

ACADEMY FOR SUSTAINABLE HABITAT RESEARCH AND ACTION (ASHRA)

Capacity Building for Sustainable Development. Education, Training & Awareness for Sustainable Human Settlement Design

Sustainable Development Challenge

Human settlements are the basis of all development activities and the interaction of man with his environment. The building industry and other activities related to human settlements account for nearly half of the GNP in most developing countries. It is also the single largest factor that contributes to environmental degradation and has a direct consequence on finance, productivity and social behaviour. The design of human settlements encompasses a plethora of issues including land use strategies, watersheds and drainage systems, water supply, economic activity and resource generation etc. Their sustainable approach in a holistic manner, is a powerful mechanism for promoting appropriate development.

A SHRA - The Concept

The Academy for Sustainable Habitat Research and Action (ASHRA) will conduct a training programme for sustainable habitat design that will integrate the efforts in sustainable development to the mainstream education system and the professions. The Centre will provide hands on training to students from architecture and planning schools, through live projects in planning for sustainable design for settlements. It will also promote awareness generation and provide information support for sustainable human settlement design, primarily to a target groups of future and current practitioners as well as to lay persons. ASHRA activities will focus mainly on three programmes the ETA (Education, Training and Awareness) aimed at training select future practitioners, the international habitat technology network and the habitat technology website, directed at the student body, educators, practitioners and civil society at large. The two-latter programmes have already been partially mobilised and implemented. The three programmes are supportive of each other and will work in conjunction with one another.

Objectives:

The education, training and awareness for sustainable human settlement design (ETA) is envisaged as a programme to train future professionals in the areas of appropriate building technologies and sustainable planning strategies and develop a corps of sustainable habitat advocates, within the mainstream. Through this programme a discerning group of trained personnel would be created to become future practitioners and educators within the field as well as in government and other institutions.

The future prospects of ASHRA would be manifold, serving as a model for other Building Centres at the state level as well as across the country, thus making its impact on developmental activities of significant magnitude. Some successful regional building centres are the Nirmithi Kendra in Kerala and the Auroville Building Centre in Pondicherry.

The ETA

Approximately fifteen students will be recruited from different regions, from amongst the student members of the website, to undertake a one year training programme with the Academy. This will form a part of the practical training that students in architecture schools have to undertake during the third or fourth year of their curriculum. Thereafter, the students will return to their colleges and complete their educational programme. With their increased awareness and knowledge from the



training received at the Centre these students will bring their experiences into the regular studio curriculum and hence influence thinking amongst other students and the faculty. This is expected to raise the awareness amongst the student body at large. Support for guidance and information regarding issues and questions raised in the schools will be provided by the Academy through its website. This mechanism would hopefully generate interest amongst other students to undertake the training programme at the Academy and motivate them into achieving the high standards therein. During the first few years the core faculty of the Academy will also make eight presentations each month to different colleges across the country to propagate sustainable human settlement design and planning. This is with a view towards increasing awareness amongst the student body and faculty of the schools and encouraging their active participation in the Centre activities through its website. The Academy will develop and upgrade its existing website, the Habitat Technology Website (HTW) and operationalise online communication with the target audience through its server. Through this site it will provide online lectures to regional colleges, and discussions on the various issues by means of video conferencing. Colleges will be invited to become members of this website by paying a nominal subscription. In addition, each individual student can subscribe to the network. The trainees will be recruited through a system of online communication through the Centre's website. The training will be open to any student of architecture or planning who are members of the international HTN. Students from other developing countries will be encouraged to participate. During the training period they will receive a stipend at par with what an average assistant engineer would receive, and will be provided boarding and lodging at the Centre. At the end of their training a certificate stating their specialised training will be given to them. The Academy will strive towards self-sufficiency and gain recognition amongst the student body and profession on the basis of its quality of experience.

With over a hundred schools of architecture and planning, each having an average of 60 students in the 3rd and 4th year of their studies, there are 6000 potential students in the identified target group. We expect a website membership of approximately 16% of these students i.e. about 1000 students. From amongst these, 15 students will be selected for participation in the Academy's training programme, on the basis of their inclination, response and consistency, as assessed through interaction with the student over a sustained time period. The online communication with the students through the Centre's website will provide the medium for such interaction. Selection of students for the ASHRA training programme will be done annually through its website.

The Habitat Technology Network

Prospective house builders are often curious and wish to experiment with new systems being researched and used, but are often discouraged by a lack of comprehensive information. The sheer magnitude of people who want information makes it impossible for anyone to give personal attention to each query. Publications brought out for the purpose are inadequate since users do not get a visual feel of the process involved and of its final outcome. The aim of the Habitat Technology Network is to provide commonly sought after information and data on alternative building techniques and sustainable planning process, in a comprehensive and simple manner, through audio-visual means. It is meant for a wide viewership, comprising architects, builders and lay persons, enabling them to make appropriate decisions regarding the usage of technologies that are appropriate and sustainable.

Over the years the Building Centre has continually developed innovative and ecoresponsive building and planning techniques recognising the fact that visual aids are the best way to learn as out the process of building systems. Thus, the Centre has been documenting its work in the development of appropriate technologies and sustainable planning on video films. These films also discuss the rationale and the process of appropriate development, simultaneously dovetailing it with traditional practices. This is the crux of the Habitat Technology Network, which encapsulates weeks or months of the implementation process into short demonstration sequences. Eventually these video demonstrations will be accompanied by expert comments from people involved with the actual



design and construction of the system. The Building Centre has its own equipment for filming broadcast quality films and preparing rough cuts. It has completed 11 films and has footage for about another 50 films.

Implementation Mechanisms

The Centre will design and implement settlement projects for local governments and for the housing needs of industrial townships, using appropriate construction techniques and sustainable planning strategies.

It will continue research into building technologies and planning systems with continuous feedback. It will study and analyse regional responses related to traditional practices in planning and settlement design and their management; rationalise them with respect to dovetailing them into current development and technologies, thus evolving indigenous and appropriate solutions.

It will document and evaluate these projects and techniques and feedback to develop better strategies.

It will generate awareness and provide information and technical assistance to students and faculty in the field of habitat design through its website, the Habitat Technology Network.

The Academy will also provide information and access to these technologies to the general public through the website and through exhibition of technologies, materials and equipment and through the medium of films.

Awareness Promotion and Diffusion of Technology

Apart from the training programme, information dissemination is also a related objective of the Academy. Awareness promotion, information and technical support will be provided to students of architecture and planning, architecture and planning schools, architects, builders and developers, interested citizens, institutions, business and industry, in the following ways:

An exhibition area at the Centre which will display the technologies, various equipment and moulds, cost effective technologies and planning strategies.

The Habitat Technology Network has films on these technologies and planning issues. Facilities for viewing these will be provided in the exhibition area; in addition these films will be available through subscription to schools, institutions and individuals.

The Anangpur Building Centre website will also answer queries from the various subscribers and provide technical support.

Many tools and equipment that produce better workmanship and greater efficiency, are not commonly used in the local building industry since the capital costs for such tools is too high for the individual workman and home owners. Individual home owners and independent architects who cannot afford high investment equipment for specialised workmanship will be provided the facilities to rent equipment from the Centre to facilitate good quality construction, using appropriate technologies at the individual level. This will include equipment such as drills, hilti guns, fibreglass moulds, hand block casting moulds and semi-mechanised block casting. Partnership arrangements will be made with the manufacturers of such equipment, wherein they will display their products at the Centre's exhibit area and provide information support to this activity. We already have positive feedback from a number of companies for their participation in such a programme.



Technology Developments:

- Pre-cast, exfoliated vermiculite panels for roofing a low cost, thermally insulated roofing alternative.
- Pre-cast, pre-finished, exfoliated 'Jack Arch' for roofing minimising steel consumption in roofing
- Hollow core pre-cast, pre-finished block Interlocking Block for walling.
- Development of the use of fly-ash (an industrial waste material) for walling blocks
- Diaphragm blocks
- Sandwich polystyrene panels
- Funicular shells in brick and stone waste for roofing.
- Flat funicular shells
- Ferro-cement purlins, rafters and beams
- Lightweight Structural systems for use in village schools and community buildings based on octagoodules, geodesics, A-frames and hyperbolic paraboloids

Finance and Resource

The objective of the programme is to make ASHRA a self-sustaining organisation. The Academy will undertake pilot projects, low cost housing and other human settlement projects with state and local governments within India. It will also be available to provide support and training for similar projects in other developing countries. Consulting fees and project management fees as payable under the usual norms for these projects will provide the revenue for the Academy's resource needs. The Academy will undertake actual implementation of such projects at rates competitive to the market rates. This will serve a two-fold purpose firstly projects that introduce innovative design and planning strategies often remain unrealised due to a lack of implementing agencies with the experience of executing such work. Implementation of projects by ASHRA will ensure that actual work on site takes place. Secondly, under the usual system of project implementation, the project costs become inadvertently high compared to the actual amount of work undertaken due to a very large component of overheads, comprising high departmental overheads, speed money and dual contracting (thus creating profit margins at two levels).

The Services the Academy will provide to the client group:

- Planning and design of the projects using appropriate techniques
- Implementation and project management of pilot projects
- Technical support for implementation in terms of equipment and manufacture of building components
- Development of building technology, systems and equipment

The current slum population in Delhi alone is estimated at 3 million, with a housing need of 6,00,000 houses. The Delhi Government has allocated a budget of Rs. 26, 400 million. A project for rehabilitation of slum dwellers at Jaunapur, Delhi has already been finalised and the Centre has constructed 52 pilot units at the site with the stipulated cost of Rs. 44, 000 per unit and made a reasonable profit of 15%. The cost per unit under the conventional system of building and its related overheads was estimated at Rs. 80,000 per unit. The cost of the entire settlement is estimated at Rs. 160 million over a period of two years to provide for 3600 families.

The Anangpur Building Centre has established itself as a resource for appropriate building techniques and sustainable planning strategies over the years. It has independently set up, without external funding and infrastructure, an information and knowledge base and a network of trained persons as



detailed below. To disseminate the knowledge, skills and attitudes at a scale large enough to have an impact a programme such as the ASHRA is essential. It is to upgrade and mobilise the current set up according to the required scale and level of activity as outlined in the ETA programme, that the ASHRA is seeking funds.

Available Resources

Substantial resource is available for the Academy in terms of space, infrastructure and support. These include:

Building techniques and systems developed over the past 12 years are one of the important resources available to the ASHRA. These have been tested through demonstration buildings and also been executed in a number of pilot projects such as those at Jaunapur, Bhoomiheen Camp and Prayog Vihar. The Building Centre also has the experience of implementation projects with, as well as for government agencies and industrial houses.

Back up documentation in the form of video films, slides and photographs, written papers and articles and drawings for these practices is available. The Habitat Technology Network has already completed 11 films dealing with issues and solutions for appropriate technologies, building materials and techniques, recycled materials and water management. Two hundred hours of unedited film on various sustainable human settlement design strategies is also available.

The documentation has also been converted into 'html' format for uploading on the Centre's website, and 180 Megabytes of information have already been uploaded and are available on the Internet.

In addition, the Centre has a large bank of resource persons that have been associated with its past activities and have received training at the Centre. Approximately 200 architects have trained with the Centre in the past and a large number of them are available to support the Anangpur Building Centre Academy in its objective of promoting sustainable design practices in mainstream planning. Over 6000 masons and skilled workers have been trained by the Centre and currently 400 skilled masons and other specialists familiar with the developed techniques are available to support the implementation of sustainable design projects that the Centre proposes to undertake. The Centre also has the experience in training government personnel. It has conducted training programmes for administrators of housing boards and PWD (Public Works Department) engineers. Films produced by the Habitat Technology Network are being used at the training institute of the CPWD.

Built-up space of 8000 square feet at the Centre at Anangpur, including office space, studios and exhibit area, space and facilities for boarding and lodging to be provided to the trainees, and open grounds for demonstration of technologies. Ancillary areas such as stores, kitchen and toilets already exist. The built-up areas are themselves demonstrations of various building technologies. The site is fully developed and serviced with its independent bore well for water supply, and a stand-by generator for electricity back up.

A fabrication unit for fabrication of steelwork for development of building equipment such as moulds and jigs and for building components such as trussed girders, space frames and A-frames is available as a support to the ASHRA. Equipment and tools, such as fibreglass shuttering moulds, block making machines and moulds, cutting, welding and grinding tools are available to support the building techniques that have been developed by the Centre.

Video documentation equipment consisting of video cameras, both Hi Band and Digital, and cut to cut editing facilities in Hi 8 format is already available.

