Right Bank Canal (112 km) having head discharge of 42.5 m3. To irrigated a total of ICA of 44100 ha. Lift irrigation scheme on the fringe of Ujjani reservoir to irrigate a total ICA of 8500 ha.

Sine some of the Command Area is lost due to cut off lad and river bank, Begampur Branch canal (Ex. Ujjani IBC) has been extended to cover an additional area of 4436 hectares. The quantum if Lift Irrigation on the fringe of Ujjani reservoir has also been increased to 20,284 ha against 8500 ha. Provided in the original estimate. The Government of Maharashtra has also changed the Cropping pattern provided in the original estimate therefore the revised cropping pattern is as follows.

TABLE No. 4.7
Cropping Pattern of Study Area of the Bhima (Ujjani) Project.

Seasons	Pattern of Crops		Percentage %
Kharif	1	Jawar	5%
	2	Bajra	10%
	3	Groundnut	50%
	4	Maize	5%
	5	Vegetable	2%
	6	Sunflower	7%
	7	Tur	5%
			84%
Non Irrigated	8	Pulses & green manuring	15%
Rabbi	9	Wheat	10%
	10	Jawar/hybrid	45%
	11	Gram	2%
	12	Sunflower	5%
	13	Vegetable	3%
Two Seasons	14	Chilies	3%
Total Cropping intensity			167%
Existing pattern of cultivation	% Of Principal Crop		Total in thousand Hectares
Perennials	0.4		1.42
Tow seasonal	7.5		26.60
Kharif seasonal	13.5		47.50
Rabbi seasonal	17.9		276.00
H.W.seasonal	6.7		2.43
			353.95

Source – Socio economic Report of Bhima (Ujjani)Projcet in 1996-97

Table No: 4.8
Seasonwise and cropwise Sanction of water rates as per Hectare.

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Name of the Crops	Summer Season 1999-2000				Kharif Season 1999-2000				Rabbi Season 1999-2000				Summer Season 1999-2000			
	Canal flow	Canal lift	River lift	Store water lift	Canal flow	Canal lift	River lift	Store water lift	Canal flow	Canal lift	River lift	Store water lift..	Canal flow	Canal lift	River lift	Store water lift
Sugarcane banana fruits & other perennial	1260	1260	793	630	600	600	380	300	1000	1000	633	500	1400	1400	887	700
Vegetable fodder & flower orchard	1260	1260	308	630	600	600	145	300	1000	1000	242	500	1400	1400	338	700
Ground nut	900	900	450	450	330	330	165	165	900	500	250	250	1000	1000	500	500
Cotton from 1st March	1200	1200	600	600	0	0	0	0	0	0	0	0	1320	1320	660	660
Cotton from 1st April	900	900	450	450	0	0	0	0	0	0	0	0	1000	1000	500	500
Onion, Khariff and Rabbi	0	1260	308	630	495	600	145	300	330	1000	242	500	0	1400	338	700
Onion, Rabbi and Summer	480	1260	308	630	0	600	145	300	792	100	242	500	528	1400	338	700
Tur, Kharif & Rabbi	0	0	0	0	150	170	50	90	100	250	70	125	176	500	125	250
Tur, Rabbi & Summer	160	450	120	225	0	0	0	0	264	250	70	125	176	500	125	250
Wheat	0	0	0	0	0	0	0	0	330	250	70	125	0	0	0	0
Sunflower, fodder Maize, Bajari, pulses Jawar ect	450	450	120	225	165	170	50	90	250	250	70	125	50	500	125	250
Drip, Irrigation Sugarcane Banana & Fruits	817	817	513	420	385	400	240	200	642	668	400	333	898	933	560	467

20% Local Taxes are extra for above water Rates.
Source- complied by Researaher.

The irrigation charges are periodically Collected through the Village officers from the farmers along with other revenue Collections.

It can be revealed from the above table, that the per hectare irrigation charges for groundnut varied Rs200 to Rs600 from 1994-97 and Rs330 to Rs1000 in the year 1999-2000. Wheat was the important crop grown in the rabbi season. The per hectares on wheat Rs200 in 1994-97 and rs250 to Rs330 in 1999 to 2000. The per hectare irrigation charges for jawar ranged from Rs100 to Rs150 in 1994 to 1997. These charges were raised in 1999to 2000 from Rs250 to Rs500. The per hectare irrigation charges of onion varied from Rs700 to Rs500. The per hectare irrigation charges of onion varied from Rs700 to Rs800 in 1994 to 1997. These charges were raised from Rs495 to Rs1400 in 1999-2000. The per hectare irrigation charges for cotton were from Rs600 to Rs800 in 1994 to 1997 and Rs1000 to Rs1320 in 1999-2000.

Sugarcane was the main cash crop grown by the farmers. Being a long duration crop, the irrigation charges were also the highest for the crop. The per hectare irrigation charges for this crop was Rs 1750 in the year 1994 to 1997.But it is decreased to Rs 1400 in 1999-2000. So it is most beneficial to large-scale farmers. Ditales of wate utilization for Non Irrigation schemes of the project. Today nearly 83.29 TMC water unitises as per revised plan of Ujjani project. Out of 83.29 TMC water, only 5.33 TMC water is proposed to utilizes for drinking and industrial purpose i.e- 94% water is proposed for irrigation use and only 6% water is proposed for irrigation schemes. Total storage Capacity of Ujjani Dam is 117.27 TMC out of 53.75 TMC water is useful. The following table shows the detail about water utilization for Nonirrigation schemes of Ujjani project.

Table No. 4.9
The details of water utilisation for Non Irrigation Schemes of Bhima (Ujjani) project.

Water utilisation for drinking purpose			Water utilisation for Industrial purpose		
Quota of water (TMC)	Percentage of water	Water charges (Rs in Corers)	Quota of water (TMC)	Percentage of water	Water charges (Rs in Corers)
3.95 %	4.74%	Rs 3.35	1.87	2.17%	R s 15.93

Source: CADA Irrigation Department of Solapur year 2001.

From the above table it can be revealed that Rs 3.35 Corers should be expected as revenue by utilization 4.74% water for drinking purpose and 2.17% water should utilize for industrial purpose and expected Rs 15.93 Corers as revenue. Rs 19.28 crores should expected as a total revenue. Today utilization of water is very less than quota sanctioned in many schemes of Ujjani project. The details about it is given in the following table No. 4.10

Table No. 4.10
Actual utilisation of water for Non Irrigated schemes of Bhima (Ujjani) project and expected revenue.

Water for drinking purpose			Water for Industrial purpose		
Utilization of water TMC	Percentage of useable water storage	Water charges (Rs in Crores)	Utilization of water TMC	Percentage of useable water storage	Water charges (Rs in Crores)
2.85	3.42%	0.0242	0.48	1%	4.22

Source : Compiled by Researcher.

From the above table we come to know that the actual revenue is very less and as stated earlier nearly 94% water utilise for irrigation that is why we should study the details of revenue obtained from irrigation since 1980-87 onwards.

TABLE No. 4.11
Year-wise charges of Irrigation and Total Revenue (Rs in Crores)

Year	Irrigation		Non Irrigation (drinking purpose + Industrial purpose		Total Revenue (3+5)
	Charges	Revenue	Charges	Revenue	
1	2	3	4	5	6
1985-86	0.13	023	–	–	0.23
1990-91	0.69	0.57	0.08	0.07	0.64
1995-96	2.32	2.13	1.27	1.13	3.26
2000-01	4.26	4.08	6.69	3.28	7.36
2001-02	5.24	2.88	5.52	4.34	7.22
2002-03	5.76	2.97	7.94	5.41	8.38
2003-04	7.91	1.29	6.14	5.40	6.69

Source : Compiled by Researcher.

From the above table it can be revealed that at the beginning revenue from irrigation schemes is high, but not greater than revenue from Nonrrigation schemes. It means that 94% water is utilized for irrigation purpose and revenue is only

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Rs 1.29 crores (i.e 16% revenue) and for Nonirrigation purpose utilization of water is very less but revenue is Rs.5.40 crores (i.e 84% revenue) obtained in 2003-04.

4.3Impact of Bhima (Ujjani) Project –

Irrigation Potential Created : -

As stated in the table no 4.12 the tow major talukas of Solapur district i.e Pandharpur and Mohol are the beneficiaries of Ujjani Project. Seventyfive villages of Pandharpur and Mohol taluka each enjoy the fruits of the irrigation facilities. The 100 % irrigated potential has been used at the level of 33454 and 38663 hectares in Pandharpur and Mohol taluka respectively as on June 2004. as per 12 Months Crop Method.

Table No. 4.12
Talukawise- Proposed Irrigated Area and Irrigation Capacity created for Crop Area (in Hactarers)

Taluka	Villages	Irrigated Area (I.C.A) in Hectare		Irrigation Capacity Created up to 6/2004 (Crop Area) in Hectare
		Proposed	Created up to 6/2004	
Madha	20	3280	3.280	4986
Pandharpur	75	34454	34454	52370
Mangalwedha	29	18212	15213	23124
Mohol	75	38663	38663	58768
Malshiras	16	7054	7054	10722
N.Solapur	23	10985	4424	6724
S.Solapur	1	292	292	444
TOTAL	221	1,12,940	1,03,380	1,57,138

Source –CADA Irrigation Department Solapur year 2004

The irrigated area under canal (flow) irrigation (Table N0. 4.13) lift irrigation (Table No. 4.14) shows that, the total 34883 hectares of irrigated area under lift irrigation, Karmala and Indapur talukas get maximum area i.e 13604 and 12900 hectares respectively. Other talukas do not get much advantage.

The talukawise Scenario of the irrigation wells and instruments of irrigation is stated in the following table No. 4.13 and 4.14. From the following table we come to know the brightent position of Mohol and Pandharpur taluka.

Table No. 4.13
Talukawise Sources of water uses of Irrigation in Solapur District.

Name of Talukas	Year	Number of Wells on Irrigation	Pumps On Wells		Number of Unused Wells	Number of Other Wells
			Diesel Pumps	Electric Pumps		
Karmala	1997-98	5586	600	3000	880	80
Madha	1997-98	6457	530	2515	245	_
Barshi	1997-98	4870	722	3912	775	_
N.Solapur	1997-98	1679	288	2832	285	_
Mohol	**1997-98**	**3406**	**473**	**1337**	**195**	**181**
Pandharpur	**1997-98**	**10864**	**135**	**12240**	**1280**	**39**
Malshiras	1997-98	2255	1780	41040	140	_
Sangola	1997-98	7956	70	2053	445	92
Mangalwedha	1997-98	5675	962	4268	445	_
S.Solapur	1997-98	5711	980	3330	1920	_
Akkalkot	1997-98	9130	430	2480	254	_
SOLAPUR		61589	6970	79007	6864	392

Source :- Agricultural Commissioner Pune, year 2001

Table No. 4.14
Talukawise Technical sources of water uses of Irrigation in Solapur District.

Taluka	Number of Successful Boring wells	Number of Hand Pumps	Number of Electric Pumps	Number of Hand Pumps (Running condition)	Number of Electric Pumps (Running Condition)
Karmala	1391	1296	49	1059	48
Madha	1676	1544	44	988	43
Barshi	1156	1052	86	704	84
N.Solapur	776	764	14	329	14
Mohol	1448	1310	63	1129	63
Pandharpur	1806	1692	34	1281	34
Malshiras	2061	1941	48	1058	48
Sangola	1892	1725	43	1114	43
Mangalwedha	1691	1587	38	1227	38
S.Solapur	1101	1101	42	799	40
Akkalkot	1245	1106	71	677	71
SOLAPUR	16243	15118	532	10365	526

Source:- Groundwater survey Report. Dist. Solapur year 2004.

4.4 Impact of Irrigation in Pandharpur Taluka

In order to study the cropping pattern the data was analysed (data at Pandharpur taluka level) and presented in the following table. Rabbi Jawar and sugarcane are the important crops in the study area. Study of changes in the area of these crops, help us to know about the changed cropping pattern since 1979-80 to 1998- 99.

Table No. 4.15
Year-wise area under Rabbi Jawar and Sugarcane in the study area of Pandharpur Taluka (since 1979-80 to 1998-99)

(Area in Hectares)

Year	Crops			
	Rabbi Jawar		SugarCane	
	Area in Hectares	Income (Rs. In Crores)	Area in Hectares	Income (Rs. In Crores)
1979-80	4884	0.24	2324	4.82
1980-81	5242	0.34	3128	7.81
1982-83	4452	0.13	3476	5.01
1984-85	4498	0.16	3637	8.73
1986-87	5577	0.52	3660	12.34
1988-89	12779	2.00	9667	30.56
1990-91	10804	1.82	13474	42.83
1992-93	10402	1.87	7101	29.45
1994-95	13630	3.67	12211	77.13
1996-97	10200	2.94	17995	150.92
1998-99	11729	4.31	12030	88.67

Source : CADA irrigation Department Solapur 2004

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It can be revealed from the above table – the area under rabbi jawar in 1997-80 was 4884 hectares, which was increased up 11729 hectares in 1998-99. in 1979-80 under sugarcane was 2324 hectares, which was increased upto 12030 hectares in 1998-99. the income from these crops was also increased. The area under these crops has been increased due to availability of water of Bhima Ujjani irrigation project.

Apart from these crops, the area under wheat, maize and vegetable has been increased with the increase in the supply of water. The big and medium scale farmers enjoy the irrigation facilities to the maximum extent. The area under banana, grape and pomegranate has been increased slowly. This show that, the irrigation facilities have definitely made an impact on the cultivation of cash crops like sugarcane and perennial crops. The area under sunflower, cotton, bajari, tur and pulses has been reduced with the increasing area under cash crop.

4.5 Water users Association in the Bhima (ujjani) Project.

Management of irrigation water both at policy level as well as Actual Utilisation at the farmers level the Govt. of Maharashtra irrigation Department has taken initiative for farming of the water user's Association on the irrigation projects in the realm of co.operative principles. The farmers are encourage to farm water user association in their respective villages and in their command area of the irrigation projects, The movement of water users Associations was started in 1996 and nearly 90, water user Association were functioning in nearly 35000 Acres of land. The Govt. of Maharashtra has made pioneering afforts in formation water user's Association in collaboration with the canal officers.

Accordingly the water supply will be controlled and Regulated by the canal officer.

Functions of water user's Association :

1) Every a Water Users' Association at any minor level shall perform the following functions namely :-

(a) to seek the following information from the upper Level Association or the concerned Canal Officer, as the case may be, and maintain its record and pass it on to its members:-

(I) Applicable water user Entitlement of such Association and that of its members,

(ii) Number of rotations planned,

(iii) Irrigation interval fixed,

(b) to collect, check and either sanction or reject partly or fully water applications or water indents of members based on criteria prescribed;

© to seek information regarding canal operation schedule from upper Level Association or the concerned Canal Officer, prepare detailed water distribution programme or Rotational Water Supply of members before every rotation and ensure volumetric supply to each members as per their entitlement; Provided that, in the case if Minor Irrigation Project having only one Water Users' Association, that Water Users' Association itself shall prepare canal operation schedule for the project;

(d) to convene a meeting of the Managing Committee before each irrigation season to guide and help the members regarding

I. Canal operation schedule and water distribution programme;

II. public notice to be issued;

III.maintenance of canal system before commencement of season;

IV. the information about the latest decisions taken by the upper Level Associations and the Appropriate Authority;

(e) to receive applicable water entitlement from upper Level Association or the Canal Officer and supply it to the members as per their Water Use Entitlement strictly following principle of tail to head;

(f) to maintain rotation wise or season wise Water Account in the prescribed form;

(g) to regulate and monitor water to the members;

(h) to assess water chares for the members and send bills in the prescribed form;

(I) to collect prescribed service charges for operation and maintenance from the lower Water Users' Association at minor level and to remit its share to the upper Level Association, or, the concerned canal officer, as the case may be;

(j) to carry out annual maintenance and repairs to canal system falling under its jurisdiction;

(k) to ensure that the members maintain their canal system in good condition and they receive agreed maintenance amount in time;

(l) to maintain the records as prescribed;

(m) to resolve disputes, if any, amongst the members;

(n) to raise and utilize resources mentioned in Chapter V of this Ordinance;

(o) to undertake all allied activities related to irrigated agriculture;

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(p)to prepare and submit annual report including the Water Audit and Audited Accounts to the General Body;
(q) to undertake any other activities required to accomplish the objectives of Water Users' Association;
2) without prejudice to the generality of the provisions of subsection (1), the water users' Association at minor level shall also perform the following functions on its area of operation :---
a. to convene a meeting of the members before each irrigation seasons to share with them information available regarding water availability and water entitlement and invite their suggestions, if any, for efficient management of available water;
b. to recover current water charges and previous dues, if any, from the members;
c. to issue irrigation passes to members whose water applications are sanctioned;
d. to prepare water distribution program or Rotational Water Supply (RWS) for sub-minors, outlets and amongst members within the limits set by canal operation schedule;
e. to implement the Agreement.
3) Without prejudice to the generality of the provisions of sub-section (1), it shall also be the function of a Distributary Level Association to send a copy of the bill of the water charges assessed under clause (h) of sub section (1) to the Canal Officer concerned.
4) Without prejudice in the generality of the provisions of Sub-section (1), it shall also be the function of a project Level Association to assist the Canal Officer in assessment of the water charges for non-irrigation use, which are to be remitted by such users to the Canal Officer.
5) The project Level Association shall also perform the following functions, in addition to the functions under sub-section (1), namly :-
(a) to prepare water budget or preliminary irrigation programme for project before commencement of each irrigation seasons and determine Applicable Water Entitlement, number of rotations and irrigation interval in consolation with the concerned Canal Officer;
(b) to assist the concerned Canal Officer in assessment of water charges for Lift Irrigation Water Users' Association on reservoirs and non-irrigation user, which are to be remitted by such users to the Canal Officer;
(c) to obtain and use area capacity table or curve of reservoir and discharge tables of head regulators or canals.
6) Without prejudice to the generality of provisions of sub-section (1), the Lift Irrigation Water Users' Association shall also perform the following functions, namely :-
(a) to give guidance to members regarding the crops and the areas to be irrigation in a season considering Applicable Water Use Entitlement, number of rotations and irrigation interval;
(b) to receive measured volume of water from the concerned Canal Officer and to supply it to the members.

WATER USER'S ASSOCIATION ON IRRIGATION PROJECTS :-

The state Government has taken policy decision on 23rd July, 2001 on formation of Co-operation Water User's Association (WUAs) and handing over the area for the irrigation management to WUAS, on all irrigation projects. The policy seeks (i) to reduce the gap between irrigation potential created and actual area irrigated, (ii) to increase water use efficiency of irrigation management, (iii) to restrict expenditure on maintenance and repairs of irrigation system and (iv) to recover water charges effectively. By the end of 2001:2002 in all 183 WUAs, were in fall operational area of 101.00 thousand hectares (th.ha) in addition to this, 281 WUAs have come in to operation, by the end if 2000. As a result, at the end of 2003-2004, total 564 WUAs were in operation, which covered an area of 165.00 Th.ha. Besides this, members of WUAs which have been registered and entered in to agreement, was 158, covering an area o about 56.15 Th, ha. By the end of 2001-2002, the number of registered WUAs was 414, which was increased to 1009 by the end of 2003:2004 it is proposed to cover an area of 359.4 Th.ha by these 1009 WUAs,

In order to bridge the gap between irrigation potential created and its actual utillsation and also to optimize the benefits from proper use of surface and ground water through an increased efficiency in distribution, delivery, application and removal of excess water, the State Government has taken a policy decision to provide a legal recognition to the contribution and operation of water Users' Association. Accordingly, the Maharashtra Management of Irrigation Systems by Farmers Act-2003 has been prepared and approved by the State cabinet. The bill of this act has been placed before the State Legislature for approval.

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STATE WATER POLICY

As per the recommendation laid down in the National Water policy and Maharashtra Water and Irrigation Commission Report, the State water policy has been framed by Maharashta State in July, 2003.

The objective of the Maharashtra State Water policy is to ensure the sustainable development and optimal use and management of the State's water resources to provide the greatest economic and social benefit for the people of the State of Maharashtra in a such manner that maintains important ecological values within the rivers and adjoining lands. The policy has innovative features such as water audit, benchmarking of water resources projects, water entitlement etc.

Maharashtra Farmers Management of Irrigaction Systems Act, 2003

The National water policy (2002) lays down that efforts should be made to involved farmers, progressively, in the various aspect of Management systems. The Commission (1995) has also recommended that statuary provisions may be made for Management of Irrigation systems by providing water from public canal systems to water Users' Association (WUAs) on volumetric basis.

In order to bridge the gap between irrigation potential created and its actual utilization and also to optimize the benefits from proper user of water through efficient has taken a policy decision to provision a legal recognition to the contribution and operations of Water Users Association. Accordingly, the Maharashtra Farmers Management of Irrigation systems Act 2003 has been prepared and approved by the State Cabinet. The bill is placed before the State Legislature for approval during winter session 2003. It will come in force once it is passed by legislature.

Maharashtra Water Resources Regulatory Authority

The state cabinet has approved the draft of Maharashtra Water Resources Regulatory Act. The Bill of this authority is placed before the state Legislature for approval during winter session 2003. After approval of the state Legislature, this authority will be empowered to decide the water rates for various users, decided water allocation/priority to various water using sub-sector (irrigation, drinking, industry and others)

Water User's Association:

Maharashtra is pioneer in implementing Participatory Irrigation Management (PIM) through Water Users Associations. PIM will not only result in effective and efficient operation and management of irrigation system but also result in cost saving. State Government is keen to expend farmers' participation in irrigation management.

The GOM has taken a policy decision to handover the management of the entire irrigation potential created to the WUAs in case of projects under construction. no work on construction of minor will be taken up unless WUA is formed. So far, there are 759 WUAs, and about 263909 ha area has been handed over to them.

As per the information complied by DIRD annual reports published by water users association reveal that –

- An appreciable increase in irrigated area has taken place in the area under water users' association.
- They user water economically; irrigation more area with unit quantum.
- They gain concession by paying water charges in time.
- Majority of the organisations accrue profit by systematically accomplishing water management.
- They user water during hot weather season by achieving saving in water distribution in Rabbi Season.
-

Maharashta Water Sector Improvement Project (MWSIP)

Though the state Government has created an irrigation potential of about 3.815 Mha, the actual utilization is about 50% only. The Government of Maharashtra is, seriously concerned to improve the performance of the exiting irrigation system. This will be effected by initiating a combination of policy, institutional and physical improvements by modernization of the irrigation sector. This approach of the State Government in the irrigation sector is in tune with the Government of India's policy. Top priority is being given for the improvement of the performance of the existing irrigation schemes through active involvement of water user's As the resources available with the State are limited the State has decided to seek external assistance (from World Bank), for implementation of the MWSIP.

The MWSIP has been planned to achieve the object of Participatory Irrigation Management and to meet the problems being faced by the water sector in the State. Recently, the World Bank has

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principally approved MWSIP for its funding amounting to Rs. 17910 million for 2243 irrigation projects.

Impact of Present Practices :

The present practice of performance evolution & monitoring of irrigation project and water auditing has resulted in improvements in efficiency, transparency and accountability of the officers responsible for providing services and increased participation of users.

Water Saving

Water user efficiency is very important parameter in performance evaluation of irrigation projects. As the irrigation sector consumes 75-80% of water resources, an increase in water use efficiency will make available for other sectors. It is necessary to produce more crop per unit of water.

The water use efficiency is shown in figure below and it is observed that it is having an increasing trend.

Improvement In Financial Performance :

As discussed earlier, O & M expenses are reduced through downsizing establishment and user participation in irrigation management. With increase in water rates simultaneous efforts were made for effective assessment and recovery of water charges. As a result, O & M costs are met from recovery of water charges during 2002-2003. The figure below shows the present status of assessment and cost recovery. It is observed that operation and maintenance costs are met with from recovery of revenue receipt. With membership of 4848 covering culturable command area in 10486 Ha. Pandharpur taluka has 85 water user's association with membership 10542 under culturable command area in 18231 ha.

4.6 Water User's Association in Pandharpur Taluka .

Table No. 4.16

Name of the Taluka	Registered No. of Canal Water Users Co. operative Societies	Total Culturable Command Area in Ha.	Total No. of members of water users co.op. societies
Mohol	51	10486	4848
Pandarpur	85	18231	10542
Total	136	28417	15390

Source - CADA Irrigation Department yearly progress Reopt, year 2004

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