

Invited Article

Role of Renewable Energy and Sustainable Technologies in Building an Eco-friendly and Sustainable Anti-poaching Unit in a Forest

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Natural calamities/Disasters can hit any part of the world and thereby damage the networks of water, energy, food and other amenities as well by and large. Although Disasters/Natural calamities are beyond the control of humans, the impact of the disaster can be localized and minimized by incorporation of Renewable Energy and Sustainable Technologies. The present article illustrates the effectiveness of Renewable Energy and Sustainable Technologies in building a sustainable habitat. The article is based on the case study of an implemented project by NIE-CREST.

NIE-CREST (Centre for Renewable Energy and Sustainable Technologies) is a centre of excellence at the premises of NIE (National Institute of Engineering), Mysuru. The centre is promoting eco-friendly energy systems, Renewable energy and sustainable technologies. The centre itself has successfully implemented numerous projects on eco-friendly and renewable energy systems and sustainable technologies in and around Karnataka.

Major technologies promoted by NIE-CREST include Waste to wealth Systems, Kitchen Waste Biogas

Plants, Biodiesel from non edible seeds like Pongamia (Honge), Jatropha, Simarouba, Neem, Mahua (Hippe) and many others, Solar energy technologies - Design & implementation of Solar lighting systems, Parabolic concentrators, Solar cookers and many others, Sustainable building materials like Stabilised Mud Blocks, Alternative building;

Apart from the promotion and implementation of these technologies, the centre is actively involved in Research and Development (R&D) of the eco-friendly technologies. Exhibits of all the technologies promoted are arranged for visitors. The centre is continually involved in conducting Awareness and Training Programmes for all the technologies mentioned above.

Case study of project implemented by NIE-CREST

Aranyaka is an antipoaching unit constructed deep inside the Bandipur forest, Karnataka, India. The project is executed by NIE-CREST. The unit is self sustainable owing to the incorporation of renewable energy and sustainable technologies. The ant poaching unit is rugged, eco friendly and can sustain natural calamities.

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“Aranyaka”



“Aranyaka” An Eco friendly, Sustainable, Renewable Energy based “Anti Poaching Unit”

Source: Authors

“A joint venture of **Wild Life Conservation Trust, Mumbai and Tiger Conservation Foundation, Bandipur**, Designed and Implemented by **NIE-CREST [NIE-Centre for Renewable Energy and Sustainable Technologies, www.niecrest.in]**, **NIE, Mysore** and **Voice for Wildlife Trust – Mysore**”.

‘Aranyaka’- is a first ever of its kind in Indian Forest Zones. It is built at Avarepura, Moleyur, Bandipur. The uniqueness of the unit lies in the fact that the unit has been planned and designed with emphasis on two major aspects viz. **Basic amenities and Renewable Energy & sustainable Technologies.**

Basic Amenities: Basic amenities provided in the unit include spacious living room well ventilated with ample natural lighting, a fire place, Kitchen, Beds of Kadapa slab, Good sanitation via toilet and bathroom. These provisions render the unit a pleasant and comfortable place for the forest personnels to stay even for longer periods in the forest region which in turn helps in conservation of forest.

Renewable Energy and sustainable Technologies: Renewable energy and sustainable technologies include the following


Stabilised Mud Blocks: The camp is built with stabilized mud blocks which were prepared at Moleyur RFO Office site using local soil, sand and 9% cement. About 5000 blocks were used for construction. Unlike traditional clay bricks, these blocks do not require fire





for burning instead they are cured for 21 days. They look natural and provide thermal comfort inside the unit. In addition to this, the stabilized mud block masonry does not require plastering.

Rain water Harvesting: Considering the deficit of water, rain water harvesting has been implemented to fulfill the water demand for major part of the year, for a roof area of 54m² about 40000L of water can be harvested in an year at 93% efficiency. This also contributes towards conservation of water. A total of 9000L storage facility is provided **Thaijar**-A storage tank of capacity 1000L above ground level for storing rainwater, is an other attractive feature of the system

Solar Lighting: Utilisation of solar energy does not essentially fulfill the objective of conservation of energy, if solar energy is utilized with LEDs, the efficiency will be far better. Solar LED (8 Nos.) lights along with a provision for walkie-talkie charger and mobile charger ensures uninterrupted electric power supply and also makes the unit self reliable in terms of energy.

Fuel Efficient Biomass Stoves: The efficiency of conventional cook stoves is less than 10% with release of enormous smoke within the surroundings. These stoves are poor in thermal insulation as lot of heat is wasted in to the surroundings. Fuel efficient Biomass Cook Stove (with a higher efficiency of 45%) and Bath stove have been provided to conserve wood, create a smoke free surroundings.

Sl. No.	Particulars/ Technology	Specifications/ Components of the Systems	Picture
1.	Construction of Building with Stabilized mud block	Construction of building with Stabilized Mud Block Masonry includes Portico, Hall, Kitchen, Toilet and Bath room	

Sl. No.	Particulars/ Technology	Specifications/ Components of the Systems	Picture
2.	Rain Water Harvesting + Thaijar	Includes Trapezoidal channels, PVC Pipes and fixtures, Storage of 9000L (Thaijar of capacity 1000L, Under ground storage tank of capacity 8000L), Settling tank and Sand filter, Simple Hand Pump	
3.	Solar Lighting	Solar LED Lighting includes Solar Photovoltaic Panel of capacity 175W Battery of 12 V rated 100Ah, Wireless set charging point and cell phone charging point and LED Lights (8No.s)	
4.	Fuel Efficient Biomass Cook Stove	2+1 Fuel Efficient Cook Stove including Grate, Door with frame, concrete top plate, ash tray, cooking vessels, heat recovery pan	
5.	Fuel Efficient Biomass Bath Stove	Fuel Efficient Bath Stove including Grate, Door with frame, concrete top plate, ash tray and water heating Vessel	

Source: Authors

Conclusions

Renewable energy and sustainable technologies are effective tools for minimizing the damage which can result from natural calamity, and also help in achieving self reliability in terms of energy, water and hence achieve sustainability.

The implementation of renewable energy and sustainable technologies is likely to reduce the impact of natural calamities like floods, drought to an extent and minimize the after effects of the calamity. With this one can achieve a sustainable habitat.