



Development Alternatives World Headquarters
**Eco Architecture for a
Sustainable Future**



Development Alternatives

B-32, TARA Crescent,
Qutab Institutional Area,
New Delhi - 110 016, INDIA

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Website : www.devalt.org; www.tara.in

Land Area : 3116 sqm
Built Area : 3096 sqm superstructure
: 1526 sqm basement
Population : 300 persons
Functions : Offices
: Resource Centres
: Conference Facilities

Architect : Ashok B. Lall – Architects
Design Team : The Development Alternatives Family

Consultants
■ Structural : Mr. Subir Roy Chowdhry
■ Electrical : M/s Kanwar Krishn Associates Pvt. Ltd
■ Plumbing : M/s Krim Engg. Services Pvt. Ltd
■ HVAC : M/s Abid Hussain Consultants

Builders/Contractors
■ Civil : M/s Gurubaksh Singh B.A. Builders Pvt Ltd
■ Electrical : M/s Shivam Engineers
■ Plumbing : M/s Yash Plumbing Engineers
■ HVAC : M/s Adhunik Vatankool Pvt Ltd.
■ AHU : M/s Vikram Hitech
■ Lift : M/s Schindler

This path breaking project has been generously supported by the Swiss Agency for Development and Cooperation with whom Development Alternatives has a long term institutional partnership. It has also received funding from ACC Limited, India's leading Cement Company, and the Holcim Foundation for Sustainable Construction. When completed, the building will house the new Centre of Excellence in Sustainable Housing and Rural Infrastructure.



Green Solutions for GREEN BUILDINGS

The Development Alternatives World Headquarters, located in New Delhi, is one of the first buildings in India that aims at Zero Emissions.

The building is best described as a living ecosystem: a fine balance of natural and man-made processes employing environment-friendly energy, material and water management methods. A living testimony to the vision, mission and commitment of Development Alternatives to creating a national future that is based on social justice and a cleaner environment. It is already becoming the benchmark for green buildings in India.

It is now widely accepted that the business decisions enterprises make should be based not only on the conventional financial factors such as profits or dividends, but must also consider the immediate and long-term social and environmental consequences of their activities. India, which is still a transition economy, has the opportunity to bypass the costly environmental mistakes of the industrialized world and get a head start in building a greener world by promoting the use of environmentally sound, affordable building materials and technologies.

Development Alternatives believes its newly reconstructed Headquarters building will set a standard for 'responsible construction practices' in India that will rely on the use of alternative, eco-friendly and cost-effective methods, technologies and solutions.



What is it that makes the DA World HQs so significant?

The new DA World Headquarters is probably the most sustainable building on the Indian subcontinent, its construction involving a wide range of resource conserving strategies that include:

- User defined norms and standards for thermal comfort, ventilation, lighting, waste management and water use for high worker performance while minimizing resource consumption, for example:
 - acceptance of indoor temperature range from 16o to 30° C (vs. the international norm of 18° to 28° C) that is relevant for tropical regions
 - maximum use of natural lighting and installation of high-efficiency lighting systems
- Conservation measures that harvest, reduce, reuse, recycle and recharge the scarcest resources – energy and water – through
 - maximum reuse of material from the previous HQ
 - maximum use of local materials
 - total rainwater harvesting and ground water recharging
 - innovative hybrid cooling system to minimize use of energy and water

The construction systems used are an inventory of innovative and green building materials and techniques that are easy to replicate in both urban and rural areas and therefore ideal for the mass market which:

- Employ production systems for easy-to-use, quality prefabricated elements for roofs, floors and walls which are eco-friendly
- Use decentralized and even onsite production methods innovated by DA such as utilizing debris from demolished buildings to make fly-ash and mud blocks
- Use advanced, environment-friendly construction systems that conventional contractors can easily adopt, such as ferro-cement channels and fly-ash blocks
- Provide a template of building management systems such as for water, energy and waste that can be adopted by urban neighborhoods to reduce their ecological foot-print.



A cutting edge prototype to showcase environmentally sound solutions for contemporary work space demands in urban centres of North India, the new headquarters building design optimises use of local resources, materials and skills through the application of advanced scientific and engineering knowledge.

An Eco-Architecture MILESTONE

DA's HQs exemplifies the social and environmental values that the organization promotes and seeks to fulfil the expectations of its partners, customers, peers and indeed the society at large by demonstrating:

Responsibility towards use of scarce natural resources

- all wood work and furniture uses timber from certified managed plantations
- all rainwater at the site will be collected for recharging the ground aquifer

Recognition and promotion of local crafts in various building elements, e.g.

- terracotta elements for fenestration
- artisan based carpentry works

Promotion of sustainable livelihoods and local rural and peri-urban economies

- by using building elements made by technology and skill-based small enterprises

Promotion of an inclusive approach in design in:

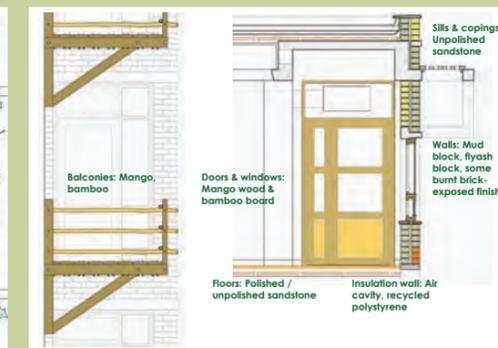
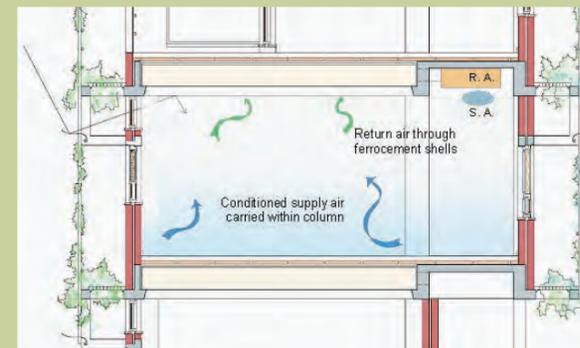
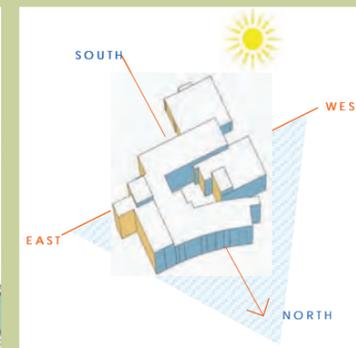
- the highly participatory process followed to design the building, which has been fully documented, increasing ownership and responsible use by user building and spatial design, which is highly sensitive to requirement of universal access, including
 - enabling persons with disability to reach all points with ease
 - enabling persons from all strata of society to feel welcome

Promotion of the principle of equal opportunities employment by providing:

- child care facilities for parents, especially working mothers
- security systems for women employees

Conforming to the highest standards of

- environmental and resource conservation
- safety and security of personnel
- total compliance and transparency in processing statutory approvals



A SUSTAINABLE BUILDING

...Maximising performance, minimising resource use



The DA World Headquarters seeks to serve as a model for enhancing the productivity of those who work in it while reducing the use of scarce natural resources such as energy, water and materials.

Embodied Energy

The construction industry and buildings, on account of increasing operational needs, account for 30-40% of the primary energy consumed in developed and rapidly developing economies; their resulting contribution to greenhouse gas emission have become too significant to be left unattended. Buildings also account for one-sixth of the world's fresh water withdrawals, one-quarter of its wood harvest, and two-thirds of its materials and energy flows. If "business as usual" methods of using glass, steel and aluminium, in large span tall structures continue unabated, the impacts on climate can only keep growing.

In pursuit of a more sustainable energy use trajectory, DA's innovative HQs Building uses materials and construction technology that have low embodied energy. The structural system consists of a short span RCC frame with ferro-cement shells and shallow masonry domes, which significantly reduce the consumption of steel. The building also uses the earth excavated from the site, materials recycled from the earlier HQs, as well as fly-ash waste from local thermal plants for masonry infill walls. All these are extremely low energy materials that can be processed into building components locally, thus involving minimum transportation. Over 90% of the building materials are sourced from regions neighbouring Delhi. Use illustrations (iii), (iv), (v) and (vi), these are presumably from a presentation or some other report.

Operational Energy for Indoor Environmental Control

In a climate like Delhi's, with its highly variable temperatures and humidity, cooling, heating and reducing humidity in different seasons involve considerable energy – accounting for a major impact on the environment. The DA building employs two methods for minimising energy use with innovative approaches for integrating the passive built fabric with its active systems. It is designed to save 40% in operational energy consumption.

Passive Energy Systems

The primary strategy is to curtail heat gain through the building fabric by ensuring favourable orientation with respect to the sun's trajectory and carefully designed shading and insulation of walls, windows and roof. Secondly, the building is "clothed" with plants on its eastern and western faces and on the roof.

The window system is designed to allow altering the heat transfer properties by opening and shutting the inner leaf of double glazed panels to take advantage of favourable ambient temperature in some seasons.

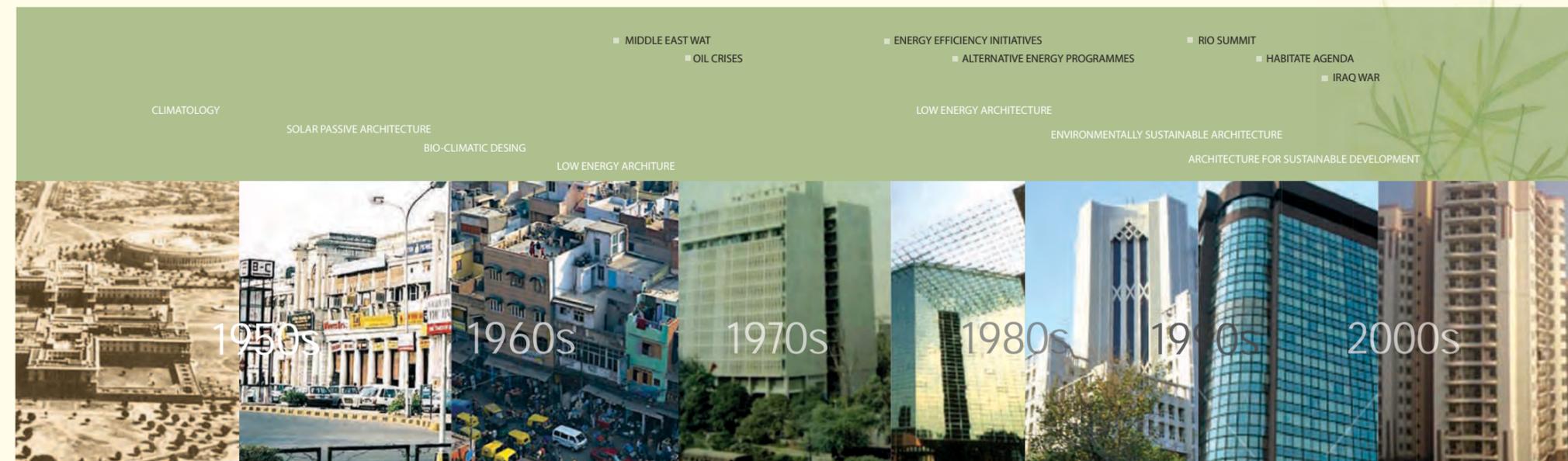


Ecological quality and energy conservation

The building demonstrates a high degree of energy (and water) conservation while maximising the ecological health of the workplace by

- Employing a lifecycle ("cradle to grave") approach for selecting design and materials
- Reducing embodied energy by using less energy intensive building components such as
 - compressed earth and fly ash blocks for walls
 - ferro-cement channels and shallow masonry domes for roofs and ceilings
- Reducing total operational energy needs up to 30% below conventional buildings by
 - rationalizing energy requirements according to actual user preferences
 - optimizing orientation to maximize natural lighting, insulation and ventilation
 - meeting remaining energy needs for lighting, heating, cooling, etc., through innovative systems that integrate renewable energy, hot water and the highly efficient hybrid HVAC system

- providing green cover and built-in shading devices that also
 - serve as vertical access for building maintenance
 - reduce energy load
 - provide aesthetic appeal to the building
- Minimizing use of "virgin" material such as soils, aggregates and steel
 - the building has reused the basic building material recovered from the demolishing the earlier structure, demonstrating a "grave to cradle" approach
 - use of prolifically available industrial wastes such as fly ash and stone dust
- Minimizing use of drinking quality water for purposes other than drinking and cooking, e.g.
 - modular HVAC system balances energy-water requirements
 - selective thermal conditioning of work-places
 - water is recycled for use in toilets as well as for gardens and recharging water tables
 - efficient devices such as water conserving faucets and showers



Economic performance

The DA HQ maximises economic benefits to users and promoters by
Reducing initial construction costs by up to 20% in civil construction and services below conventional contemporary construction through efficient design and optimum use of materials

Selecting low maintenance, high durability materials and finishes that provide long term benefits to users and eventually to the environment, e.g.,

- stone instead of vitrified tiles for floors
- exposed brick finish without paints

Reduced operational costs by

- designing for secure access without large security staff
- using highly efficient lighting and airconditioning systems
- reducing energy costs for cooling and heating by appropriate passive design and incorporation of double glazed windows



Design and Building Management

Development Alternatives does not promote any particular style or aesthetic. Design is a process of discovery where solutions are found appropriate to a given building in a specific context. The process was driven by three guiding principles:

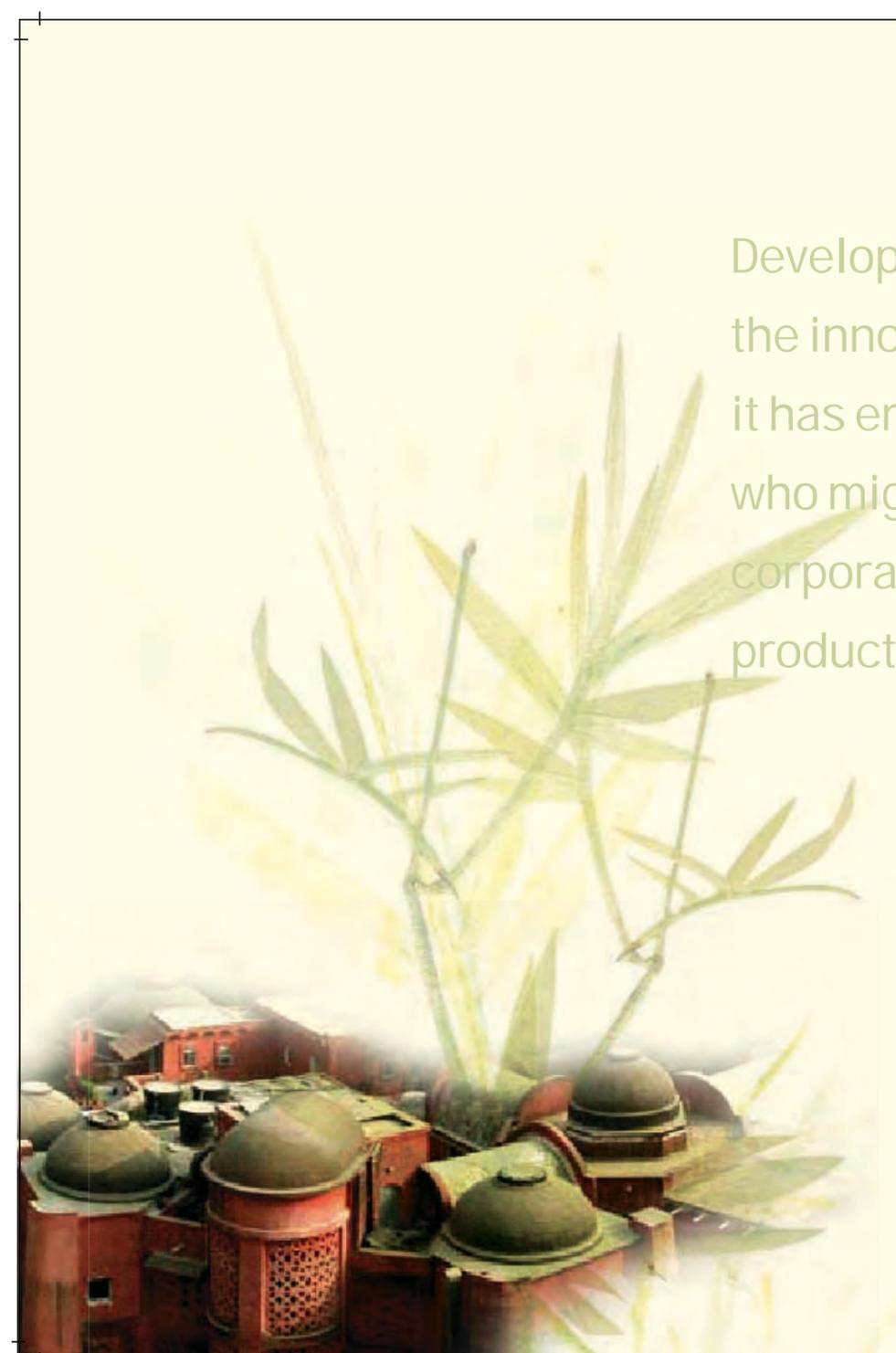
- Inclusion of the views of all user groups at all stages of the project by appropriately structured consultation
- Search for simplicity and economy of means
- Prioritizing selection of design strategies and technologies in favour of sustainability and energy conservation

To this end, the process of design thinking has been a partnership between Development Alternatives and the Architects, taking advantage of the experience and resources of Development Alternatives community.

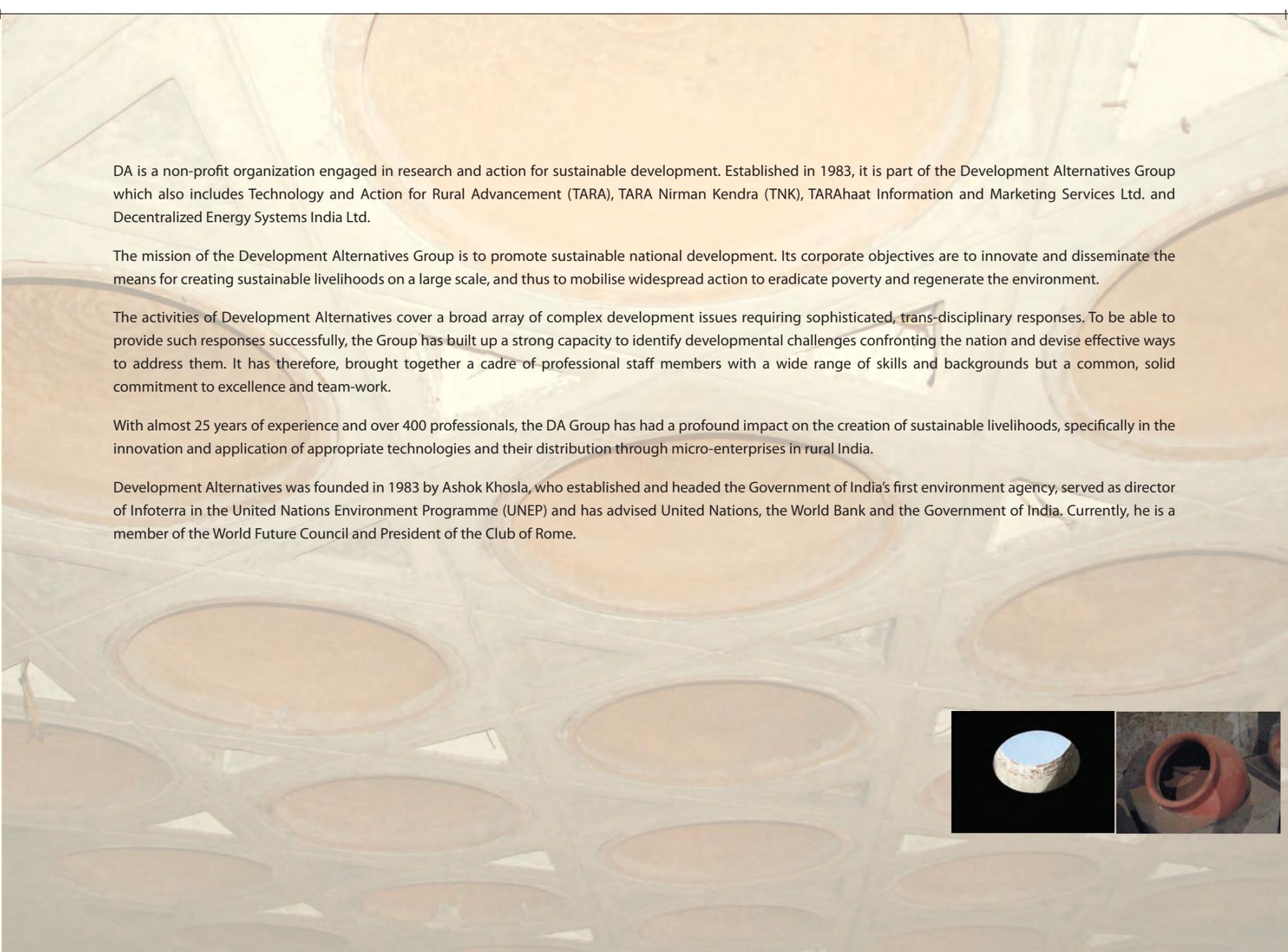
The building is designed to be highly modular and flexible to allow it to be reconfigured as needed for changing work patterns and staff requirements

- Each section of the building can be individually controlled for climate, ventilation and lighting
- Limited space for each workstation, generous arrangements for meetings, group work
- Advanced network design enables staff members to tailor connectivity and communications to their needs
- Flexibility in design of the HVAC system allows compatibility with present and projected norms and standards, e.g. permissible refrigerants R-410 used in the modular system can be changed as new and more stringent norms come into existence
- Procedures for operating the building codified and internalized by users to ensure that water and energy conservation is maintained





Development Alternatives is pleased to offer the innovative methods and technologies that it has employed in the new DA World HQ to all who might wish to take advantage of them – corporations, manufacturers of building products, architects and interior designers.



DA is a non-profit organization engaged in research and action for sustainable development. Established in 1983, it is part of the Development Alternatives Group which also includes Technology and Action for Rural Advancement (TARA), TARA Nirman Kendra (TNK), TARAhaat Information and Marketing Services Ltd. and Decentralized Energy Systems India Ltd.

The mission of the Development Alternatives Group is to promote sustainable national development. Its corporate objectives are to innovate and disseminate the means for creating sustainable livelihoods on a large scale, and thus to mobilise widespread action to eradicate poverty and regenerate the environment.

The activities of Development Alternatives cover a broad array of complex development issues requiring sophisticated, trans-disciplinary responses. To be able to provide such responses successfully, the Group has built up a strong capacity to identify developmental challenges confronting the nation and devise effective ways to address them. It has therefore, brought together a cadre of professional staff members with a wide range of skills and backgrounds but a common, solid commitment to excellence and team-work.

With almost 25 years of experience and over 400 professionals, the DA Group has had a profound impact on the creation of sustainable livelihoods, specifically in the innovation and application of appropriate technologies and their distribution through micro-enterprises in rural India.

Development Alternatives was founded in 1983 by Ashok Khosla, who established and headed the Government of India's first environment agency, served as director of Infoterra in the United Nations Environment Programme (UNEP) and has advised United Nations, the World Bank and the Government of India. Currently, he is a member of the World Future Council and President of the Club of Rome.

