International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878 (Online), Volume-8, Issue-1, May 2019

Willingness and Acceptance, To Pay for the Solar-Based Home System: Survey Evidence from Kerala

Nirmal G, Dileep G. Menon

Abstract: ***The significance of solar-based energy has been acknowledged worldwide from the age of power, however lamentably, India presently has to apply endeavours on the improvement of this wellspring of energy. The motivation behind this examination is to investigate the public acknowledgement and enthusiasm for the SHS. Moreover, the wants for the overall public towards SHS improvement in India and the difficulties they face in SHS use are perceived. The outcome of the outline exhibits that about 82% of respondents show higher eagerness for SHS. Regardless, various respondents ensure that a couple of impediments square them from using SHS, which fuses; staggering expense of cost panel's, absence of data and trust on sun based board suppliers. Practically 60% of the respondents expect that administration arrangement of propelling powers could be the best way to deal with assistance the utilization of SHS countrywide. For the compelling execution of new SHS arrangement, the legislature of India needs to set up solar power plants, increment foundation of solar-based boards gives subsidizing and full data to directing free research. What's more, practically 90% of the respondents believe that administration should stand out in creating up this division. Accordingly, the study gives some noteworthy references to SHS movement in India.***

Index Terms: ***Solar-home frameworks, Social assertion, Vitality approach, Readiness to pay***

I. INTRODUCTION

As of now, there are 1.317 billion individuals internationally who don't approach the essential need of power and around 99.8% of individuals are living without power in creating nations(IEA, 2012). To give energy administrations worldwide is to be sure a noteworthy test. Arrangement of power to all segments of the economy and for family unit utilization is a major test looked by the creating nations, particularly in their country territories (Rebane andBarham, 2011). Network power can be utilized for this reason; however, that is joined by an enormous venture.

Revised Manuscript Received on 22 May 2019.

***** Correspondence Author

Nirmal G*, Masters in Business Administration, specializing in Finance and Business examination from Amrita School of Business, Amritapuri campus.

Dileep G. Menon, Assistant Professor, School of Commerce, Narsee Monjee Institute of Management Studies (NMIMS), Hyderabad, Telangana

Further, it will be liable to oil-based goods that transmit ozone-exhausting substances. Along these lines, economical power source (RE) sources have gotten pervasiveness.The changing lifestyle with brisk industrialization has made power a goal and fundamental product consistently. In the midst of the latest couple of decades,
growing expenses of intensity with extending demand and decreasing oil based good holds have raised various stresses for game plan makers, budgetary authorities, and customers. Additionally, existing inventory network likewise represents a test of carbon impression because of its reliance on petroleum products like coal and oil for power age. To reduce the worry, approach producers over the world have been searching for some maintainable and doable elective info-energy hotspots for power age. They found numerous alternatives like atomic, wind, sun-oriented controlled, hydro, biomass, tidal, geothermal, and so on. Regardless, composing supports sun arranged vitality as it is the most arranged and green option open over the world. The report dispersed by Indian Meteorological Department (IMD), Ministry of Earth Sciences, and Government of India (GoI) states the sun based fueled vitality gotten by the earth is an overabundance of different occasions the world's business vitality usage and more than various occasions the world's known coal, gas and oil holds. In addition, this vitality is immediately available in the midst of the day for anyone to tap and that unreasonably free and with no requirement (NREL 2012). At first, used to supply capacity to satellites in view of its high age cost, daylight based advances and its potential have adequately improved to supply control not only to remote territories yet moreover to upgrade the national cross-section control at multi-megawatt levels. In India, wind and sun oriented based systems have been getting incredible response under the supportive condition made through different game plan measures. To keep up the speed of fiscal improvement with the reduction of ozone-harming substance radiation, India must diminish its reliance on the standard vitality sources and move towards the conservative power sources like sun-based, wind, tidal, and so forth. Ref. features the basic model for check-in establishment and work of sun-controlled power in the Indian circumstance. Creators have been given some suggestion to the flight of the points of confinement concerning light-based power establishment in India. "JNNSM" is one of the key strategies of the Indian government to advance sun-fueled power in India.

As per the "Jawaharlal Nehru National Solar Mission (JNNSM)", 1800 MW of matrix-related sun based peak plant foundation ought to be conceivable inside the year 2022. Shows the chances and inconveniences for the establishment of sun based zenith headway in the Indian setting.

CSP is a believability for the age of force and it is studied that 7% of immovable power request on earth fulfilled through CSP always 2030 and 25 per cent of full-scale control request fulfilled persistently 2050(MNRE 2016). Presents the potential, blueprint and headway with respect to the movement of CSP in the Indian power condition. The progression made in sun oriented fueled power age in the nation, with the start of 'National Solar Mission'(NSM) which also named as 'Daylight based India'. Sun situated home lighting frameworks; sun based lights and daylight-based off-cross section lighting systems (SOLS) are some less focused sunlight based controlled applications. Due to the tremendous expansion in the expense of elective wellsprings of vitality, SOLS will be used as a correlative wellspring of vitality. The openness, methodologies, status, progression courses of action, perspectives, real achievements and future capacity of sun-arranged vitality in India has been accounted for. Nation region electrification assumes a noteworthy job to improve the individual fulfilment of the all-inclusive community in many creating nations. How normal area electrification can be cultivated in India by SPV in the downsized scale arrange structure. The present state and viewpoints of utilizing two or three criticalness sources in India for the creation of force and the real gadgets for fortifying their improvement and use have appeared.

In remote country area's limited power framework, photovoltaic and wind vitality sources are being viewed as fiscally sharp age sources. The execution examination of SPV structure, created in the Saga significant Island in West Bengal, has been demonstrating specific sunshine based cell efficiency in different research focuses of the world. The general sun based PV types of progress, per capita characteristics, government suffering reactions and techniques of top ten sun-filled power-production nations, interests in the overall sun arranged significance among the nations and government driving force approaches have point by point(Gireesh Shrimali n , Sunali Rohra 2012).The public affirmation and excitement to pay will be reviewed to choose affirmation of this system development in India. Keeping in view the flow overall imperativeness example and future essentialness circumstances in India, this examination studies the ebb and flow utilization of sun-based imperativeness and hopes to investigate perspective of general populace on the affirmation of SHS. The deferred result of the review shows that about 20% of the respondents were prominent, 38% were extraordinary and 42% were not content with Renewable vitality. Component of consideration about RE stays low even among potential customers of SHS, also, the possible result of the examination spread such things as the centrality of light based significance, care among respondents, and solid and right data about SHS in India. This examination would like to cross any hindrance between the general people, scholars and plan producers concerning the impression of the SHS advance. Altogether more explicitly, the motivation behind this examination is four-cover. To start with, this examination will get some data about the segment of attention to SHS among regular inhabitants. Second, this examination explores the viewpoint of open toward SHS use. Third, this examination will explore the troubles looked in SHS use. Fourth, this examination look at the viewpoints of open on the update of SHS spread in India.

II. INDIA'S SOLAR ORIENTED BASED VITALITY CONDITION REVIEW

India is organized in the northern side of the equator, lying b/w degrees 8°4′N and 37°6′N and 68°7′E and 97°25′E; nation is allotted into essentially two proportionate parts by Tropic of Cancer (23°30′N). The southern half agrees with peninsular India, lies in the tropical zone, while the northern half has a spot with the subtropical zone. Because of its locational space, as it were, nation encounters 250 to 300 splendid days of the year and gets normal radiation of 200 MW/km2.Yearlylarge radiation sways from 1600 to 2200 kWh/m2 [6], which is regular of the tropical and subtropical territories. NREL beginning late discharged 10 km targets sun arranged asset maps for India dependent on the SUNY satellite (Renew Sustain Energy Rev 2015).

Figure (a).Displays yearly run of the mill direct standard irradiance (DNI) transversely over India, exhibits nation have more obvious than five kWh/m2/day of DNI.

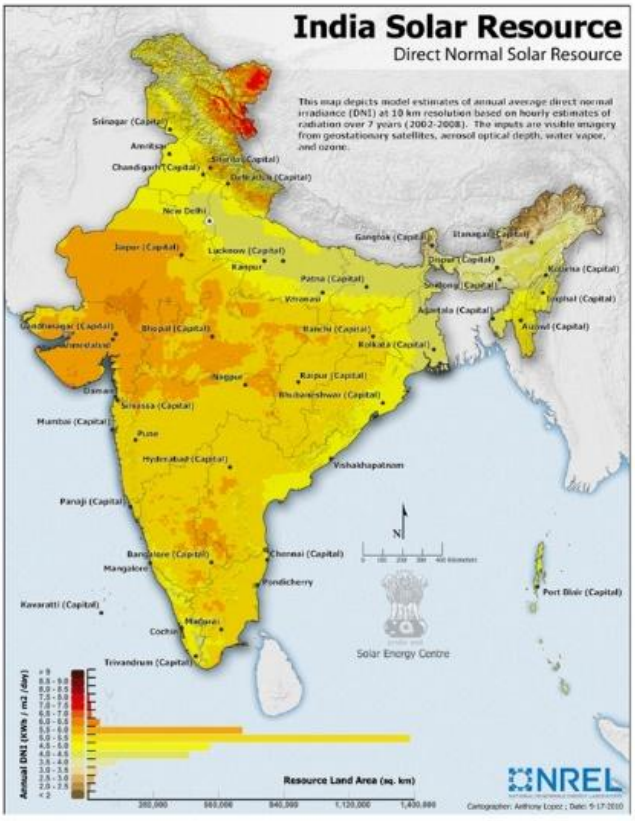
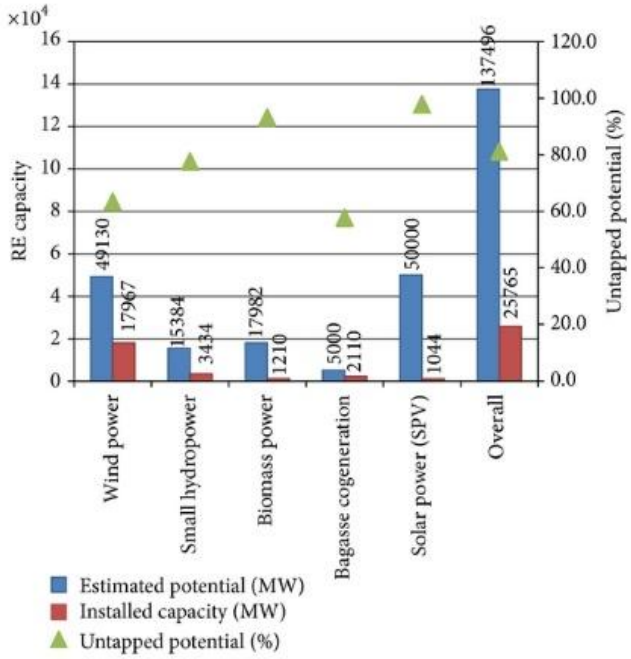


Figure (b). It likewise exhibits that sun based power has the most extreme undiscovered potential as 97.9% of the evaluated capability of 50000 MW.

What's more, the in general undiscovered capability of 81.3% looks for quick consideration of strategy creators for abusing this accessible RE asset in an extremely proficient and viable way to conquer the issue of power lack.



India has an exceptional potential to deliver control from sun based fueled vitality and the Country is on course to create as a sun-based vitality focus. The techno-business ability of photovoltaics in India is massive. With GDP making in an abundance of 8%, the vitality 'opening' among free market activity will just extend. Sun orchestrated PV is a supportable power source asset fit for cross this 'opening'. Most bits of India has 300 – 330 splendid days in a year, which is for all intents and purposes indistinguishable to more than 5000 trillion kWh reliably – more than India's immovable hugeness utilization reliably. Standard sunshine based repeat remains at a strong 4 – 7 kWh/sq. Meter/day. Around 66 MW of complete most distant point is introduced for different applications including one million ebb, flow PV frameworks – 80% of which is sunlight based lights, home/road lighting structures, and sunshine based water siphons, and so on. The reviewed potential achieved by the Ministry for the sunlight based PV program, for example, sunshine based road/home lighting frameworks, sun-masterminded lights is 20 MW/sq. kilometer. The limit of the sunlight based warm division in India correspondingly stays new(IMD 2016). The Ministry of Renewable Energy proposes an augmentation of 500 MW amidst stage 1 of JNNSM. Setting up gathering units at Export Situated Units, SEZs or under the SIPS program demonstrates a regular open gateway for firms, which can use India's cost tendency to pass on sun based modules at focused costs to business parts in Europe and the United States. To the degree all sensible power source, beginning at now, India is arranged fifth on the planet with 15,691.4 MW grid related, also, 367.9 MW off-sort out supportable power source based power limit. India is among the best 5 goals around the world for Sun-controlled vitality movement according to Ernst and Young's reasonable power source attracting a quality summary. Sun-controlled power is participating in light of how it is interminable and offers a reaction for oil backup discharges and largely environmental change. Earth gets sun-arranged significance at the rate of around 1,73,000 TW. This massively outflanks both the present yearly by and large vitality use rate of around 15 TW and any possible need later on. India is both thickly populated and has high sunlight based insolation, giving a perfect blend to a sun controlled control in India. India is among the best 5 targets far and wide for sun-filled centrality progress as demonstrated by Ernst and Young's plausible power source attracting quality summary. Sun-controlled power is participating in light of how it is unending and offers a reaction for oil backup discharges and generally speaking environmental change. Earth gets sun-orchestrated essentialness at the rate of around 1,73,000 TW(MNRE 2016). This hugely beats both the present yearly by and large centrality use rate of around 15 TW and any possible need later on. India is both thickly populated and has high sunshine based insolation, giving a perfect blend to a sun controlled control in India. The power division is one of the key territories contributing in a general sense to the improvement of the country's economy. Power part needs a continuously supportive job to be played in describing, itemizing and completing the examination adventures with the nearby commitment of all utilities to such a degree, that the bit of leeway accomplishes an authoritative customer. In India, there is a titanic hole between vitality age and vitality utilization. India has an overwhelming potential for sun-oriented power and it is evaluated so frequently of the vitality need, which is around 5000 trillion kWh consistently. The sun-based radiation over India is indistinguishable to 4–7 kWh per square meter every day with yearly radiation going from 1200–2300 kWh per square meter. It has a type of 250–300 clear brilliant days and 2300–3200 hours of sunlight for every year. India's capacity needs can be met on a flat out land locale of 3000, which is comparable to 0.1% of the total land in the country. Legislature of India is attempting to improve the idea of vitality age from daylight-based vitality

III. RESEARCH METHODOLOGY

The study is orchestrated as an exploratory examination in light of the way that obliged information is accessible for the social insistence of these systems in India. This system is in addition used by Solangi et al. (2015). Additional data can help in the use of SHS. This examination uses both fundamental and assistant kind of information. The review method was utilized to amass major information. In this way, an audit review streamed among the adjacent inhabitants in the southern state Kerala in schools, universities, malls, stores. Data was gathered from both commonplace and urban zones. The audit was done between April and May 2019.

The language of the study was kept basic and fated number of explicit terms had been joined into it so respondents with another foundation, getting ready in addition, prologue to SHS can undoubtedly get this. In the example design plan of the chart, three criteria were viewed as basic. At first, the respondent should be an immutable occupant of Kerala. Second, they should be created for example at any rate of 18 years of age.

Third, both country and urban respondents will be joined into the examination. Prior to get-together data, respondents were asked some wide solicitation identified with a supportable power source RE, for instance, data about an Earth-wide temperature help, affirmation with unlimited vitality improvements, and energy for common issues and enthusiasm for SHS. Along these lines, those respondents who answered by one way or another firmly or on the other hand negatively to them as of late referenced solicitation were considered for the review. The accommodation testing was used to aggregate information. The example taken was just 350. Our examination anticipates genuine commitment for creating by giving a point of view and fittingness of SHS rejecting, pay class, ethnicity, and rank. What's more, this examination is not an agent of whole nation and its degree obliged to southern area of India (Kerala).

IV. RESULTS AND DISCUSSIONS

SHS progress has sketched out reliant as of late referenced establishment. This area presents, the estimation qualities of respondents, the outlook moreover, the vitality of open towards the usage, well known feeling on the challenges they face in SHS use, needs of individuals when all is said in done about SHS progress in India and open perspectives on the execution of new experiences. The layout was driven between April and May 2019 utilizing the comfort methodology for inspecting in Kerala. The number of inspectors scattered were 550 and got 350 responses. Study was managed without division in sex, ethnicity, and neighbourhood regions of respondents. The age, in any event, were 18& above. Besides, the survey was done through up close and personal trade with the respondents. The examination of the data used to be finished using SPSS programming.

Table I
Socioeconomics of respondents (350).

Respondent's attributes	Frequency	Percentage
Gender		
Male.	242	69.1
Female.	108	30.9
Age		
Less than 18–20.	59	16.9
20–29.	117	33.4
30–39.	64	18.3
40–49.	55	15.7
50 and above.	55	15.7
Education		
High school.	26	7.4
College.	56	16
Graduate.	219	62.6
Diploma	49	14
Area Urban	152	43.4
Rural	59	16.9
Semi-Urban	139	39.7
Occupation Shopkeeper	20	6
Businessman	20	6
University student	184	53
Farmer	10	3
Govt servant	12	3
Daily wager	10	3
Housewife	10	3
Private sector	84	21
Monthly Income		
0-20000	69	20
20001-40000	138	39
40001-60000	92	26
60001 & above	51	15
Type of Roof		
Curved Roof	18	5.1
Flat roof	230	65.7
Gable roof	24	6.9
Pyramid Hip roof	66	18.9
Shed roof	12	3.4

Table II
The enthusiasm of the public on SHS

Public enthusiasm for SHS	Frequency	Percentage
Agree	290	82.9
Disagree	6	1.7
Neutral	54	15.4
Total	350	100

A. Statistic Data Of The Respondents

The general measurement traits of the respondents are according to the accompanying. Practically 69.1% of the respondents are male, while 30.9% are female. Almost 33.4% of the respondents are somewhere in the range of 20 and 29 years. Regarding educational qualification, about 62.6% have graduation, 7.4% have a secondary school, 16% have school and simply 14% have a confirmation. The respondents are around comparatively scattered between urban (43.4%), semi-urban (39.7%) and rustic (16.9%) locales. The greater part of the respondents were college graduates (62.6%). Monthly income of the respondents comes round 20001-40000(39%), 40001-60000(26%), 0-20000(20%), 60001&above (15%).Majority of the respondent's house has a flat roof (65.7%) The statistic attributes of chosen respondents appear Table 1.

B. The Intrigue And Frame Of Mind Of The General Population Towards The Usage

The overview coordinated to pick temper of individuals largely towards the usage of this system. Table II demonstrates the vitality of general society. The outcome demonstrates around 82.9% are intrigued overwhelmingly, while 1.7% is surely not enchanted and about 15.4% is fair. Thusly, a high state of intrigue seen among them, which shows a high potential for its utilization.

Remembering the recently referenced establishment, the examination was finished to explore the eagerness of the general population in gaining SHS and in using the power created from SHS for homes. In particular, they posted two

nonattendance of data about normal issues and poor brand picture. This outcome demonstrates that SHS can be advanced in India if the key cost is controlled also just as the purchasers were given sun-arranged board from a solid

Table III
Public enthusiasm for the purchase of solar based and petroleum derivative produced power (n = 350).

Publicinterestinsolarhomesystem	Yes		No		Unsure	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
The likelihood of purchasing SHS if the all-out expense is financed by half by the government	266	76	48	13.7	36	10.3
The likelihood of utilizing SHS if the cost is equivalent to that of non-renewable energy source produced power	80	22.9	246	70.3	24	6.9

Demands. One is for buying of SHS if half of the expense is checked by administration as an endowment, second is with respect to the buying of solar-based produced power if its expense is the equivalent as the non-renewable energy source produced power.

Table III revealed that essentially 76% assented to buy SHS if half of the expense whenever financed by the administration. Nearly, 13.7% showed logical inconsistency on the acquisition of SHS, while 10.3% are dubious. It exhibits eagerness of the overall public in the buying yet just if administration blessings half of its expense. The eventual outcome of second request derives, 22.9% are keen on utilizing power produced from solar-based boards if the expense is equivalent to non-renewable energy source created power. About, 70.3% of the respondents were not intrigued and the rest 6.9% were uncertain about its utilization. In this way, the improvement of SHS and its objectives might be accomplished if the administration finance half of the expense.

C. Difficulties In The Usage Of SHS That Public Faces

Motivation for driving examination is to investigate insistence of solar household systems in India. Study investigates the troubles looked by the general population in its utilization; also, it is like way tries to discover reasons, at last, bewilder potential customer. The aftereffect of review demonstrates a few potential blocks that have influenced the buyer chooses to buy, what's more, introduce SHS. The underlying expense of the SHS is the real obstacle confronted by the purchasers as demonstrated in Figure (c). Respondents were given five choices to look over. Practically 62% of the respondents guaranteed that they are affected by the initial cost. About 14% of the respondents are lacking information regarding SHS, 10% of the respondents are not having trust on solar energy, and 7% of the respondents are facing challenges due to ROI & Best price respectively. The respondents were reluctant to introduce SHS until they locate the ideal cost. Besides, trust in close planetary system supplier is a noteworthy hindrance. The information additionally assumes a pivotal job in the buy choice of SHS such data contained how this framework functions, how much the bill of force is reduced and what are the encounters of various clients. Other than the as of late referenced cutoff points, others meld more data about the structure, need of specific help, need of learning and low trust on sunlight based system supplier,

source. Thusly, by joining this recommendation the usage of SHS will help in India and will in all probability demolition the sufferings of the standard masses as a result.

D.Opinion Of Public Towards Headway Of Solar House Systems In India

The evaluation of open is basic in get-together the objectives of association concerning solar house systems strategies. Reason for this examination picks the needs of general society with respect to SHS use in India by considering the inclination and temper towards new SHS technique execution. Furthermore, this investigation looks into public points of view on role of an affiliation that could incite the improvement of SHS. Figure (d) uncovered the completion of open that redesign the utilization of it. The result of the review shows that essentially 37% of the respondents ensured that administration blessing is the perfect way to deal with overhaul the utilization of SHS everywhere throughout the nation. In expansion, almost, 25% trust that finding a dependable contractual worker is a smart thought, while over half backings the expansion in the establishment of sun-oriented sheets meet the vitality necessities. Outcomes show the majority of respondents trusted the organization to be a standard cautious body for movement use.

Figure (c). Reaction of the common in general as for the difficulties in the usage.

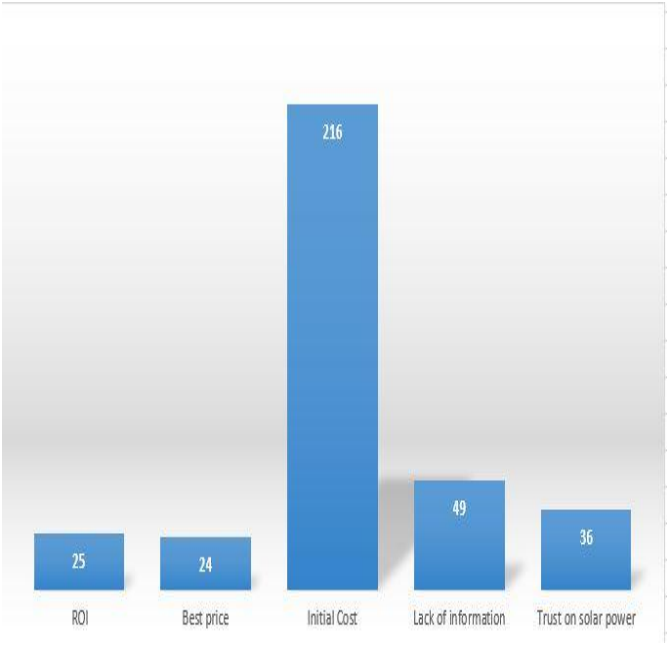


Figure (d). Supposition of the common in general on ways to deal with improvement in the solar household systems.

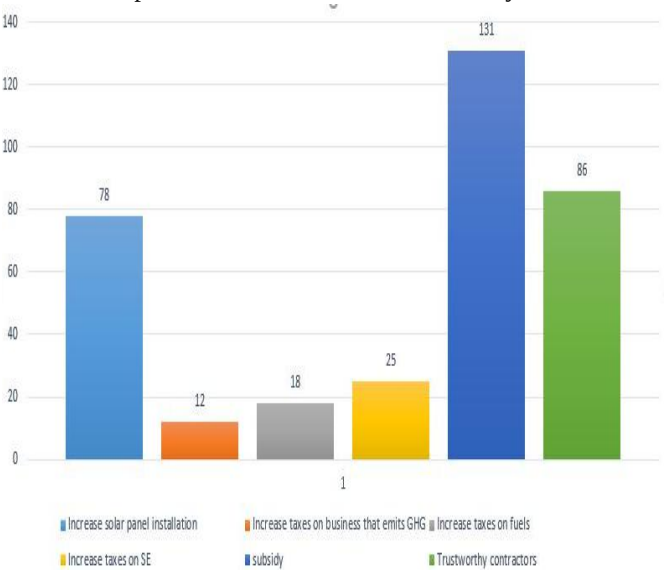


Figure (e) shows mood of mind general population towards the new SHS arrangement execution. The outcome uncovered that practically 14% of the respondents upheld the establishment of solar power plants everywhere throughout the nation to upgrade the improvement of SHS. About 21% thought of it as important to approach full information, almost 16% proposed that an enormous measure of subsidizing with the end goal of independent research. The respondents bolstered the thought of expanding the establishment of solar-based boards, 26% prescribed and thought of it as most imperative to give low-cost panels across the country. The aftereffect of the study demonstrates that the administration can upgrade the advancement of SHS by giving different impetuses (sponsorships) and expanding imposes on firms that utilization traditional energy.

Moreover, this study additionally prescribes that the government ought to give full data of the overall population, research financing and should start widens that advancement the establishment and its use. Finally, this researches the supposition of general society on the job of an association that would lead and update the improvement of solar household systems in India. Figure (f) exhibits that for all intents and purposes 64% of the respondents recommend the legislature to stand out in the spread of SHS; about 15% considered private firm and research organization separately and just 2% believe that scholastic should be given top need. The outcome of broad communications is alarming as only 3% of the respondent's trust that ought to be given top need in spite of the way in which that the media can spread care among inhabitants and fabricates the data identified with SHS improvement.

Figure (e). Mindset of common towards new solar household systems ventures execution

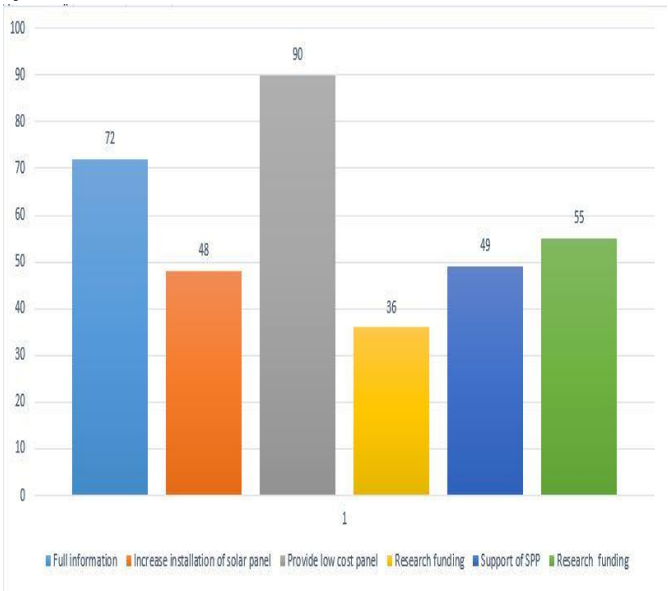
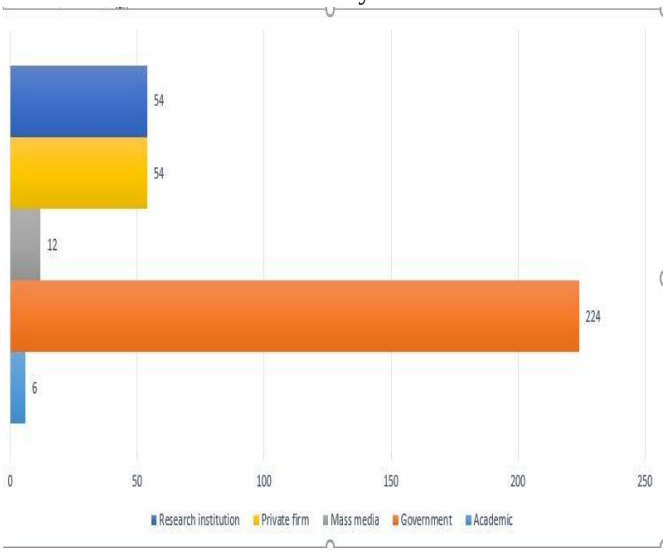


Figure (f). The points of view of the common in the role of associations in the solar panel system's headway.



Strategies dependent on the study led:

1. The administration needs to defeat the boundaries looked by buyers in SHS use.

The study demonstrates that other boundaries incorporate the requirement for specialized help, low brand picture, trust in the sun based situated supplier, nonappearance of the information and time. Care about the advantages of solar panel systems spread through media for example TV, magazines, courses and the workshops.

2. A few solar oriented put together sheets have been introduced with respect to schools and housetops notwithstanding the extensive openness of daylight based imperativeness in the southern district of India. The authentic hindrance on the upgrade of the solar home system is the nonappearance of motivations from the association side. They need to vanquish this to help the theory of society in SHS advancement.
3. Improvement of SHS requires productive money related help. The organization needs to give such assistance in the sort of gift (Consumer sponsorships, thing apportionments and hypothesis sponsorships) and methodologies of evaluating. The organization inspiring powers will invigorate usage and would lead towards the augmentation of the market. As we in all probability are careful from the review result that about 76% of the respondent's consent to buy solar based orchestrated sheets if the association advancements half of its cost. Along these lines, allocations can empower buyers towards SHS.

V. CONCLUSION

In the midst of last five to ten years, India is standing up to a noteworthy issue with the lack of power. The lawmaking body of India foreseen that the all-out control solicitation would develop 400,000 MW around the end of 2020. It requires tremendous additions in the breaking point of electrical age to satisfy the need and to keep up the progression in the power feature economy of the country. Thinking about the huge potential, viable availability and other unavoidable characteristics of sun-based power, the Government of India has given more emphasis on the advancement of sun-based power. Currently, India is in the best ten positioned nations on the planet for contributing Investment, limits expansion and making of openings for work in solar power. The nation is confronting an extreme lack of power. Hence, the government stressed to expand the energy blend to survive the inadequacy of vitality in the country. Sunlight based vitality is viewed as a legitimate wellspring of vitality as India lies in the brilliant belt and has a rich proportion of light reliably. The motivation driving this examination is to ask about the social insistence and ability to pay for SHS in India. The examination looks into the insistence of solar house system by evaluating the vitality of public, public sentiment on the troubles they face in the use of SHS and the needs for people in general on refreshing the utilization of SHS in India. The result of the examination shows that individuals are eager about gaining SHS just if the association sponsorships some piece of its expense. Moreover, the basic obstructions saw in the improvement of SHS are starting cost, getting the perfect expense and information about SHS. In addition, the respondents see government to lead the pack in SHS improvement.

ACKNOWLEDGMENT

The Authors want to stretch out appreciation to unknown commentators for their supportive remarks and recommendations.

REFERENCES

1. IEA, World Energy Outlook, International Energy Agency, Paris, France, 2011.
2. GEA, Global Energy Assessment: Toward a Sustainable Future, Cambridge University Press, Cambridge, UK, 2012.
3. REN21, "Renewables 2012," Global Status Report, REN21 Secretariat, Paris, France, 2012.
4. IPCC, "Special Report on Renewable Energy Sources and Climate Change Mitigation," Cambridge University Press, Cambridge, UK, 2007.
5. IEA, Energy Technology Perspectives, International Energy Agency, Paris, France, 2008.
6. "Solar radiant Energy over India," India Meteorological Department, Ministry of Earth Sciences, Government of India, 2009.
7. M. Pipattanasomporn, A study of remote area internet access with embedded power generation [PhD thesis], Virginia Polytechnic Institute and State University, Alexandria, VA, USA, 2004.
8. NREL, http://www.nrel.gov/international/ra_india.html, 2010.
9. Ansari Md Fahim, Kharb Ravinder Kumar, Luthra Sunil, Shimmi SL, Chatterji S.
10. Analysis of barriers to implementing solar power installations in India using interpretive structural modelling technique. Renew Sustain Energy Rev2013; 27:163–74 November.
11. [6] Gopala Krishnan Srilakshmi V, Venkatesh NC, Thirumalai, Suresh NS. Challenges and opportunities for Solar Tower technology in India. Renew Sustain Energy Rev 2015; 45:698–709 May.
12. [7] Summarizing Amita, Soni MS. Concentrating solar power –technology, potential and policy in India. Renew Sustain Energy Rev 2011; 15(9):5169–75December.
13. [8] Pandey Shreemat, Singh Vijai Shanker, Gangwar Naresh Pal, Vijayvergia MM, Sharif, I., Mithila, M., 2013. Rural electrification using PV: the success story of Bangladesh. Energy Procedia 33, 343–354.
14. Sheikh, M.A., 2010. Energy and renewable energy scenario of Pakistan. Renewable Sustainable Energy Rev. 14 (1), 354–363.
15. Solangi, K., Saidur, R., Luhur, M., Aman, M., Badarudin, A., Kazi, S., et al., 2015.
16. Social acceptance of solar energy in Malaysia: users' perspective. Clean Technol.Environ. Policy 17 (7), 1975–1986.
17. Urpelainen, J., Yoon, S., 2015. Solar home systems for rural India: Survey evidence on awareness and willingness to pay from Uttar Pradesh. Energy Sustain. Dev. 24, 70–78.
18. Wamukonya, N., 2007. Solar home system electrification as a viable technology option for Africa's development. Energy Policy 35 (1), 6–14.
19. WB. 2004. World Bank. Renewable energy for rural development. Washington: The Role of the World Bank Group; May 2004.
20. Wijayatunga, P.D., Attalage, R.A., 2005. Socio-economic impact of solar home systems in rural Sri Lanka: a case study. Energy Sustain. Dev. 9 (2), 5–9.
21. Yee, K.F., Tan, K.T., Abdullah, A.Z., Lee, K.T., 2009. Life cycle assessment of palm biodiesel: revealing
22. Bacon,R.,Bhattacharyya,S.,Kojima,M.,2010.ExpenditureofLow-IncomeHouse-Holds onEnergy.ExtractiveIndustriesforDevelopmentSeries#16,TheWorld Bank.
23. Balachandra,P.,2011.DynamicsofruralenergyaccessinIndia:anassessment. Vitality 36, 5556–5567.
24. Bhide,A.,Monroy,C.R.,2011.Energypoverty:aspecialfocusonenergypovertyin India and renewable energy technologies. Renewable and Sustainable Energy Reviews15, 1057–1066.
25. Chakrabarti, S.,Chakrabarti,S.,2002.Ruralelectrification programmewithsolar vitality inremoteregion–a casestudyinanisland.EnergyPolicy30,33–42.
26. Chikkatur, A.P.,Sagar,A.D.,Abhyankar,N.,Sreekumar,N.,2007.Tariff-based incentivesforimprovingcoal-control plantefficiencies inIndia.Energy Policy 35, 3744–3758.

27. DeJager, D., Rathmann, M., 2008.PolicyInstrument Designed to Reduce Financing Expenses inRenewableEnergyTechnologyProjects.Ecofys,Netherlandsp.142.
28. Division forEnergyandClimateChange(DECC), 2009.Sub-regional Fuel PovertyMethodologyandDocumentation.
29. DelRío,P.,2007.Encouragingtheimplementation of small renewable electricity CDM projects: aneconomicanalysisofdifferentoptions.Renewableand Practical Energy Reviews11, 1361–1387.
30. Demirbas, A.H.,Demirbas,I.,2007.Importance of rural bioenergy for developing nations. EnergyConversionandManagement48, 2386–2398.
31. Division forInternationalDevelopment(DFID), 2002.EnergyforthePoor UnderpinningtheMillenniumDevelopmentGoals.
32. DineshBabu,N.Y., Michaelowa,A.,2003.Removing barriers for renewable energy CDM projectsinIndiaandbuildingcapacityatstatelevel, Hamburginstituteof Global EconomicsReportp.237.
33. Alam, M., Rahman, A., Eusuf, M., 2003. Diffusion potential of renewable energy technology for sustainable development: Bangladeshi experience. Energy Sustain. Dev. 7 (2), 88–96.
34. Ashnani, M.H.M., Johari, A., Hashim, H., Hasani, E., 2014. A source of renewable energy in Malaysia, why biodiesel? Renewable Sustainable Energy Rev. 35,244–257.
35. Azimoh, C.L., Klintenberg, P., Wallin, F., Karlsson, B., 2015. Illuminated but not electrified: An assessment of the impact of Solar Home System on rural households in South Africa. Appl. Energy 155, 354–364.
36. Barua, D.C., 2001. Strategy for promotions and development of renewable technologies in Bangladesh: experience from Grameen Shakti. Renew. Energy 22 (1), 205–210.
37. Biswas, W.K., Diesendorf, M., Bryce, P., 2004. Can photovoltaic technologies help attain sustainable rural development in Bangladesh? Energy Policy 32 (10), 1199–1207.
38. Cherni, J.A., Preston, F., 2007. Rural electrification under liberal reforms: the case of Peru. J. Cleaner Prod. 15 (2), 143–152
39. IEA. 2012. International Energy Agency France (IEA). Key world energystatistics,http://www.iea.org/publications/freepublications/publication/kwes.pdf (Accessed25.05.14).
40. Javadi, F., Rismanchi, B., Sarraf, M., Afshar, O., Saidur, R., Ping, H., Rahim, N., 2013.Global policy of rural electrification. Renewable Sustainable Energy Rev. 19,402–416.
41. Katinas, V., Karbauskaite˙ , J., Perednis, E., Valančius, R., 2013. Efficiency analysis ofcombined biomass and solar energy in Lithuania. Clean Technol. Environ. Policy15 (4), 667–676
42. Komatsu, S., Kaneko, S., Ghosh, P.P., Morinaga, A., 2013. Determinants of user satisfaction with solar home systems in rural Bangladesh. Energy 61, 52–58.
43. Komatsu, S., Kaneko, S., Shrestha, R.M., Ghosh, P.P., 2011. Non-income factors behind the purchase decisions of solar home systems in rural Bangladesh. Energy Sustain. Dev. 15 (3), 284–292.
44. Kooijman-van Dijk, A.L., Clancy, J., 2010. Impacts of electricity access to rural enterprises in Bolivia, Tanzania and Vietnam. Energy Sustain. Dev. 14 (1), 14–21.
45. Laufer, D., Schäfer, M., 2011. The implementation of Solar Home Systems as a poverty reduction strategy—a case study in Sri Lanka. Energy Sustain. Dev. 15(3), 330–336.
46. Millinger, M., Mårlind, T., Ahlgren, E., 2012. Evaluation of Indian rural solar electrification: a case study in Chhattisgarh. Energy Sustain. Dev. 16 (4), 486–492.
47. MNRE2016-2017,https://mnre.gov.in/file-manager/annual-report/2016-2017/EN/pdf/1.pdf
48. India's solar mission: A reviewhttp://wgbis.ces.iisc.ernet.in/biodiversity/sahyadri_enews/newsletter/issue45/bibliography/India's%20solar%20mission.pdf.

AUTHORS PROFILE

Nirmal G is pursuing Masters in Business Administration, specializing in Finance and Business examination from Amrita School of Business, Amritapuri campus. He has done his Bachelors in commerce. His areas of interests are Credit Analysis and Management & Data Analysis

Dileep G. Menon,Assistant Professor, School of Commerce, Narsee Monjee Institute of Management Studies (NMIMS), Hyderabad, Telangana