swasthigram

INTRODUCTION

Swasthigram Trust, ICELA (Indian Council For Enviro – Legal Action) and MCMehta foundation together has around 12.5 acres of land, 12 km off Rishikesh in Utter Pradesh, India. In this land, Mrs. and Mr. Mehta, the principal trustees wish to set up on behalf of the above said organizations, an 'Ashram' which evokes the spirit of human beings to dedicate their energies for the cause of upkeep and revitalization of the environment. The design and construction of the 'Ashram' should be such that the life there becomes a model of austere, eco-friendly, non-wasteful, sustainable yet aesthetic, spiritually uplifting lifestyle suitable and relevant to the conditions prevalent in the country this day, yet scrupulously maintaining international standards in technicalities and basic comforts.

CONCEPT

The activities of the 'Ashram' can be broadly categorized as activities of the following eight communities namely,

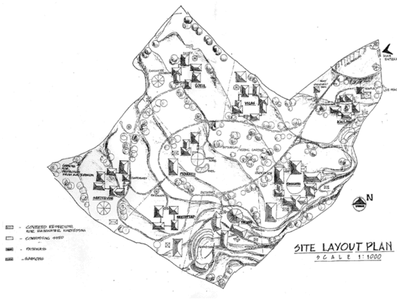
1. **Kailas** : abode of lord Shiv : Temple, Yagyashala (with lab and equipment for scientifically monitoring effects of vedic chanting and yagyas) together with accommodation for priest and caretaker.
2. **Swagath** : Reception, administration, a store for supply of eco-friendly natural products conference facility for 50 people, kitchen and dining facility for 50 people, together with accommodation for a manager and caretakers.
3. **Vigyan** : Resource centre, information centre, library, communication facility including internet, fax, phones, exhibition facility, arts and crafts centre, amphitheatre etc. including accommodation for librarian and caretakers.
4. **Vikas** : Building centre, training centre for training in appropriate technology applications in the fields of building construction, soil conservation, sanitation, energy, water etc. including accommodation for engineer and caretakers.
5. **Sanjeevini** : Dispensary, pharmacy and clinic which can expand to a centre for wholistic medicines together with accommodation for doctor and caretakers.
6. **Neethipeet** : World environmental law centre, classrooms, library, teachers' cabins together with canteen and accommodation for caretakers.
7. **Gokul** : Dairy, cowshed for 5 cows, caretaker's accommodation, biogas plant etc.
8. **Prakriti** : Plant nursery, herbal gardens, green house, botanical garden and gene pool, caretakers' accommodation.

Each of the communities together with the land surrounding the cluster of buildings, can be looked after by a dedicated senior person (may be a retired person) well versed in the respective subject, staying there along with a team of caretakers and interacting with the local communities and people of the region. Each of these communities can have guest accommodation which can accommodate an average of 8 people, thus altogether providing for over 50 guests on a given day. Guests, depending on their choice of subject can choose to stay in the different communities and can come to understand about their activities. They can be built in stages, the first phase having just 'Kailas' and 'Swagath', later on expanding to the others. Also each of these communities can be designed so that it can expand to accommodate a few more spaces.

Principles of bio-climatic designs and technologies making optimum use of local materials are adopted for the buildings. In all the communities, the different spaces are arranged around a central courtyard, taking principles of 'Vastu', traditional design principles derived from times of vedic India, into consideration. The foundations shall be of local stone; superstructure frames of preservative treated bamboo with joints engineered to resist earthquakes and cyclones; cavity walls for the exterior of building and partition walls of stabilized earth making use of the soil from the site itself; and roof of renewable material like local grass (or terracotta tiles). There can be a ceiling of reconstituted bamboo or bamboo ply; flooring of terracotta tiles used in combination with local stone slabs and red-oxide ; optimum built-in furniture. These together with murals and wall paintings form the interior.

Each of the communities will harvest the rain water falling on their land and roofs of buildings to form small covered storage pools, the water in which can be used for irrigation. The community will see to to conservation of soil by a combination of bamboo gabions, geo-textiles, sub-surface drains and soil retaining vegetation. There shall be decentralized waste water treatment system, solid waste management system, solar photovoltaic energy generating and storage system, solar concentrator system for hot water and cooking, photovoltaic powered external lighting, maintained by each community.

Water supply will be from a centralized water tank and sump tank, taken to the communities by underground pipes, as also are fire protection systems. There will be parking space for vehicles near the entrance. Walkways paved with local stone will connect the different communities, which can also be used as bi-cycle paths, for trolleys for transport of goods etc. and also will function as a jogging track. These tracks will also carry solar powered vehicles for elderly people, and in case of medical or fire emergency, should be big enough for bigger vehicles to come in



SWASTHIGRAM IS AN ECO-ASHRAM IN NORTH INDIA ESTABLISHED BY MC MEHTA, AS A SHOWCASE FOR ALTERNATIVE LIVING. TO DEMONSTRATE THE EFFICACY OF SOLAR ELECTRICITY TO A WIDE INTERNATIONAL AUDIENCE OF ATTENDEES TO SWASTHIGRAM'S SEMINARS AND PROGRAMS, A SOLAR ELECTRIC SYSTEM WILL BE INSTALLED TO OPERATE ALL LOADS SUCH AS REFRIGERATION, CEILING FANS, MULTIMEDIA EQUIPMENT, AS WELL AS LIGHTING.

REDI IS RAISING THE FUNDING TO INSTALL THE SOLAR ELECTRICAL SYSTEM AT SWASTHIGRAM. BELOW IS A BASIC SURVEY OF THE SITE NEAR HARIDWAR, AS WELL AS AN ASSORTMENT OF LEVELS OF NEED FOR THE EQUIPMENT AND COSTS:

REPORT AND RECOMMENDATIONS FOR SWASTHIGRAM

Swasthigram is an eco-ashram near Hardiwar, Uttar Pradesh, India which is being developed by the M.C. Mehta Foundation of Delhi, India as a demonstration/teaching center for various eco-friendly technologies and philosophies, in an effort to increase the Foundation's environmental outreach and activism. This report outlines the solar electrification component of the center.

Swasthigram is a compound of approximately 15 acres which will have 20 to 30 small to medium sized buildings, which will be a mixture of residential, cafeteria, lecture hall, workshop, and Shiva temple. All will require lighting, and the cafeterial/dining hall will also require refrigerators, ceiling fans, and appliances. All of these electrical requirements will be supplied by solar electricity.

Because the construction and development will be done in phases over time, the recommendation is that the initial power installation be small to meet the present requirements, and that the system be grown in size as Swasthigram develops. Solar electrical systems are modular, so that as the needs of the complex grow, more solar panels and batteries can easily be added.

The recommendation is that the "General's house" be used temporarily as the powerhouse. The modules should be mounted flat on the south-facing roof near one of the lower corners. This will facilitate periodic cleaning from the ground, rather than someone having to climb onto the roof. The batteries and control center should be mounted inside the building in the same corner so that the wire run is short. The batteries should be enclosed in a box, and the controls and breakers should be mounted on the wall in a separate box. The output cable to the buildings must be routed through breakers before it feeds to the buildings so that the mains can be shut off while new electrical work is being done. Both boxes can conveniently be made from wood by a local carpenter.

The initial system for Swasthigram should be four 75 watt modules. The voltage controller and inverter can be obtained in one inexpensive unit. A small inverter of 550 watts @ 220 volts AC, will be enough power for low-watt lighting and small appliances such as one or two fans, as well as rechargeable battery packs for cordless power tools and cameras, etc. However, water pumps larger than 1/2 horsepower or other power tools cannot be operated. As the power requirement increases the inverter can be upgraded to a larger unit.

The recommendation for specific equipment and costs is as follows: (one $US is 48 Rupies)

SYSTEM ONE: 550 watts	COST: 110,000Rs.
1) four Seimens SP75 modules @ 15,000Rs. each =	60,000Rs.
2) one Steca combination charge controller/inverter @ 120Amps DC/500watts/220volts)	20,000RS.
3) four 120 amphour deep-cycle storage batteries	24,000Rs.
4) miscellaneous wire and hardware	6,000Rs.

SYSTEM TWO: 2400 watts	COST: 252,000 Rs.
1) eight Seimens SP75 modules	120,000 Rs.
2) one 100 amp charge controller	14,000 Rs.
3) one Trace 2400 watt inverter	60,000 Rs.
4) eight 120 amp hour batteries	48,000 Rs.
5) miscellaneous wire and hardware	10,000 Rs.

SYSTEM THREE: 4500 watts	COST: 580,000 Rs.
1) sixteen Seimens SP75 modules	240,000 Rs.
2) 100 amp charge controller	14,000 Rs.
3) Trace 4500 watt inverter	180,000 Rs.
4) sixteen 120 amp hour batteries	96,000 Rs.
5) miscellaneous wire and hardware	50,000 Rs.

COSTS ARE NOT INCLUSIVE OF TRANSPORT AND LABOR/INSTALLATION.

The Indian Government offers a 50% subsidy for solar electrical installations under certain conditions. Because the M C Mehta Foundation is a registered non-profit, it qualifies for the rebate. The money is first spent on the equipment and installation costs, and then the installing agency (be it an Indian company or another non-profit) files the appropriet papers to receive the rebate. REDI is prepared to do the installation within 6 months of the receipt of funding.