

## International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

# A Case Study of KRP Dam of Krishnagiri- TamilNadu

K.M.Triveni<sup>1</sup>, R.Thirumalai<sup>2</sup>, Dr.S.Sureshbabu<sup>3</sup>, T.Gunaseelan<sup>4</sup>, V.Arunraj<sup>5</sup>

P.G Student, Dept. of Civil Engineering, Adhiyamaan College of Engineering, Hosur, TamilNadu, India<sup>1</sup>

Assistant Professor, Dept. of Civil Engineering, Adhiyamaan College of Engineering, Hosur, TamilNadu, India<sup>2</sup>

Head of Dept, Dept. of Civil Engineering, Adhiyamaan College of Engineering, Hosur, TamilNadu, India<sup>3</sup>

U.G Student, Dept. of Civil Engineering, Adhiyamaan College of Engineering, Hosur, TamilNadu, India<sup>4</sup>

U.G Student, Dept. of Civil Engineering, Adhiyamaan College of Engineering, Hosur, TamilNadu, India<sup>5</sup>

**ABSTRACT:** A Dam could be a barrier that stops or restricts the flow of water or underground streams. Reservoirs created by dams not solely suppress floods but also provide water for activities such as irrigation, human consumption, industrial use, aquaculture, and navigability. The main objective of the study has been to evaluate the impact of irrigation on the socio-economic conditions of the farmers depend on KRP dam. Krishnagiri Reservoir and Irrigation Project is a major social and economic importance for development of the region. This paper is about agriculture, industry, ground water potential, fisheries on surrounded area and practice of irrigation in commanded areas.

**KEYWORDS:** Dam, irrigation, economy, revenue.

## I. INTRODUCTION

As civilizations developed, there was a greater need for water supply, irrigation, flood control, navigation, water quality, sediment control and energy. Therefore, dam's area unit made for selected purpose like water supply, flood control, irrigation, navigation, sedimentation control, and hydropower. A dam is that the cornerstone within the development and management of water resources development of a geographic area. The multipurpose dam is a very important project for developing countries, because the population receives domestic and economic benefits from a single investment. Dams is also made to satisfy one or a lot of functions:

1. Irrigation
2. Hydropower development
3. Domestic, municipal, industrial water supply
4. Stock watering
5. Flood control
6. Recreation
7. Fish and wildlife protection and development, and improvement of river ecology
8. River water quality
9. Stream flow regulation for various purposes
10. Navigation

The primary operate of the many dams is to supply water for farming. Some dams divert rivers into canals or pipelines to irrigate land several miles away. Dams are unit used additionally once a stream flows at a lower elevation than the land to be irrigated. Some rivers have nice seasonal changes within the quantity of their flow, flooding during part of the year and slowing nearly to a trickle at other times. Irrigation dams constructed on such rivers store water to equalize the provision for crops throughout the year. The dam additionally has allowed farmers to cultivate many thousands of acres of erst barren desert land.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

## II. CASE STUDY-KRP DAM

The River Ponnaiyar takes its source near Nandidurg hills in Karnataka state South India at an altitude of 1000 m above MSL. In Karnataka it is known as 'Dhakshina Pinakini'. After traversing through the Devanahalli and Hoskote taluks of Karnataka, it enters the TamilNadu state at a place near Bagalur village of Hosur taluk.

The Krishnagiri reservoir project was constructed across the Ponnaiyar River in Dhuduganahalli village about 7 km from Krishnagiri town in Krishnagiri district, Tamil Nadu. KRP is situated at the latitude of 12°29'37.44"N 78°10'41.51"E and longitude of 12.4937333°N 78.1781972°E.



Figure 2.1 River map of Krishnagiri district



Figure 2.2 KRP dam Krishnagiri district

is in the Northwestern part of Tamil Nadu, bordering Karnataka and Andhra Pradesh states. The Dam is operational from 10 November 1957, inaugurated by the then Chief Minister of Tamil Nadu Thiru K. Kamaraj

This reservoir is one of the earliest projects constructed in post independence India in the dry and barren areas of the state. The KRP Dam Project was projected within the First Five Year Plans of India and began in the year 1955. The Dam works are completed in the Second Five Year Plans of India and is operational from 1958. Several soil and water conservation programs have been implemented in the catchment area of the reservoir by the Agricultural Engineering Department and Forest Department of the Government of Tamil Nadu, since 1990's.

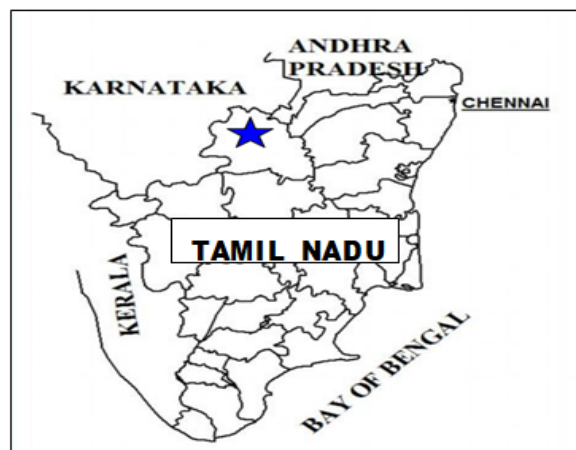


Figure 2.3 Krishnagiri Reservoir as Seen through Google Earth and Its location in Tamil Nadu, South India

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

**Table 2.1** Sailable features of the dam

Sl.No.	Description	Detail
1	Type of the dam	Gravity dam
2	Length	990.59m
3	Height	29.26m
4	At FRL water spread area	12.32km <sup>2</sup>
5	Volume	509TMC
6	Catchment area	5428.43 km <sup>2</sup>
7	Initial capacity	68.2 x 10 <sup>6</sup> m <sup>3</sup>
8	Gross storage capacity	68.2MCM
9	Maximum water level	484.63m
10	FRL	483.11m
11	Water supply period	10 months
12	Spillway type	OGEE crest type
13	Spillway NOS	8
14	Spillway size	12.19x6.10m

15	Crest level	483.11m
16	Spillway capacity	4061m <sup>3</sup>
17	Flood capacity	4233.33m <sup>2</sup>
18	River sluices	3 NOS
19	Canal sluices	2 NOS
20	Length of canals	35km
21	Irrigated area	3642ha
22	Approved cost of the project	₹20.2 million
23	Actual cost of the project	₹15.9 million

**Table 2.2** Present condition of dam

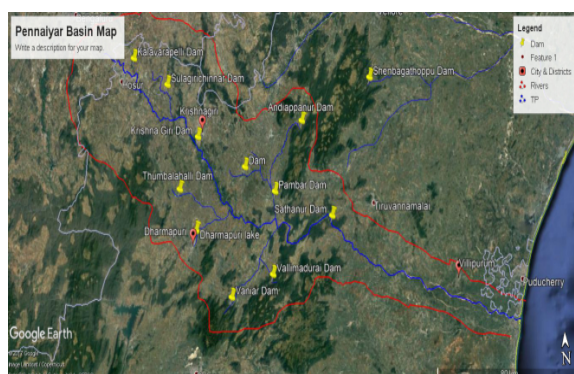
Current scenario of dam at 20.03.2019

Sl.no	Parameters	Details
1.	Water level	41.00 feet
2.	Water storage level	0.42TMC
3.	Water incoming	150 cu ft
4.	Water discharge	Nil

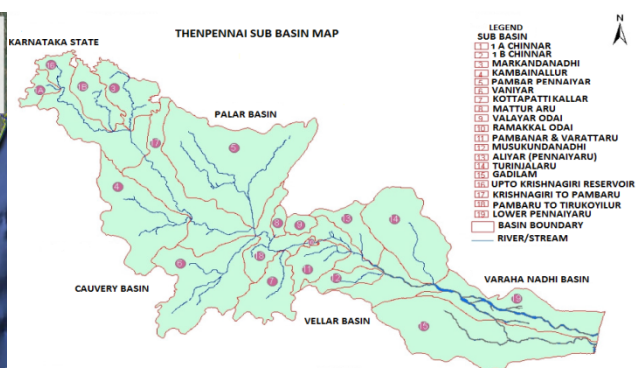
## III. A STUDY OF PONNAIYAR RIVER

Thenpennai River is also known as Ponnaiyar river, Ponnaiyar river or South Pennar Small dams of Kelavarapalli and Krishnagiri dams are built across this river near Hosur and Krishnagiri. The largest dam on this river, Sathanur Dam with 7.3 Tmcft Gross Capacity is built near Tiruvannamalai.

It originates in the Chikkaballapur district of Karnataka state and flows through Krishnagiri, Dharmapuri, Vellore, Tiruvannamalai, Cuddalore and Villupuram districts of Tamil Nadu before falling in Bay of Bengal. With a catchment of 3,690 km<sup>2</sup>, the total length of the river is 400 km. It is dry for the most part of the year but swells during the north east monsoon season.



**Figure 3.1** Thenpennai river basin map



**Figure 3.2** Thenpennai sub basin map

## Industry

Moongilthuraipattu Sugar Factory is situated on the bank of river.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

## IV. IRRIGATION AND AGRICULTURE

The important crops of Krishnagiri District are Paddy, Maize, Ragi, Banana, Sugarcane, Cotton, Tamarind, Coconut, Mango, Groundnut, Vegetables and Flowers. The district has an excellent scope for agri business. Regional Agricultural Research Center of Tamil Nadu Agricultural University is functioning efficiently at Paiyur in Kaveripattinam since 1973. This center is functioning in 18.5 ha of land. It helps the peasants to develop and adopt the modern techniques of cultivation.



Figure 4.1 Agricultural land Near Kaveripattinam



Figure 4.2 Paddy cultivation near Paiyur

Table 4.1: Cropping pattern in the study area

Sl.no	Name of the crop	Area (Krishnagiri district) in ha
1.	Paddy	11137
2.	Cholam	3488
3.	Cumbu	302
4.	Samai	802
5.	Ragi	27471
6.	Maize	159
7.	Cereals	43362
8.	Pulses	18482
9.	Sugarcane	1654
10.	Oil seeds	21758
11.	Cotton	1086
12.	Fruits	24403
13.	Vegetables	6178

Table 4.2 The list of tanks fed by the KRP canals

Sl.no		Command area (in acres)
	<b>Left main canal</b>	
1.	Mohammed Ghouse Tank	102.48
2.	Thimmapuram Tank	548.01
3.	Malayandahalli Tank	42.20
4.	Thalihalli Tank	290.00
5.	Annankuttai Tank	89.99
6.	Baleguli Tank	102.00
7.	Chinnagoundan Tank	73.58
	<b>Right main canal</b>	
8.	Pudu Eri	64.12
9.	Kurumbaratti Eri	105.41
10.	Gopala Joshiyar	27.01



# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

	Kuttai	
11.	Mittahalli Eri	14.14
12.	Ellukuttai Eri	14.94
13.	Suriyanarayana Eri	152.00
14.	Senguttai Eri	8.79
15.	Muchikan Kuttai	19.54
16.	Mallappan Eri	209.00
17.	Golla patti Eri	29.86
18.	Oddan Kuttai Eri	13.31

19.	Errahalli Eri	54.11
20.	Kalleri	8.77
21.	Nadu Eri	94.96
22.	Manickanar Eri	7.30
23.	Kottaiyur Eri	24.95
24.	Pappan Eri	37.93
25.	Paiyur Peria Eri	133.45
26.	Alamarathu Kuttai	5.40

**Table 4.3** Land Use Pattern of the District

Sl. No.	Classification	Area(in acres)	Percent
1.	Forest	202409	39.35
2.	Barren and Uncultivable uses	25016	4.86
3.	Land put to Non-Agricultural uses	42161	8.20
4.	Cultivable Waste	4951	0.96
5.	Permanent Pastures and Other Grazing Land	8156	1.59
6.	Land Under Miscellaneous Tree Crops and Groves not included in Net Area Sown	9682	1.88
7.	Current Fallows	23328	4.54
8.	Other Fallows Land	8606	1.67
9.	Net Area Sown	190017	36.94
10.	Geographical Area According to Village Papers	514326	100.00
11.	Gross Cropped Area	198593	38.61
12.	Area sown more than once	8576	1.66

# International Journal of Innovative Research in Science, Engineering and Technology

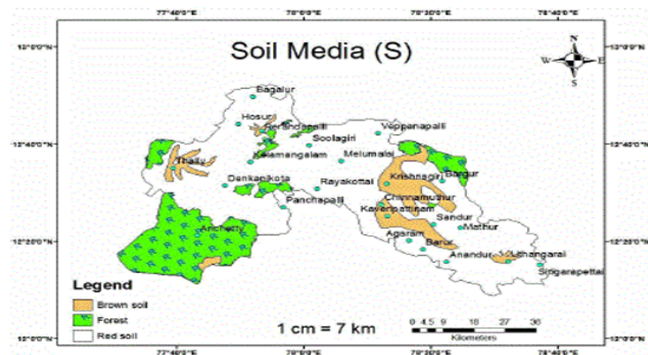
(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019



**Figure 4.4** A canal from Kelavarapalli dam near Hosur



**Figure 4.5** Spatial distribution of soil type-Krishnagiri

**Table 4.4** Details of Soil Classification

Sl.No.	Type of Soil	Places in District (Talukuks)	Area in ha.	Percentage in total geographical area
1.	Red soil	Hosur, Kelamangalam, Tally	273221	53
2.	Clay soil	Krishnagiri	43505	8
3.	Kavi soil	--	--	--
4.	Vandal soil	--	--	--
5.	Barren	--	--	--
6.	Other soil	--	--	--
7.	Forest & Barren	All blocks	197600	39
8.	Catchment Area	--	--	--
	Total Geographical Area	--	514326	100

## V. REVENUE

### a. Agriculture

Krishnagiri district is famous for mangoes, and for the granite industry with quarries and processing units spread around the district. With a 40% share, the district is the top producer of ragi in Tamil Nadu.

As Krishnagiri District has 2,02,409 hectares of forest land which constitutes 39% of the total geographical area, there are abundant produce from the forest areas. Bamboo products, honey collection and tamarind production are

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

the forestry land activities found in Anchetty, Denkanikotta, Thally and Berigai areas. This has generated employment opportunities for thousands of rural people in these areas.

## b. Animal husbandry and fisheries

### Fisheries

**Table 5.1** Details about the revenue in fisheries up to 15 July 2007

Reservoir	Target (MT)	Achievement	Revenue collection (Rs)	Fishermen benefited / amount
Krishnagiri Dam	51.0	6.810	4844	23/4844
Pambaru Dam	30	2.018	13570	16/13570
Kelavarpalli Dam	29.0	15.110	95387	30/95387
Barur Lake	284.0	17.600	124600	37/124600
Chinnaru Dam	6.8	0.931	10410	5/10410
Mayil Ravan Lake	3.0	0.164	820	1/820
Ramanayakan Lake	4.0	0.273	2305	1/2305
Paraiyur Lake	2.0	0.216	1869	1/1260

## Animal husbandry

**Table 5.2** In Krishnagiri District the annual income in the animal husbandry sector was as follows for 2006-07

### a. Rainfall and climate

The district receives the rain under the influence of both southwest and northeast monsoons. The normal annual rainfall over the district varies from about 750 to about 900 mm. It is the minimum around Hosur (767.7 mm) and Rayakottai (768.0 mm) in the northern and central parts of the district. It gradually increases towards west and east and is the maximum around Denkanikotai (910.7 mm) in the western part.

Classification	Income received
Milk	24,94,926
Egg	3,88,192
Pork	1,54,496
Sale of livestock	4,21,578
Miscellaneous	13,55,244
Artificial insemination	5,79,898
LN 2 (liquid nitrogen)	1,27,819
<b>Total income</b>	<b>55,22,153</b>

## VI. GROUND WATER POTENTIAL AND RAINFALL

### a. Rainfall and climate

The district receives the rain under the influence of both southwest and northeast monsoons. The normal annual rainfall over the district varies from about 750 to about 900 mm. It is the minimum around Hosur (767.7 mm) and Rayakottai (768.0 mm) in the northern and central parts of the district. It gradually increases towards west and east and is the maximum around Denkanikotai (910.7 mm) in the western part.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

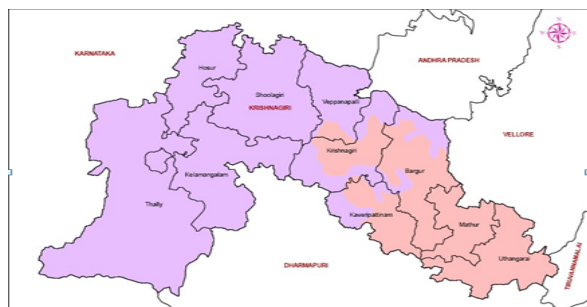
Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019

The climate of Krishnagiri district is comparatively more pleasant than that of the surrounding districts due to general dryness of atmosphere and appreciable drop in temperature in the monsoon season. The year may be divided into four season namely dry season from January to March, summer season April and May, southwest monsoon season from June to Sept. and northeast monsoon season from October to December. As a result of erratic distribution of rainfall, crop production often fails causing economic loss besides unemployment problem. Drought is a regular phenomenon in this district.

**Summer months: March-June, Rainy season: July-November and Winter season: December-February**

The total downfall received throughout 2017 is 1130mm against the conventional downfall of 842mm with average of fifty nine rainy days.



**Figure 6.1** Agro climatic zones of Krishnagiri district

**Table 6.1** The average annual rainfall and the 5 years rainfall collected from IMD, Chennai is as follows:

Actual Rainfall in mm					Normal Rainfall in mm
2013	2014	2015	2016	2017	
766.0	757.6	1049.7	590.6	1145.9	850.58

The annual rainfall normal (1970-2000) of Krishnagiri district is 863 mm.<sup>3</sup> Projections of rainfall over Krishnagiri for the periods 2010-2040 (2020s), 2040-2070 (2050s) and 2070-2100 (2080s) with reference to the baseline (1970-2000) indicate a general decrease of 4.0%, 3.0% and 5.0% respectively.

**Table 6.2** Percent change in Annual Rainfall

Parameter	2020s	2050s	2080s
Annual Rainfall	-4.0%	-3.0%	-5.0%

## b. Ground water potential

The Ground Water levels from the 44 number of observation wells of TWAD have been analysed for Post-Monsoon and Pre-Monsoon. Since 1991, average Ground water level in m Below Ground Level for pre and post monsoon is as follows:

Jan 2012	May 2012	Jan 2013	May 2013	Jan 2014	May 2014	Jan 2015	May 2015	Jan 2016	May 2016	5 Years Pre Monsoon Average	5Years Post Monsoon Average
7.60	8.43	8.20	13.58	17.10	21.27	14.43	28.50	9.05	12.85	16.92	11.28

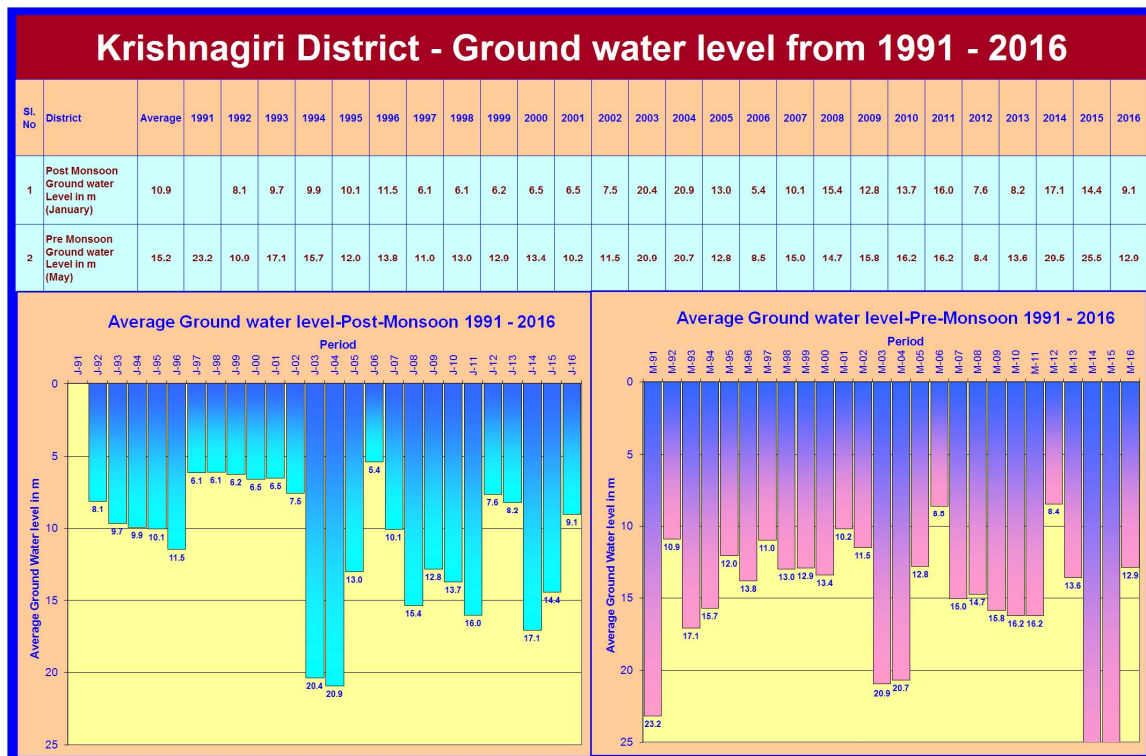


# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 8, Issue 4, April 2019



**Figure 6.2** ground water levels – Krishnagiri district

**Table 6.3** Groundwater Potential as on March 2011 (as per CGWB):

Net Groundwater Availability (in MCM)	354.94
Existing Gross Groundwater draft for all users (in MCM)	471.44
Stage of Groundwater development (in %)	133 %
Categorization of District	Over –Exploited

## VII. CONCLUSION

KRP Dam plays major role in development of Krishnagiri district. The river Ponnaiyar serves its source and prevents the district from drought. Almost 60% of peoples depend upon agriculture, forestry activities and livestock. The ground water potential and annual rainfall in this district is not sufficient. So the formers depend upon the dam for their agricultural activities. The development of fisheries among these areas creates employment and benefits. Thus KRP dam creates employment in agricultural activities and reduce drought in the major part of the district.

## REFERENCES

- [1] National Agricultural Development Programme (NADP) District Agriculture Plan Krishnagiri District 2008.
- [2] Chattegee, N. (1995): "Irrigated agriculture: a case study of West Bengal", District, Statistical Abstract of Kolhapur District (1972-73) pp 16-21.



ISSN (Online): 2319-8753  
ISSN (Print) : 2347-6710

## International Journal of Innovative Research in Science, Engineering and Technology

*(A High Impact Factor, Monthly, Peer Reviewed Journal)*

Visit: [www.ijirset.com](http://www.ijirset.com)

**Vol. 8, Issue 4, April 2019**

- [3] Rao, R.Ram, Mohan & Simhadri, S.,(1989),: "Development dynamics in command areas of major irrigation projects", Inter-India Publications
- [4] Pawar, D.H. & Jadhav, K.R.(2012): Agriculture Problems and Prospects of Drought Prone Region in Sangli District of Maharashtra, Maharashtra Bhugolshastra Sanshodhan Patrika, ISSN: 0971-6785, Vol. XXIX, No.1, January-June 2012, pp 42-45.
- [5] Michael, A.M. (1989); Irrigation Theory And Practice. Vikas Publishing Pvt. Ltd. New Delhi.