

# Children in Poverty at a Crossroads

Impact Assessment of Panasonic Corporation's CSR Initiative to  
Provide Solar Lighting to Children in Rural India

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## INTRODUCTION

### Global Poverty and the Education Crisis

Education is a basic right of every child and provides a future of hope. Without fundamental skills in reading and writing, a child's pathway to reaching their full potential is severely limited, thus confining millions of young children to a life of poverty. According to a recent study commissioned by the World Bank (2016), nearly 385 million children are living in extreme poverty or in households that survive on less than \$1.90 dollars a day. UNICEF Executive Director, Anthony Lake, warns "Children are not only more likely to be living in extreme poverty, the effects of poverty are most damaging to children. They are the worst off of the worst off – and the youngest are the worst off of all-because the deprivations they suffer affect the development of their bodies and their minds." Similarly, The World Development Report (2018) recently forewarned of an imminent "learning crisis" due to the fact that primary and secondary schools are failing to educate children to succeed. This report argues that education is failing to deliver on its commitment to eradicate extreme poverty, pointing to the fact that millions of children today cannot read or write. Furthermore, this learning crisis has resulted in a widening social gap for children who are disadvantaged by poverty, civil unrest, caste discrimination and disabilities. The World Bank President, Jim Yong Kim, asserts "When delivered well, education promises young people employment, better earnings, good health, and a life without poverty. For communities, education spurs innovation, strengthens institutions, and fosters social cohesion. But these benefits depend on learning, and schooling without learning is a wasted opportunity. More than that, it's a great injustice: the children whom societies fail the most are the ones who are most in need of a good education to succeed in life" (World Bank, September 2017).

The large number of children who remain in extreme poverty points to a critical need for governments, corporations, nongovernmental organizations and individual citizens to play a more active role in implementing programs and services to break the cycle of

intergenerational poverty that plagues millions of children today. In response to this poverty dilemma, Panasonic Corporation (Japan) has assumed a leadership role to provide LED solar lighting to thousands of children in developing countries who do not have access to adequate lighting. Over a 6-year period from 2013 to 2018, the company will have donated 100 thousand lanterns to children and needy families in developing countries, including Cambodia, Indonesia, Vietnam, Myanmar and India. In doing so, the company believes that inadequate lighting is an obstacle to children reaching their full potential, particularly because study time during the evening hours is severely restricted due to the absence of reliable electricity, and an overdependence on unhealthy and costly non-electric sources. While poverty reduction is indeed complex and requires concurrent strategies, Panasonic affirms that energy is a key determinant of improved education and sustainable development.

### **Global Challenge of Energy Poverty**

The world is faced with a serious challenge of energy poverty, defined as lack of access to modern energy sources. Despite the fact that the United Nations has targeted as a part of the Sustainable Development Goals (SDG) to “ensure access to affordable, reliable, and modern energy for all by 2030”, it is estimated that 1.3 billion people globally still lack access. These same individuals are dependent on traditional sources of firewood, charcoal, manure and crop residues that emit harmful pollutants when used. Shockingly, unhealthy energy sources are responsible for an estimated 2 million premature deaths each year, of which 44 percent are children. In point of fact, the World Bank reports that 40 percent of the world’s population are dependent on energy sources that are unhealthy and costly. Moreover, traditional energy use has negatively resulted in forest degradation, soil erosion, and carbon emission – all of which has exasperated global climate change (Worldwatch, 2018). In addition to health concerns, the causal relationship between poverty and access to affordable energy is clear. People are often trapped in a cycle of energy poverty, limited income and using significant amounts of income to purchase costly sources of energy that are unsafe, such as dry cell batteries, kerosene lamps and candles.

### **India Economic Context**

The country of India can be described as a “paradox”, whereby the nation is now ranked as the seventh largest economy in the world and is third in terms of purchasing power parity. The country’s economy is growing at a rapid pace of seven percent per year, and the nation is on track to become the world’s fifth largest economy in 2019. Soon it will rank only behind Germany, U.S., China and Japan. Moreover, The World Economic Forum (2018) reported that India continues to improve on a global index of talent competitiveness.

At the same time, India can be described as a country of contradictions. Despite its growing national power and prosperity, it is estimated that more than 400 million citizens –

representing 21 percent of the population – live below the UN-designated poverty line. Development experts commonly agree that India’s infrastructure and medical sector, particularly in rural areas, remains underdeveloped. It is estimated that less than 20 percent of the rural population is without clean drinking water and the national electrification rate is comparatively low at 54 percent. Moreover, a 2016 report issued by Credit Suisse reports that inequality is rising, with India now ranked second in the world in terms of income inequality. Government statistics show that the top one percent of the population owns 58.4 percent of the wealth, compared to the bottom 10 percent claiming ownership of 0.2 percent of the country’s assets. The global comparisons are equally disappointing, whereas India ranked 131st among 188 countries on the Human Development Index – with a score of 0.624. Additionally, the country ranked 97th among 118 countries on the Global Hunger Index, with more than 195 million people identified as undernourished.

### **India Energy Context**

Electricity is commonly cited as one of the most important infrastructure components for social and economic development, and it is considered an important standard of living index. Development experts and government officials worldwide believe that electrical and other sources of energy remain critical for sustainable development, particularly in the areas of business and agriculture, as well as in the delivery of quality education and healthcare. A World Bank – IFC study (2012) finds that over 75 million or 33 percent of the households in India do not have access to electricity and are commonly dependent on kerosene for cooking and lighting. This report also notes that these same households that use kerosene are comparatively poor, meaning that it is financially prohibitive for these households to purchase other energy sources. Other studies reveal that the seven poorest states in India, including Bihar, Uttar Pradesh, Jharkhand, Orissa, Assam, West Bengal and Rajasthan, are overly dependent on kerosene as the main source of energy. In total, it is estimated that off-grid and under-electrified households in India spend 2.2 billion dollars on kerosene each year. Of this amount, 82 percent is spent in poor, rural areas.

In addition to kerosene, a majority of the homes in rural India are dependent on biomass, such as wood, charcoal, agricultural waste, and animal dung, for energy. Yet, as populations grow, families – especially young children – are spending more and more time to collect biomass fuels, leaving less time for study and school activities. As shown in Table 1 below, 765 million people or 89.5 percent of the people in rural India rely on traditional biomass. This is a clear indication that rural residents currently have limited access to affordable and cleaner energy sources. Looking ahead, the IEA reports that due to the increase in alternative energy sources, the shift to cleaner and more efficient options has actually slowed – and biomass use has increased. Moreover, the use of biomass or traditional fuels are no longer free – and oftentimes must be purchased in the local market. Then, combined with

**Table 1** Rural and Urban Populations Relying on Traditional Biomass

Subregion	Total number of people relying on traditional biomass (million)			Proportions of population relying on biomass within subregion (%)		Population relying on biomass as share of subregion's population (%)
	Rural	Urban	Total	Rural	Urban	
Africa	481	176	657	73.2	26.8	67
Sub-Saharan Africa	477	176	653	73.1	26.9	80
Developing Asia	1694	243	1 937	87.5	12.5	55
China	377	47	423	89.1	11.1	32
India	765	90	855	89.5	10.5	75
Other Asia	553	106	659	83.9	16.1	63
Latin America	60	24	85	70.6	28.2	18
Developing countries*	2235	444	2679	83.4	16.6	54

Source: Adapted from IEA, 2010

poor stove technology, the net energy cost can be double that of an electrified home. The World Bank reports that poor, rural households in India spend eight to ten percent of their disposal income on energy, as compared to five percent or less in urban areas.

Despite the high cost of kerosene and batteries, the solar lighting market in India remains underdeveloped, with only 2 million solar lights currently used. That translates only into a market penetration of four percent of homes that use solar. (World Bank, IFC-p. 41). The reasons cited for this minimal penetration include low solar manufacturing capacity, overabundance of poor quality products and expensive products that have limited use, a lack of lending structures, fragmented market with underdeveloped distribution and repair outlets, and a lack of public awareness regarding the benefits of solar energy. Yet, since only 54 percent of the country is currently electrified, analysts concur there is significant business potential for solar lighting. (World Bank-2018). Government and industry experts agree that long-term market success is favorable if the nation is able to solve these challenges.

## RESEARCH METHODOLOGY

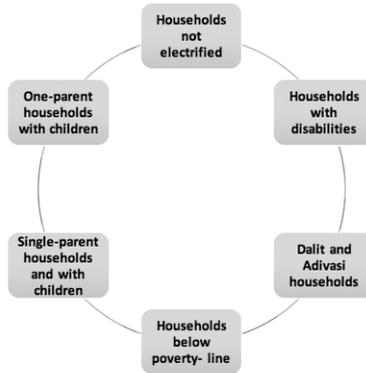
The key objectives of this study are to assess the appropriateness of the solar lantern distribution, suitability of solar lanterns for poor households, and to more fully understand the socio-economic impacts in the areas of child education, health, family finances, community socialization and safety. This empirical research used a mixed quantitative and qualitative methodology. In gathering data, interviews were conducted with individuals and community-based focus groups, while at the same time collecting impact data through the use of a written survey instrument. The survey was semi-structured, and provided useful quantitative information about household demographics, pre-solar energy use and solar lighting benefits. Consistent with the data collection plan, 150 solar light recipients, representing 20 percent, responded to a 30-question survey that was translated into Bengali and Hindi. The impact

survey was undertaken at multiple times during the 2014 to 2017 period, using a stratified random sampling methodology that included an equal number of households from each phase of the three distributions. Due to minimal literacy in reading and writing, local NGO office staff helped the local residents in completing the written survey. Then, a few months after the completion of the survey, the researcher visited the distribution sites near Kolkata to meet residents to obtain more in-depth, qualitative information about energy use and to more fully understand the changes that occurred as a result of solar lighting. In total, six focus group discussions were held over a four-year period, in addition to 50 individual interviews. A staff of the local NGO, Lutheran World Service India Trust (LWSIT), served as translator and helped to facilitate these discussion sessions. During the community gatherings, participants were encouraged to openly talk about their experience with solar lighting, and to share opinions about problems facing their respective community. It is important to note that the triangulation of research data also included interviews with local NGO staff, community leaders and village-level educators. To enhance the accuracy of information received, local NGO staff in Kolkata were trained in data collection, and data collection methods were tested and modified as deemed necessary. Both the written survey and interview data from 150 solar recipient households was compiled and analyzed in accordance with SPHERE International Guidelines.

## **SOLAR LIGHT DISTRIBUTION**

### **Distribution Criteria**

In cooperation with Panasonic Corporation's CSR management team and the local staff of LWSIT in Kolkata, the researcher monitored the distribution of 744 solar lanterns to households in the states of Jharkhand, Odisha, Assam and West Bengal in 2014, 2016 and 2017. Prior to the distribution of solar lights, one of the first significant tasks of the team was to establish clear criteria to ensure that the solar lanterns would be used by those showing the greatest need. The internal stakeholders – including Panasonic, the local NGO, and community leaders – agreed that the criteria for distribution should include the following: i) households off the national electric grid and having no authorized electric connection, particularly in unrecognized slums; ii) households with school-aged children, especially female students; iii) single-parent households headed by women; iv) households below the UN-designated poverty-line and belonging to Dalit and Adivasi tribes; v) households in forest, urban slums and disaster-prone areas; vi) individuals with HIV or disabilities.



**Figure 1**  
Panasonic Solar Lantern Distribution Criterion

## SOCIO ECONOMIC CHARACTERISTICS OF THE DISTRIBUTION AREA

The Panasonic solar lights were primarily distributed in the states of West Bengal, Jharkhand and Odisha – all of which have HDI scores below the national average and ranked 13th, 19th, and 22nd out of 29 states in India. A high percentage of the distributions fell within the Chotanagpur Plateau region, commonly known as the Central Indian Adivasi belt. While much of the region is rich in natural resources, a greater part of the inhabitants remain at the bottom of the economic pyramid, particularly in terms of health, education, poverty, and food security. According to the World Bank, all three regions are extremely low on the Gini Coefficient Inequality Scale, with scores of approximately 0.5.



**Figure 2**  
Eastern India Distribution Area: West Bengal, Jharkhand and Odisha  
Source: Learning India

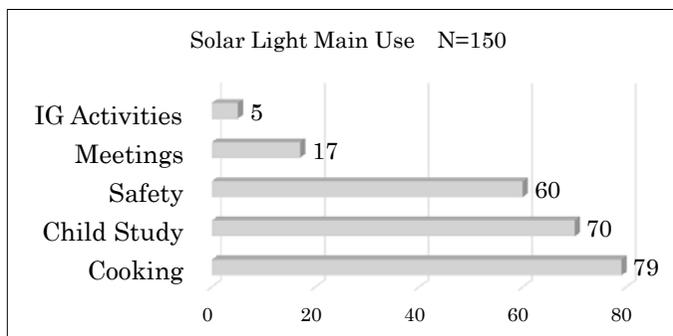
Consistent with the distribution criteria established, the household survey confirmed that more than 80 percent of the solar light recipients belonged to the most vulnerable communities, castes and tribes. Additionally, survey data showed that 75 percent of the households had at least one member identified as a part of “prioritized distribution groups”, defined as households with female students, persons living with HIV-AIDS, or individuals with disabilities. Moreover, the survey response confirmed that – on average – 73 percent of the solar lanterns were distributed to households which were non-electrified.

During the follow-up field visits in 2015, 2016 and 2017, a detailed review of the socioeconomic characteristics of the distribution areas was carried out. Similar to other rural villages throughout India, households included extended families, such as aunts, uncles, grandparents and distant relatives. The average number of adults per household equaled four adults, as compared to three children. Approximately 75 percent of the solar light recipients are directly engaged in agriculture, with the remaining 25 percent are involved in teaching, maid service, and garment factory work. Only a few households had automobile ownership, while approximately one-third had regular use of a motorbike. Rural mobility is limited and people are highly dependent on public transportation. Approximately 50 percent of the households reported television ownership, a sign of improving family finances. Cellular phone ownership is high at 92 percent, and is considered the main source of regional, national and international news. Still another socioeconomic characteristic of the area is the quality of home construction, whereby one-third of the households reported living in homes constructed of cement, one-third in homes using a combination of bricks and wood, and the remaining one-third living in poorly constructed structures of mud and thatch. Finally, families reported average monthly income of approximately 4,500 India Rupee, equivalent to approximately \$61 dollars – at current exchange rates. On average, these families spend 50 to 60 percent of disposable income on food, which is characteristic of families living in poverty. Discussions with slum and village residents confirmed that people are seriously concerned about a broad range of issues, including insufficient food, employment, healthcare, child education, housing and access to clean water.

## SOLAR LIGHTING IMPACT ASSESSMENT

### Solar Lighting Use

The mean hours of solar light ranged from 2.66 hours during the rainy season to 3.88 hours during the dry season. The survey data further confirmed that solar lanterns were used for multiple purposes, with cooking, child education and outdoor safety to be the most prominent uses. Seventy-nine percent of the survey respondents cited cooking as one of the major uses of the lanterns. Moreover, follow-up interviews confirmed that solar lanterns were



**Figure 3**  
Benefits Identification

preferred for cooking purposes because solar was considered a clean source of lighting, unlike kerosene which often resulted in food contamination. In addition to kitchen use, 70 percent of the household reported that the solar lanterns were used for child study purposes. Oftentimes a child would use a solar lantern for study while, at the same time, a mother was preparing the evening meal. A third major use, reported at 60 percent, is to use solar lighting to enhance outdoor safety, particularly at night when using outdoor toilet facilities. Seventeen percent of the respondents said that solar was used for community meetings, 16 percent for protection against wild animals, and five percent for evening income generation activities. Another used noted during follow-up discussions included that of providing light during celebrations, traveling from one household to another, leisure reading, and praying.

### Impact on Education

Since child education was identified as one of the most important benefits of solar lighting, a focus of this research was to conduct an in-depth qualitative and quantitative analysis to gain a more comprehensive understanding of changes that had occurred as the result of solar light use. As shown in Table 2, prior to solar use primary school children studied approximately 1.2 hours each evening; however, after solar, study hours increased by 50 percent to 1.8 hours.

**Table 2** Mean Hours of Child Study for Primary School Students

Child Study Hours	Year	Mean Hours of Child Study	Number of Students
Hours After Solar	2014	1.80	30
Hours After Solar	2016	1.83	36
Hours Prior to Solar	2017	1.21	35

With respect to secondary school students, Table 3 shows that study hours increased to a range of 2.1 to 2.4 hours, as compared to 1.78 hours prior to the use of solar. This study further confirmed that the use of solar enabled children to study much later in the evening. Parents noted that good solar lighting reduced strain on children's eyesight, thus positively encouraging longer study hours.

**Table 3** Mean Hours of Child Study for Secondary School Students

Child Study Hours	Year	Mean Hours of Child Study	Number of Students
Hours After Solar	2014	2.15	20
Hours After Solar	2016	2.42	46
Hours Prior to Solar	2017	1.78	25

Data collected from the survey instrument confirmed that 40 percent of the children reported improved school performance as a result of solar. Related, 38 percent of the households reported that students attend class more regularly after the introduction of solar lanterns. In follow-up focus-group discussions, parents and teachers said that students were now better able to study during the evening hours, thus enabling them to complete home assignments. A lesser percentage of five percent of the students were now able to take supplementary classes during the evening hours. Thus, these children were better prepared and confident, and reported an increased interest in attending school. In addition to benefiting children, six percent of the households reported that solar use facilitated the enrollment in Adult Education classes.

The periodic field visits to the slum and rural distribution areas included in-depth discussions with parents, teachers and community leaders, thus providing valuable qualitative insight into other issues and benefits related to solar light use. First, parents reported that the use of solar freed up children – especially young girls – from collecting wood for lighting purposes. Prior to solar, children lost valuable study time, but also experienced higher school absenteeism due to respiratory sickness. In prior years, young girls were sometimes even withdrawn from primary school due to illness. Teachers also noted that solar lighting allows students to engage in evening school activities, including additional classes, club activities and sports. The use of solar lighting provides greater flexibility in allowing students to shift study time from the afternoon to early evening. Also, parents confirmed that children can now better fulfill home chore responsibilities, while at the same time improving school performance. Finally, teachers also make effective use of solar lights in preparing daily lesson plans and studying during the evening hours. Not surprisingly, there is a positive impact of solar use on the retention of teachers in the rural areas. When the quality of life improves due to the use of solar, teachers are more willing to work in rural areas, thus mitigating the problem of teacher turnover and shortage.

### **Impact on Family Finances**

Ninety-six percent of the survey respondents reported that reduced household expense on non-renewable energy sources, such as kerosene and battery recharging, was a significant benefit of solar lighting use. The survey data revealed an average monthly savings – as a result of solar – to equal approximately 142 India rupees, equivalent to 2.18 dollars. This savings has a profound impact on families who live on a daily income that is close to the UN-designated poverty line of \$1.90 dollars set in October 2015. Below this level, it is generally believed that families would not have sufficient income to pay for basic food, clothing and medicine. Recipients reported that solar lighting allowed these poor families to reallocate energy savings to purchase basic necessities of food, medicine and school supplies. Field research interviews confirmed these findings that solar use took pressure off the family budget, and allowed for additional money to purchase essential items. Recognizing the positive impact of solar use on family finances, a majority of those participating in field interviews said they would like to use a part of their energy savings to purchase additional solar lights in the future. There was a clear understanding among local residents that solar lighting had a direct relationship to improved livelihood, both in terms of finances and the quality of health. Recipients exhibited a high level of awareness that energy savings as a result of solar could be used to in a variety of ways to help their families.

### **Impact on Health and Safety**

A third and final impact of solar lighting is that of improved health. Eighty percent of solar light recipients noted that solar was appreciated for its “clean” light emitted. Heads of households said that close proximity to toxic kerosene fumes was responsible for respiratory problems, especially for women and children who required light during the evening hours for cooking and studying. Parents reported that school absenteeism is now lower due fewer respiratory problems associated with the use of kerosene and other unclean energy sources. Also, housewives commented that the use of kerosene often resulted in poor tasting and contaminated food.

In addition to direct health-related benefits, 60 percent of the respondents reported using solar lights when using the toilet during the evening hours. Still another 17 percent said that solar allowed them to safely walk to community-sponsored meetings at night. This was especially important for household women and young girls who often face the threat of sexual abuse. Moreover, a lesser percentage of 16 percent reported using solar lights to scare away dangerous animals at night.

## SUMMARY

### Key Impacts

This study revealed that Panasonic solar lighting had four significant impacts, particularly in the areas of education, health, safety and family finances. As described in this report, the duration of study in the evening has significantly increased, and teachers are reporting improved school performance and enhanced student motivation. Another significant impact is improved health for families, which includes a reduction in child respiratory illnesses. Moreover, heads of household report a clear benefit of safety while walking and using toilet facilities at night. A final benefit of solar reported is improved family finances, meaning that poor households are able to use energy savings to purchase food, medicine and needed school supplies.

### Linked Cultural Shifts

It is also significant to point out that solar lighting has contributed to ongoing cultural shifts in rural India, identified as improved family socialization, greater gender equality, and enhanced environmental awareness. Households report that solar lighting makes it easier to socialize with friends and neighbors during the early evening hours, in addition to facilitating more time together among family members. Further, gender equality has improved because young girls spend more time studying, and less time collecting wood and other traditional fuel sources. Still another corollary benefit is improved environmental awareness. Solar light recipients commonly reported that kerosene was responsible for bringing dangerous pollutants into the home, and people exhibited a new awareness that the use of fossil fuels is not good for our global environment. A final linked social impact of solar use was that of improved information access, particularly because 92 percent of households are now able to charge their cellular phones - using the phone-charging function of the solar light. As explained during focus group discussions, smartphones are used extensively to access news and information.

## FINAL RECOMMENDATIONS TO ENHANCE SOLAR LED SUSTAINABILITY

- Expanded market penetration and long-term sustainability of solar lighting will require the development of structures to train local technicians to provide after-sales service. Individual companies, in cooperation with vocational training institutions, must offer more comprehensive skills-based training which covers installation, maintenance, repair, and spare parts procurement.
- Key stakeholders in development – including NGOs, community-based organizations, local

and national governments, and corporations need to collectively work together to promote access to low-cost solar lighting. Further, these entities should take an active role in setting up responsible quality assurance structures.

- Today, almost 20,000 rural village communities throughout India do not have adequate access to electricity. This is hindered by the fact that the expansion of the national electric is costly and will take another 20 to 30 years to fully develop. In the short-term, then, it is the responsibility of the national and regional governments to play a more active role in promoting energy sources that are cost effective, reliable and environmental friendly.

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## REFERENCES

- Adkins, E. et al. (2009). *Off-grid energy services for the poor: Introducing LED lighting in the Millennium Villages Project in Malawi*. Elsevier Energy Policy Journal 38.
- Buragohain, T. (2012). *Impact of Solar Energy in Rural Development in India*. International Journal of Environmental Science and Development, Vol. 3, No. 4.
- Brossman, M. (2013). *Off-grid Rural Electrification and Fighting Poverty. A Comparative Impact Assessment of Solar Home Systems in Rural Bangladesh*. Global Studies Working Papers. University of Tubingen.
- Electricity and education: The benefits, barriers, and recommendations for achieving electrification of primary and secondary school*. (2014) . UNDESA.
- Energy Poverty Remains a Global Challenge for the Future*. (2018, 11/3). Press Release: Worldwatch.
- Gretebeck, L. (2017) Socioeconomic Impact of solar lighting for India’s Rural Poor. *The Kyoritsu Journal of International Studies*, 34.
- Half, A. and Sovacool (2014) *Energy Poverty: Global Challenges and Local Solutions*. Oxford: Oxford University Press.
- Harrison, K., Scott A., and Hogarth R. (2016) *Accelerating access to electricity in Africa with off-grid solar. The impact of solar on household solutions*. London: Overseas Development Institute.
- International Energy Agency (IEA). (2016). *World Energy Outlook*. Paris.
- Lighting Africa: Solar Lighting for the Base of the Pyramid – Overview of an Emerging Market*. (2010) IFC and the World Bank. New York.
- Meister, K. *Maximizing the Positive Socioeconomic Impact of Solar Energy for the Cameroonian Rural Poor*. (2012). Athabasca University, Centre for Innovative Management Applied Project. Athabasca, Canada.
- Panasonic Launches 100 Thousand Solar Lantern Project*. Panasonic Corporation. (22 Feb. 2013).

- <http://news.panasonic.com/global/press/data/2013/02/en130222-6/en130222-6.html>.
- Saghir, J. (2005). *Energy and Poverty*. Energy Working Notes, no. 4. Energy and Mining Sector Board. World Bank: Washington, D.C.
- Smil, V. (2005). *Energy at the Crossroads*. Boston: The MIT Press.
- Human Development Report* (2015). New York: UNDP. [http://hdr.undp.org/sites/default/files/2015\\_human\\_development\\_report.pdf](http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf).
- Wong, S. *Overcoming obstacles against effective solar lighting interventions in South Asia*. (2012). Energy Policy, Volume 40, p. 110-120.
- World Bank Warns of 'learning crisis' in global education*. (2017, 9/26). Press Release: World Bank.
- World Databank*. (2016). New York: World Bank. <http://www.worldbank.org>
- World Development Report* (2018). Washington D.C.: World Bank. <http://www.worldbank.org>

# Children in Poverty at a Crossroads

## Impact Assessment of Panasonic Corporation's CSR Initiative to Provide Solar Lighting to Children in Rural India

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Education is commonly described as the process by which society transmits its cultural heritage, knowledge, values and skills from one generation to another. It is for this reason that inequality in education is a clear obstacle to imparting knowledge and inculcating new ideas. In response to the dilemma of education inequality, international NGOs – working in cooperation with private sector companies – have taken steps to propose a vast array of solutions to improve child education amongst the “poorest of the poor”.

The purpose of this empirical research is to assess key socioeconomic, education and cultural shifts after solar lighting was provided to approximately 200 children living in rural India during the 2014-2017 period. The key working hypotheses of this study is that solar lighting will have a direct, positive impact – particularly in the socioeconomic areas of child education, income generation, and employment.

The researcher developed an impact assessment survey and carried out qualitative field research interviews that allowed for an evaluation of various socioeconomic changes and cultural shifts, against key baseline data. Through this study, the researcher sought to answer the following key questions: 1) What socioeconomic changes occurred as a result of solar lighting use at the household level? 2) What is the impact of solar lighting on child education, both in terms of daily study hours and academic performance? 3) What cultural shifts took place as a result of solar use in the areas of family socialization, gender equality and environmental awareness? 4) How has energy saving – as a result of solar use – improved the three dimensions of the Human Development Index (HDI), including Life Expectancy, Education and Standard of Living.

**Keywords:** solar lighting, poverty alleviation, Panasonic, India