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## Eco India Magazine's Documentary Video Series' on the Solar Energy Usage's Success Stories across India

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**Abstract:** *The research paper analyses the usage of solar energy across the rural and urban parts of India, compiled into several documentary episodes by the leading environmental magazine-Eco India which airs on Scroll.in's YouTube channel every week. Unlike non-renewable energy, derived from fossil fuels like coal, petroleum, and natural gas, solar energy is a 'clean' energy, which does not emit greenhouse gases like carbon di-oxide and pollute the atmosphere. According to the 2022 statistical research, India is the 4<sup>th</sup> largest producer of solar energy in the world and is also the world's 3<sup>rd</sup> largest producer of renewable energy with over 40% of electricity comes from non-fossil fuel sources like solar, wind power, and hydroelectric projects. In India, despite the industrial usage of solar energy for providing electricity, it has also entered the people's homes in the form of household appliances like bulbs, lamps, and cookers. So the research adopts the case study approach to study the same. It is concluded that the documentary series has highlighted usage of solar energy in a positive manner, for people from all walks of life. It also highlighted various government schemes and innovative ideas put forth by the government and startups to increase its popularity among the common man.*

**Keywords:** *Solar Energy, Eco India, Youtube Videos, Climate Change, India.*

### 1. INTRODUCTION

Solar power is the energy harnessed from the Sun which is converted into thermal or electric energy for industrial and commercial purposes. It is one of the popular types of renewable energy that does not get depleted or run-out, like the fossil fuels, and can be used forever until the Sun shines on Earth. Its potential was first discovered in 1839 by a French scientist called Edmond Becquerel, who found out that some materials can produce electricity while exposed to sunlight, which is now called the 'photovoltaic effect'.

Due to the rise of global warming and prevalent climate change across the world, the demand for 'clean' and 'sustainable' energy emerged as the main focus. So to counter the climate



change issue, several world countries came together and signed the ‘Paris Agreement’ at the UN Climate Change (COP21) in Paris, France on December 12, 2015, for reducing the overall temperature of the Earth and to reduce global warming effect.

Several climate experts and scientists have pointed out that burning fossil fuels for industrial and commercial purposes emits gases like carbon di-oxide, nitrous oxide, and methane, which traps the Sun’s heat exceedingly and makes the Earth hotter, and warmer. Rising heat levels has led to climate change, which has caused increase in temperature levels, ocean acidification, rising sea levels, forest fires, droughts, loss of species, and so on. As the world cannot function without electricity, widespread solutions have been developed to tap renewable energy sources like solar and wind power as a viable alternative.

Under British rule, India depended heavily on fossil fuels to generate electricity. But in 1897, a small hydropower project was established in Darjeeling, followed by the Sivasamudram Project in Mysore in the year 1902 for providing electricity to Kolar gold mines. After independence, the government turned its focus towards harnessing renewable energy, despite the widespread usage of fossil fuels. Throughout the 20<sup>th</sup> century, India has developed many projects and schemes harnessing nuclear, wind, solar, and biomass energy, for providing sustainable and clean energy across the country.

As of 2023, India in total, has generated 70,000 MW of solar energy, with Rajasthan generating the highest amount of solar energy at 17,839 MW, by harnessing solar energy products like solar panels, solar bulbs, solar cookers, solar water heaters, and many more.

Eco India-solutions for a greener, healthier, and more inclusive tomorrow, developed by Deutsche Welle (DW TV), has collaborated with Scroll.in for publishing weekly magazines and video stories on various environmental challenges and on several success stories for combating climate change across the Indian subcontinent. With regard to solar energy, they have documented how people from different walks of life harness solar power to light up their homes and businesses and aims to educate the viewers on how to adapt to sustainable living, one video at a time. The video series covers even the remotest villages, where solar power has truly empowered them.

## **2. REVIEW OF LITERATURE**

Bridie McGreavy & Laura Lindenfeld (2014) analysed the hidden ideologies in three cli-fi genre films, which showcased stereotypes related to gender, race, and ethnicity, with the researchers concluding that the films’ representations of the characters not aligning with sustainable development goals, which are necessary to combat climate change. Graham Huggan (2015) reviewed how the footage of polar bears can be used for communicating and invoking ‘guilt’ among the viewers about global warming and climate change. C.N. Reddy and T. Harinarayana (2015) have concluded that widespread usage of solar thermal energy has produced large amounts of electricity in Southern states of India like Tamil Nadu, Karnataka, Andhra Pradesh, and Kerala, whereas electricity generated using solar thermal energy is very low in North-Eastern states. Mary Derbett (2017) analysed three public service genre programmes telecasted in Australia, and concluded that it has increased public trust and discussed solutions to educate people about climate change. Joe Smith (2017) investigated the overall design and effects of television channels’ coverage on climate change, with specific



reference to BBC, and concluded that there are some challenges in telecasting stories on increasing engagement related to climate change. Amir Shahsavari and Morteza Akbari (2018) discussed solar energy's potential in developing countries to combat climate change and to reduce carbon emissions from burning fossil fuels, while analysing solar power's potential in the future. K. Standal (2018) reviewed the implementation and distribution of solar power in rural India, under the Village Electrification Project, which has led to the rural women getting empowered and to rise against patriarchy. Mira Rochyadi-Reetz et.al (2019) analysed the mass media's framing of renewable energies in 11 countries between 2010 and 2012, who developed the frameworks based on economical, and environmental problems, and on technologies' positive impact. Sarang Shidore and Joshua.W. Busby (2019) conducted in-depth interviews with researchers, consultants, government employees, Indian media officials, etc, for India's tilt towards adopting solar energy, who concluded that domestic politics, country's sovereignty, investments, and global pressure have led to India embracing the same. Sandeep Gupta and A.K. Nurkhani (2020) analysed the financial potential, challenges, and policies of solar power usage in India, by reviewing the development of solar power plants across the subcontinent. T.R. Keller et.al (2020) investigated Indian news media's coverage on climate change in India by analysing data from 1997 to 2016, who reiterated the importance of education among people through media. Marcel Mbamalu and Nnanyelugo Okoro (2021) assessed four newspapers covering news about renewable energy's usage and impact in Nigeria, where some recommendations had also been added for future prospects of harnessing renewable energy in Nigeria. Neelam Rathore and N.L. Panwar (2022) studied the solar PV incentive policies drafted in India, and its policy challenges faced during the Covid-19 Pandemic. H.P. Bedi (2022) investigated the uneven power relations in allotting solar power schemes in Kerala, by giving special treatment to the middle and upper-class consumers, and excluding Adivasis (tribals). C. Anupama (2023) reviewed the acceptance and usage of solar devices by Coimbatore city residents, who had at least one solar device, and concluded that the respondents were eager to use them, but do not want to completely embrace solar power due to high costs and widespread ignorance. E.D.S. DeVore (2023) analysed the emotional responses triggered while watching climate change trailers featured in documentary, television and a narrative film, where the researcher found out that it triggered a negative emotional response among the respondents who considered those as the effective means to showcase the science behind climate change.

### **Theoretical Framework**

A theoretical framework is based on the relevant theory, concepts, and suitable literature incorporated for the particular study. The theoretical framework helps in the critical analysis of the research and paves the way for further developments.

One of the theoretical frameworks adopted for the research article is the Agenda-Setting Theory, which was developed by Dr. McCombs and Dr. Shaw in 1968, which showcases how mass media, including new media, can shape people's thoughts and perceptions about a certain event or an issue. The research paper also takes into account the Social Cognitive Theory, which was developed by the famous Canadian psychologist, Albert Bandura, which describes how mass media can make the respondents take informed decisions about certain issues and initiate behavioural change among them. The research paper also takes into account the



psychological theory, Cognitive Theory of Multimedia Learning, which was developed by Mayer and Moreno in 1999. The theory analyses that there are two channels for effective learning-visual and auditory, and the audience can get deeper knowledge if the information is shown as a combination of text and visual graphics. The research paper is also based on the New Media Theory, developed by the renowned Canadian scholar, Marshall McLuhan that shows the effects of digital technology and computer-mediated communication.

### **3. RESEARCH METHODOLOGY**

Research methodology explains how a researcher proposes to carry out their research. It is a logical and systematic approach to solving the research problem. The research paper adopts qualitative research methodology and adopts the case study method for analysing the overall usage of solar power by people from different walks of life, in addition to innovative technologies using this energy.

#### **Research Gap**

After carefully reviewing the available research articles and journals, it is discovered that most national research journals focused on the assessment, popularity, and impact of solar energy usage across India, alongside the latest technology developments and related commercial products. But in terms of media representation of harnessing solar energy, not many journals were found covering the same. However, many international journals emphasised on mass media's coverage on climate change and its long-term impact, in addition to providing media's narrative and its influence on the audience.

#### **Research Objectives**

1. To review the struggles faced by marginalised communities and the villagers due to lack of proper electricity.
2. To analyse government, NGOs, social enterprises and private companies' initiatives to inculcate behavioural change among the marginalised communities and the villagers to adopt solar energy in their daily lives.
3. To investigate the episodes maximising solar power's potential using innovative ideas, initiated by the techies and changemakers.

#### **Analysis and Interpretation**

##### **Marginalised Communities' Journey towards Embracing Solar Power in Their Villages after Large-Scale Intervention**

Most videos documented and published by Eco India focus on the marginalised communities, living in villages, who lack basic access to power, food, and water. In most videos, it is shown that the users had limited access to uninterrupted electricity, which hampered their livelihood, for earning money and for their children to continue their studies. Though initially wary of new technology, they finally embrace solar, after experiencing large-scale interventions from the government, NGOs, social enterprises, private companies, and also getting influenced by their peers and neighbours.



For example, one of Eco India's videos dives deep into the lives of indigenous communities of Dubukhana in Bankura district of West Bengal, who had benefited from subsidised Micro Solar Domes (MSDs). One of the residents, Namita Soren, when interviewed, confessed their plight before using solar energy, that they had to do all the work in the dark and could not buy kerosene lamps, as kerosene was costly.

**The Excerpt from the Interview with Namita Soren (Translated to English)**

“Before solar, there were several challenges. During the monsoon, we hardly have electricity here. After returning from the fields, we had to go fetch water in the dark. It wasn't easy. We used to eat in the dark. Our children couldn't study in the evenings. Kerosene oil is so expensive. Even if people wanted to buy it to light up lamps, they couldn't afford to. The situation is such that some people don't even have oil lamps or lanterns. They live in darkness. It used to be very difficult before solar came in.”

It is also depicted that the solar power government schemes have been successfully implemented, thanks to several NGOs and social enterprises working hard to earn the trust of the villagers to invest their hard-earned money for beneficial projects.

When Namita Soren and others were suffering, PRADAN NGO' representative, Santosh Kumar Mahatha, aided them to get the solar lights at a very meagre price with the help of Scheduled Tribes (ST) quota.

**The Excerpt from the Interview with Santosh Kumar Mahatha (Translated to English)**

“The villages that we narrowed down on for MSDs, more than 85% of them are Adivasi houses. ST or Scheduled Tribes are mostly people who have lived in and around forests for a long time - so, they are actually the indigenous tribes. They are mainly dependent on the forests for their livelihoods. Some are into agriculture. Some make ropes out of Babui grass and sell them. They are also into Kent leaf collection or Saal leaf collection or Mahua collection which they sell and earn money.”

“You will notice that the indoors in these houses are dark even in the day. The MSD allows daylight to enter the houses. Additionally there is light for 6-7 hours at night. They can now cook, etc comfortably. Their eyes are not strained or affected. Apart from the harmful smoke, the red light from the fires or embers hurts the eye. But this is white light which is a much better option.”

In addition, another episode shows how a small village in Maharashtra, has 24\*7 power supply, all year round, due to the Micro Solar Grids installed in the village outskirts by the Pune-based social enterprise, Gram Oorja. When interviewed, Sameer Nair, co-founder of Gram Oorja conveyed that there was initial scepticism among the villagers and only after seeing the grid's potential first-hand, they had invested their money. This was due to the villagers getting cheated over the years, in the promise of getting uninterrupted power.

**The Excerpt from the Interview with Sameer Nair (Translated to English)**

“Only if they actually want this project to be installed, having seen it, and are willing to put in that initial money, willing to create a bank account, willing to create a committee, only then do we come in.”



Marginalised communities in urban areas too face the same plight, as shown in the episode- Solar lamps and green cooking appliances have become lifelines in Bengaluru's slums, who started using solar lamps, thanks to trust-building exercises and community engagement done by some NGOs. Lakshmi, a 'Suryamukhi' with the Pollinate NGO, has motivated the residents to use solar bulbs for getting uninterrupted power in their homes, which has benefitted them greatly, and has also changed her and her family's life for good, by saving sufficient money.

**The Excerpt from the Interview with Lakshmi (Translated to English)**

"The people who have been living in the community for 18 years have always known me but a lot of the new people don't know me. That is when the neighbours started telling them about me that I sell clean energy appliances like lamps, cookers, etc. They all have my phone number now, so the newer folks also call me saying they have just moved, and they also need appliances for their home. People used to buy candles for light. Per night they needed 5 candles, per candle was 5 rupees and it would cost 25 rupees per night. Before kerosene was available for 150 per litre, now it's not even available in the market, people use candles only.

Residents in the Bengaluru slums have also expressed their gratitude towards solar bulbs as they used to suffer in darkness, before the bulbs came. With no awareness towards harnessing solar power, they learnt it from time to time, after multiple interactions with representatives from the Pollinate NGO.

**The Excerpt from the Interview with Mariamma, a Resident of Nagavarapalya Slum (Translated to English)**

"Some days we would run out of kerosene and have to be without light till we were able to get it again. Back then we didn't even have mobiles to use torches. We would cook in darkness and eat, sleep in the dark. In reality, these solar lights have lit up my life, not only my home." Sanchi, a small town, home to UNESCO World Heritage Site and located near Bhopal, has become the first solar city in India and aims to reduce CO2 emissions by 14, 324 tonnes every year, by installing solar panels, using solar streetlights, bulbs and so on. Though some eager villagers have installed rooftop solar panels and have installed solar bulbs and lights on their roads, some have not yet registered for government subsidised programmes due to digital divide, according to Vikas Tomar, a certified USHA trainee. So to educate the residents, certification training has been conducted to interested candidates, who in turn, educate their fellow neighbours and also conduct outreach programmes on how to use energy efficient solar power for their daily lives.

**The Excerpt from the Interview with Vikas Tomar (Translated to English)**

"A camp was put up at my college by Sanchi municipality and big people like collectors had also attended it. So, this has happened in every small municipality, and (solar) charging bulbs, lamps, and batteries were distributed. And if you see, our whole colony has only solar street lights. The form was easy but it was an online process. So a small number of people faced difficulties. Even though everyone is well versed with online processes these days, rural people, and people in villages aren't quite acquainted with it."

India's first solar-powered village, Modhera, depicts how one Modhera resident, Mahendra Patel, installed solar panels, after seeing their neighbour not paying any electricity bills and



receiving solar credit from the government. He was inspired by his neighbour's success in reducing power bills and wanted to try it out for himself.

**The Excerpt from the Interview with Mahendra Patel (Translated to English)**

“Earlier our bills would be around 2,500 rupees per month. But now we get money credit for all the electricity we don't use. Every month we get a credit of sometimes 500 or even 800 rupees. The way it works is that the government adds up all this credit. We save on unused electricity every month and give us a cashback for the unused units. In summers we use more electricity and in winters we don't need much power. So at the end of March every year all our savings of 600-800 rupees are credited into our bank accounts. This has been of great help to us.”

**Maximising Solar Power's Potential Using Innovative Ideas**

India's urban cities like Mumbai have limited outdoor space for developing a solar field, with the residents looking for multiple options to minimise their electricity bill. Shail Vani, a Mumbai resident in a high-rise apartment, was not able to install solar panels on rooftops due to shared accommodation, but subscribed to a digital assets plan provided by the digital solar company-SundayGrids, which converts solar energy from panels set up in remote areas to 'credits' used for reducing the subscriber's electricity bill, that has helped users like him to opt for clean energy with no strings attached.

**The Excerpt from the Interview with Shail Vani**

“Living in a city like Mumbai right you really understand that the rooftop is like a communal space. It's a shared space. It's not like the other cities where you have your own house, your own rooftop, that you can, you know, use or control. So getting access to the rooftop to set up a solar panel who owns that electricity because that electricity can't be claimed by only me given that it's a society that's kind of having the shared space and of course living on a rented premises right also puts you at a weaker footing.”

**The Excerpt from the Interview with Mathew Samuel, Co-Founder of Sunday Grids**

“When you come to our platform is that you're reserving digital solar capacity and depending on how much capacity you reserve it's a proportional amount of solar credits get generated on a monthly basis because of economics of scale that we kicked in because we are building large systems and then we are basically you can come and reserve smaller portions on it (solar panels). Say they let me reserve two kilowatts of solar we actually segregate and basically allocate two kilowatts of this 50 kilowatt project for your requirements. So whatever power gets generated from this right we trade the power to a local partner of ours in the case it is this building we trade this power at a predefined price point, so that is around 5.5 rupees per unit. That power essentially whatever gets traded that credits then come to a wall so every time you come and create an account with us on our platform we also create a wallet like a digital wallet in for that particular account and onto that wallet we essentially add those credits from the system”.

Hybrid projects, combining solar with other renewable energy options, are on the rise, due to innovative ideas developed by changemakers and scientists. Solar energy is often combined



with wind energy, by using solar panels and small wind turbines generators to produce power. Wind solar hybrid projects were mostly developed to produce a consistent power supply when the weather constantly changes. As wind-solar hybrid projects complement each other, it has the ability to meet the power demand of India, by working day and night.

A 400 -MW wind-solar hybrid project was installed in a small village called Babra in Rajkot, Gujarat, by a C & I renewable energy company CleanMax Enviro Energy Solutions, to harness the favourable location, (i.e), the village. The generated power is fed to grid service stations and can be purchased by the users from the government through bilateral power purchase, with over 60 commercial and industrial consumers across Gujarat using them. To encourage the state's users, Gujarat has also announced several incentives, including 100% exemption on electricity duty for over 25 years for projects that were authorised before March 2023.

While having a conversation with Eco India, the project director, Mr. Shobhit Shashank Sharma, remarked that they chose Babra for its ideal location and the widespread functioning of wind solar hybrid projects across Gujarat.

#### **The Excerpt from the Interview with Shobhit Shashank Sharma, Project Director, RE, Cleanmax**

“Why we chose these locations for wind-solar hybrid projects, this region, in terms of elevation and radiation, is better. So when compared to other districts in Gujarat, it is better for WTG (wind turbine) generation”.

“So when we call it our wind solar hybrid projects, you can categorise it into four different parts. One, is a wind turbine, solar plant, cooling service station, where the power will be connected and stepped up from 33kb to 66kb, and again with the common transmission line, it will go over to the GSS (Government or Grid Service Stations). So it will be connected to the power stations with the government service space. And so we are ultimately feeding the power to the government”.

Due to the increased government incentives and recent technological developments, many private players have started manufacturing hybrid models for their clients, which has become a hit. Piyush Wagadia, co-founder of Speedwell, a private company for manufacturing hybrid models, stated that the demand for wind turbines will increase in a year or two, thanks to government incentives.

#### **The Excerpt from the Interview with Piyush Wagadia, Co-Founder of Speedwell (Translated to English)**

“The government has announced a policy for this sector recently. So now those in solar energy will also start manufacturing wind turbines. Many people are already preparing for it. The market right now has a lot of solar, but in about a year it will be flooded with wind turbines too. There will be a lot of competition.”

One of the users, Anand Sagpariya, an entrepreneur, has remarked about the merits of using the hybrid technology for over two months that has made a positive impact in his business, by reducing his electricity bill.





**The Excerpt from the Interview with Anand Sagpariya, Founder, ACS Lighting Pvt. Ltd (Translated to English)**

“I used to get an electricity bill of Rs. 5000- Rs. 8000, but since I installed this model, my bill has been around Rs. 1000-1200”.

#### **4. RESULTS AND CONCLUSION**

The study proposes insightful, unbiased, and meaningful implications on harnessing solar energy by people from all walks of life throughout India. From analysing the documentary, it is concluded that the series has highlighted usage of solar energy in a positive manner, for people from all walks of life. It also highlighted various government schemes and innovative ideas put forth by the government and startups to increase its popularity among the common man. It has also given a personal and an emotional connect to the audience by showing the struggles, dreams and hopes of marginalised people who have struggled without uninterrupted power and a proper light source during night time for several years. Solar power, though is not a relatively new technology, has not yet picked up pace in the country, due to misinformation and lack of awareness. Mass media is the most powerful tool in shaping the public's opinion, which can make or break a society. Though Eco India's documentary episodes put forward in-depth stories of solar energy usage, it has not yet reached the grassroot level, which has a significant population, awaiting for solid change. So in addition to giving incentives to installing solar power, the respective state governments must rope in NGOs, social enterprises, contract workers, etc, and conduct mass media campaigns in a large-scale to influence public opinion.

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