

Impact of solarisation in schools: Learnings from Jharkhand

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The NITI Aayog SDG report 2020-21 placed Jharkhand under the aspirant category for SDG 4: Quality Education, with index score of less than 50. Access to reliable energy acts as an enabler to progress towards education. Evidence suggests that states with lower literacy rates also have low electricity rates at the schools and vice-versa (GoI, 2020). The UDISE (2019) report highlights that 93% of the total schools in the state have grid connections. However, access to electricity alone does not fulfil the daily energy demand of schools. Attributes such as quality of the power supply, legality, reliability, affordability, etc., play a pivotal role in enhancing energy-related education outcomes.

To improve the energy access status at schools, it is imperative to understand the present scenario of electricity supply. IRADe evaluated the status of energy access in 15 schools across three districts of Jharkhand, namely, Ranchi, Deoghar, and East Singhbhum. Among these 15 schools, 12 were non-residential, and 3 were residential. The study included identifying the different indicators to assess the quality of the current power supply and mapping them into different tiers based on the multi-tier framework developed by World Bank-ESMAP. Interviews and discussions with the staff and students revealed the school activities affected by the power supply.

The survey result highlights that majority of surveyed school's face power outages from the primary source, i.e., the grid, which may range from 3- 5 hours during the working hours. Power availability also has the seasonal dimension, as power cut duration exceeds the above range during monsoons (for line maintenance) or increased load shedding during the summer season. During the group discussion with teachers, access to uninterrupted quality electricity emerged as significant factor for effective cooling and lighting; it creates conducive environment for learning. A reliable power supply is much needed to run computers, internet, audio-visual classes which primarily focus on the modern technological advances to improve and strengthen the knowledge imparted to the students. The computer-aided learning process by introducing the Information and Communication Technologies (ICT) in schools has provided the students with opportunities to build up their knowledge in an interactive way. However, erratic supply of grid electricity during school working hours necessitates the availability of a secondary electricity source, to improve the reliability of the power supply.

The residential schools operate 24x7 with hostel facilities for students and working staff. Traditionally, diesel-operated generator sets or battery-inverters have supported the schools in maintaining the electricity supply during power cuts. Owing to the expensive fuel and limited budgets, the schools cannot operate the generator sets every time the power goes off. In the past few years, the Government of Jharkhand launched a scheme to solarise government residential schools with battery storage. Jharkhand Renewable Development Agency (JREDA) has installed rooftop solar power plants for self-consumption in government-run residential

schools. The vacant roofs and terraces of the school buildings and hostels are utilised to install the rooftop solar panels.



Figure 1 Rooftop solar panels at a residential school in Ranchi

JREDA has installed a 10kW rooftop solar system at residential schools with battery storage. Schools with rooftop solar installations have witnessed improvement in the daily power supply, both during the daytime and evening hours. The solarisation of schools has helped run the smart classes and ICT labs smoothly, even in the absence of grid electricity. Students and staffs feel much safer due to the availability of uninterrupted electricity during the evening and night. The budget required for purchasing the fuel for generators has been reduced by introducing solar energy as secondary power in these schools. The rooftop solar scheme had eased the staff's life in these residential schools enormously. Operating generators during power cuts in evening hours or night-time was difficult for the staff.

Energy is vital in education institutes; smart classes have made knowledge delivery easy and effective. Adequate fans and lights make the atmosphere comfortable for the students and have improved the student learning graph.

Headmaster, Kasturba Gandhi Balika Vidyalaya (KGBV), Ranchi



Figure 2 Students interview to understand the effects of power supply on their academic curriculum and their views on solar energy

We find that introduction of solar energy has not only made the schools energy- secure; it also benefits the environment and human health. The use of diesel-run generators produces particulate matter and air pollutants that significantly contribute to serious health hazards. The solar installations provide new learning opportunities for the students and promote the habit of energy conservation, environmental sustainability among school children. The cost savings also contribute to the financial stability of schools. Thus, renewable electricity, especially solar electricity, is a viable and sustainable alternative source of electricity to ensure an uninterrupted energy supply. Framing the policy for installing rooftop solar systems for the non-residential schools as well, will improve the learning environment along with the environmental benefits.