Project description by author
This 1,000-sq. ft. home for an extended family sits on a 0.8 hectare site located in the historically rich zone of Mehrauli, New Delhi. The site surroundings conceal myriad stratified physical, historical, social, and ecological contexts that are waiting to be unearthed. The sustainable nature of the project is driven by the distinctive vision of the patriarch of the family who has relentlessly put together a comprehensive team of architects, engineers, artisans, and fabricators that shares his vision.

The home is designed around a central courtyard which is flanked by bedrooms on its south and west sides. The north and east sides house the living/dining and kitchen areas, the less private spaces. The courtyard defines the end of all boundaries between the public and private, between the upper and lower floors, and between the outside and inside. The site also houses quarters for domestic helpers. The building is shaped by utilizing environment as a mold. Adding an atrium in the belly of the building makes the inner space fluid and also make the interior space one with outer space eliminating the divide that is otherwise too a characteristic of built forms.

The home and its surroundings incorporate sustainable features and practices at many levels. All micro-level features were assessed qualitatively for their social and ecological impacts. Some of the innovative features integrated in the project, contributing to the sustainability, are given below:

1. Optimum building orientation and shading
2. Day-lighting integrated with artificial lighting
3. Naturally ventilated spaces
4. Cavity mass walls with insulation
5. Double glazed, low-e, energy efficient windows
6. Fly ash compressed brick masonry
7. Earth Berming of exterior walls
8. High efficient ground source heat pump HVAC system
9. Earth air tunnel for pre-cooling outside air
10. CO2 Sensors based ventilation system
11. Integrated building management system
12. Evacuated tube solar hot water system
13. Recycled/salvaged wood used for all interior/exterior woodwork
14. Photo-switch control for garden and exterior lights
15. Minimizing impervious surfaces in landscape
16. Xeriscape with native plant species
17. Sub-surface drip irrigation
18. Rain water harvesting and ground water recharge
19. Grey water recycling for flushing
20. Organic plant based sewage treatment through a root zone system
21. Plant based biological treatment system for sewage plant for future use
22. Composting/vermiculture of organic waste
23. Solar garden and emergency lights
24. Community orchards

Relevance to target issues (by author)
This project will serve as a regional showcase, setting a new trend for sustainable construction. The project incorporates innovative ecological features having a tremendous demonstration value, a proof of concept which integrates these features both overtly and covertly into an architectural vocabulary. It has a potential to effect a change in the housing as well as commercial construction.

Economic standards and social equity
The project houses sizable living quarters for domestic helpers, cooks, drivers, and gardeners and their families. Use of wall and roof insulation, ground source and earth air tunnels, root zone systems, solar hot water systems are shared between the owners and the employees in an equitable way keeping the gender issues in mind, single women employees have separate living quarters within the main house.

Ecological quality and energy conservation
The project houses sizeable living quarters for domestic helpers, cooks, drivers, and gardeners and their families. Use of wall and roof insulation, ground source and earth air tunnels, root zone systems, solar hot water systems are shared between the owners and the employees in an equitable way keeping the gender issues in mind, single women employees have separate living quarters within the main house.

Energy usage, both for domestic as well as landscape use, is reduced significantly through low flow fixtures, dual flush toilets, recycling of grey water, sub-surface drip irrigation system. 100% of storm and rain water is either stored on site for irrigation or sent to recharge wells on site.

Economic performance and compatibility
Many design solutions that have emerged, have scaleability business models. A fly ash block production system is being set up for the project which will be partially financed through this project, and the contractor will take over the machines for future projects. The technical capacity and skills in sustainable construction developed during the project will influence other projects in the region.

Daylighting and energy simulation models
Detailed analysis and simulations were done for energy, HVAC, and natural ventilation system optimization.