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A Study of Agriculture Development & Irrigated Area Under Palkhed Irrigation Division, Nashik (MH)

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Abstract :-

Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing agriculture crops & vegetation of disturbed soils in dry area and during the period of inadequate rainfall or water & mostly to increase the productivity of food.

Palkhed irrigation method are provides the enough to supply the entire field of Palkhed division like, Karanjavan Project, Palkhed Project, Ozerkhed Project, Vaghad Project, Punegaon Project & Tisgaon Project etc. uniformly with water. Means these are all the sub-projects of Palkhed irrigation division and they provide the sufficient water to agriculture purpose also other minor purposes by the way of canal facility, both left bank canal and right bank canal. One of the most important, this irrigation division mostly benefitted to increases the ground water table in study area.

With the help of this Palkhed irrigation system we can find out the irrigated area falling under the division, then study direct involvement of farmers in irrigation management under this division also sub projects. These objectives should Impact on the productivityof major crops under irrigated area by Palkhed division.

Palkhed irrigation division & sub projects of these division has to increase the production of major crops like as Jawar, Wheat, Groundnut, Rice, Oilseeds, Sugarcane, Grapes & Vegetables etc. from the year of 2011-2012 to 2014-2015. Total irrigation area in the year of 2011-2012is 66716 Ha., 2012-2013 is 43967 Ha., 2013-2014 is 70730 Ha. & 2014-2015 is 59834 Ha.respectively from Palkhed irrigation division and its sub project by canal & well.Total availability of water to the irrigated area of Palkhed division and its sub project in the year of 2011-2012 is 308.83 mcum., 2012-2013 is 228.16 mcum., 2013-2014 is 318.04 mcum., & 2014-2015 is 308.07 mcum. respectively.
(MCUM = Million Cumbic Meters)

Introduction:-

Irrigation facility provide the right amount of water at the right place at the right time by the way of irrigation. Irrigation means artificial application of water by human agency for healthy growth of the plant & the need of irrigation may be identified as follows:-(B.D.Dhawan)

1) Irrigation is essential for removal of adverse effects of drought.
2) To adequate irrigation for intensive agriculture.
3) For maximization of production of food.
4) It is basic input influencing the cropping pattern.

Palkhed irrigation division developed in the year of 1968 & firstly "Palkhed canal division, Nashik" name was given by irrigation department. Under the Palkhed canal division "Palkhed Dam" & Palkhed Left canal (0 to 128.50km) was built up in the year of 1975 to 1976. Means to developed the step by step irrigation facility & to increase the productivity of major and minor crops in the total irrigated area falls under these Dam and Palkhed left canal. Then from 1982-1983 Palkhed canal division was converted into the Palkhed Irrigation Division,Nashik& now the whole management functioning of these division under Civil Engineering department of Maharashtra government.

According to Israelson & Hanson, regarding irrigation & agriculture planning & development "irrigation is defined as the application of water to soil for purpose of supplying the moisture essential for plant growth". Thus,irrigation in a broad sense for agriculture development is the application of water to the soil for various purposes viz.,

1) To cool the soil & surrounding atmosphere thereby cresting a more favorable environment for healthy agriculture productivity.
2) To reduce the hazards of soil pore space.
3) To soften tillage pans.

4) To washout salt on agriculture land.
5) To add a water to soil to supply the moisture which is essential for the smooth growth of crops.

According to M.S.Kallur, "the term irrigation is generally understood as the conscious utilization of diverse source of water to produced more of food production, fiber & other commercial crops in a scientific way",(diverse source of water denotes both major , medium & minor irrigation)

Pal,(1985) explain the contribution of irrigation to agricultural production & planning. Irrigation helps agricultural production in three way:-

1) Raised yield unit per area.
2) Fertilizer & pesticides leads to expansion in gross cropped.
3) Irrigation may raise to high yielding & high value crops.

Tak,(1986) examined the impact of Purana Canal irrigation facility on cropping pattern, cropping intensity & use of modern inputs like high yielding seed, fertilizer, pesticides etc. He analyzed the relative changes in income among the irrigated & un-irrigated conditions. He also calculated the cost benefit ratio under irrigated & un-irrigated conditions, and he find out the variation between them.

Following table shows the general information about Palkhed Irrigation Division,Nashik –

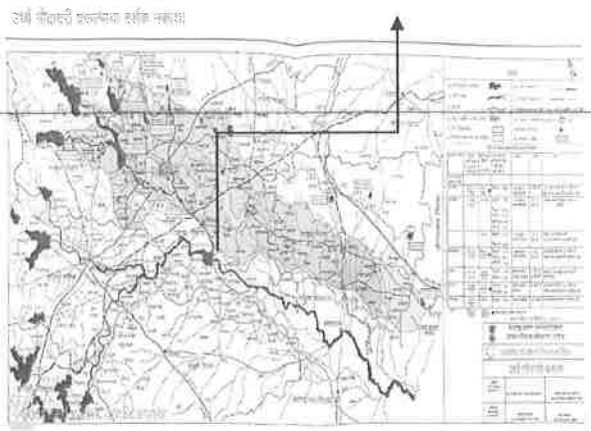
Projects under Upper Godavari	Suitable Water Storage(Mcum /Lacks ft^3.)	Irrigated Area(ha.) I.C.A/C.C.A	Beneficial Tahsil & I.C.A	Canal	Length K.M.
Karanjwan	152.09/5371	1574/2742	Dindori 1574	Left Canal	12
Palkhed	21.24/750	44171/65045	Dindori 467 Nifad 21833 Yeola 18410 Vaijapur 1028 Kopergaon 2441	Left Canal Left Canal Right Canal Right Canal Right Canal	128.50 19.2
Ozerkhed	60.32/2130	10400/14857	Dindori 3915 Nifad 5180 Chandwad 1305	Left Canal	49
Vaghad	70.84/2502	6750/9642	Dindori 6050 Nifad 700	Right Canal Left Canal	45 15
Punegaon	17.57/620	6984/7230	Dindori 650 Chandwad 300	Left Canal Left Canal	 25
Tisgaon	12.76/451	1727/2467	Dindori 1727	Right Canal	0.45
Khirdi sathe	2.00/70.62	531	Yeola	Right Canal	12.88
Dongargaon	1.94/68.50	304	Yeola	Right Canal	5.00
Savargaon	0.80/28.25	118	Yeola	Right Canal	2.00
Jambutke	2.24/79.10	471	Chandwad	Left Canal	9.20
Khadak Malegaon	2.5/88.26	356	Nifad	Left Canal	5.00
Raulas Pimpri	1.80/63.34	464	Nifad	--	--
Shirasgaon	2.88/130.00	602	Nifad	--	--

(Source :- Palkhed Irrigation Division, Nashik "SINCHAN NAMA" 2015) **I.C.A = Irrigated Commanded Area, C.C.A = Culturable Commanded Area)Table no.1**

Study Area:-

Palkhed dam is an earth fill (it's a subtype of Embankment dam also called terrain dam made of compacted earth, and the rock- filled dam) dam on Kadava river near Dindori tahsil of Nashik district in the state of Maharashtra in India. Official name of this dam irrigation division is "Palkhed Dam D02975" under Maharashtra Water Recourse Department. The latitudinal & longitudinal extent of this dam is 20.1911225^{O}N & 73.8834431^{O} E respectively and they impound by Kadawa river. The height & length of this dam above lowest foundation is 34.75 M AMSL (114.0 ft.) & 4110 M respectively. The volume of dam is 1228km^3 (295 cu mi) & gross total capacity is 212,400 km^3 (295cu mi) & total surface area of the dam is 5760 km^2 (2220 sq.mi) and the most purpose of this dam should only for the irrigation to the surrounding areas.

Map of Study Area



Methodology:-

For this study mainly secondary data has been used. Information about study region is taken from "SINCHAN NAMA" of Palkhed irrigation division, Nashik (Publishing year 8). Data is related to canal wise area under this irrigation of the years of 2011-2012 to 2013-2014. Then some statistical tools also used for this study like average, percentage were used. Data is also represented by graph, tables, & chart were prepared by author on the basis of information available from secondary data sources.

Objective:-

1) To study the irrigated area under Palkhed irrigation division.
2) To study farmers directly involves in the irrigation management under this project.
3) To identify the productivity of major crops under the Palkhed irrigation division.

Result &Discussion :-

Following table shows theproject wise irrigated area & the use of water between the year of 2011-2012 to 2014-15:-

Year	Project Name	Irrigated Area			Capacity(Lacks m^3)	15 oct.Storage	Used Water (Lacks m^3)			Ha. (Lacks m^3)
		Canal	Well	Total			Irrigation	Non-Irrigation	Total	
2011-2012	Karnjvan	1246	294	1540	152.08	152.09	6.805	0.729	7.534	183
	Palkhed	10931	24065	34996	21.24	17.99	109.905	57.579	167.484	99
	Vaghad	4918	4661	9579	70.84	70.84	38.560	2.722	41.282	128
	Ozerkhed	6622	8589	15211	60.32	40.23	45.519	2.994	48.513	145
	Tisgaon	620	0	620	12.76	8.73	3.968	0.389	4.375	156
	Punegaon	2300	939	3239	17.56	14.85	13.485	0.000	13.458	171
	Total	**26637**	**38548**	**65185**	**334.80**	**304.73**	**218.215**	**64.413**	**282.628**	**122**
	Small Canal	424	745	1169	9.50	2.53	1.973	0.000	1.973	215

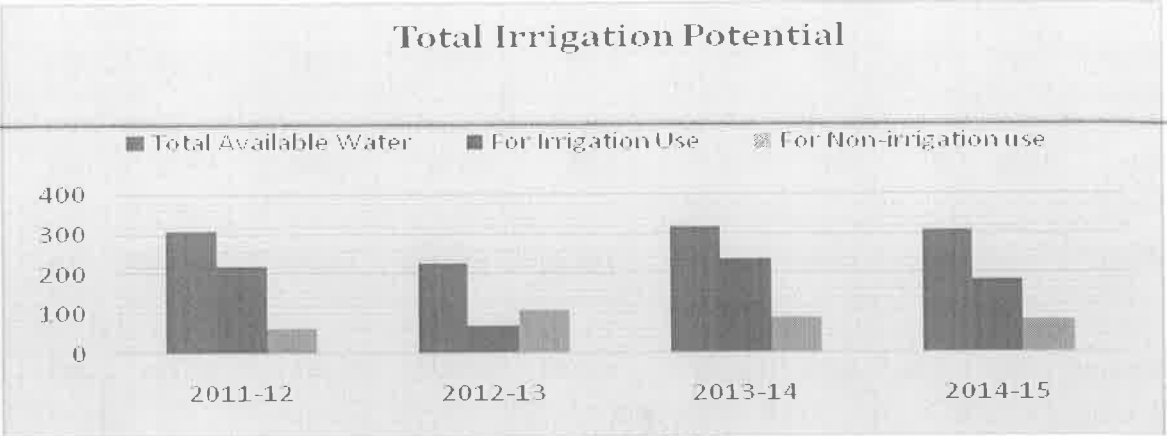
	Big Canal	362	0	362	4.68	1.57	0.752	0.000	0.752	481
	Total	**27423**	**39293**	**66716**	**348.98**	**308.83**	**220.940**	**64.413**	**285.353**	**124**
2012 - 2013	Karnjvan	1585	266	1851	152.08	93.24	6.080	0.195	**6.275**	261
	Palkhed	2337	17046	19383	21.24	21.24	12.773	88.478	**101.251**	183
	Vaghad	5621	4277	9898	70.84	70.84	37.032	4.635	**41.667**	152
	Ozerkhed	524	7148	7672	60.32	19.96	1.861	15.405	**17.266**	282
	Tisgaon	374	0	374	12.76	2.04	0.856	0.502	**1.358**	437
	Punegaon	2512	715	3227	17.56	17.57	10.694	0.000	**10.394**	235
	Total	**12953**	**29452**	**42405**	**334.80**	**224.89**	**69.296**	**109.215**	**178.511**	**187**
	Small Canal	341	822	1163	9.50	1.72	0.455	0.000	**0.455**	749
	Big Canal	399	0	399	4.68	1.57	1.220	0.000	**1.220**	327
	Total	**13939**	**30274**	**43967**	**348.98**	**228.16**	**70.97**	**109.215**	**180.186**	**193**
2013 - 2014	Karnjvan	1830	340	2170	152.08	152.09	8.670	0.170	8.840	211
	Palkhed	16760	23450	40210	21.24	20.71	141.300	84.560	225.860	119
	Vaghad	4780	5300	10080	70.84	70.84	35.510	2.090	37.600	135
	Ozerkhed	4680	8540	13220	60.32	44.24	33.530	3.440	36.970	140
	Tisgaon	760	0	670	12.76	4.82	3.510	0.630	4.140	191
	Punegaon	2480	680	3160	17.56	17.57	12.400	0.060	12.460	200
	Total	**3120**	**3831**	**6951**	**334.80**	**310.27**	**234.920**	**90.950**	**325.870**	**133**

		0	0	0						
	Small Canal	440	430	870	9.50	4.22	1.940	0.000	1.940	227
	Big Canal	350	0	350	4.68	3.55	0.870	0.000	0.870	402
	Total	**31990**	**38740**	**70730**	**348.98**	**318.04**	**237.730**	**90.950**	**328.680**	**135**
2014 - 2015	Karnjvan	1695	350	2045	152.09	152.09	6.383	0.191	6.574	265
	Palkhed	8000	23173	31173	21.24	19.96	94.716	78.462	173.178	84
	Vaghad	4348	5006	9354	70.84	70.84	37.276	1.781	39.057	117
	Ozerkhed	4179	8117	12296	60.32	38.54	28.772	3.469	32.241	145
	Tisgaon	683	0	683	12.76	4.36	3.446	0.072	3.518	198
	Punegaon	2483	712	3195	17.57	16.48	9.879	0.070	9.949	251
	Total	**21338**	**37358**	**58747**	**334.82**	**302.57**	**180.472**	**84.045**	**264.517**	**119**
	Small Canal	208	434	642	9.48	2.21	1.716	0.000	1.716	121
	Big Canal	445	0	445	4.68	3.59	0.028	0.000	2.028	219
	Total	**22041**	**37792**	**59834**	**348.98**	**308.07**	**184.216**	**84.045**	**268.261**	**120**

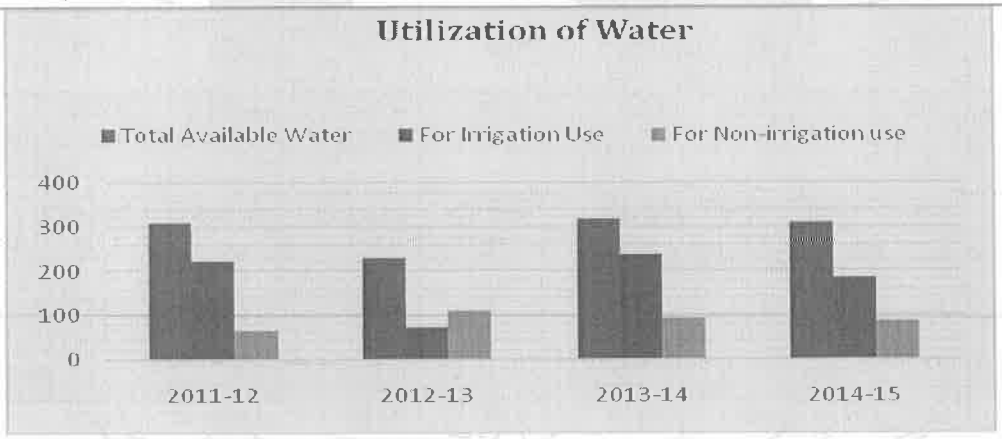
(Source :- Palkhed Irrigation Division, Nashik "SINCHAN NAMA" 2015)

Total Irrigation Potential & Utilization on Canal & Wells

Year	2011-12	2012-13	2013-14	2014-15
Total Irrigated Area(Ha.)	66716	43967	70730	59834
Irrigation on Canal	27423	13693	31990	22041
Irrigation on Wells	39293	30274	38740	37792
(Source :- Palkhed Irrigation Division, Nashik "SINCHAN NAMA" 2015)				



Year	2011-12	2012-13	2013-14	2014-15
Total Available Water	308.83	228.16	318.04	308.07
For Irrigation Use	220.94	70.97	237.73	184.216
For Non-irrigation use	64.413	109.215	90.95	84.04
(Source :- Palkhed Irrigation Division, Nashik "SINCHAN NAMA" 2015)				



In the year of 2014-2015 Project Wise Major Crops In Irrigated Area (Ha.) by Store Water/Canal/River:-

Project Type	Crops											Total
Big Project	Jawar	Wheat	G.nut	Chickpea	Rice	Oilseed	Sugarcane	Cotton	Grapes	Vegetables	other	
Karnjvan	0.00	307.94	0.00	177.10	0,00	0.00	111.10	0.00	721.21	273.75	103.90	1695.00
Palkhed	408.25	3119.82	0.00	1791.57	0.00	36.00	19.83	126.00	565.23	1784.83	76.47	8000.00
Vaghad	0.00	1045.75	0.00	364.50	0.00	0.00	202.15	0.00	2052.89	306,30	376.41	4348.00
Ozerkhed	16.00	513.63	0.00	423.67	0.00	0.00	28.15	0.00	2676.37	362.86	158.32	4179
Tisgaon	0.00	181.75	0.00	0.00	0.00	0.00	0.00	0.00	414.12	0.00	87.13	683
Punegaon	0.00	569.94	0.00	91.73	0.00	0.00	23.20	0.00	1214.95	182.93	400.25	2483
Total	**496.25**	**5738.83**	0.00	**2848.57**	0.00	**36.00**	**384.43**	**126.00**	**7644.77**	**2910.67**	**12.0248**	21388

Medium Project	--	--	--	--	--	--	--	--	--	--	--	--
Small Project												
Khirdisathe &other 4	0.00	67.50	0.00	33.70	0.00	0.00	0.00	0.00	49.80	0.00	57.00	208
Ko.P.Dam 2	0.00	222.76	0.00	18.60	0.00	0.00	7.75	0.00	181.21	1.23	13.45	445
Total	**496.25**	**6029.09**	0.00	**2900.87**	0.00	**36.00**	**392.18**	**126.00**	**7875.78**	**2911.90**	**1272.93**	**22041**

(Source :- Palkhed Irrigation Division, Nashik "SINCHAN NAMA" 2015)

Conclusion:-

Palkhed irrigation division & their sub project of Karanjvan, Palkhed, Vaghad, Ozerkhed, Tisgaon, & Punegaon was developed from 2011-2012 to 2014-2015 due to their irrigated area & the production of major crops are increases due to the proper irrigation facility are provided by this division. Groundwater table were increased in the study region by this division.

Under these Palkhed irrigation division (all canal & dams) total 66 co-organizational sub-irrigation scheme are working on 5678 ha. Estimated area.

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