

Renewable Energy: An Assessment of Public Awareness in Jhansi

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ABSTRACT

India is one of the countries with the largest production of energy from renewable sources (solar light, bio gas, hydro, bio diesel, wind etc). Jhansi city has a very good scope to generate renewable energy due to their geographical situation and environmental factors. Diffusion methods are a key factor in promoting renewable energy production. Present time Indian government uses different types of effective extension education and diffusion method a deep gap which needs to be addressed in the area of energy education and awareness in India. This study aims to address the awareness of renewable energy and running Indian government different subsidy scheme like Jawaharlal Nehru National Solar Mission (JNNSM), Government Yojana: Solar Energy Subsidy Scheme, UDAY Scheme, SECI scheme, ROOFTOP scheme. Methodology used sample size was 250 respondents from Jhansi three different local area were chosen Shiva Ji Nagar, Veerangana, Kochha Bhanwar its duration from November 2018 to February 2019. Questionnaire based on self-structured questionnaires including demographic data that includes gender, age, income, education, area of residence, life quality, and interest of implementation. The statistical analysis used percentage and ratio, stated that middle class and rural respondents were more (76%) interested to use renewable energy, government launched different schemes but 96 % respondent had no knowledge. The government needs to improve its diffusion method that changes Indian people's view of renewable energy not only economically but eco-friendly and helpful in various type of health issues.

Keywords: Awareness -Renewable Energy, Diffusion method, government subsidy, eco-friendly.

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INTRODUCTION

Not being blessed with abundant energy resources India is still the 4th largest consumer of energy after the USA, China, and Russia. It must, therefore, meet its developmental needs by using all available domestic resources of coal, uranium, oil, hydro, and other renewable resources. Energy is the key to the development of a nation. It is seen that Countries that have achieved self-sufficiency in energy production have always remained high in human development index. Thus, it is widely realized that the key to the development of a nation is being self-sufficient in energy production. The progress of a country is now indicated by its per capita consumption of energy by the people. The demand for energy dates long back, after the industrialization began in Europe in the last two centuries. As a result of industrialization, there was heavy pressure on fossil fuels which resulted in degradation of the environment [14, 10].

Since its independence in 1947 India is facing an energy crisis. With a view of making the country self-sufficient in energy production, successive government's both at the center and

the states accorded high priority to the promotion and utilization of renewable sources of energy to supplement conventional sources[5]. Achieving energy needs of 8% economic growth, while also meeting energy requirements of the population at affordable prices, presents a major challenge. It calls for a sustained effort at increasing energy efficiency while increasing domestic production as much as possible. India is blessed with an abundant solar energy potential with 300 days of sunlight. About 5,000 trillion kWh per year energy is experienced over India's land area with most parts receiving 4-7 kWh per sq. m per day. Henceforth, Indian government is aiming to create solar schemes to use this renewable source of energy efficiently. Below is a list of some of the most successful and known solar schemes in India [2]

JAWAHARLAL NEHRU NATIONAL SOLAR MISSION (JNNSM)

Also called as the National Solar Mission this mission is a part of one of the eight key National Missions comprising of India's NAPCC. The main objective of the solar scheme is to establish India as a global leader in the solar sector by creating the policy conditions. The Mission has set the ambitious target of deploying 20,000 MW of grid-connected solar power by 2022, which was revised to 1, 00,000 MW by 2022 during June 2015[3].

GOVERNMENT YOJANA: SOLAR ENERGY SUBSIDY SCHEME

This Yojana aims at explaining that a person is eligible for a subsidy if he has solar panels installed on the rooftop. The subsidy is provided as per the capacity of the solar power plant. But the good part is that the people are going ahead with solar panel installation. Other inclusive benefit is that people are able to cut down on their electricity bills and the load on thermal power plant which will reduce increased power generation [3, 8].

DEVELOPMENT OF SOLAR PARK SCHEME

MNRE has formed a scheme aiming to set solar parks in various states, each with a capacity of above 500KW. This scheme proposes to offer financial support by the government to establish and facilitate the infrastructure necessary for setting up of solar power plants. MNRE is executing a scheme for the development of at least 25 solar parks with a combined capacity of at least 20,000 MW [3].

UDAY SCHEME

This scheme was launched in November 2015 as a revival package for electricity distribution companies of India initiated by the Government of India with the idea to find a permanent solution for the financial mess the power distribution is in. The aims of UDAY scheme is reforming the power sector, operational improvement, and development in renewable energy, reduction of cost generation of power, energy efficiency and conservation [3, 12].

SECI SCHEME

The main objective of this scheme is to engage in the development of large scale and rooftop solar projects, to channelize the investment in the government sector, and implementing MNRE and VGF schemes, project management consultancy and trading of solar power. SECI has also played a major part in installing rooftop solar power plant. Till date, it has released tenders for 4307 MW of large-scale solar projects of which 675 MW have been commissioned. In the rooftop part, it has released tenders for around 200MW of projects of which 46.5 have been commissioned [12, 6].

ROOFTOP SCHEME

Under the rooftop scheme executed by SECI, 200MW of projects have been allocated of which 45MW have been commissioned. Special schemes including 75MW for warehouses and 50MW for the CPWD have been launched. Recently, SECI has commissioned a tender which is the largest global one of its kind. It has 132 bidders who bid for a total capacity of 602MW. This tender is a part of the MNRE's initiative to gain momentum for achieving a target of 40 GW rooftop solar capacities by 2022[3, 4].

CHALLENGES WITH RENEWABLE ENERGY:

1. **Weatherdependent:** Both solar and wind sources are weather dependent; many times, weather does not cooperate such as overcast sky, storms etc.; ensuring steady power supplies in such cases is difficult.
2. **Grid harmony:** Keeping power from different renewable sources in harmony over the grid is also difficult; especially in the context of intermittent power flows from such sources.

3. **Land acquisition:** Sources such as wind & solar both require large land area to ensure large scale generation; difficult to obtain in agrarian countries like India.
4. **Poor battery efficiency:** Proposal to utilize batteries to meet peak loads during evening & mornings is marred by poor battery efficiencies.
5. **High capital cost:** The high initial cost of investment & technological expertise in harnessing sources such as wind, tidal, geothermal etc. is unavailable in most of the countries.
6. Thus, India has alternate sources for its energy needs. As part of the signatory of various international conventions, India adheres to the norms for promoting environmental protection at the same time meeting the current needs as well as the demand of the future generations. Aim of this study is the awareness of renewable energy and the effect of a socioeconomic and demographic factor [13].

MATERIAL AND METHODS

The subjects 300 male and female age 18 to 55-year age candidates in Shivaji Nagar, Veerangana, Kochha Bhanwar at Jhansi participated in the study on the development of the Renewable Energy Awareness Scale.

The Renewable Energy Awareness Scale

Within the scope of this study, the following activities were carried out to develop the "Renewable Energy Awareness questionnaire" to know renewable energy awareness. 300 participants were involved but only 250 candidates were eligible due unknown nonrenewable energy and incomplete information.

TABLE -1: Sex Information Table

Gender	Frequency	Ratio
Male	196	78.4
Female	54	21.6

TABLE -2: Demographic Data

S.No	Particulars	No	Percentage	
1	AGE (YEARS)	MALE	FEMALE	
	18-30	92	18	44
	31-42	76	24	40
	43-55	28	12	16
2	EDUCATION	MALE	FEMALE	
	Illiterate	12	3	6
	Secondary	80	11	36
	Senior Secondary	42	8	20
	Graduate	30	12	16.8
3	RELIGION	MALE	FEMALE	
	Hindu	64	32	38.4
	Muslim	48	06	21.6
	Jain	34	11	18
	Others	6	4	4
4	Caste	Male	Female	
	General	60	24	33.6
	OBC	72	22	37.6
	SC & ST	64	08	28.8
5	AREA OF RESIDENCES			
	Urban	142	36	71.2
	Rural	54	18	28.8
6	ECONOMIC CONDITION			
	Lower income	86	21	42.8
	Medium income	41	21	24.8
	Upper middle class	54	18	28.8
	Upper class	11	4	6
7	OCCUPATION			
	Government	40	18	23%
	Private job	70	37	43%
	Self employed	55	12	27%

TABLE -3: QUESTIONNAIRE ABOUT RENEWABLE ENERGY

S.NO	QUESTIONNAIRE	ANSWER (%)	
		YES	NO
1	You know about benefits Renewable energy	80	20
2	I believe that all countries should use nature-friendly renewable energy resources.	65	35
3	You know about Renewable energy subsidy programme	2	98
4	You know about sources Renewable energy	55	45
5	The slogan of this country swatch Bharat should be using clean energy resources.	43	57
6	Using renewable energy resources would not decrease the use of fossil fuels.	56	44
7	I use fossil fuel but I do not know anything about their disadvantages	24	76
8	The greenhouse gases that come out because of fossil fuels cause some of the heat to stay within the atmosphere and parallel to this, global warming makes me ha:y.	34	66
9	I strongly support the use of renewable energy resources.	86	14
10	Wind energy is an important renewable energy resource	67	23
11	Solar energy is an important renewable energy resource	89	11
12	Biogas is an important renewable energy resource	78	22
13	Geothermal energy is an Important renewable energy resource	56	44
14	I believe that education at schools on renewable and non-renewable energy resources is important	67	33
15	I believe that there is no enough improvement in the world related to the renewable energy usages	55	46
16	Renewable energy resources have a feature that increases environmental pollution.	09	91
17	I believe that it is necessary to extension programs on the importance of energy resources and energy saving within the in-service educational programs for urban people.	98	2
18	I believe that media has a great responsibility in emphasizing the importance of using renewable energy resources.	97	3
19	I am not attracted to the renewable energy resources because they require more improved technology.	87	13
20	When we live in a natural environment, the supply of our energy needs from natural resources is more suitable.	84	16

TABLE - 4: Willingness To Use Renewable Energy

WILLINGNESS TO USE RENEWABLE ENERGY	FREQUENCY	PERCENTAGE
Yes	173	69.2
No	29	11.6
Undecided	48	19.2
Total	250	100

TABLE - 5: Chi-Square Analysis Showing Relationship Between The Respondents' (Male And Female) Level Of Perception Of Renewable Energy And Some Of Their Selected Socio-Economic Characteristics

VARIABLE	P-VALUE	DECISION
Religion	0.0006	Significant
Age	0.1505	Not Significant
Income	0.0005	Significant
Gender	0.1737	Not significant

* Significant at 5% level of significance

RESULT

Total- 250 candidates in this study 78.4 % male and 21.6 % female participated in table 2- Demographic data in a table -2 divided in three age group 18- 30, 31-42, and 43-55 responded where, type of the family was 13 per cent joint 87 % nuclear type. In this locality respondents were 66.8% Hindu, 19.2 % Muslim, and 13.2% Jain. Economic condition where the income was self-saturated below 15 thousand lower class was 42%, where income of 24% middle economic income group was from 16 to 30 thousands were 28 %. Uppermiddle group's income was 31 to 55 thousand. Upper-class income group incomes more than 55 thousand per month was 6%. Area of residence respondents were 71.2 % in urban and 23% in the rural area. 23% of the respondents engaged in government jobs. 43% of respondents did a private job and 27 % of candidates were self-employed. In Table 3- we designed self-structured 20 questionnaire to acquire information from respondents that give different aspects of respondent's view. Table 4- respondents that had knowledge of renewable energy were in majority. Here 173 respondents were interested to adopt, 29 respondents were not interested and 48 respondents were undecided. Table 5- statistical analysis chi-square showed religion ($p=0.0006$) and income ($p=0.0005$) significant difference but gender ($p=0.1717$) and age ($p=0.1515$) were not significant

DISCUSSION

Renewable energy and bioenergy technologies are seen as a panacea for climate change through limiting carbon emissions, the creation of a sustainable bio-economy, aiding poor people's aspirations, and guaranteeing energy security, safety, and independence [1, 7]. Nowadays, almost all the countries trying to develop nuclear power that has much threat so renewable energy may have better alternative sources of energy. UN organizations and countries should develop a policy that recognizes an impediment to the development of renewable energy [3,11]. Environmentalists in any modern society and young citizens are the cornerstone to transform current societies into more sustainable ones. They are the future policymakers, leaders, educators, and the main results of this study revealed some knowledge gaps and misconceptions among the different economic status, education, area of residences. The statistical analysis suggested that the respondent lacked the knowledge and skills required to effectively contribute toward solutions, thus accentuating the need for education that improves energy literacy by impacting civil person's attitude. The major challenges that exist in determining the type of knowledge required, how much knowledge each individual needs to possess, and what is the best tool to elevate the public knowledge in developed nations, while modern formal extension and diffusion technique.

CONCLUSIONS

One key conclusion of this study is that there is a lack of knowledge and awareness in respondents that needs to be immediately and effectively addressed. Moreover, social norms and beliefs, culture, and societal values are of crucial importance when crafting new public policies and need to be understood and embedded in any framework of solutions. Mass media and social media are becoming more and more influential on the behavior. And values of young citizens so new measures are therefore needed to utilize opportunities in the digital world. Public education needs to be interactive, contemporary, and to be able to accommodate emerging problems and effectively deal with challenges and societal difficulties.

RECOMMENDATIONS

My main recommendation is to the Indian Central and State governments and the education authorities for the establishment of a comprehensive, dynamic, interactive and inclusive RE and environmental public education strategy. All stakeholders, governmental staff members and officials, religious clerics, NGO members and leaders, school students and teachers, and rural housewives, must be informed, educated, and trained in all available communication means and in all available learning settings.

MY RECOMMENDATIONS ARE

- Laws, regulations, and fiscal incentives for energy efficiency and energy saving.

- All vital sectors are essential and must be aligned with policies and incentives for renewable energy development.
- New policies for elevating public awareness of renewable energy.
- Energy conservation is immediately required. Mass media must be deployed with consistent, transparent, and easy- to- understand messages.
- Objectively work toward removing disputes and controversies in mass media.
- Among ordinary citizens, regarding the future choices of the energy system (renewable instead of nuclear).
- Successful energy policies from other countries, such as the Renewable Energy Resources Act from Germany can be adopted as a model for policy development and implementation.
- Revisit the current public education policies and accentuate environmental awareness and renewable energy development as a new means for sustainable societies.
- Empower females with knowledge, skills, and tools to become pacesetters to assist society in addressing and tackling challenges such as population growth.
- Establish household training programs for females to learn more about how to conserve energy and water.
- Develop a curriculum with a title such as Renewable Energy Sciences and try to teach at the school level.
- Assist local associations that exist in almost every village in India to adopt small- scale and decentralized renewable energy development projects by educating the leaders and members of these associations.

CONFLICT OF INTEREST

The author(s) declare(s) that there is no conflict of interest.

REFERENCES

1. A Singh, A Singh, NK, Maurya ; (2019) Health-Care Waste Management International Journal of Scientific Research and Review 8 (4):410-416
2. Bajpai, P. and Dash, V., (2012). Hybrid renewable energy systems for power generation in stand-alone applications: A review. *Renewable and Sustainable Energy Reviews*, 16(5):2926-2939.
3. <https://amplussolar.com/blogs/what-are-the-solar-schemes-in-india> accessed on 12/06/2019
4. <http://vikaspedia.in/energy/policy-su:ort/renewable-energy-1/schemes> accessed on 12/06/2019
5. <http://www.fao.org/energy/home/en/> accessed on 12/06/2019
6. Manju, S. and Sagar, N., (2017). Progressing towards the development of sustainable energy: A critical review on the current status, applications, developmental barriers and prospects of solar photovoltaic systems in India. *Renewable and Sustainable Energy Reviews*, 70:298-313.
7. Padmanathan, K., Govindarajan, U., Ramachandaramurthy, V.K., Rajagopalan, A., Pachaiyannan, N., Sowmmiya, U., Padmanaban, S., Holm-Nielsen, J.B., Xavier, S. and Periasamy, S.K., (2019). A sociocultural study on solar photovoltaic energy system in India: Stratification and policy implication. *Journal of Cleaner Production*, 216:461-481.
8. Plutshack, V., Sengupta, S., Sahay, A. and Viñuales, J.E., 2019. New and renewable energy social enterprises accessing government su:ort: Findings from India. *Energy Policy*, 132:367-378.
9. Sarkar, K., Chowdhury, S.R. And Dutta, A., 2018. A Review on India's Potential of Solar Energy. *Global Journal of Ecology, Environment and Alternate Energy Technologies*, 1(1):1-10.
10. Szulecki, K., Fischer, S., Gullberg, A.T. and Sartor, O., 2016. Shaping the 'Energy Union': between national positions and governance innovation in EU energy and climate policy. *Climate Policy*, 16(5):548-567.
11. Tripathi, L., Mishra, A.K., Dubey, A.K., Tripathi, C.B. and Baredar, P., (2016). Renewable energy: An overview on its contribution in current energy scenario of India. *Renewable and Sustainable Energy Reviews*, 60:226-233.
12. Veluchamy, A., Sunder, R.G., Tripathi, R. and Nafi, R.M., (2018). Powering India: The Next-Generation Reforms in Power Distribution Sector. *International Journal of Allied Engineering Research*, 13(21):15016-15034
13. Verma, S. and Abdelrehim, N., (2017). Oil multinationals and governments in post-colonial transitions: Burmah Shell, the Burmah Oil Company and the Indian state 1947-70. *Business History*, 59(3):342-361.
14. Zyadin, A., (2015). Prospects for renewable energy education (REE) in elevating youth energy and environmental awareness in Jordan. *Dissertationes Forestales*, 207 :1-39