



INGENUITY OF FARMERS OF GUJARAT- ON THE WAY TO PROGRESS

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Abstract

A 2016 sustainable energy study by the international Energy Initiatives found that an average Indian household that relies on kerosene lamp for lightening spends 3200 rupees each year on the fuel and emits more than 380 kg of climate- changing gases in the process. Lightening is one area which needs energy. A Rural house needs more energy for mechanization of farming operation, well-pumping, threshing, milking etc. The present paper tries to study the dynamics of energy requirement in Rural Gujarat and use of solar energy. it stresses on India's clean energy future.

Introduction

Gujarat is the most applauded as well as criticized state. Its growth pattern, formulae and model has been argued and counter argued. A report titled "Gujarat: Growth to sustain" by Anirudha Dutta and Bhavesh Praveen Shah have concluded that Gujarat has one of the most unique growth models in the country. It is one of the best states in terms of improved governance in the past decade. It shows superior growth in literacy rate levels, per capita income, and drinking water and sanitation facilities.

In the present paper the issue of solar power as one of the alternatives to traditional energy source and the contribution of Gujarat and particularly Rural Gujarat in creating green investment climate is discussed.

Gujarat is one of the most solar developed state and it has total photovoltaic capacity of 1,262MW by the end of July 2017. due to some geographic and infrastructural facilities like

availability of vacant land, connectivity, transmission and distribution infrastructure and utilities Gujarat has been a front runner in solar power generation.

Objective

The objective of this paper is to analyze the percentage of rural people using solar energy and to study their problems and prospects.

Dynamics of energy requirement in Rural Gujarat and a shift therein

Rural area of Gujarat requires energy for all purposes, like any other state. It need energy for lightening the houses, irrigation, using appliances etc., but the salt industry located in Gujarat also require energy to a larger extent. It is appreciable that Rural Gujarat has not only shifted its power generation towards solar energy but also generated energy for earning money. They are considering solar energy generation as cash crops.

Taking a glimpse on distribution of household by main source of lightening among districts of Gujarat we could able to find that Rural Gujarat is improving on solar energy generation.

DISTRICTWISE DISTRIBUTION OF HOUSEHOLD BY MAIN SOURCE OF LIGHTING HOUSING CENSUS (2011)

Sr no	State/ District	Total/ Rural / Urban	Total No Of household	Main source of lightening					
				Electricity	kerosene	Solar energy	No lightening	% of Rural Population Using solar energy	% of population with no electricity
1	The Dangs	Total	48448	29794	17904	86	529	0.177509908	1.091892338
		Rural	43842	25723	17456	84	476	0.191597099	1.085716892
		urban	4606	4071	448	2	53	0.043421624	1.150673035
2	Kachchh	Total	444761	403294	33451	387	4801	0.087013025	1.079456157
		Rural	285991	250045	29719	339	3609	0.118535199	1.261927823
		urban	158770	153249	3732	48	1192	0.030232412	0.750771556
3	Banas	Total	561128	396873	134954	984	16839	0.175361058	3.000919576
		Kantha Rural	479308	320718	130629	955	15984	0.199245579	3.334807681
		urban	81820	76155	4325	29	855	0.035443657	1.044976778

4	Patan	Total	269174	223424	39171	328	3573	0.121854265	1.327394
		Rural	21593	167897	36684	317	3169	0.15052732	1.504798
		urban	58581	55527	2487	11	404	0.018777419	0.689643
5	Mahesana	Total	425907	385609	33247	255	5160	0.059872226	1.211532095
		Rural	318040	282698	25427	157	4320	0.04936486	1.358319708
		urban	107867	102911	3820	98	840	0.090852624	0.778736778
6	Sabar	Total	478497	438606	31474	263	6364	0.054963772	1.329997889
	kantha	Rural	404203	367378	29550	199	5700	0.049232688	1.410182507
		urban	74294	71228	1924	64	664	0.086144238	0.893746467
7	Gandhinagar	Total	287200	262539	19542	162	3733	0.056406685	1.299791086
		Rural	160460	144168	13065	81	2291	0.05047987	1.427770161
		urban	126740	118371	6477	81	1442	0.063910368	1.137762348
8	Ahmedabad	Total	1494656	156046	28771	624	6511	0.041748737	0.435618631
		Rural	228886	210869	14353	231	2219	0.100923604	0.969478256
		urban	1265770	1245177	14218	393	4292	0.031048295	0.33908214
9	Surendranagar	Total	342337	302068	32781	389	4551	0.113630721	1.329391798
		Rural	241831	206654	28523	357	4120	0.147623754	1.703669091
		urban	100506	95414	4253	32	431	0.031838895	0.42883012
10	Rajkot	Total	782631	747352	28835	404	3980	0.051620751	0.508541062
		Rural	313713	290296	20109	202	1979	0.064390064	0.630831365
		urban	468918	457056	8726	202	2001	0.043077894	0.426727061
11	Jamnagar	Total	424336	386538	29424	754	5299	0.177689378	1.248774556
		Rural	230295	199065	25323	565	3991	0.245337502	1.732994637
		urban	194041	187473	4101	189	1308	0.097402095	0.674084343
12	Porbande	Total	124769	117040	6458	423	475	0.33902652	0.38070354

	r							1	
		Rural	63553	57397	5104	406	358	0.638836876	0.563309364
		urban	61216	59643	1354	17	117	0.027770518	0.191126503
13	Junagadh	Total	526674	498326	23826	630	2705	0.119618588	0.513600444
		Rural	340939	322584	20784	540	2121	0.158386104	0.622105421
		urban	179735	175742	3042	90	584	0.05007372	0.324922803
14	Amreli	Total	294071	273331	15710	343	3314	0.116638499	1.126938732
		Rural	218891	200799	13798	320	2799	0.146191483	1.278718632
		urban	75180	72532	1912	28	515	0.037243948	0.685022612
15	Bhavnagar	Total	542464	500757	33370	418	5015	0.077055805	0.924485311
		Rural	303727	271671	27217	296	3192	0.097455939	1.050943775
		urban	238737	229086	6153	112	1823	0.046913549	0.763601788
16	Anand	Total	427164	378310	40987	290	6263	0.067889616	1.466181607
		Rural	297069	256461	34291	166	5162	0.055879274	1.737643443
		urban	130095	121849	6696	124	1101	0.095314962	0.846304624
17	Kheda	Total	462134	372226	78878	405	8226	0.087636919	1.780003203
		Rural	358132	276137	72191	344	7251	0.096053969	2.024672467
		urban	104002	96039	6687	61	975	0.058652718	0.937481972
18	Panchmahal	Total	446746	398937	42327	608	3980	0.136095231	0.890886544
		Rural	378617	333520	40081	589	3609	0.155566179	0.95320601
		urban	68129	65417	2246	19	371	0.027888271	0.544555182
19	Dohad	Total	329872	241117	81456	577	5353	0.174916331	1.622750643
		Rural	294997	209440	78555	551	5121	0.18678156	1.735949857
		urban	34875	31677	2901	26	232	0.074551971	0.665232975
20	Vadodra	Total	880121	798277	68015	6566	8797	0.74603378	0.999521657

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		Rural	418851	348321	59749	2465	6487	0.58851477	1.548760777
		urban	461270	449956	8266	101	2310	0.02189607	0.500791294
21	Narmada	Total	122039	101940	14610	3915	1084	3.207990888	0.888240644
		Rural	109005	89749	13966	3911	927	3.587908812	0.850419706
		urban	13034	12191	644	04	157	0.030688967	1.204541967
22	Bharuch	Total	335098	309091	22294	227	1777	0.067741377	0.530292631
		Rural	217028	194063	20101	201	1225	0.092614778	0.564443298
		urban	118070	115028	2193	26	552	0.022020835	0.467519268
23	Navsari	Total	294176	267679	24189	68	1608	0.023115414	0.546611552
		Rural	203615	179882	21831	60	1326	0.029467377	0.651229035
		urban	90561	87797	2358	08	282	0.008833825	0.311392321
24	Valsad	Total	361928	329218	29681	330	1899	0.091178356	0.524689994
		Rural	215288	186677	26304	265	1434	0.123090929	0.666084501
		urban	146640	142541	3377	65	465	0.044326241	0.31710311
25	Surat	Total	1299670	1252452	41569	414	3489	0.03185424	0.268452761
		Rural	263433	230212	30174	118	1990	0.044793173	0.755410294
		urban	1036237	102240	11395	296	1499	0.028564894	0.144658027
26	Tapi	Total	175717	142370	30889	161	1578	0.091624601	0.898034908
		Rural	159096	126797	30066	155	1433	0.097425454	0.900714034
		urban	16521	15573	823	06	145	0.036317414	0.877670843
								calculated	calculated

Source: Office of Registrar General and census commissioner, India

Energy is required by Urban and Rural areas for different purposes. Urban population requires it for industries, malls, street lightening, households, clubs, institutions, school, colleges and rural population needs it basically for its agriculture and household. It is known fact that urban population has more need, availability and consumption of energy then Rural areas. Lighting of

housing is one area which needs energy. It is clear from the table that rural house are using solar energy as a resource more than urban areas, looking comparatively, but still solar energy is underused. There is prodigious need to improve our infrastructural framework in such a way that we can use more equipment's based on solar energy as it can reduce their cost of production to higher extent.

Talking about the areas with no electricity, we find that Banas kantha, Dang, Kachchh, Dohad, and Rural area of Kheda district have major population with no electricity.

District like Ahmedabad, Rajkot, Porbander and Junagadh have very less population deprived of electricity.

Gujarat is supplier of salt to major parts of India. In Gujarat Little Run of Kutch desert, surendranagar, Bhavnagar, Jamnagar are producing salt. Farmers working are living in poverty because they are working typically in traditional method of production which is diesel powered and which takes away 40% of their earning. Natural Resource Defense Council (NRDC) and SEWA and other partners were able to provide them solar pumps through a low-cost loan. This has following advantages.

- 1 It avoids the expense of diesel and pollution from diesel.
- 2 solar pumps are more efficient and reliable.
- 3 They save time and energy of Agarias.
- 4 Low -cost loan is available to buy pump from various NGO's
- 5 Saving increased by 150 percent.
- 6 Diesel exhausts contain fine particles which can enter in Lungs and bloodstream, create Respiratory problems, heart disease etc.
- 7 Diesel pump bring climate pollution.

Few farmers have created solar co-operative parks and sell energy created in that at good price. Hence solar energy has turned to cash crop. Even for irrigation farmers are using solar water pump and saving money.

Problems with Solar Energy Generation

- High upfront cost as solar panel requires batteries and inverters to convert electricity to altering electricity.
- Farmers and Rural people can't bear the maintenance cost. Solar Panel being fragile can easily be damaged.

The above problems are not so large that cannot be dealt with. Government of Gujarat is already promoting solar power generation but still it is not used by masses as alternative for contemporary method of power generation. A small village in Gujarat Dhundi has created Solar Urja Utpadak Sahakari Mandali (DSUUSM) the solar co-operative in support with International Water Management Institute which is successfully helping farmers to adopt this method easily and generate solar power.

This can be an example for other villages looking towards Government to take initiative.

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