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ASSESSING THE PERFORMANCE OF THE PROMOTERS (NGOS), DISTRIBUTORS, AND POLICYMAKERS FOR THE USE OF SOLAR ENERGY AND THE PRESERVATION OF THE ENVIRONMENT

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1. Abstracts:

The solar energy and environmental sustainability development has focused on green economics concepts. Economic, environmental and social sustainability are not equal (three-fold circles) in the first stage but fourth stage economic, environmental and social sustainability are ideologically equal. The study evaluates the effort and support of distributors, promoters, NGOs, and policymakers. That is (**A4**) **A**wareness programs, **A**doption **A**ccessibility challenges and problems and economic environmental and social **A**ffordability it has assessed through PCA Medal based on selected (10) popular applications. Principle component analysis (PCA) and the decision-making model of the study identified behavioural adequacy rate and respondent-accepted issues are considered to develop the model. The demands of different solar energy applications have been determined by the economic, environmental, and social benefits of solar applications. Therefore, this study constructed the Economic Sustainability Benefits of the solar applications model. Environmental Sustainability Benefits and social sustainability benefits evaluate the demand for different solar applications and analysis the expansion strategies of the solar market. The models evaluated supply-side impacts on solar energy adoption, the household's decisions to adopt solar applications and factors which have inspired them. This study is helpful to make better policies and encourages solar energy adoption and sales for energy consumption and environmental sustainability. And above the above model and PCA analysis have evaluated problems of solar energy consumption and identified the encouraging factors and hindering factors of solar market expansion,

2. **Keywords:** Solar energy, Environmental Sustainability, Awareness programs, Adoption, Affordability, Accessibility

3. Introduction:

Indian being a nation with gigantically huge diversity and differences in terms of education, socio-economic distribution, language, belief etc possesses a number of states with people having diverse demographic constructs as stated above. Under such circumstances, generalizing the acceptability of a singular factor to fit with all seems unfair. There are a number of states where education is high and economic capacity, say purchase capacity per person is also high. Under such circumstances, it becomes

significant to assess the perception of people towards their affinity for renewable energy sources such as photovoltaic cells can be of paramount significance. With this motivation, in this thesis, the emphasis is made on assessing the interest or affinity of people towards solar energy sources. This study uses information about energy consumption, economic growth, growth rate of pollution, economic growth and per capita energy consumption energy growth, rate and pollution growth rate and per capita emission growth rate, energy production and energy consumption gap, total clean energy generation capacity, and total share of clean energy in total energy production at international, national and state levels. This study considers the policy and practices of the energy economy and environmental policy and efforts at state, national and international levels. This study explores the efficiency of current policies and practices to promote solar energy in THE DK district so as to accomplish the cumulative objective of environmental sustainability. In this study, primary and secondary data have been considered as key stakeholders including householders, promoters and Non-Government Organizations. All these have been interviewed for their respective perception towards solar energy and its significance for environmental sustainability. Besides this study on the role of policymakers' impact on householders, distributors and promoters & NGOs to necessitate increased solar energy consumption for environmental sustainability. This study evaluated the criteria of awareness, adoption accessibility, and affordability of solar energy consumption to environmental sustainability. Above two major issues are considered to be the ten common affecting factors of economic issues, environmental issues, social issues, policy issues, institutional issues, technological issues, marketing issues, awareness and promotion issues, financial issues and general issues

4. Reviews of literature:

1. ***Soteris A. Kalogirou (2011):*** The study conducted on "**Environmental Benefits** of Domestic Solar Water Heating Systems" evaluated the energy-related causes of pollution. Traditional sources of fossil fuels discharged more emissions. It was accessible easily at a cheaper price but highly damaged the ecosystems so for environmental protection economy should avoid fossil fuel consumption and offer pollution-free sources of energy that are solar, wind, biomass, geothermal, and tidal sources of energy. Economic and environmental advantages were assessed among different sources of energy forms. Solar energy-related application cost and pay-back period and total expenditure were compared with other conventional energy systems and non-conventional energy systems. This study concluded that solar applications are user-friendly and eco-friendly with long-run gains for users, the economy and ecosystems
2. ***Owura Kofi (2012):*** The project study "**Assessing the Feasibility of a Solar** Water Heating System Based on Performance and Economic Analysis" has investigated SWH's cost-effective ways of heating water in residential and public buildings such as hospitals and health centres in various places in Ghana. They calculated annual energy and cost savings. The variables were the type and size of SWHs, usage habits, and year of use. They concluded, SWHs had a better long-term thermal performance when the flat plate collector was used than the evacuated tube collector. The economic analysis of the system was done with an initial total investment of US $28,829 and a life cycle saving of US $76,127. It gave a positive net present value of US $31,869 with a payback period of 6 years. It meant an economically positive effect on society.
3. ***Area Greece (2018)****:* The study measured the efficiency of renewable **energy sources and socio-economic contribution**. This study analyzed and evaluated the quality of life. The usage of renewable sources impacts social acceptance and improvement of the socio-economic status discussed. The social acceptance level of RES depended on perceived benefits, economic incentives, promotion barriers, price compared to fossil fuel, and purchase with interest-free instruments. This study used the theoretical concepts of Green Development. Energy independence and environmental protection, and statistical approaches were the legit regression, AHP- PCA and Pseudo R square statistics

4. ***Caird et al., (2008)****:* This study **measured the efficiency of solar energy and technological feasibility**. The betterment of solar energy technology and the decrease in the cost of solar equipment inspired customers to use solar energy and lead to the expansion of the solar market. In the present situation, solar technological applications are efficient as well as need-based various applications are available in the market, but financial issues have not encouraged the adoption the solar application. Carbon and emission-related health problems have educated the advertisement, media and awareness.
5. ***Berger, (2001):*** This study emphasized **affordable solar PV technology** by evaluating the commercial and household affordability of solar energy consumption. The compatibility of solar applications determined the demand for the technology. The cost of solar application and financial feasibility is not favourable to **solar energy adoption**

5. **Statements of Problems:** Past reviews have not considered the economic and environmental viability of solar energy generation. Reviews have not even focused on solar energy potential, generation capacity and distribution. Studies have not identified micro-level studies on solar energy availability and its reduced impact on energy demand and environmental pollution. This study systematically assessed the energy consumption problems and challenges of economic development and environmental protection, availability of alternative energy sources, cost of production and supply management of alternative energy sources and problems of human health and environmental pollution. The study even assessed the solar energy accessibility problems and institutional strategies for solar energy usage. Problems of traditional energy crises, pollution and financial burdens attracted solar adoption on one side and the success of institutional strategies of solar energy promoters to achieve solar sustainable developments in the study area on another side. Assessing the promoters' (NGO) activities, distributors', and policymakers' activities in relation to the use of solar energy and environmental protection. The study evaluates the process of consumer decision-making, green energy promoter's decision-making, solar energy adoption decision-making, and economic, social and environmental affordability of solar applications.

Objectives

- *To assess the performance of the promoters (NGOs), distributors, and policymakers for the use of solar energy and preservation of the environment*
- *To assess the performance of Awareness programs, Adoption, Affordability, Accessibility related Factors to the use of solar energy and preservation of the environment*

***Hypothesis Testing: PRESERVATION OF THE ENVIRONMENT* MODEL USING ANOVA**

H_0: *There is no relationship between the unhappiness of the preservation of the environment and green energy Promotions Projects and different suggestions and expectations. (**Before** adoption or implementation of solar Project)*

H_1: *There is a relationship between the happiness of preservation of the environment and green energy Promotions Projects and different suggestions and expectations (**After** the adoption or implementation of solar Project)*

Research Methodology: This study explores the efficiency of current policies and practices to promote solar energy in the DK district to accomplish the cumulative objective of environmental sustainability. In this study, primary and secondary data have been considered as key stakeholders including householders, promoters and Non-Government Organizations. All these have been interviewed for their respective perception towards solar energy and its significance for environmental sustainability. Besides this study on the role of policymakers' impact on householders, distributors and promoters & NGOs to necessitate increased solar energy consumption for environmental sustainability. This study evaluated the criteria of awareness, adoption accessibility, and affordability of solar energy consumption to environmental sustainability. Above two major issues are considered to be the ten common affecting

factors of economic issues, environmental issues, social issues, policy issues, institutional issues, technological issues, marketing issues, awareness and promotion issues, financial issues and general issues. The above each (E.1.1…10) issues identifies the 10 different aspects (statements) for the collection of opinions (Excellent, V.Good, Good, satisfactory and not good) from the stakeholders. Solar energy accessibility and affordability factors determine the adoption of solar applications based on different strategies and efforts of policymakers, distributors, financial institutions, promoters, and NGOs. assessed using three statistical tools and techniques. The economic, environmental, and social benefit of the different solar applications determines the environmental sustainability benefits in present and future. This study uses (PCA) the six types of benefits from the different (10) applications in the study area. Secondly, this research evaluates the decision-making of consumers and green energy promoters, which also determines, economic and environmental sustainability. Thirdly, Principle component analysis gives the importance and necessity of different (10) affecting factors to adoption of solar energy. PCA evaluates the role and responsibility of policymakers, distributors, financial institutions, promoters, NGOs and media. Principle component analysis identifies the impacts of awareness, accessibility, adoption and affordability criteria to increase clean or green energy consumption, reduces the dependency on other sources of energy and reduce the emissions growth rate. Fourthly, the multiple regression model and Pseudo R-Square Garret Ranking Method proves the accuracy of environmental sustainability in the study area The above institutional policies, plan, schemes, efforts, and strategies are classified into four sections that are awareness, accessibility, adoption and affordability criteria. Categorized groups of awareness, accessibility, adoption and affordability are based on ten important issues of economic, environmental, and social affordability. It is economic issues, environmental issues, social issues, policy issues, institutional issues, technological issues, marketing issues, awareness and promotion issues, financial issues and general issues. The above issues determine consumer decision-making regarding solar energy adoption and green energy adoption the above aspects assessed the decision-making factors for economic and environmental feasibility through the adoption of solar applications. That is proved by principal component analysis, multiple regression models and different hypothesis tests thereby fulfilling the expectations. solar applications distributor's strategies, service, and sales maximization strategies of solar equipment dealers, and the role and responsibility of policymakers, and financial institutions in the promotion of solar energy adoption are evaluated in this study. The necessity of green energy adoption and control of the emission according to promoters and NGOs assesses. The Problems of financial institutions, manufacturers, distributors, marketing agencies, and government policy implementation agencies are included The NGOs and promoters are unhappy about the adoption of the present solar energy applications for environmental protection and environmental sustainability development so they suggested different aspects. In this study factors and green energy promotion decision-making are suggested which would fulfil environmental sustainability. The above discussion is able to fulfil the sixth objective.

Finally, all the different aspects of the above discussion identify the actual condition of solar energy adoption to environmental protection and improvement in the status of health and family income. Solar energy usage offers many economic benefits to householders, distributors, and business activities, at the same time environmental benefits of no waste management, no pollution, and socially beneficial to no energy crisis and no energy supply problems.

Data interpolations:

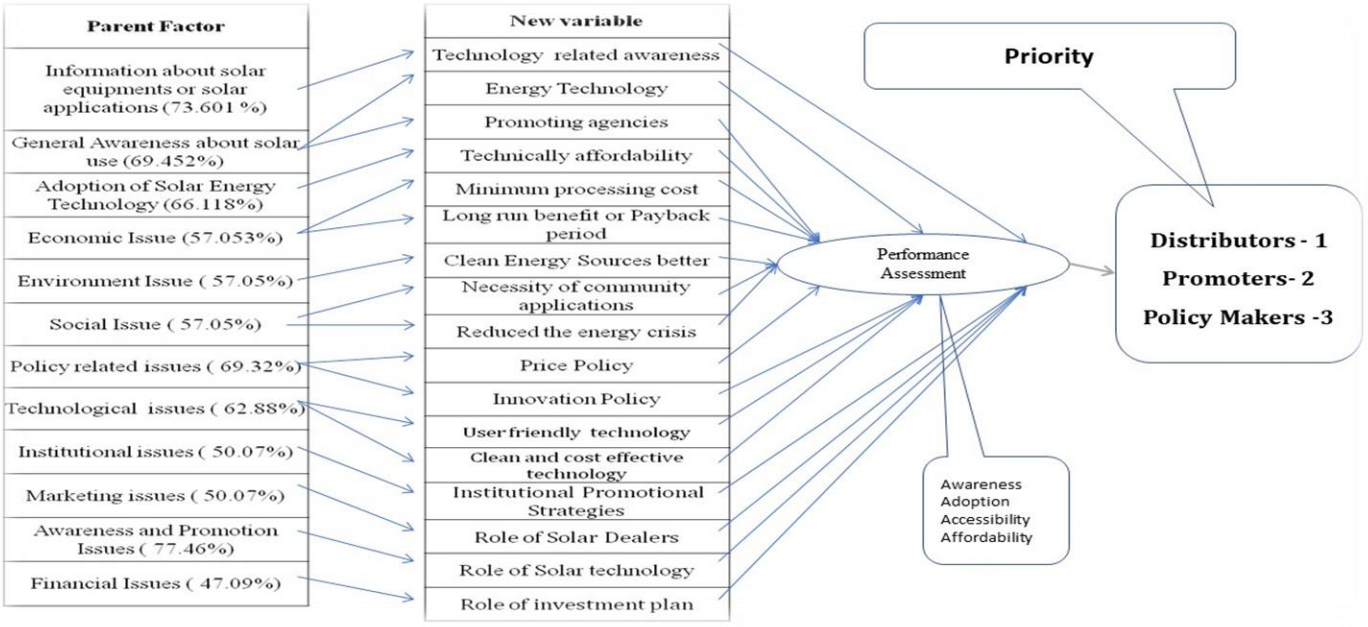
On the bases of the new variable,s this study insists on the responsibility of policymakers, distributors, and promoters &NGOs. The chi-Square value of Bartlett's Test explains (hypothesis) the relation among the new variables. so in the case, the hypothesis is accepted it means all new variables are interdependent (one New variable influenced by another New variable)

Table 1.1 ASSESSING THE PERFORMANCE OF THE PROMOTERS (NGOS), DISTRIBUTORS, AND POLICYMAKERS FOR THE USE OF SOLAR ENERGY AND THE PRESERVATION OF THE ENVIRONMENT

Solar energy-related Awareness				
Parent variable	**New variable**	**Rank**	**A4 factors**	**Institutional**
Information about solar equipment or solar applications (73.601 %.)	Policy and Advertisement	1	Awareness	Policy maker
	Encouragement and promotions	2	Affordability	Promoters & NGOs
	Dealer strategies	3	Adoption	Distributors
	Technology related awareness	4	Accessibility	Distributors
	Advertisement	5	Awareness	Promoters & NGOs
General Awareness about solar use (69.452%)	Consumption of Clean Energy	1	Affordability	Promoters & NGOs
	Support and facilities by the Govt.	2	Adoption	Policy maker
	Energy Technology	3	Accessibility	Distributors
	Overcome the instability of energy	4	Awareness	Distributors
	Improve the Standard of leaving	5	Affordability	Policy maker
	Price Policy	6	Affordability	Policy maker
	Promoting agencies	7	Accessibility	Promoters & NGOs
Adoption of Solar Energy Technology (66.118%)	Environmental responsibility	1	Awareness	Policy maker
	Technically affordability	2	Accessibility	Distributors
	Advertisement of solar technology	3	Adoption	Distributors
	Environmental statues	4	Awareness	Promoters & NGOs
Different affecting factors of solar energy				
Economic Issus (57.053%)	Cost and Contribution	1	Adoption	Promoters & NGOs
	Minimum processing cost	2	Accessibility	Distributors
	Long-run benefit or Payback period	3	Accessibility	Distributors
	Economically Feasible	4	Affordability	Distributors
Environment Issus (57.053%)	Quality of life and ecosystem	1	Affordability	Promoters & NGOs
	No Negative Impact on the Ecosystem	2	Awareness	Promoters & NGOs
	Clean Energy Sources better	3	Accessibility	Distributors
	Encourage the Pollution free Society	4	Adoption	Policy maker
Social Issus (57.053%)	Social Responsibility of Energy loss	1	Affordability	Policy maker
	Necessity of community applications	2	Accessibility	Promoters & NGOs
	Reduced the energy crisis	3	Accessibility	Distributors
Policy related issues (69.323 %)	Financial Policy	1	Adoption	Policy maker
	Price Policy	2	Accessibility	Distributors
	Innovation Policy	3	Accessibility	Distributors
	Promotion or sales Policy	4	Adoption	Distributors
	Environment policy	5	Awareness	Promoters & NGOs
Technological issues (62.879%)	User friendly technology	1	Accessibility	Distributors
	Eco friendly technology	2	Affordability	Promoters & NGOs
	Clean and cost effective technology	3	Accessibility	Promoters & NGOs
	Different applications	4	Adoption	Distributors
	Efficiently use the solar radiation	5	Awareness	Distributors
Institutional issues (50.066%)	Institutional Promotional Strategies	1	Accessibility	Distributors
	Institutional coordination's	2	Adoption	Promoters & NGOs
	Public and Privet sector Efforts	3	Affordability	Policy maker
Marketing issues (50.066%)	Sales Strategies	1	Adoption	Distributors
	Role of Solar Dealers	2	Accessibility	Distributors
	Solar Energy promotions	3	Awareness	Promoters & NGOs
Awareness and Promotion	Awareness of economic benefits	1	Awareness	Promoters & NGOs
	Comparison of solar policy	2	Adoption	Policy maker

Issues (77.462 %)	Role of Solar technology	3	Accessibility	Distributors
	Comparison -different energy sources	4	Awareness	Distributors
	Role of Green energy promoters	5	Awareness	Promoters & NGOs
Financial issues (47.09%)	Contributions and donations	1	Adoption	Promoters & NGOs
	Role of Govt. solar Schemes	2	Adoption	Policy maker
	Role of investment plan	3	Accessibility	Policy maker
	No Maintenance cost	4	Affordability	Distributors
General Issues (62.879)	Environmental benefits	1	Affordability	Promoters & NGOs
	Change the pattern of energy use	2	Affordability	Policy maker
	Economically viable	3	Adoption	Distributors
	The impact of Government Policies	4	Awareness	Policy maker
	Positive impact on Environmental	5	Awareness	Promoters & NGOs
Socio-economic and environmental benefits Solar Applications				
Economic benefits from solar applications (52.629)	Agriculture applications	1	Economic Gain	Distributors
	Lighting applications	2	Economic Gain	Promoters & NGOs
	Rural business applications	3	Economic Gain	Distributors
	Water heating	4	Environmental Gain	Distributors
Environmental benefits from solar applications (50.643%)	Pollution Free applications	1	Environmental Gain	Promoters & NGOs
	Energy Conservation applications	2	Social Gain	Policy maker
	Water heating	3	Environmental Gain	Distributors
Social benefits from different solar applications (69.308%)	Community lighting applications	1	Social Gain	Distributors
	Lighting applications from donor	2	Economic Gain	Promoters & NGOs
	Solar applications for remote area	3	Economic Gain	Promoters & NGOs
	emery and fuel wood Conservation	4	Environmental Gain	Promoters & NGOs
	Social responsibility of Promoters	5	Social Gain	Distributors
Energy Conservation from different solar applications (53.587%)	Energy conservation applications	1	Social Gain	Policy maker
	Control the Energy loss	2	Social Gain	Policy maker
	Reduced the dependency of electricity	3	Economic Gain	Promoters & NGOs
	Reduced the use of other sources of energy	4	Environmental Gain	Promoters & NGOs
Solar applications helpful to rural poor (50.202%)	Use to Business activities	1	Economic Gain	Distributors
	Useful to rural poor(lighting)	2	Economic Gain	Promoters & NGOs
	Increased the priority on solar usage	3	Environmental Gain	Promoters & NGOs
Social Responsibility applications (55.316%)	Eco-friendly applications	1	Environmental Gain	Promoters & NGOs
	Community based applications	2	Social Gain	Distributors
	Change the energy usage pattern	3	Environmental Gain	Promoters & NGOs
	energy crisis free	4	Social Gain	Policy maker
Sources: Result of PCA analysis –using the primary data and SPSS out put				

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Sources: Result of PCA analysis –using the primary data and SPSS output

So this study concludes the that, strategies of policymakers, distributors, and promoters &NGOs have cooperative and efficient support to use the solar application through awareness, accessibility adoption and affordability. That holds a positive impact on householders to the adoption of solar applications. This study assesses the affection factors of economic issues, environmental issues, social issues, policy issues, institutional issues, technological issues, marketing issues, media and advertisement issues, financial issues and general issues.

all the above issues are parent (Main) variables. According to PCA techniques, this study evaluates the impacts on solar energy adoption and assesses contributions of awareness, accessibility, adoption and affordability. Prioritized new variables explain that the first priority variable more efficiently inspires the respondent and less priority new variables are important but less importance is given by the policymakers, distributors, and promoters &NGOs so not inspire the respondent in the study area. (Cart and Table explained)

the above graph explains the process **of solar energy and environmental sustainability development of green economics concepts**. And economic environmental and social sustainability are not equalled (three-fold circles) in the first stage but fourth stage economic, environmental and social sustainability are ideologically equated this study evaluates the effort and support of distributors, promoters, NGOs, and policymakers. That is (A4) awareness programs, adoption accessibility challenges and problems and economic environmental and social affordability also assessed (PCA) through selected (10) popular applications. The principle component analysis and decision-making model of the study identified behavioural adequacy rate and respondent-accepted issues considered to develop the model. According to the literature survey, this study identified ten affecting factors, ten popular solar applications and three stakeholders considered for assessment. That is explained above in the theoretical inferences of the study (SESM2). Parent factors explained the adequacy rate which is the percentage of fulfilment expected (100%) goals of solar energy and sustainability model that means the current status of public interest in a solar application depends on awareness, adoption accessibility and affordability strategies of distributors promoters and policymakers. information and awareness of solar applications greatest affecting factors (73,601%) and the least performing factor are financial issues (47.9%) this percentage is related to the public interest in 8 out of 10 popular solar applications of the study area, solar technological-related awareness, energy technological related awareness (best alternative choice) promoting agencies support, technological affordability, the minimum cost of processing, benefits and payback period, clean energy sources, community applications, reduced the energy crisis price policy innovation policy. user-friendly technology institutional strategies and investment plans positively contribute provided to solar energy adoption and accessibility. In this study used the 100 statement (sub-variable) of parent factor (different affecting issues). 41 out of 100 issues are accepted in the model. And 17 out of 41 new variables reconstructed by PCA techniques based on the varimax coefficient of correlation (0,5 to 1) that is contributed more share of adequacy rate of percentage, which means large scale weightage (arrow mark) to parent factor from the new variable. that is considered only 41 variables out of 100, and 49 out of 100 variables rejected the analysis in PCA so the expected adequacy rate have less than 100% in the solar energy sustainability model so promoters, NGOs, distributors and policymakers more impotence to build the efficient coordination (varimax coefficient of correlation=1) and rejected (49 out of 100) or not considered sub variables also adoption in future strategies to the betterment of the model suppose all parent variable performed in maximum level (adequacy rate 100%) model will reach the solar energy sustainable condition that means threefold circles equal in the market.

Solar energy and environmental sustainability are determined by consumer decision-making and decision-making of green energy adoption. Both the above decision-making concepts evaluated solar energy and environmental sustainability. The decision-making concepts have affected the model of economic affordability, environmental affordability, and social affordability. All the above five models assess the solar energy demand side impacts. Solar energy promotion determines the efficiency of the

sales maximization strategies from awareness, accessibility adoption and affordability strategies of the policymakers, distributors, and promoters &NGOs. The demands of different solar energy applications have been determined by the economic, environmental, and social benefits of solar applications. Therefore, this study constructed the Economic Sustainability Benefits of the solar applications model. Environmental Sustainability Benefits from the solar applications model and social sustainability benefits from the solar applications model evaluates the demand for different solar application and expansion strategies of the solar market. PCA models evaluated supply-side impacts on solar energy adoption. Above the models concluded the household's decisions to adopt solar applications and the factors which have inspired them. This study is helpful to make better policies and encourages solar energy adoption and sales for energy consumption and environmental sustainability. And above the above model and PCA analysis have evaluated problems of solar energy consumption and identified the encouraging factors and hindering factors of solar market expansion,

Multiple Regression Models for Assessing the promoters' (NGO) activities, distributors', and policymakers' activities in relation to the use of solar energy and the preservation of the environment

Regression analysis is to establish an equation prediction by the value of the dependent variables from the values of independent variables. The dependent variable is unhappiness about the **preservation of the environment and green energy projects** which means opinions on the current statute's green energy promotion activities. Green energy promotion activities encourage the usage of different solar applications and environmental protection. NGOs and promoters are very much interested in green energy promotion activities. NGOs give an opinion about the current status of green energy projects, so opinions are collected about green energy projects. But they are unhappy so they suggest the government, solar application manufacturers, financial institutions, sellers, distributors, media and other promoting agencies. Suppose all the suggestions and expectations of NGOs and promoters are fulfilled by the government, solar application manufacturers, financial institutions, sellers, distributors, media and other promoting agencies green energy projects can be implemented. The agencies adopt the suggestions of NGOs and promoters if more numbers of people are adopted the green energy projects. NGOs and promoters are happy about green energy projects or green energy promotion activities. After the implementation of suggestions, the solar energy and green energy projects have satisfied the NGOs and promoters. So, the statement of the null hypothesis is accepted and the alternative hypothesis is rejected. However, after the implementation of all suggestions about green energy promotion activities the promoters and NGOs have been satisfied. That means the happiness of green energy promotion activities and execution of all suggestions are positive in relation to the solar market and environmental protection. This study uses the dependent and independent variables for multiple regression analysis. The dependent variable is the unhappiness with the **preservation of the environment and green energy projects** and the dependent variables are an expectation of Government support, promotion of solar equipment, advancement of technology, more green energy awareness, expansion of the solar market, financial support and general factors. This study assumed that there is no relation between unhappiness with the **preservation of the environment and green energy projects** and suggestions. This means that green energy projects are influenced by the necessity of implementation and suggestions. The model summary exhibits the regression. Dependent and independent variables use the degree of satisfaction of householders namely Excellent (6), Very Good (2), Good (3), satisfied (4) and not satisfied (5).

Table 1.2 Multiple Regression Models for Assessing the promoters' (NGO) activities, distributors', and policymakers' activities in relation to the use of solar energy and preservation of the environment

Multiple Regression Model Summary and ANOVA				
Statistics		Regression	Residual	Total
	Sum of Squares	86.461	11.539	98.000
	Df	43	6	49
	Mean Square	2.011	1.923	
	F	1.046	H_0 accepted and H_1 rejected, null hypothesis is true and alternative hypothesis is not true (0.534>0.05)	
	Sig.	0.534		
	R	0.939		
	R Square	0.882		
	Adjusted R Square	0.038		
	Std. Error of the Estimate	1.387		
Green Energy Promotions Model				
	Alpha value (α)	-9.772		
1	Expectation of Government. Support (β_1)	+1.989	Positive direction	
2	Promotions solar equipments(β_2)	+1.130	Positive direction	
3	Advancement of technology (β_3)	+1.277	Positive direction	
4	More green energy awareness(β_4)	**-1.452**	Negative direction	
5	Expand the solar Market (β_5)	+0.558	Positive direction	
6	Financial support(β_6)	+0.695	Positive direction	
7	General factors(β_7)	**-0.1320**	Negative direction	

Source: Primary data.

preservation of the environment and Green Energy Promotions decision Making = -9.772+(1.989 *Expectation of Government. Support) +(1.130 * Promotions solar equipments) +(1.277 *Advancement of technology) +(-1.452 *More green energy awareness) +(0.558 *Expand the solar Market) +(0.695 *Financial support) +(-0.1320 *General factors)

Table 1.1 shows, R, R^2, adjusted R^2 and standard error of the estimate. These estimations can be indicating, whether this model is suitable to construct or not with data. The R-value is 0.939; it represents the multiple correlation coefficients. R^2 indicates the goodness of fit, this value (0.882) Adjusted R Square 0.038. This explains the decision-making of green Energy Promotions which is dependent on the expectation of Government support, promotions of solar equipment, advancement of technology, more green energy awareness, expansion of the solar market, financial support and General factors. Table 6.19 exhibits the ANOVA table to test for F-ratio. This test indicates the multiple regression model is a good fit for the data. The table clearly shows that; Independent variables significantly predict the decision-making of green energy promotions. The value of F is 1.046 and the significance value is P = 0.534 (0.534>0.05). So the alternative (H_1) hypothesis (0.534>0.05) is accepted which means that the null hypothesis is true and the alternative hypothesis is not true as more than 95 per cent of respondents are not satisfied by green energy promotions before the implementation of the suggestion. After the fulfilment of the suggestion, green energy projects and promotions have successfully satisfied the alternative hypothesis. This rejects the alternative hypothesis as they are not happy before the implementation of suggestions. This result shows that it is significant. Therefore, the regression model is a good to fit. There is no relationship between the unhappiness of green energy Promotions Projects and different suggestions and expectations for decision-making of **preservation of the environment and green energy promotions** influence the implementations of the suggestions before the implementations of suggestions they are not interested in green energy adoption as well as solar energy usage. The multiple regression model shows that coefficients of variables result in a beta value of Expectation of Government. Support (β_1+1.989), Promotion of solar equipment (β_2+1.130), Advancement of technology (β_3+1.277), More green energy awareness (β_4-1.452), Expand the solar

Market (β_5+0.558), Financial support(β_6+0.695) and General factors(β_7-0.1320). **5 out of 7** variables are in a positive relationship with dependent variables. The other **two** variables are in a negative relationship with a dependent variable which means, the expectation of Government support, promotions of solar equipment, advancement of technology, expand the solar Market and financial support positive relationships with decision-making. The suggestions are essential for green energy adoption and helpful to reduce emissions and environmental protections. But green energy-related awareness and general factors must be given the better suggestions to create the awareness

	A4	**Multiple Regression Model**	Result
1	Environmental Protection **Awareness** Multiple Regression Model	**Green Energy Promotions decision Making** = -9.772+(1.989 *Expectation of Govt. Support) +(1.130 *Promotions solar equipments) +(1.277 *Advancement of technology) +(**-1.452** *More green energy awareness) +(0.558 *Expand the solar Market) +(0.695 *Financial support) +(**-0.1320** *General factors)	Suggested **5 out of 7** issues are implemented in the market positively impact green energy adoption
2	Solar Energy **Adoption** Pseudo R-Square Model	1. **Decision Making** = Awareness+ interest to adoption + accessibility 2. **Decision Making for adoption** = awareness of alternative energy sources+ interest to purchase the solar equipments+ financial and technical support	All dependent variables are positively impacted by solar energy adoption
3	Economic **affordability** Multiple Regression Model	**Economic Affordability (E.1)** = 2.728 – (0.024*Environmental affecting factors) +(0.052*Social affecting factors) +(0.07*Policy affecting factors) +(0.014* Institutional affecting factors)–(0.002*Marketing affecting factors)–(0.004*Awareness affecting factors) -(0.007*Financial affecting factors) –(0.02*Technological affecting factors)	5 issues not affordable 3 not affordable to householders
4	Environmental **Affordability** Multiple Regression Model	**Environmental Affordability factors (E.2)**= 0.929 –(0.044*economic affordability affecting factors) +(0.022*Social affecting factors) +(0.047*Policy affecting factors) +(0.016* Institutional affecting factors)–(0.075*Marketing affecting factors)–(0.003*Awareness affecting factors) -(0.038*Financial affecting factors) –(0.015*Technological affecting factors)	3 issues have affordable 5 not affordable to householders
5	Social **Affordability** Multiple Regression Model	**Social Affordability factors (E.3)**= 4.99 –(0.012*economic affordability affecting factors) -(0.054* environmental affordability affecting factors) -(0.022*Policy affecting factors) -(0.006* Institutional affecting factors)+(0.087*Marketing affecting factors)–(0.014*Awareness affecting factors) -(0.034*Financial affecting factors) -(0.008*Technological affecting factors)	1 issue has affordable 7 issues have no affordable
6	Economic Sustainability Benefits from the solar applications **Accessibility** Multiple Regression Model	Economic Benefits of solar applications **(ECOAS)** = -0.357- (0.08* Economic affecting factors) + (0.158*Environmental affecting factors) – (0.015*Social affecting factors) – (0.004*Policy affecting factors) + (0.024* Technological affecting factors) +(0.926*Institutional factors) -(0.012*Marketing factors) –(0.115* Awareness affecting factors) -(0.003* Financial affecting factors) -(0.003*General affecting Factors)	3 factors contributed the benefits 7 factors not contributed the benefits

Solar energy and environmental sustainability aspects based on objectives identify the relevant theoretical, energy-related socio-economic and environmental concepts. Based on the above research objective **solar energy sustainable Model** (SESM) has been proposed **solar energy sustainable Model**

Findings

1. Economic growth, population growth, industrialization and socioeconomic development are measured by the rate of energy consumption. That means positive relation between economic growth and energy consumption rate. But the scarcity of energy supply rate and emissions or (CO_2) pollution growth rate increased therefore this study insisted the energy consumption substitution between traditional sources to best alternative sources of energy. This study has been discussed in the review of the literature and secondary data analysis.

2. According to the respondent, Solar energy accessibility is influenced by the unhappiness with traditional energy sources, and solar has a better option compared to other alternative energy sources, there is no maintenance cost, processing cost, and waste management cost, and there is saving and postponement the cost of a painting of RCC building above all issues are inspired respondents that means increasing the public interest on solar applications but some cost of solar equipment and payback period of return have hindered the accessibility of solar applications so reduced payback period from 7 to 10 to 2 to 3year and more efficient financial support essential.
3. Economic environmental, social affordability of solar energy consumption dependence of affecting factors awareness, accessibility, and adoption, affordability strategies of institutions (policymakers, distributors, promoters and NGOs). Institutional strategies are related to economic issues, environmental issues, social issues, policy issues, technological issues, institutional issues, awareness issues, Marketing issues, financial issues and general issues. This study has discussed in principle component analysis, consumer decision, green energy decision making and solar energy promotion decision-making models. The analysis concluded that economic and financial issues have not been favourable to solar energy adoption and environmental protection. Accessibility strategies of distributors and awareness strategies of promoters and NGOs are more efficient. Coordination of distributors and Promoters and NGOs have more power full to the adoption of community development-related solar applications that is increased the consumption of green energy.
4. Green energy promoters and NCOs are efficiently aware of the different energy and environmental issues environment policy, and solar energy promotions. Awareness of economic benefits, the role of green energy promoters, the positive impact on ecosystems and health, and convinced the problems of pollution more impacted the respondent. Above all issues created a positive impression and generated public interest in the adoption of solar energy to control the pollution and energy crisis. Promoting agencies are more important and support community applications, and clean and cost-effective technology. Promoters and NGOs' solar adoption strategies preferred the cost and contribution-based budget, and build the institutional coordination to collect the contributions and donations for the adoption of community-based solar applications in the remote area. Promoters have concerns about the increased consumption of clean energy, improved quality of life and ecosystem, development the eco-friendly technology, more environmental benefits, and healthy encouragement and promotions of green energy (solar energy) the discussion concluded the effort and support of promoters and NGOs. Energy and environmental education change the consumption pattern of energy and the social responsibility network reduced the burden financial of the rural poor and increased the energy consumption rate to improve the quality of life without loss of society. Respondents of Promoter and NGOs have contributed to the Green energy model.
5. According to respondents' opinions reviles that, the Distributors' plan and strategies of awareness focused on overcoming the instability of energy; efficiently using solar radiation, comparative the cost and benefits of sources of energy. Distributors only focused the sales maximization and market expansion-related exhibitions and advertisements. Distributors' strategies concentrated the sales maximization. They are aware of the market conditions and problems of solar equipment sales, solar hot water systems have more in demand in the market without expectation of financial support in the market. But public interest in other solar applications is not satisfied. They introduced the agreement strategies among village Panchayath, financial institutions (Bajaj Finance, and Vijay Bank) promoters (SDM-SELCO Research foundation) NGOs (SKDRDP and SCLCO SOLAR PROJECT). That means cooperation agreement (tie-up) of solar or green energy promoters and NGOs with different institutions contributed to comparative advantage benefited. Those strategies increased the solar lighting systems in the study area. Sales promotion strategies of minimum processing on installation cost (many distributors have not to charge on system installation), more distributors free transportation cost of the systems, more number of distributors offered free maintenance cost, 'No repair the solar systems(used recycling there in no waste) only replacement facility without

additional cost, EMI facility long term warranty, technological advancement and continually reduced the payback period, and long term benefits so solar dealers successfully sales the lighting applications in recent year. In addition, Commercial solar projects (micro (1 to 5KW) solar projects) were also recently interdicted by the MESCO which is the best option to sell equipment to householders or businessmen, they are (households or businessmen) sales generated energy to MESCO. According to the respondent that is the best project to reduce the energy crisis, reduced pollution, and improve the energy business and income of people but the energy purchasing price, repayment system, energy transporting system and cooperation and execution system of the Govt. have not satisfied the respondents. Distributors' sales strategies are economically viable to householders and increased adoption of different applications improved the economic and health status of the family as well as ecosystems. cooperative and user-friendly sales maximization strategies have more efficiently expanded the solar market, which is gain to distributors householders, energy businesses and entrepreneurship, that is protected the ecosystems, health condition

6. Policymaker comparatively less performing in the solar market has concentrated the mega and ultra project interfused in the country Govt. India has introduced different solar projects in different places for solar energy generation but has not selected Dhakshina Kannada for any solar (Medium or Big) project. This distracts has comfortable radiation availability but large-scale land space is not available (All most area forest, agricultural Land) and lack of public, businessman, Govt. interest so the mega project not succeed but huge opportunities for the micro solar project(1 to 5KW) Therefore, huge solar radiation available (Proved By Costal Karnataka solar radiation report of TV Ramachandran), energy ministry of Karnataka approval to Micro solar Entrepreneurship project (individual generated the solar energy and excisable energy purchased by govt. more number of bankers ready to facilitate the finance some herding factors do not support this project. relaxation of electricity bills, solar energy and environmental-related seminars, workshops, and awareness campaigns green energy campaigns promoted solar energy consumption but according to householder's distributors and promoters NGOs, have unhappy about the strategies of policymakers. That is electricity supply, reduced firewood consumption, long-run energy sustainable plans and lake (no) of interest of Govt. to encourage solar energy generation.
7. Solar energy adoption depended on the personal interest of householders according to respondents more graduates, employed and RCC building owners are interested to the adoption of solar applications. Economic and financial issues are hindering the adoption of solar energy. and they expected financial contributions but the status of the economy, education and RCC building have not been encouraged (Not approached) by promoters and NGOs to contribute and donate to the adoption of solar applications. They are aware of the problems of smoking more inspired by the adoption of solar applications. And they are planning to reduce energy consumption expenditure without fluctuations in the energy supply
8. The consumer decision-making model is more favourable to distributors than consumers but green energy projects have contributed the more feasible to householders. That means unfavourable issues to householders in the consumer decision-making model are favourable in the green energy decision-making model. So householders are getting benefits from lighting applications, Rural business applications, Lighting applications from the donor, Solar applications for remote areas, and agriculture applications. Reduced dependency on electricity and solar use for business activities above the all-selected application is according to respondents economically beneficial because they are all spooned projects of promoters.
9. Solar energy and environmental feasibility variables are getting the highest response in the study area. Policymaker support and carelessness of financial institutions' distributors' profits maximization strategy discouraged the green energy project so promoters' and NGOs suggested the best alternative green energy project. Respondents are very much aware of the problem of firewood smoke (health –eye, asthma Problems) and they are aware of the problems of emissions and CO_2.

Reduced firewood consumption and more use the solar water heating systems. Reduced the usage of electricity lighting more used solar lighting in residential purposes, govt. privet, schools, hostels hospitals corporate buildings, and business marketing places used solar lighting, reducing the electricity use in street light and garden lighting. Above all applications increased energy consumption without the additional burden and environmental loss. Lighting and water heating purpose more amount of energy used by householders environmentally feasibly with financial support has able to green energy project of the study. According to above the discussion environmental concern, public interest, and financial facility have capable to be changed the energy consumption pattern for the betterment of life in the present and future increased the solar applications

10. Solar energy sustainability is based on social, economic and environmental issues. Social affordability is more influenced to environmental feasibility. Promoters, NGOs, distributors and Village Panchayath are more focused on community (solar Village Project-remote area) based solar applications and Street and garden lighting applications. contributors and donors also gifted to schools (Solar schools Kite), lighting for temples, and public gardens according to the above the discussions focused on publicity purposes gifted solar lighting, experimentation model of research institute installed for experimentation and demonstration purposes and dealing and agreement (tid-up)of distributors, promoters & NGOs more application adapted for community use. Above the applications are helpful to reduce expenditure-controlled energy loss. Solar energy's social sustainability improved the social status of the community. People's participation and public interest have been encouraged the solar energy consumption and saving electricity power, money and ecosystems in the community

6. SCOPE OF FUTURE RESEARCH

- The quest for knowledge and solutions to problems faced by the use of non-renewable sources of energy is the need of the hour.
- The Socially, Policy related and technologically affecting Factors must coordinate to bring about sustainability in the environment.
- There is a need to assess comparative economic and environmental sustainability.
- The impact of other renewable sources of energy on environmental sustainability needs to be explored.

7. Conclusion: The present study focuses on the importance of imparting awareness of curbing pollution and halting global warming. If solar energy suggestions are implemented effectively environmental sustainability is sure to become a possibility. Self-sufficiency in energy generation will not be a dream and an uninterrupted supply of energy would be a reality

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