

# Simply Sustainable

Architect Ashok B Lall presents a strong case for cost-effective, creative and simple, sustainable architecture with his design of the IRRAD building in Gurgaon.

When the SM Sehgal Foundation decided to create a workspace for its social initiative - the Institute of Rural Research and Development (IRRAD) in Gurgaon, it wanted a frugal, environmentally sensitive structure that would symbolise its dedication to rural development. Concerned about increasing energy consumption, the foundation was particular about the office design addressing the danger of global warming. With all these ideas in mind, they approached architect Ashok B Lall, the guru of sustainable architecture.

"The brief was clear - use as many natural materials as possible and try to reduce dependence on energy," says Lall. Apart from his client's brief, Lall planned to maximise the use of daylight and minimise the need for air conditioning. To achieve all this, his team turned the conventional practices of interior design upside down. "There is continuity in the building - offices, classrooms, boardrooms and exhibition areas are related to the outdoor space," claims the architect. "There is a strong relationship between the indoors and the courtyard; you have to look at the building in totality," he adds.

## Basics of light and air

Natural light plays a very important role in all the functional spaces of the IRRAD building, which require artificial light only on overcast days. The architect has tried to modulate the quantity of light based on the positioning of the building and by using fixed blinds. "Only the classrooms have movable blinds to shut out light during film projections. Here, one west facing window uses blinds, while the rest are daylight modulated," says Lall. The auditorium has the option of using both natural as well as artificial light, with the help of a simple pulley.



*Natural light is modulated through fixed blinds and based on the positioning of the building.*



*The courtyard has been converted into a semi indoor space with a huge photovoltaic solar roof. A concrete jaali controls light and filters designs from sunbeams.*



*Glass partitions allow natural light in all functional spaces and minimise the need for artificial lights.*



*The building optimises on natural ventilation, which helps to restrict the use of air conditioners. Apart from the auditorium, most areas have ceiling fans.*

Explaining the relation between light and energy, Lall says, "Shading systems should be designed in such a way that practically no sun hits glass."

Choosing green techniques, he has used timber instead of aluminium for air conditioner grills, since timber is renewable and helps reduce energy consumption. Lall says that he ensured that most of the timber was sourced from managed forest resources. Air conditioning ducts are contained in a limited area and therefore only about 20 per cent of the building has false ceilings. The building optimises on natural ventilation, which considerably reduces the need for air conditioning. Most spaces including the auditorium, have ceiling fans. "This building requires air conditioning only for 60-70 days in a year," claims Lall.

Every material in this structure, like timber and bamboo, have been used in their natural condition and artificial colours have been consciously avoided. "You are sure to enjoy the building and appreciate its originality," declares a satisfied Lall.


Hues like white, grey and brown dominate the palette. Glass partitions ensure natural lighting, and the converted semi shaded courtyard has a large photovoltaic solar roof. The building generates power from 35 kW photovoltaic solar panels. A concrete jaali modulates natural light and filters pretty patterns from the sunlight.

#### Creating out of waste

Sourced locally within a 500 km radius, most of the




*Bio-mass materials like bamboo, teak wood, timber and rubber wood used in the building, required very little processing energy to make them suitable for usage.*



Natural light flows into the auditorium through narrow slits in the wall while waste materials make up the creative backdrop.



The offices, classrooms, boardrooms and exhibition areas are all related to the outdoor space and maintain continuity in design.



Materials like timber and bamboo have been in their natural condition and artificial colours been consciously avoided.

materials required very little processing energy to make them suitable for the building. His team was partial to bio-mass materials like bamboo, teakwood, timber and rubber wood. "These are easily renewable and hold carbon dioxide within. We banned aluminium because it consumes great amounts of energy," explains Lall.

Known for their sustainability, large quantities of granite and sandstone were favoured in the project. Tireless efforts were made to minimise wastage to the utmost extent. The design team created stone patterns very different from traditional geometrical shapes. Lall feels that this helped utilise the leftovers and gave the project a new dimension in design. "Our mantra was 'no wastage' and our creative challenge was to move beyond the conventional," he elaborates. Apart from stones, other waste materials like mirrors, broken tiles and plywood were imaginatively employed to fashion backdrops of important parts of the building, like the reception and the auditorium. Even leftover materials from lifts were used at the entrance and on benches. The bricks in the building are made from earth excavated for creating the basement. The architect even left a portion of the wall uncovered, to give visitors an idea about what lies beneath its shiny surface!

The IRRAD office is self sufficient with a pantry as well as segregated biodegradable and non biodegradable dustbins on each floor, which leverage its sustainable model.

### Concept and cost

Backed by over a quarter of a century of architectural experience, Lall feels that 80 per cent of sustainable designing is about common sense and only a small part deals with sophisticated technology. "Technology is only required to cut the energy consumed by air conditioners. With intelligent designs such as the IRRAD building, electricity costs can be brought down by almost 50 per cent."

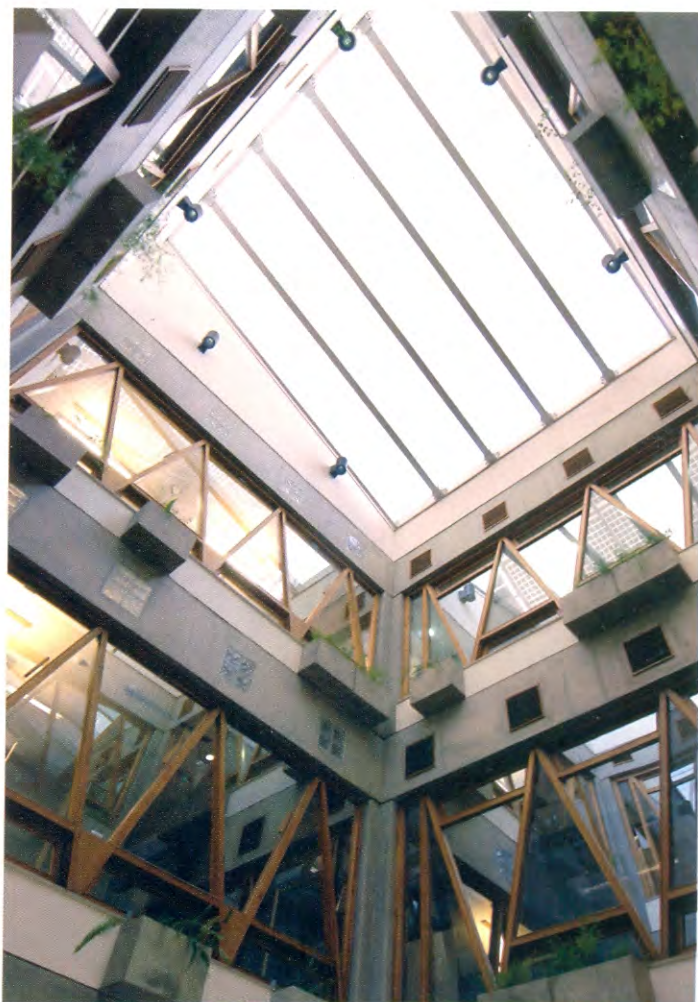
Acknowledging that sustainable architecture is misunderstood and that some architects even fail to see the connection between the environment and buildings, Lall laments, "Architects need to use their imagination to create new designs based on green principles. Since they are the experts on the impact of buildings on the ecology, it is their professional responsibility to practice sustainable design."

With the IRRAD project costing just Rs 20,000- Rs 22,000 per square metre, Lall rubbishes the popular belief that sustainable architecture is expensive. "Sustainability assures 25-30 per cent reduced expenses in five years. About 90 per cent of any sustainable project requires no extra expenditure, and may be constructed with even less. This notion about high cost is a complete myth," he says.

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- Ashok B Lall, Architect