Sustainable Tourism

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Abstract: The Incredible India brings forward the vision of sand dunes, sparkling blue water and tea covered hills. Tourism is an industry which holds a promising future in our economy. The various campaigns aim towards attracting the diverse array of tourists from India and abroad.

Though being economically fruitful, such ventures cause disruption to the nature through intrusion of commercial and hospitality areas into the untouched mountains, biodiversity hot spots or river deltas. The weekend retreats or holiday homes popping at an alarming rate are creating irreversible damage to the bio diversity of such areas.

There is a dire need of integrating land, water, ecology, waste, construction management before constructing these buildings. The 3 pillars of Sustainable Development i.e. Economy, Environment and Social must become the foundation of such ventures so that the damage can be minimized as much as possible. With time, the awareness levels towards the fragility our eco systems, especially the hilly ones has come to light.

The concept of Sustainable Tourism must become truly an environment protecting and enriching phenomena. The most transcendent tourism places are also the most vulnerable in terms of earthquake, landslides, soil erosion and degradation, deforestation, ecological disturbance etc.

That's why the idea of Sustainable– Tourism provides the people opportunity to experience the serenity of these beautiful places and at the same time protecting them. This paper focuses on providing guidelines for creating a habitable place, nestled in the nature with minimum disturbance to the surrounding eco-system.

It tries to discuss the 3 facets of sustainability i.e. Economic, Environmental and Social with focus on land management, ecological management, construction management and energy management.

1. INTRODUCTION

The World Conservation Union (IUCN) defines ecotourism as: "Environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features - both past and present) that promotes conservation, has low negative visitor impact and provides for beneficially active socio-economic involvement of local populations".

Sustainable Tourism broadly has twelve aims: Economic Viability, Local Prosperity, Employment Quality, Social Equity, Visitor Fulfillment, Local Control, Community Well-being, Cultural Richness, Physical Integrity, Biological Diversity, Resource Efficiency and Environmental Purity. These aims have to become the base of any design project proposed in the areas with potential of tourism.

2. THE PILLARS OF SUSTAINABLE TOURISM

When an idea of a resort or hotel is conceived, that must be considered the beginning point of integrating the 3 pillars of sustainability into the whole process. According to the Brundtland Commission (1987), sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs."

This definition is the foundation of the 3 pillars of sustainability: Economy, Society and Environment. The pillar of economy deals with the optimum financial output from the project, both for the owners and the visitors. The Society part targets the interests of the surrounding communities, the importance of protecting their cultural practices and making them a part of the project. Whereas the environmental pillar holds the biodiversity, ecology intact. The aim must be to achieve a project on the foundation of these pillars. The process of achieving sustainability in tourism is a comprehensive plan comprising of the following sections:

2.1 Ecological Management

This pillar is the most vulnerable and affected by the erratic construction of hospitality sector. Land is a precious resource, therefore, Land Management is the first and foremost step before initiating a project. The natural land form of the site must be conserved and altered to the least possible extent. This is especially important in hilly areas where cutting must be avoided and the construction should be in the terraced form and contained to a smaller footprint.

The eco system of a site gets altered to generally disastrous results after manmade disruption. The top soil (5-8 cm depth) is the most precious resource of any site so it must be removed and stored in a separate location. Preferably a natural grass cover should be developed on the top to preserve its nutritive value. After the construction is complete, it should be used for landscaping. Soil depletion is a problem faced in the semi-arid areas. Local Species of nutrient rich trees and plants must be used for landscaping.

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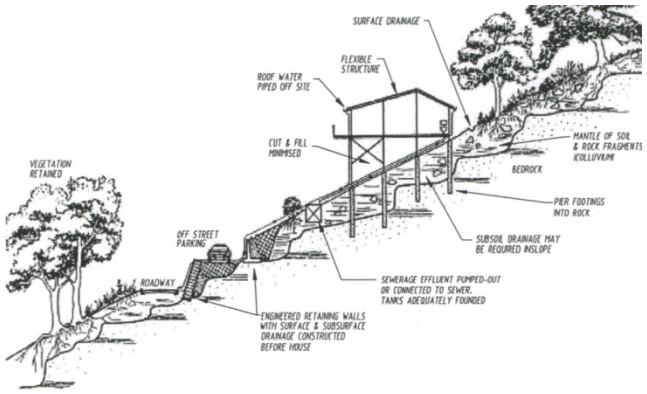

Fig. 1. Example of Good Hill Side Practice

Exotic species consume more water, demand more care and not accepted by the local fauna. Whereas the local species are easy to maintain and are home to the local fauna. Similarly a mix of various trees must be planted rather than few select trees. The combination of various trees provides a healthy eco system for nature to thrive and safe guards against any epidemic.

The trees must be selected as per the site study, as they can act as wind barriers, soil binders, shade providers etc.

Fig. 2. Peelu and Rohida provide moisture retention and shade

A layered development i.e. grass, small plants, shrubs, medium and then large trees provides a wholesome environment for the bio-diversity.

Fig. 3. Layered Development

Every region has its own type of flora, which should be researched and then used like medicinal plants in hilly areas. Bamboo is used for soil erosion control in regions like Garhwal. It acts as a fencing material and serves aesthetic purpose also.

Layered development helps in mimicking forest ecosystem as well as it acts a wind barrier in arid areas. A deformed net like material can be used for soil binding. It allows plants to grow and acts a reinforcement for the soil.

Fig. 4. Deformed polymeric net installed at Kulish Van, Jaipur

2.2 Water Management

Water is required for construction and then for the day to day needs of a project. The natural slope and depressions must be utilized to the best possible extent. Rainwater harvesting measures must be adopted as per the local practices. Kunds, step wells in arid areas can be integrated as aesthetic design features. The water table in the hilly areas is generally high so the focus must be on decreasing the speed of water flow to control soil erosion and landslides so a systematic system of water channelization and percolation must be provided.

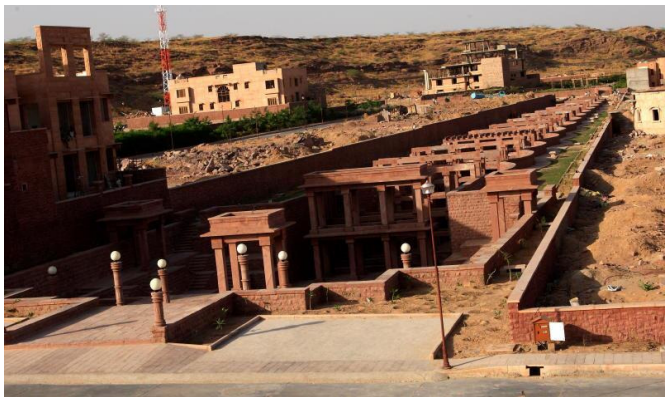

Fig. 5. Birkha Bawri, Jodhpur, A stepped well in a residential colony

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Talwadi system of Uttarakhand is a method of providing small ponds of approximately 1 metres diameter, which allows water retention at regular distances and sow percolation. Similarly in the desert state of Rajasthan, a residential colony in Jodhpur has incorporated the traditional step well in its site planning. Known as Birkha Bawri, this structure is an example of conserving our traditional practices.

Land cover changes can modify the natural hydrological cycle and thus the water resources are very sensitive towards the unplanned land conversions. The nonstructural measures deal with the sustainable modifications of the land cover which provide a natural way of controlling the quality and quantity of storm water. To capture the excess surface runoff, detention drains can be constructed across the slope and retention ponds can be constructed in a suitable location. This can minimize downstream erosion and flooding.

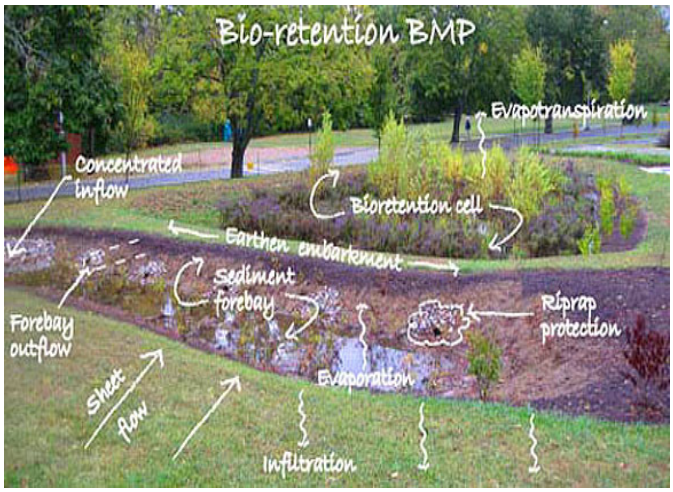

Fig. 6: Bio-Retention Pond

Vegetated paths (or channels) of accumulated surface runoff provide an obstruction to the flowing water. It reduces velocity and hence the erosive power of the flowing water. This reduces erosion of channel bed and bank and prevents gully formation. Root systems of a vegetated waterway not only increase bondage of soil and make it resistant to water erosion, but also promote infiltration.

Fig. 7. Green Pavers & Street side Infiltration Swale

Depending on the status of degradation of the waterway, different types of vegetation can be suggested. [6] Street side infiltration pits and green pavers increase the water retention and decrease the water runoff speed. Such systems must be incorporated in site planning.

2.3 Construction Management

The design of the built structures must allow natural ventilation and light i.e. the design must be climate responsive. It includes in depth study of the climate conditions, critical points, the thermal properties of the material used, shading devices design etc.

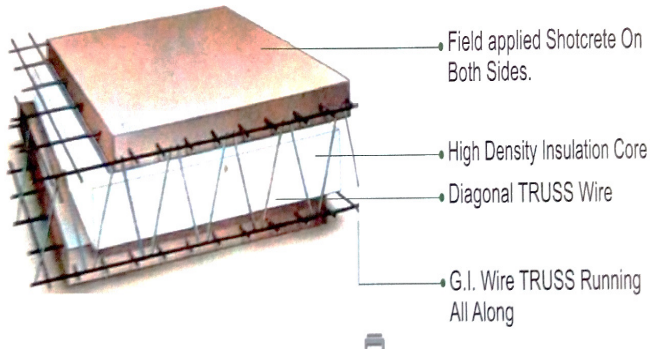

Fig. 8. TRIC Wall

Local material and techniques must be used for construction. The vernacular construction techniques and materials must be researched and used for construction. Local materials are usually best suited for the climate. The mud construction in Kachh or local stone in Uttarakhand will preserve the local techniques and provide employment to the people.

Advanced materials such as TRIC wall can make construction lighter and cheaper. TRIC Eco wall consists of a 3-dimensional structure of up to 3 mm galvanized wire truss. It incorporates a soul made of Expanded Poly – Styrene of minimum density 15 kg/ $m^{3.}$ The EPS core can be of 50 mm – 1oo mm with 40-50 mm M25 grade concrete.

2.4 Waste Management

Individuals seem to create more waste when on vacation than in everyday life. As per UNEP manual of waste and water management, annual solid waste generation per capita is 25% higher than the national average of that particular region.

The kitchens of a resort or hotel generate huge quantities of organic waste which must be used of vermin composting or bio gas, depending on the site conditions and space constraints

Color coded dustbins must be provided at every 400 metres or so as people tend to throw waste around when they don't see a dustbin in sight. The bio- degradable waste must be segregated and used for bio gas production as and the non – recyclable and toxic waste should be segregated and sent to a dedicated facility.

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Accommodation Sector (hotels, guesthouses)

Accommodation facilities generate various types of solid waste:

- newspapers and magazines
- cleansing agent containers used by housekeeping and laundry services
- flowers in guestrooms and public areas
- plastic shampoo and cosmetic soap bottles
- old towels, linens, bed sheets and furniture
- paint and varnishes, used fittings, fixtures and plumbing supplies, refrigerators and other bulk items.

Food and Beverage Services

Most restaurants or restaurant/bar sections of hotels, guesthouses or golf courses dispose of large quantities of solid waste including:

- empty cans, bottles, tins and glass
- food
- small non-refillable product containers (sugar, salt, pepper, flour and cream)
- paper serviettes, coasters, straws, toothpicks and cocktail napkins
- used aprons, kitchen towels and napkins.

Open Spaces and Grounds

Landscaping and gardening activities at golf courses and many hotels generate ground related solid waste including:

- plant trimmings
- empty pesticide/insecticide bottles and fertilizer packs, pesticides, insecticides and fertilizer products (which are often hazardous).

Administrative and Office Functions

A facility's main office, front desk and shipping/receiving areas create solid waste including:

- paper and envelopes
- travel pamphlets and brochures which are often quickly discarded by tourists.

Fig. 9. Solid Waste Generation by Tourist Facilities

Sewage Treatment Plants must be selected as per the space available and the quantities generated. Packaged plants are the most convenient but when a bigger space is available the constructed wetlands or root zone treatment can be done which is a slow process but provides cleaner water.

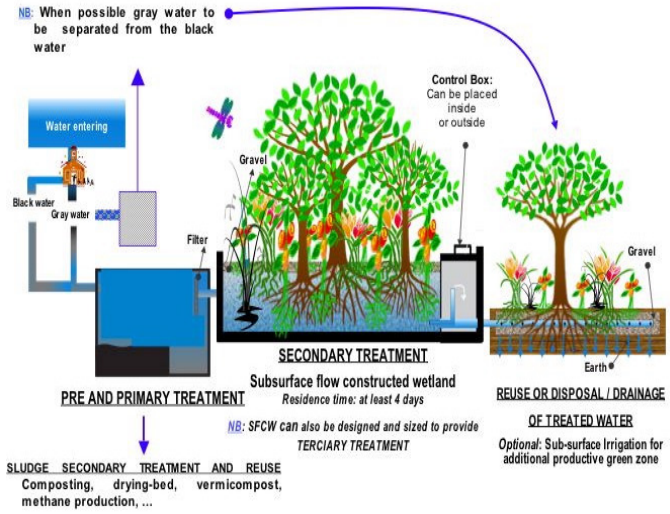

Fig.10. Process flow diagram for a typical treatment plant via subsurface flow constructed wetlands

2.5 Energy Management

Each site is unique in terms of the renewable energy available for harnessing. A study must be done before starting the project about the energy potential of the site so that the best possible hybrid system can be worked out.

A single type of renewable energy is erratic in nature and therefore expensive and not reliable. A hybrid system utilizing 2 or more type of energy becomes reliable. The major types of renewable energy are as following: Wind, Solar, Biomass, Tidal and geo – thermal. These are not available in a uniform manner but are distributed regionally depending upon the physical and geographical characteristics.

In Western India, Solar and wind energy have good potential where in coastal zones tidal energy and wind energy have good potential. Bio mass energy usually works better in fertile areas but nowadays plantation is done in desert areas as well.

Fig. 11. BIPV and Wind Turbine Integration

The building forms, streetscape must be designed to harness the wind energy in the best possible way. Instead of pasting the renewable energy generation measures after the completion of project, they should be integral to the design from the project initiation itself. The orientation of building and the design must be BIPV integrated and the landscaped areas can have designated plantations for bio mass energy generation.

3. CONCLUSION

Any project disturbs the social, cultural and environmental fabric of the people living around. The people residing around the project face the upheaval in their daily lives. The project must employ local people in construction and then as staff.

Skill development and enhancement workshops will create an easily accessible and friendly work force. The disappearing cultural and ethnic practices can be a serious concern. Fairs and exhibitions must be an integral part of the project showcasing the local art and craft.

The projects which imbibe the essence of their surroundings are known to have a greater success. Dastkar, an NGO at Ranthambore, Sawai Madhopur is a perfect example of providing livelihood to people and conserving the local art.

It employs 300 women and provides a steady source of income. The resort can have a workshop for the visitors in

which such techniques are displayed and the merchandise could be sold.

Economy is the base of everything, therefore, employing the local people, using the local construction techniques, providing outlets for regional art and crafts and showcasing the local talent must be a comprehensive part of the project.

This plan will help in negating any social anxiety or negativity faced by the project. Achieving sustainable tourism needs a comprehensive planning of all the factors since the conception of the project.

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