

4. IRRIGATION

Efficient use of water resource is basic to survival of the ever-increasing population of a country. In arid and semi-arid climatic conditions the timing and amount of rainfall are not adequate to meet the moisture requirement of crops. Therefore supplementary irrigation is essential to raise the crops necessary to meet the needs of food and fibre for the growing population. Scientific irrigation water management provides the best insurance against weather-induced fluctuations. This is the only way in which we can make our agriculture profitable and sustainable in the coming decades.

Irrigation is the artificial application of water to partially meet the crop evapo-transpiration requirements. It is essential for sustaining crop productivity in many parts of the country mainly because the rainfall is inadequate and unevenly distributed to meet crop-water demands. Irrigation water is costly and scarce input, and is becoming more difficult to increase the area under irrigation to meet demand for food, fodder and fibre of the growing human and livestock populations.

4.1 SOURCES OF IRRIGATION BLOCKWISE – 2015-16

Sl.No	Name of the Block	Canals		Tube & bore wells	Dug wells	Tank (Nos.)
		No's	Length (Km)			
1	Pudukkottai	0	0.0	2710	2246	428
2	Gandarakottai	1	3.0	2344	456	138
3	Annavasal	1	1.0	386	5256	566
4	Kunnandarkoil	7	5.0	1223	4305	483
5	Thirumayam	7	12.0	608	1707	786
6	Thiruvarankulam	1	1.0	3948	2122	289
7	Aranthangi	4	14.0	3266	120	467
8	Avudaiyarkoil	1	14.0	3	0	294
9	Manamelkudi	1	12.0	114	0	157
10	Viralimalai	0	0.0	897	5769	371
11	Karambakudi	1	8.4	2779	408	173
12	Ponnamarathi	0	0.0	1182	3918	884
13	Arimalam	4	8.0	955	861	415
DISTRICT TOTAL		28	78.4	27168	9631	5451

Source: 'G' Return 2015-16

4.2 DATES OF OPENING AND CLOSING OF METTUR DAM FOR IRRIGATION AND THE LEVELS AND STORAGES ON THOSE DATES.

Normal date of Opening: 12th June

Level : 120.00 Feet.

Normal date of Closing : 28 January

Storage : 93470 M.Cft.

Water Year (June-May)	Opening			Closing		
	Date	Level Ft.	Storage M.Cft.	Date	Level Ft.	Storage M.cft.
2005 – 2006	04.08.2005	106.32	73275	28.01.2006	112.24	81632
2006 – 2007	12.06.2006	115.27	86127	28.01.2007	84.56	56653
2007 – 2008	18.07.2007	109.85	78196	28.01.2008	94.67	58152
2008 – 2009	12.06.2008	103.31	69199	28.01.2009	62.23	26378
2009-2010	28.07.2009	94.80	58310	28.01.2010	76.81	38851
2010-2011	28.07.2010	82.49	44484	28.01.2011	109.39	77547
2011-2012	06.06.2011	116.00	87232	05.02.2012	83.33	45357
2012-2013	17.09.2012	84.33	46408	8.02.2013	29.72	7413
2013-2014	02.08.2013	109.33	77462	28.01.2014	51.38	18693
2014-2015	10.08.2014	109.65	77914	05.02.2015	77.12	39146
2015 – 2016	09.08.2015	96.51	60411	25.02.2016	61.06	25483

4.3 ACTUAL AREA IRRIGATED BY SOURCE – 2015-16

Source	Number	Area Irrigated (in Hect.)	
		Gross	Net
1	2	3	4
1. CANALS			
a) Govt.	28	5752	5551
b) Private	-	-	-
2. RESERVOIRS	-		
3. TANKS			
a) Large 40 hec. & above	660	50546	49954
b) Small below 40 hec.	4791		
Total	5451		
4. WELLS			
A) Total Tube & Other Wells	20415	37338	33745
a) Tube Wells			
1) Govt.	4	10	10
2) Private	17618	37328	33735
b) Bore wells	2253		
c) Dug bore wells	540		
B) OPEN WELLS			
a) Govt.	-	-	-
b) Private	27168	7358	7073
Total No. of Wells (A+B)	47583	44696	40818
Grand Total (1+2+3+4)	-	100993	96323

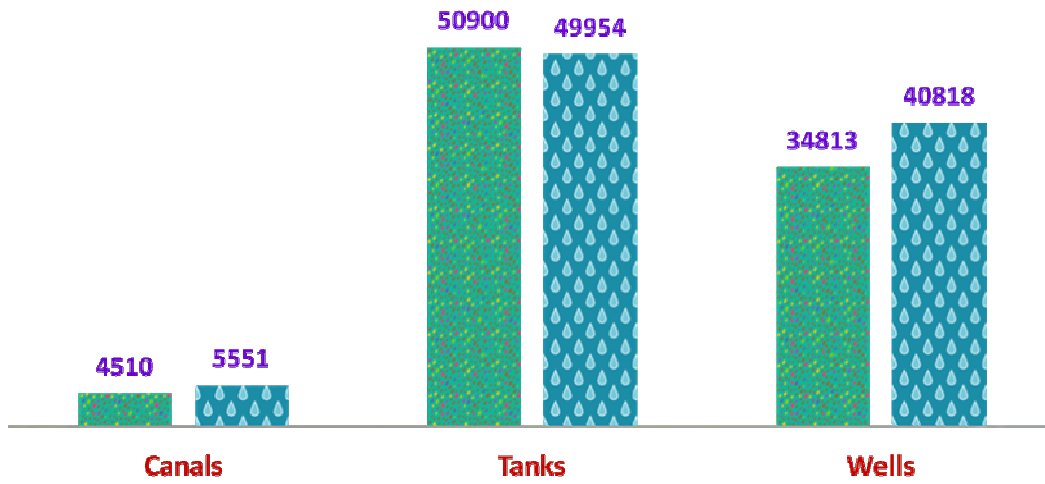
Source: 'G' Return 2015-16

4.4 SOURCE WISE NET AREA IRRIGATED - 2015-16

Sources		Net Area Irrigated (in Hec)			
		2015-16		2014-15	
		Area	%	Area	%
1.	Canals (including System Tanks)	5551	5.76	4510	5.00
2.	Tanks	49954	51.86	50900	56.42
3.	Wells				
	a) Tube Wells / Bore wells	33745	35.03	29765	32.99
	b) Open wells	7073	7.34	5048	5.59
	Total	96323	100.00	90223	100.00

Source wise Area Irrigated (in Hect.)

■ 2014-15 ■ 2015 - 16



4.5 IRRIGATION INTENSITY – 2015 - 16

(Area In Hect.)

1.	Gross Area Irrigated	:	100993
2.	Percentage of Gross Area Irrigated to Gross Area sown	:	81.63
3.	Net Area Irrigated excluding Supplementary wells	:	96323
4.	Percentage of Net area irrigated to Net area sown	:	81.05
5.	Area Irrigated more than once	:	4670
6.	Irrigation Intensity	:	1.048



4.6 AREA IRRIGATED BY DIFFERENCE SOURCE OF IRRIGATION

(Area in hect.)

YEAR	Canals		Tanks		Tube /Bore Wells		Open Wells		District Total	
	Gross Area Sown	Net Area Sown	Gross Area Sown	Net Area Sown	Gross Area Sown	Net Area Sown	Gross Area Sown	Net Area Sown	Gross Area Sown	Net Area Sown
2005-06	10790	10679	72221	71764	19451	18902	8720	8482	111182	109827
2006-07	10343	10269	70506	69769	22425	21521	6106	5895	109382	107464
2007-08	8658	8658	65828	65714	23376	22612	7772	7699	105634	104883
2008-09	5484	5484	75905	75836	23029	22566	7986	7815	112404	111701
2009-10	6040	6028	75130	75126	24675	24064	6809	6804	112654	112021
2010-11	5532	5532	74094	73948	25648	25009	6359	6295	111633	110784
2011-12	5491	5489	74276	73929	32146	28191	8859	8428	120772	116037
2012-13	2687	2687	66897	66765	30926	28950	5612	5224	106122	103626
2013-14	3085	3011	58269	57852	35400	31164	4498	4388	101252	96415
2014-15	4523	4510	51140	50900	32169	29766	5130	5048	92962	90224

**4.7 CROPWISE GROSS AREA SOWN / IRRIGATED AND ITS
RELATIVE SHARE - 2015-16**

Sl.No	Crop	Gross area sown	Gross area Irrigated	% to Gross Irrigated Area of the District	% to Gross Irrigated Area to gross area sown under the Crop
1.	Paddy	73625	66463	65.81	90.27
2.	Jowar (Cholam)	107	7	0.01	6.54
3.	Bajra (Cumbu)	0	0	0.00	0.00
4.	Ragi	16	16	0.02	100.00
5.	Maize	5097	5097	5.05	100.00
6.	Other Cereals	8	2	0.00	25.00
7.	Pulses	5976	4729	4.68	79.13
Total Food Grains		84837	76321	75.57	89.96
8.	Chillies	17	17	0.02	100.00
9.	Sugarcane	4417	4417	4.37	100.00
10.	Other Food crops	11131	4852	4.80	43.59
A. Total Food Crops		100402	85607	84.77	85.26
11.	Cotton	28	28	0.03	100.00
12.	Groundnut	7998	6039	5.98	75.51
13.	Gingelly	1049	616	0.61	58.72
14.	Coconut	9585	6623	6.56	69.10
15.	Other Non Food Crops	4660	2080	2.06	44.64
B. Total Non Food Crops		23320	15386	15.23	65.98
Total Food & Non Food Crops (A+B)		123722	100993	100.00	81.63

Source : G Return - 2015-16

GROUND WATER IN PUDUKKOTTAI DISTRICT.

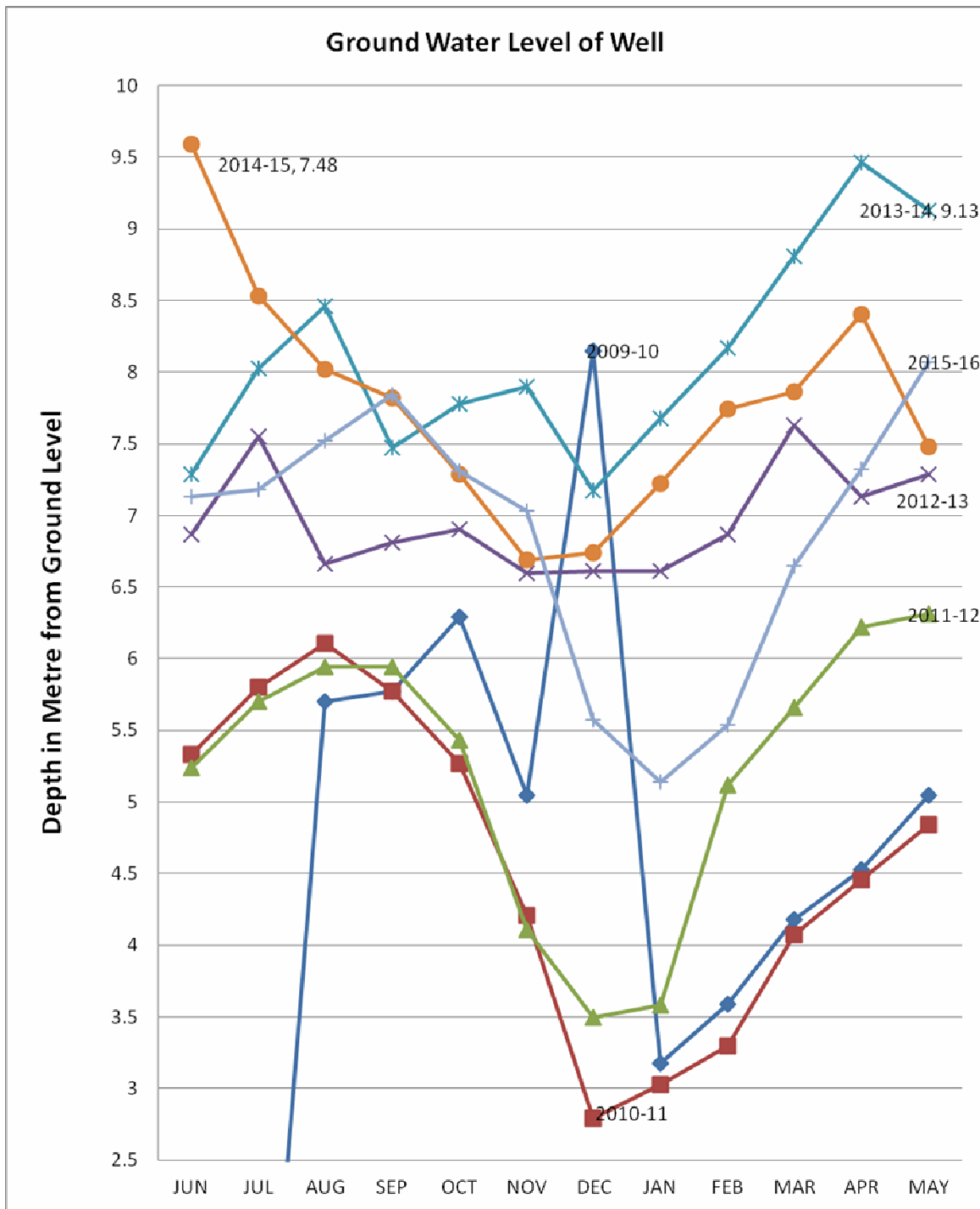
Increased use of groundwater and limited natural recharge have lowered water table to such an extent that many dug and tube wells have become dysfunctional in many blocks of this districts. Artificial recharge of groundwater has, therefore, emerged as one of the important interventions in watershed development programmes undertaken in the affected areas. Costeffective recharge filters have been developed by the research centres, to divert runoff from arable and non-arable land for groundwater augmentation. The three tier porous filter supported with field bunds and check dams is designed to deliver a substantial quantum of sediment free water to open or tube wells through a buried pipeline. In order to support this activities, it becomes foremost important to collect the statistics on changing phenomenon of groundwater level in Pudukkottai district with reference to relevant variables in conjunction with monsoon. The following table depicts the information on monthwise groundwater level in wells in Pudukkottai district for the past seven years.

4.8 Ground Water Level Wells in Pudukkottai District. (Observation Wells)

(in Mbgl)

Month / Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
June	NA	5.33	5.24	6.87	7.29	9.59	7.13
July	NA	5.80	5.70	7.55	8.03	8.53	7.18
August	5.70	6.11	5.94	6.66	8.46	8.02	7.52
September	5.77	5.77	5.94	6.81	7.47	7.82	7.84
October	6.29	5.27	5.43	6.90	7.78	7.29	7.31
November	5.05	4.21	4.11	6.60	7.90	6.69	7.03
December	8.15	2.79	3.50	6.61	7.17	6.74	5.57
January	3.18	3.03	3.58	6.61	7.68	7.22	5.14
February	3.59	3.30	5.12	6.87	8.17	7.74	5.54
March	4.18	4.07	5.66	7.63	8.81	7.86	6.65
April	4.53	4.46	6.22	7.13	9.46	8.40	7.32
May	5.05	4.84	6.31	7.29	9.13	7.48	8.07

Source: STATE GROUND AND SURFACE WATER RESOURCES DATA CENTRE, CHENNAI.



To begin with, the groundwater level details are presented in terms of Metre below groundwater level. To have a better idea, the average groundwater level has been worked out based on the set of data of seven years. It is seen from the table above, that an appreciable groundwater level is generally seen in the months from November to February. The groundwater level ranges during the above months are identified as 5.21 mbgl to 5.94 mbgl.

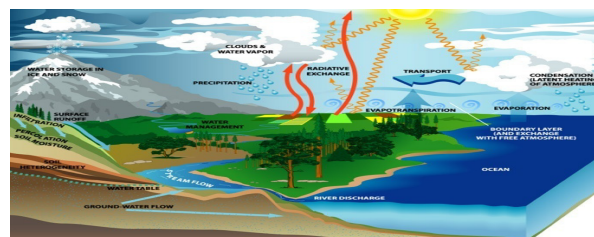
Analysing the time series data presented in the table, it could be inferred that the average groundwater level is minimum with 5.21 mbgl in November and it is maximum of 7.13 mbgl in July. A deep insight into the monthwise and yearwise data reveals that there prevails a wide fluctuations in the groundwater level in varied points of time and the causes for this oscillations might be attributed to ozone layer depletion that results in greenhouse gas effect that gives rise to global of waming, which ultimately leads to extremities in climatic and monsoon conditions. The scientists discovered a new climate and termed it “Elnino” which is the root cause for all abnormalities and fluctuations that has direct repercussion effect on groundwater levels.

The data available in the table above are grouped according to monsoon and the average for ground water level for each month is arrived at and presented in the statement below.

South West		North East		Winter		Hot Weather	
Month	Average (mbgl)	Month	Average (mbgl)	Month	Average (mbgl)	Month	Average (mbgl)
June	6.91	October	6.61	January	5.21	March	6.41
July	7.13	November	5.94	February	5.76	April	6.79
August	6.92	December	5.79			May	6.59
September	6.77						

The four monsoons namely south west, North east, Winter and Hotweather are taken into account. Under south west monsoon, September month is much more favourable for groundwater level as it has average ground water level as 6.77 mbgl. The months of June and August are also favourable as they have the groundwater level of 6.91 and 6.92 mbgl respectively. In the North East monsoon, December and November with 5.79 mbgl and 5.94 mbgl respectively are highly favourable in terms of ground water level.

As for winter season, the average groundwater level are highly conducive with 5.21mbgl in January and 5.76 mbgl in February. In hot weather season the groundwater level for March, April and May crosses more than 6.00 mbgl. The scenario above may tend to vary in the years to come in the context of changing behaviour of environmental and climatic conditions.



**4.9 IRRIGATED AREA OF PRINCIPAL CROPS IN PUDUKKOTTAI DISTRICT
2005-06 TO 2014-15**

Crop	Area in ha.									
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Paddy – Season Wise										
a. Kar/Kuruvai/Sornavari	1499	1079	997	518	417	222	1078	1112	1181	1371
b. Samba/Thaladi/Pishnam	87505	83918	78630	85761	85749	84766	85080	75376	63093	60187
c. Navarai/Kodai	217	237	272	347	292	10	185	214	850	729
Paddy Total	89221	85234	79899	86626	86458	84998	86343	76702	65124	62287
Cholam (Jowar)	5	0	1	0	8	6	182	6	95	83
Cumbu (Bajra)	9	0	13	0	0	0	2	12	0	1
Ragi	61	133	1	6	3	5	18	18	32	32
Maize	892	1541	2309	3438	3061	2888	4757	4007	8642	5689
Varagu	0	0	0	0	0	0	0	1	1	3
Samai	0	0	0	0	0	0	0	0	0	0
Other Cereals	0	0	0	0	0	0	0	0	0	0
Total Cereals	90188	86908	82223	90070	89530	87897	91302	80746	73894	68095
Bengal Gram	0	0	0	0	0	0	0	0	0	5
Red Gram	0	0	0	0	28	42	42	43	120	256
Black Gram	332	416	386	312	474	464	2653	764	3020	2666
Green Gram	0	0	0	5	1	4	18	8	15	5
Horse Gram	0	0	0	0	0	0	0	1	0	4
Other Pulses	3	17	6	2	1	3	0	0		135
Total Pulses	335	433	392	319	504	513	2749	838	3390	3071
Total Food Grains (A+B)	90523	87341	82615	90389	90034	88410	94051	81584	77284	71166
Sugarcane	9459	10204	8760	7297	7133	7858	9243	9124	6826	5062
SPICES & CONDIMENTS										
Chilies (Dry)	37	115	53	53	64	102	162	98	107	88
Coriander (Grains)	0	1	0	6	5	5	5	9	0	17
Turmeric (Cured)	4	3	2	3	10	17	14	8	8	15
Tamarind	0	2	0	0	0	1	2	0	0	1
Pepper	2	2	1	0	0	0	0	0	0	0
Arecanut \$	1	1	6	0	0	0	0	0	0	0
Total Spices & Condiments	44	124	62	62	79	125	183	115	115	121

D. FRUITS	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Banana	4050	3736	3135	3617	3426	2955	3123	2501	2303	2255
Mango	41	26	57	125	148	180	219	354	527	365
Jackfruit	36	32	53	54	57	99	73	94	57	33
Pine apple	0	0	2	0	0	0	1	0	0	0
Guava	62	43	27	2	22	58	66	0	78	70
Lemon	91	62	40	41	15	28	50	76	139	180
Cashew nut	105	101	0	0	42	1	20	0	64	43
Other Fruits	65	70	115	81	71	93	119	360	176	326
Total Fruits	4450	4070	3429	3920	3781	3414	3671	3025	3344	3272
Tapioca	21	91	33	19	18	47	50	42	57	127
Sweet Potato	3	1	3	0	1	0	1	0	3	3
Onion	0	0	0	0	0	0	1	2	9	23
Brinjal	83	61	130	102	66	114	220	175	206	181
Lady's finger	26	13	27	40	46	72	146	102	97	153
Tomato	5	0	3	2	5	6	8	2	0	6
Other Vegetables	46	71	53	37	26	28	75	95	113	211
Total Vegetables	184	237	249	200	162	267	501	418	485	704
Other Food Crops	0	0	0	7258	7133	1	0	3	3	3
Total Food Crops	104660	101976	95115	109126	101189	100075	107649	94269	88057	80328
Groundnut @	3759	4268	5365	5365	6623	5901	6924	5789	4569	3286
Gingili	108	273	517	249	243	149	305	364	856	588
Coconut	2206	2387	3872	3823	3707	3922	4450	3961	6364	6911
Sunflower	5	8	123	106	19	1	12	2	8	0
Castor	4	6	0	0	0	0	0	0	0	0
Cotton	52	23	112	56	13	12	30	10	11	47
Other Non-Food Crops	388	441	530	879	860	1573	0	0	0	0
Total Non Food Crops	6522	7406	10519	10478	11465	11558	13123	11493	13195	12634
Total Food and Non-Food Crops	111182	109382	105634	119604	112654	111633	120772	106122	101252	92962