

CHAPTER - I

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 I N T R O D U C T I O N 

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1. The problem
2. Objectives
3. The study region
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Irrigation has been considered as one of the important technological components of progressive agriculture. Irrigation is generally the artificial application of water to the soil for crop production (Cantor, 1967). It encourages the farmers to adopt scientific techniques and join for more intensive cropping thereby creating new opportunities for gainful employment.

In a country like India, where the rainfall is both inadequate and unpredictable, irrigation plays an important role. Agriculture being a backbone of our economy. Its stability and development depends on the availability of water for irrigation.

Irrigation plays an important role in meeting the rising demands for food and fodder. Investment in the irrigation leads to multiple benefits, such as it enables farmer to harvest two or three crops a year. Irrigation leads to the better productive use of cultivated land . The successful and well developed agriculture requires supply of water at regular interval and required quantities (Pawar, 1981).

Irrigation is one of the significant inputs in the process of transformation of agriculture. However, it is recognized as basic necessity of cultivator in arid and semiarid regions for sustaining high productivity of crop

and also to bring more land under cultivation. The need of irrigation is greater in the parts where rainfall is seasonal and unassured (More and Mustafa, 1984). This calls for the need of irrigation in the major parts of Maharashtra where rainfed crops are dominant depending on erratic nature of monsoon.

1. THE PROBLEM :

The land is fixed resource in its areal extent and growing pressure of population on land resources is a major problem of food scarcity. To feed these teeming millions, we have to increase farm production by a more intensive utilization of land and application of modern farm technology.

With the introduction of irrigation facilities farmer is able to grow cash crops like sugarcane, cotton etc. for gaining more benefits which may bring about the changes in cropping pattern of the region. Irrigation responds the shift from seasonal cultivation to permanent and promotes more intensive cultivation. It motivates the multiplicity in cropping, secures high yield per unit area and thus attains optimum level of verticle expansion and output.

Irrigation increases the farm income and improves standard of living, social and economic status of the farmer. The socio-economic need for irrigation has also been recognised

for supporting the growing population, rehabilitating the poor sections of the society and narrowing the gap of regional imbalances (Singh,1982).

Besides, irrigation provides employment opportunities in the rural areas. It supports many agro-based industries and the process of rural industrialization. All this leads to strengthen rural economy. Naturally, irrigation as an economic element revolves within the orbit of the agricultural development (Das and Singh,1982).

Any region, micro and macro, provides an example of imbalances in the development of irrigation facilities in its spatio-temporal perspectives. Phaltan tahsil of Satara district is not exception for this. It is the task of Geographer to study the spatio-temporal distribution of irrigation and its relationship with other attributes. Such studies would stand as basis for further planning and development of the region.

In view of the above, irrigation has become an essential input by which agricultural production could be enhanced. In fact, the disparities in irrigation developments are observed within the boundaries of either at macro or micro level regions. The regional distribution of irrigation is uneven in Phaltan tahsil.

The aim of the present investigation is to analyse the spatio-temporal developments of different modes of irrigation

in relation to the physical and demographical setting of the region. The impact on the yields is also assessed at micro and macro levels too. The study will also focus on the changes in cultivated land in Phaltan tahsil.

## 2. OBJECTIVES :

Irrigation happens to be an important input leading to agricultural transformation. The specific objectives of the present study are as under.

- i) To observe and analyse the role of physical environment in the promotion of irrigation developments in the region.
- ii) To analyse the impact of irrigation on cropping pattern.
- iii) To study the spatial pattern of irrigation and changes therein.
- iv) To highlight the developments and priority for irrigation in the region.
- v) To assess the economics of irrigation.
- vi) To examine the relationship between irrigation and other components like agricultural productivity, fertilizer consumption and mechanization.
- vii) To assess the negative impacts of irrigation
- viii) To assess the relationship between irrigation and level of agricultural development.

### 3. THE STUDY REGION :

Phaltan tahsil, covering the part of Nira river basin, is one of the economically prosperous tahsils of Satara district in South Maharashtra. It lies between 17°58' North to 18°9' North latitudes and 74°10' East to East longitudes. Phaltan is the single most tahsil in the district where more than one third (35.50%) of the cultivable area is irrigated.

It has total geographical area of 1180.50 sq.kms (11.26 percent of district) with 120 villages in 7 circles and 1 urban centre. It supports population of 224,018 (10.98 percent of the district) of which 190,159 is rural and 33,859 is urban with the density of 1.97 person per sq.km.

The author was motivated by the following matters to select this region.

- i) It is the home tahsil of the author.
- ii) Recently the region has witnessed considerable progress in irrigation.
- iii) Besides, the region has experienced the changes in the agricultural land use and socio-economic structure.

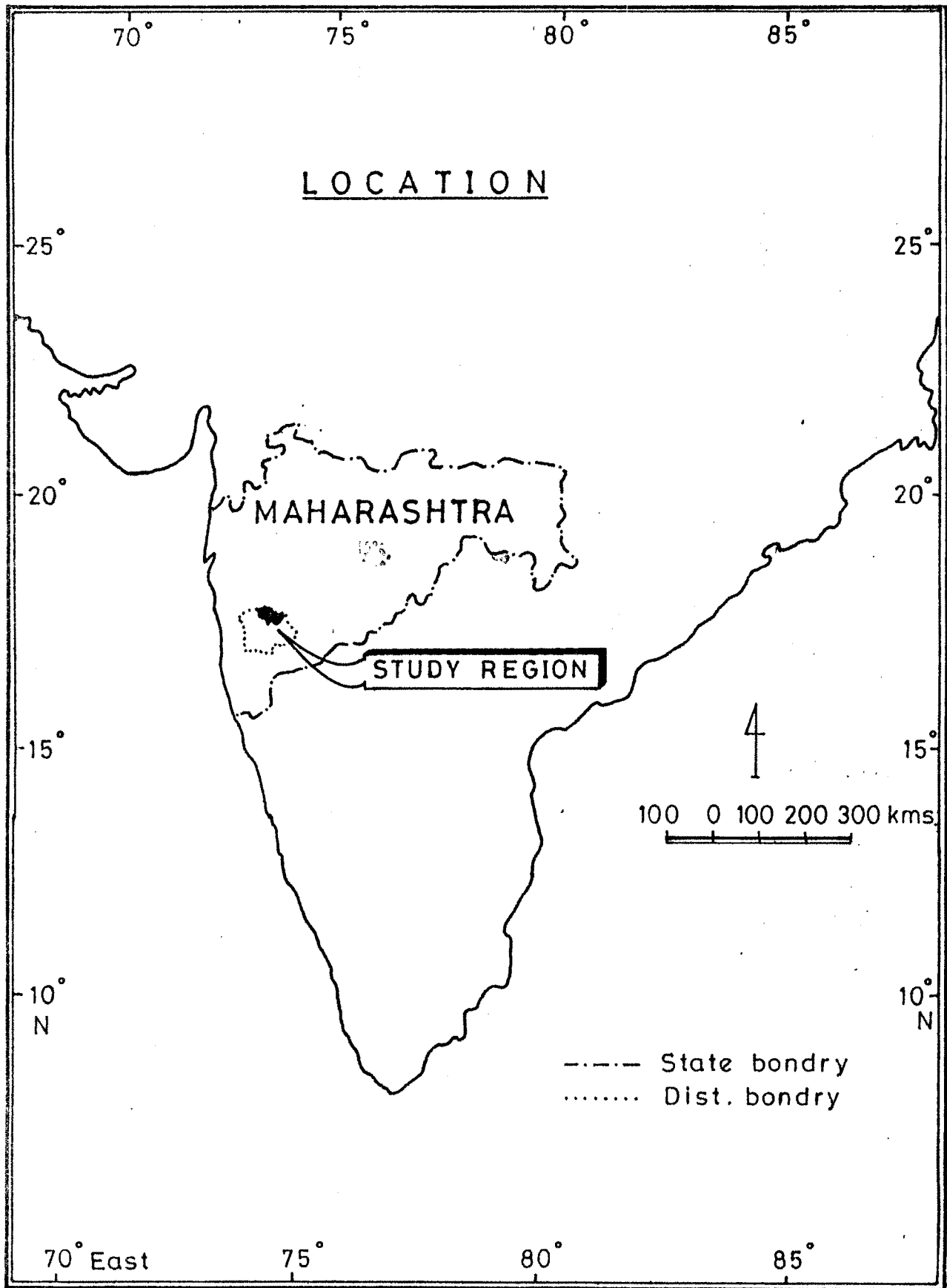


FIG.1.1

PHALTAN TAHSIL REVENUE CIRCLES 1994

Sr. No.	Village	Code No.	Sr. No.	Village	Code No.
I.	<u>TARADGAON CIRCLE</u>		22	Tadavale	41
1	Taradgaon	47	23	Ravadi Kh.	3
2	Vitthalwadi	48	24	Ravadi Bk.	4
3	Saswad	86	25	Kalaj	50
4	Takubachiwadi	85	26	Dhombalwadi	49
5	Kusur	2	27	Nandal	51
6	Shindemala	43	28	Mulikwadi	82
7	Malyachamala	42	29	Ghadgemala	61
8	Kapadgaon	45	30	Survadi	39
9	Koregaon	44	31	Kharadewadi	40
10	Salpe	92	32	Fadatarwadi	10
11	Koparde	90	33	Bhilkatti	37
12	Tambave	89	34	Jinti	9
13	Chambharwadi	88			
14	Mirewadi	106	III.	<u>PHALTAN CIRCLE</u>	
15	Padegaon	1	35	Dhuldeo	34
16	Aradgaon	87	36	Algundewadi	33
17	Chavanwadi	46	37	Khunte	11
			38	Shindewadi	66
II.	<u>HOLE CIRCLE</u>		39	Somanthali	13
18	Hole	7	40	Kambleshar	12
19	Pimpalwadi	8	41	Vidani	32
20	Khamgaon	6	42	Sastewadi	35
21	Murum	5			

Conti..



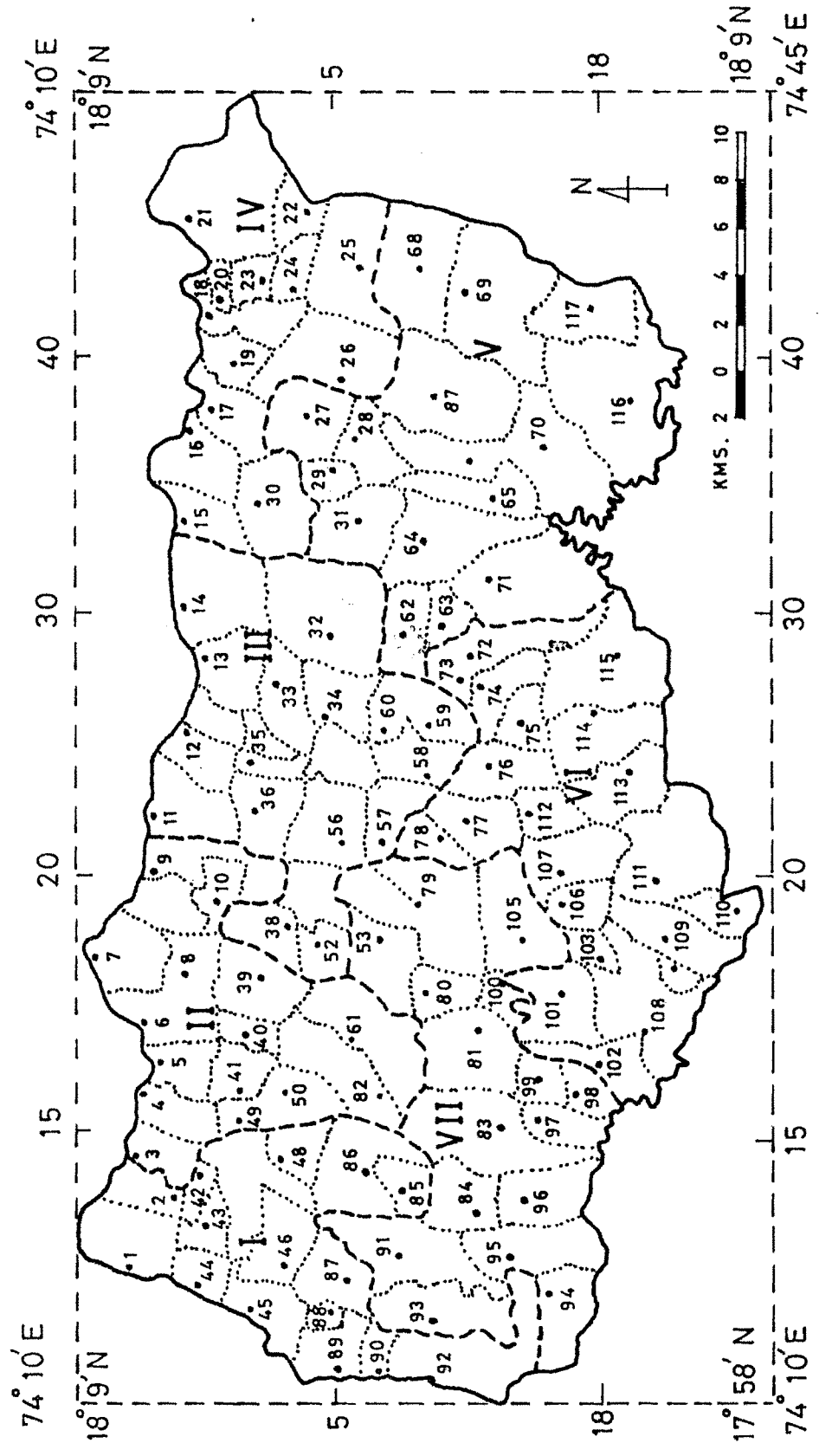
Sr. No.	Village	Code No.	Sr. No.	Village	Code No.
43	Choudharwadi	36	65	Rajale	30
44	Sangavi	14	66	Songaon	15
45	Nimbhore	38	67	Munjawadi	25
46	Kashidwadi	54			
47	Dhavalewadi	52	V.	<u>BARAD CIRCLE</u>	
48	Vadjal	55	68	Barad	67
49	Jadhavwadi	58	69	Nimbalak	28
50	Farandwadi	56	70	Mathachiwadi	27
51	Takurki	57	71	Pimparad	31
52	Kolki	60	72	Takalewadi	29
53	Zirapwadi	59	73	Rajuri	68
			74	Kurwali	69
IV.	<u>ASSU CIRCLE</u>		75	Jawali	116
54	Assu	21	76	Andrud	117
55	Hanumantwadi	22	77	Shereshinde- wadi	66
56	Jadhavwadi	24	78	Naikbomwadi	65
57	Shindemala	43	79	Vadale	64
58	Pawarwadi	23	80	Sonawadi Bk.	61
59	Dhawalewadi	20	81	Sonawadi Kh.	62
60	Gunaware	26	82	Dudhebavi	71
61	Sathe	17	83	Tirakwadi	63
62	Sarde	16	VI.	<u>GIRVI CIRCLE</u>	
63	Gokhali	18	84	Girvi	114
64	Khatakwasti	19	85	Dhumalwadi	115

Conti.

Sr. No.	Village	Code No.	Sr. No.	Village	Code No.
86	Tathawada	108	107	Kapshi	84
87	Manewadi	104	108	Aljapur	96
88	Zadakbaichi-wadi	103	109	Hingangaon	91
89	Dhaval	101	110	Sherechiwadi	93
90	Pirachiwadi	102	111	Bibi	83
91	Kurwadi Kh.	77	112	Ghadgewadi	100
92	Tawadi	78	113	Vadgaon	99
93	Dalawadi	107	114	Waghoshi	98
94	Mirewadi	106	115	Korhale	97
95	Mandavkhadak	112	116	Mirgaon	53
96	Saskal	74	117	Khadaki	80
97	Bhadali Kh.	72	118	Wathar (N)	79
98	Bhadali Bk.	73	119	Malwadi	81
99	Nirgudi	75	120	Wakhari	105
100	Vinchurni	76			
101	Upalve	111			
102	Tardap	109			
103	Veloshi	110			
104	Bodakewadi	113			
VII.	<u>ADARKI CIRCLE</u>				
105	Adarki Bk.	95			
106	Adarki Kh.	94			

# PHALTAN TAHASIL

## Revenue circles 1994



- | Index |                     |
|-------|---------------------|
| —     | Tahasil boundary    |
| - - - | Circle boundary     |
| ..... | Village boundary    |
| .     | Village code number |
- 
- | Revenue circles |                    |
|-----------------|--------------------|
| I               | - Taradgaon circle |
| II              | - Hole circle      |
| III             | - Phaltan          |
| IV              | - Assu circle      |
| V               | - Barad circle     |
| VI              | - Girvi circle     |
| VII             | - Adarki circle    |

FIG.1.2

#### 4. SOURCES OF DATA :

To assess the spatio-temporal development of irrigation and its impact on the cultivated land, a variety of data were proposed to be collected. The data has been collected mainly from primary and secondary sources. The primary data is collected through intensive fieldwork comprising schedules, interviews, discussion with the farmers, other relevant persons and authorities. Different techniques were used to collect primary data like questionnaire, schedule, interview techniques etc.

Schedules are prepared to collect data and information regarding cropping pattern, irrigated cropping sources of irrigation, economics of irrigation, yield per hectare, fertilizer consumption etc. The secondary data were collected from the published records such as socio-economic reviews, census handbooks, agricultural gazetteers, district statistical abstracts, agricultural bulletins by the Department of Agriculture , Maharashtra State. The periodicals and unpublished documents by irrigation department were also be referred to collect the data and information pertaining to the present problem.

#### 5. METHODOLOGY :

The period for the present investigation is considered from 1959-63 to 1989-93. The collected data and information

were analysed by employing statistical and cartographic techniques. The agricultural productivity was assessed by using crop concentration and crop yield ranking co-efficient technique evolved by Jasbir Singh (1984). The relationship among the variables has been tested through correlation matrix in the third and fourth chapters. The extensive fieldwork was also undertaken for the investigation of problems in the irrigated tracts especially soil degraded by salinity and waterlogging. Interviews were also carried to achieve reality. Based on the processed data maps, tables and graphs were prepared to represent geographical reality.

#### 6. PROPOSED DESIGN OF THE WORK :

The entire work organised into seven chapters. The first chapter is an introduction to the work. The second chapter is divided into two sections. The first section highlights geographical personality of tahsil. In second section, an attempt has been made to examine the general landuse and cropping pattern. The third chapter deals with the study of spatio-temporal characteristics of irrigation which consist of the spatial distribution of sources of irrigation, intensity of irrigation, sourcewise and cropwise economics, requirement and development for irrigation. The fourth chapter highlights the impact of irrigation on agricultural productivity, fertilizer consumption, the level of mechanization. The fifth chapter is concerned with the

levels of agricultural development, case studies have been undertaken to study the irrigation and its impact at micro level is attempted in chapter sixth. The last chapter attempts to summarise the findings of the study. The references are given at the end of each chapter.

#### 7. THE REVIEW OF LITERATURE :

The geographical studies, pertaining to irrigation are many in India and abroad. Irrigation has also been studied by the scholars of different disciplines such interdisciplinary approach has been adopted by Geographers, Economists, Irrigation Engineers and Agronomists too.

Cantor (1967), in his book 'A World Geography of Irrigation' has highlighted the history and present conditions of irrigated agriculture in the world. Fukuda (1976) has attempted comparative studies of irrigation and drainage throughout the world. The problems of irrigated agriculture, with special reference to India, are studied by many Agronomists. Dr.V.K.R.V Rao (1970) has forwarded a book in which the papers of different scholars are included which deal with the impact of canal, well and tank irrigation in Karnataka. Joshi A.S. (1987) deals with the economics of irrigation. He examined the comparative economics of minor irrigation from different sources. Chaturvedi and Reddy (1964) attempted a comparative study of the various sources of irrigation to analyse the

causes of present backwardness of the area in respect of irrigation. Singh J. (1974) worked out the regional imbalances and temporal developments in irrigational facilities in Harayana. Pawar and Shinde (1979) attempted to map, analyse and interpret the spatial spread and temporal variations of well irrigation in upland districts of South Maharashtra. Joshi and Dube (1979) devised a suitable index of agricultural development with reference to related factor i.e. irrigated area, cropping pattern etc. and mapped the regional disparity in a quantitative form. The study attempted by Dhillon and Sandhu (1979) focusses on the spatial temporal development of irrigation, it's potentials and limitations in the light of physico-socio-economic factors.

Michal (1983) in his book, 'Irrigation Theory and Practice' has converted all areas of irrigation related to agriculture. The methods of irrigation and water management are studied by M.Shafi (1987). 'Impact of irrigation studies of canal, well and tank irrigation in Karnataka is attempted by the Economists such as Karni M.V., Mishra, Nageshwar Rao. V.M.Gadgil (1948) studied the economic effects of irrigation. The regional aspect of irrigation is studied by Jasbir Singh (1977), C.T.Pawar (1981) and K.K.Gurjar (1987). The development of irrigation in Maharashtra has been studied by More and Mustafa (1984).

The regional account of irrigation, with one or all modes and methods of irrigation, their development and effects have been studied by different scholars such as Ayyar (1931), Krishna Swami (1939), David Fireman (1952), Sinha (1954), Unissa (1962), Chatur Vedi (1968), Prasad (1968). Some of the important studies of the current decade include those by Singh (1974), Sundharan (1974), Shanmugham (1976), Dayal (1977).

In the seminar 'Role of Irrigation in the Development of India's Agriculture' organised by the Institute for Social and Economic Change, Bangalore (1974 and published in 1976). Seventeen papers representing contributions from Economists, Administrators and Engineers were presented; in the seminar on 'Irrigated Farming in India', organized by the Department of Geography, Shivaji University (1982), many papers were presented by the Geographers dealing with different aspect of irrigation. The important articles have been edited by S.D. Shinde (1984). Salunkhe (1989) and Waghmare (1988), Ajagekar (1988) have submitted their M.Phil. dissertations to the Shivaji University attempting geographical analysis of irrigation of different irrigated tracts of South Maharashtra.

The negative effects of irrigation have also been studied by many scholars, such as Chaudry and Reddy (1987), Patil P.B. (1988), Bowonder B. and Ravi (1984). Aggarwal R.R. (1957) and Dhawan C.L. (1964).



Other work carried out by foreign scholars on the method of irrigation and on water management are by Manneir (1975), Short (1974), Bengtson (1974), Andrease (1975), Schather (1975), Bauman (1975) and Garbrecht (1978).

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