Solarization of Boat Clinics in Assam to reduce energy costs, pollution and carbon emissions

Boat Clinics, Government of Assam, National Health Mission

GGHH Agenda Goals

- Energy

Hospital Goal

- Reduce energy costs
- Reduce environmental pollution
- Reduce carbon emissions
- Promote clean energy

Progress Achieved

- Energy savings: Roof top solar power plants with the capacity of 3kW (per boat) saves up to $ 480 of yearly fuel expenditure for each boat clinics. Solar panels installed on the boat clinics run the entire medical and diagnostic equipment including a 50 liter solar refrigerator that is used to store vaccines on the boat.
- Environmental benefit: Installation of roof top solar panels contributed to the overall reduction in noise, air and water pollution that was caused due to conventional kerosene based generators.

The Issue

As on 2020 India's per capita energy consumption has reached 1200 kWh. Even though there has been no significant increase in the number of villages that were electrified in past five years, the power shortages have substantially reduced in the country during last 3 years. Given the lack of energy access in rural India and the commitment to have 40% non-fossil fuel based energy by 2030, Indian Government has been focusing on the development of country's power sector through various innovations. These primarily include phasing out fossil-based energy generation and introduction of the "off grid" energy sources such as solar energy. India's growing energy need is aligned with it's green energy transition initiatives to reduce carbon footprint. Leading the climate change deal amongst 195 countries at COP 21, India faces a massive target of 175 gigawatt to be reached by 2022 and 450 GW by 2030 (Union Budget, 2021).

Apart from the initiatives taken up by the Central Government, there are several small scale initiatives taken up by individual States and private institutions. Considering the long term cost benefits of the green and clean energy alternatives, there has been a shift among large government schemes to switch to renewable energy now a days. In turn these initiatives which end up saving electricity cost, also benefit the environment by reducing the overall ecological footprint. Boat

Clinics of Brahmaputra are one such State funded entities in Assam that have taken up the sustainable initiative of installing rooftop solar power plant to fulfill their energy requirements.

Approximately six percent of Assam's land is covered by the islands of Brahmaputra and a total of ten percent population of the state resides in these islands. The islands face the major threat of frequent floods that affect the health status of island communities. The area has few health facilities that are not sufficient to fulfill the requirements of the entire population. Construction of permanent infrastructure to provide health facilities is another challenge due to the recurring floods. The situation is worsened by the fact that people residing in these areas change their base every six months either due to erosion of land or in search of livelihood. Keeping these in view the Centre for North Eastern Studies and Policy Research (C-NES) launched a unique initiative in June 2004-2005, of providing mobile health services through boat clinics to bring better health facilities to the marginalized communities in the Brahmaputra valley.

The initiative started small initiative in the district of Dibrugarh, in partnership with the local government. Later, following a similar strategy, it was expanded to 2 more districts. In 2008 a unique public private partnership was signed with National Health Mission, Government of Assam to expand the initiative and provide adequate health facilities to the island communities at a larger scale. A total of 15 boat clinic units are now operational across 13 districts of Dhubri, Barpeta, Nalbari, Morigaon, Sonitpur, Lakhimpur, Dhemaji, Dibrugarh, Tinsukia, Jorhat, Goalpara, Bongaigaon, Kamrup with 2 additional units in Dhubri and Barpeta districts. Health services provided by the boat clinics include mother and child care through routine immunization, ante natal care, post natal care, family planning services, general health checkups, laboratory & pharmacy services and extensive awareness on sanitation, health & hygiene. In order to promote sustainable and clean energy based healthcare services, SELCO foundation installed solar rooftop power plants at 4 of these boat clinics.

Sustainability Strategy Implemented

With a clear vision of reducing energy costs, carbon footprint and environmental pollution, team at SELCO foundation and the C-NES had planned to install rooftop solar power plant on the boat clinics. In order to achieve this, below strategies were adopted:

- The technical staff at the SELCO foundation and C-NES in collaboration with the Government of Assam carry out a detailed cost benefit analysis with respect to the cost of installation, projected savings and estimated maintenance expenditure for rooftop solar power plant.
- The analysis team submits their findings and suggestions to the governing body for required funds and resources to run the roof top solar power plants at the boat clinics.
- On April 21, 2017, SELCO Foundation donates and commissions the entire system to 4 boat clinics Jorhat, Tinsukia, Dhemaji and Dibrugarh.
- The 4 boat clinics deploys a team of in-house staff to maintain the rooftop solar power plants. In terms of maintenance the team at boat clinics only need to refill the water for battery operated system, at regular intervals.
- The boat clinics assign dedicated internal staff to regularly clean the solar panels to achieve maximum efficiency and report for any inefficiency or performance related issues.

- Each rooftop solar power plant has a capacity of 3kW. It fulfils the energy requirements for running fans, lights, projector, autoclave, centrifuge, microscope, semi auto analyzer, sterilizer, refrigerator etc. present at the boat clinics.
- Each boat has two medical officers, three auxiliary nurse midwives, one District Programme
- Officer, one lab technician, one pharmacist, three community workers, one boat master, one helper, one driver, and one cook.
- The primary source of rooftop solar power plant is the solar photovoltaic (PV) module. The PV module generates electricity on the basis of sunlight exposure therefore more is the availability of sunlight, more electricity is generated. To maximize the sunlight exposure, PV module is fixed at an appropriate angle to the sun and in a location where there is no shade from surrounding objects.

Implementation process

The boat clinics used to go for long night stay trips, to conduct health camps at island villages of Jorhat and Majuli district. Therefore having a continuous and cost effective power supply was necessary for the boat clinics. Earlier the boat clinics used kerosene based generators to fulfil their power supply. However the primary challenge faced by the boat clinic staff while using kerosene based generators was noise pollution and the cost of fuel. Therefore a cost effective and environmental friendly intervention was needed to resolve the ground level challenges faced by the health workers at the boat clinics. In 2016, SELCO foundation signed a MoU with C-NES to build sustainable energy ecosystem at the boat clinics of Brahmaputra. Through the efforts of C-NES and SELCO foundation, boat clinics now have rooftop solar power plants to run their entire medical and diagnostic equipments along with fulfilling the entire lighting requirement 24 hours a day.

Fig 1: Boat clinics of Brahmaputra, Assam. Image Source: C-NES

Tracking Progress

The roof top solar power plants of the boat clinics are currently providing financial benefits of $480 on a yearly basis (per boat) which otherwise was spent on fueling the kerosene based. The solar initiative has helped in ensuring a constant power supply on the boats especially while touring in remote areas for long durations. The staff at boat clinics feel secure and comfortable during the nights particularly in summer season.

Challenges and lessons learned

- The solar panels need to be cleaned regularly, as the accumulation of dust can impact its operational efficiency.
- Rainy season is subjected to loss of productivity for rooftop solar power plant due to cloud cover.

Next Steps

The management will be taking further steps towards achieving higher efficiency in the already installed rooftop solar power plants. They will also work towards introducing more of sustainable measures to continue to reduce emissions.

Demographic information

Boat clinics of Brahmaputra are primary healthcare centres that provide basic health services to the vulnerable and marginalized communities of islands. These islands are popularly known as chars or Sapori. These are among the most backward areas of the state consisting of more than 2000 villages with little or no available health facility. The boat clinics have become primary access to healthcare for about three million inhabitants of the area. During the current pandemic of COVID-19, boat clinics of Brahmaputra have played instrumental role in scanning the remote villages, for the spread of coronavirus.

Links

To learn more about Health and Environment Leadership Platform's and its members:

https://www.ceh.org.in/activities/help/about/

To gain access to HELP's Information, Education and Communication materials and other case studies:

https://www.ceh.org.in/activities/help/resources/

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2. National Health Mission, Government of Assam. Access link: https://nhm.assam.gov.in/schemes/boat-clinic