



Centre for Chronic Disease Control



WHO Collaborating Centre for Surveillance, Capacity building and Translational Research in Cardio-Metabolic Diseases



Aravind Eye Care



 Puducherry, India

About

- Eye Hospital constructed in 2003
- 450 in-patient beds
- 1600 out-patients/day
- 25 acre campus with physician and staff housing

Sustainable Interventions Onsite

- Decentralised Wastewater Treatment System (DEWATS)
- Solar powered energy system
- Solid Waste Management
- Paddy field and vegetable garden for food production
- Blue-green infrastructure in landscaping
- Plant nursery

DEWATS

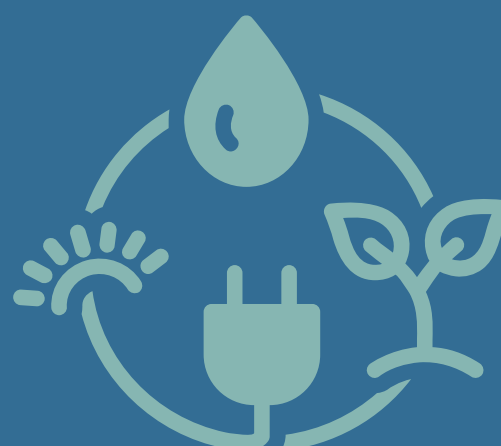


- System installed during construction of hospital
- 100 m³ of water recycled/day
- Quality tested recycled water used for toilet flush and irrigation
- Sludge from DEWATS used as compost
- 50% energy savings compared to borewell system
- INR 4.6 Lakh/year (USD 6100) through sale of food produced with irrigation

SOLAR POWER



- Implemented in 2018
- 201 kW capacity
- 27 kVA inverter
- 845 kWh/ day | 3,00,000 kWh/year
- INR 1.64 Lakhs/month (USD 2200) savings on electricity



SOLID WASTE



- Source segregation and disposal of biomedical waste as per government rules
- Segregation and sale of profitable waste (plastic, paper, glass, aluminium)
- Knowledge and capacity building of staff
- Occupational safety measures for sanitation staff
- INR 1.5 Lakh/year (USD 2000) revenue from selling recyclables



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King George's Medical University



 Lucknow, India

About

- Tertiary care public hospital built in 1911
- 4000 beds, 100% bed occupancy
- 24 acre campus

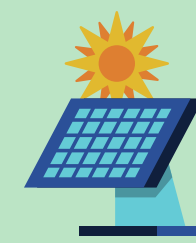
Sustainable Interventions Onsite

- Solar powered energy system
- Solid waste management

SOLAR POWER

Implementation

- Installed in 2017
- Partnership with Uttar Pradesh Non-Conventional Energy Development Agency (UPNEDA)
- 400 kW capacity rooftop solar
- 30 solar parabolas for solar cooking
- Replacement of sodium and high-mast lights with LED lights



30 MW/month generated



INR 33 lakh/year
(USD 45,000) saved



35 kW saved by switching to LED



4000 patients per day fed by solar cooking

SOLID WASTE MANAGEMENT



INR 1.5 lakh/month
(USD 2000) from sale of waste



Occupational safety for staff



Reduced waste sent to landfill



Implementation

- Waste management committee set up in 2009
- Source segregation of solid, liquid and e-wastes
- Onsite autoclaving, vermicomposting
- General plastics/glass/paper and disinfected bio-medical waste sold
- Other wastes sent to respective treatment facilities

Lokmanya Tilak Municipal Hospital



Mumbai, India

About

- Municipal general hospital and medical college
- 1462 beds

Sustainable intervention onsite

Food waste management through composting

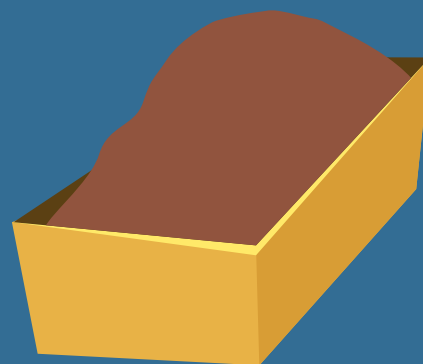
COMPOSTING FOOD WASTE

168 MT wet and dry food waste generated annually



From
2 on-campus canteens, 2 residential complexes, 1 urban health care centre

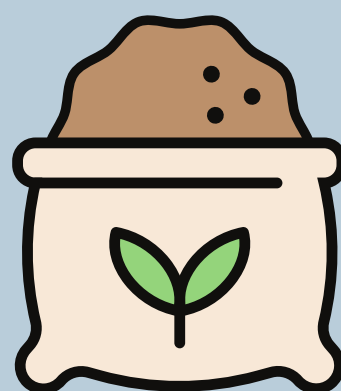
13 brick lined compost pits created in 2017
9 X 4.5 X 3.5 ft in dimension



In partnership with Brihanmumbai Municipal Corporation & Non-profit ECO ROX



168 MT waste/year diverted from municipal dump site



Manure created used for landscaping in campus



Organic kitchen garden planned to supply produce

National Institute of Ophthalmology



 Pune, India

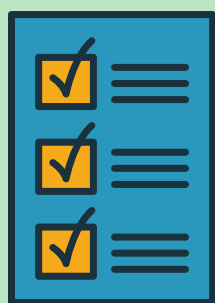
About

- Super speciality eye hospital
- New building established in 2016

Sustainable Interventions Onsite

- Green policy implemented
- Reducing energy, water and carbon footprint
- Staff sensitisation and capacity building

GREEN POLICY IMPLEMENTATION



- Green and Clean + Quality Improvement committees set up
- Green policy and standards drafted for implementation
- Focus on energy, water and carbon footprints reduction
- Staff trained on energy, water and waste management
- Audits conducted to ensure compliance

STRATEGIES IMPLEMENTED TO REDUCE FOOTPRINT

Water

- Water meters installed to measure consumption
- Plumbing checked regularly for leakages
- Posters and visuals on judicious use of water
- Non-infected water reused by cleaning staff



Material use and waste generation

- Materials with less packaging purchased
- Contracts with eco-friendly providers
- Papers used double-sided to minimise waste
- Waste segregation as per municipal guidelines



Energy

- Sustainable building maximising natural light use
- Energy efficient light fixtures (LED)
- Plan to implement solar energy for water heating
- Regular energy audits and evaluation
- Diesel generator only for essential load and emergencies



Vehicle Use



- Monitored by committee
- Regular maintenance checks
- Carpooling promoted
- Reducing idle time



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Boat Clinics, National Health Mission



Assam, India

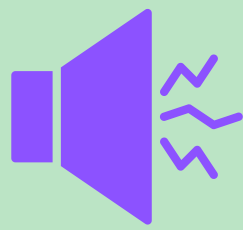
Background

- Major threat of floods to communities living on islands of Brahmaputra
- Construction of permanent health infrastructure challenging
- In 2004-05, CNES* launched the initiative of providing mobile health services through boat clinics
- First boat clinic in Dibrugarh - in partnership with the local government
- 2008 - Public Private Partnership with Govt. of Assam, initiative expanded to 13 districts

Issues with boat clinics



Dependence on fossil fuels - air and water pollution



Noise pollution due to kerosene generators



Cost of fuel

Implementation

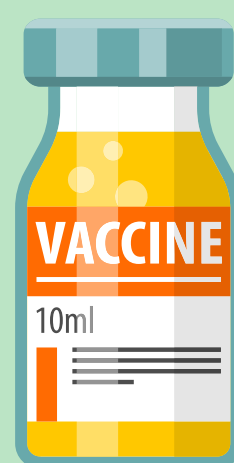


- Detailed cost-benefit analysis was carried out before installing the rooftop solar power system
- 2017 - Solar power plants were installed on four boat clinics in Jorhat, Dibrugarh, Dhemaji, and Tinsukhia
- Each rooftop solar power plant has a capacity of 3 kW
- Primary energy source of the plant - solar photovoltaic module

Outcomes



Savings of USD 480 (INR 35,000) of yearly fuel cost per boat



Better storage of vaccines in solar-powered refrigerators



Overall reduction in air, water, and noise pollution

*Centre for North Eastern Studies and Policy Research



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Bhagat Chandra Hospital



 New Delhi, India

Background

- 85 bedded multi-specialty hospital
- Compact fluorescent lamps (CFLs) were adding to the cost of electricity
- Overall electricity consumption was adding to the carbon footprint
- The hospital wished to invest in clean energy

Sustainable interventions implemented

SOLAR POWER



- 50 kW solar panels installed
- Hospital's electricity dept. and Director involved in monitoring and evaluation
- Internal staff - assigned to clean solar panels regularly

ENERGY EFFICIENCY

Sensor-based lighting systems installed

All CFLs replaced by energy efficient LED bulbs



Old air conditioners replaced with star-rated ones

Auto-locks installed on doors to automatically lock them when not in use, to help maintain the temperature of rooms

Progress Achieved



20-30% of electricity consumption reduced, since the installation of solar panels



Approximately USD 14,800 (INR 11,100,00) saved every year



About 93,000 kg of CO₂ emissions conserved, since 2016



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Holy Family Hospital

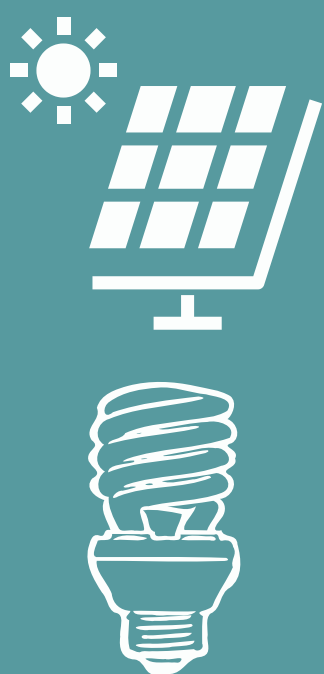


New Delhi, India

Background

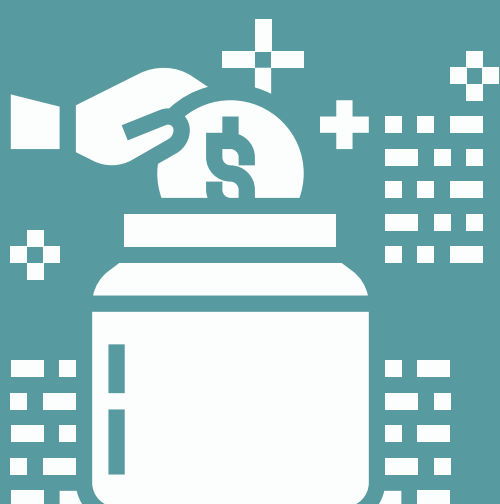
- 345 bedded multi-specialty hospital
- The hospital aimed to reduce its carbon footprint and invest in clean energy, so that they could reduce their dependence on the grid, for electricity

Sustainable Intervention Implemented



- 2014 - Solar photovoltaic (PV) power plant set up, utilising the rooftop spaces available on the hospital buildings
- The power plant covers an area of 4000 sq.m.
- Consists of 1000 PV modules
- Peak output - 300 kW of clean energy
- Regular tubelights and bulbs replaced with LED lights

Progress Achieved



Around USD 4,314
(INR 3,00,000)
saved



Reduction in emissions by
approximately 25 tonnes of
CO₂ per month



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HBT Medical College & Dr R.N. Cooper Municipal General Hospital



Mumbai, Maharashtra

Background

- A public hospital, owned by Brihanmumbai Municipal Corporation (BMC)
- Conventional electric heating systems - adding to major expenses
- Excessive food waste being dumped - creating pressure on landfill sites

Sustainable interventions implemented

SOLAR POWER



- 2016 - Solar water heating system installed
- Capacity - 3000 liters per day, each of the six buildings
- Monitoring and evaluation - carried out by the hospital's electric department and the Dean
- Internal staff members are responsible for regular cleaning of solar panels

FOOD WASTE MANAGEMENT



- BMC collaborated with the hospital management
- 2017 - one vermi-compost unit and four brick lined compost pits (6 ft L x 4 ft W x 2.5 ft H)
- Shree Astha Mahila Bachat Gat (a local non-profit) - roped in to manage the vermi-compost unit
- Cost of labour, operation, and maintenance budgeted under BMC's Swachh Bharat Abhiyan division

Progress Achieved

- 27,000 electricity units saved per year, leading to financial savings of USD 36,300 (INR 27,00,000)
- 270 tonnes of CO2 emissions saved per year
- 60 MT of waste load reduced from being dumped at the municipal site
- 200 kg of manure generated from vermi-composting - cost of purchasing manure saved