basin–South Asia

Regional Knowledge Platform

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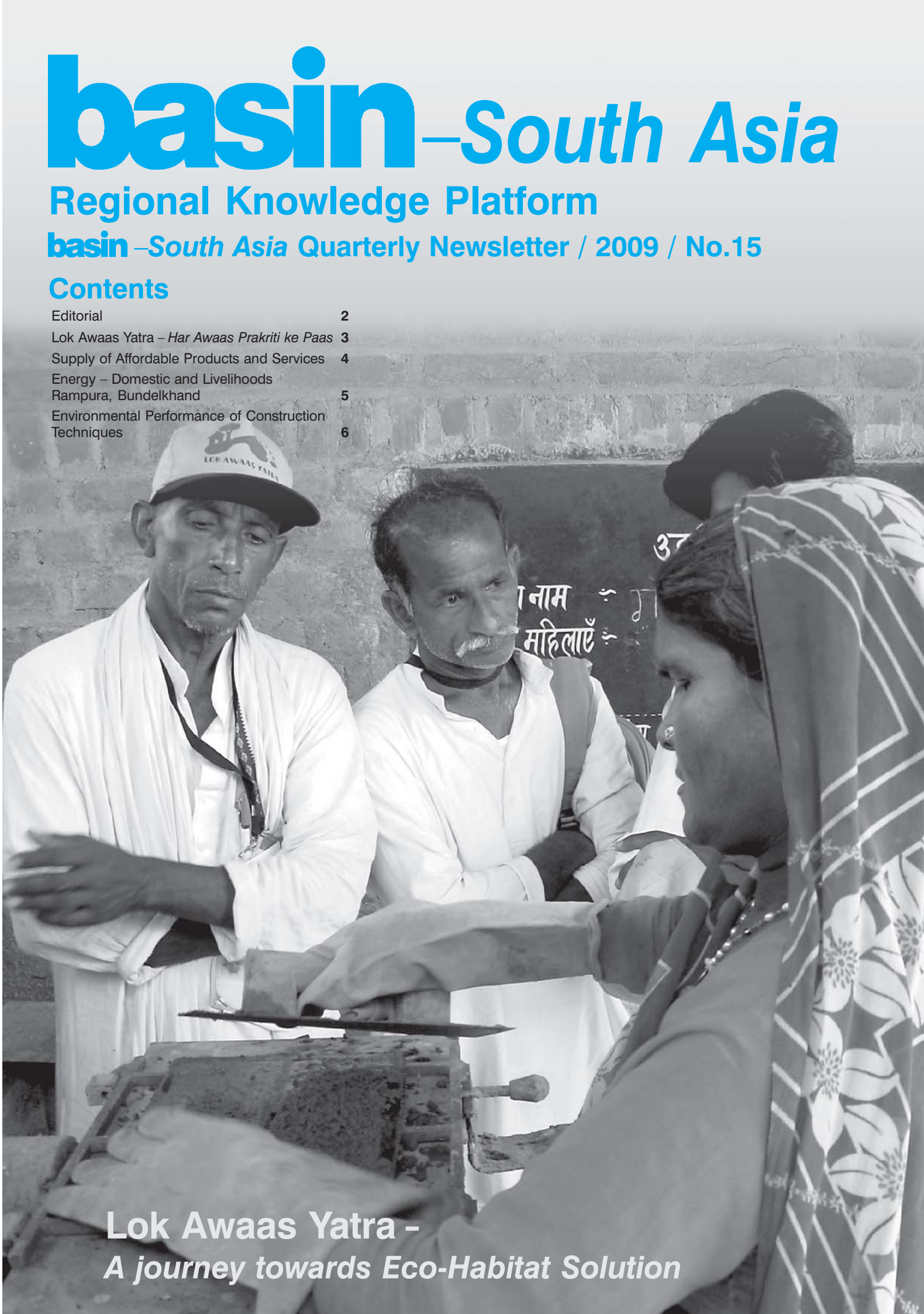

Lok Awaas Yatra –

A journey towards Eco-Habitat Solution

Editorial

Ecological and Sustainable Rural Habitat Development

Many of us are just back from the first among a series of Lok Awaas Yatra. The Yatra, as mentioned in the article 'Har Awaz Prakriti ke Paas', is a 'celebration of success' of initiatives on sustainable habitat development.

Ecological and sustainable rural habitat development has been focusing on housing delivery, water and sanitation solutions, habitat based livelihoods and cost effective, environment friendly technologies. The later addition was the disaster risk reduction and finally the habitat infrastructure with special focus on energy. However, the recent initiatives in combating climate change have also led to the introduction of the concept of low carbon building technologies.

How do we develop safe and sustainable ecological habitat in rural areas? Considering the various kinds of diversities across the region, how could we address the many concerns arising, especially in a globalized environment? Are the issues and potentials the same across all rural communities in the region? Will ''one shoe fit all'?

'How do we develop' is closely linked to rural habitat governance, which includes delivery of services, management, participation and ownership of the habitat. Identification of issues, potentials of local habitat solutions and the participation by the community require decentralized rural habitat governance. The local community knows its areas better, has its own potentials and would be nurturing its own aspirations. Various interventions undertaken in the area and their impact on environment can be monitored only by the local community. Moreover, the local community is the point of convergence wherein all components of a safe, sustainable and ecological habitat development could be brought together. This is where the decentralization of rural habitat governance becomes important. It is also to be noted that this governance process that requires participation and ownership warrants a democratic local governance structure. It is here that the role of decentralization and local governments become clearer.

In India, after the 73rd and 74th amendments to the Constitution, many of the functions related to habitat development are transferred to the various tiers of local governments. The various tasks they undertake have direct and indirect impacts on environment and ecology. Many other countries in the sub-continent are also having similar local government institutions and processes. For a few other countries, the systems are still evolving. Overall, there is an understanding that decentralization is a necessity in developing and maintaining a safe, sustainable and ecological rural habitat. The role of the local community is highlighted more than ever.

Such a concept of decentralization and local governance in rural habitat does not exclude the roles of other players. In fact, their roles become more crucial. The new technologies and concerns on ecological rural habitat development need to be transferred to the local community. In fact, more than just transfer of technology, now it also requires the building of capacities of the local community for local habitat governance. This has to be integrated with an empowerment process too. While decentralized democratic forums like the local governments would be the ideal institutions for such governance, the other players like the government departments, technical and research institutions, corporate bodies and NGOs need to focus on transfer of appropriate technologies to the rural communities along with building capacities and empowering them. Only through this process of decentralization that we will be able to make the safe and ecological habitat development in rural areas sustainable.

The Lok Awaz Yatras are meant to share such learnings and experiences on the success of big and small initiatives of the village communities on sustainable habitat development. The focus is not just on technologies alone, but also on the processes including local rural habitat governance processes. This issue of the Basin SA Newsletter provides us with insights on such success stories from various parts of the country. Similar sharing of knowledge and experiences through various means will be much useful for the local communities to learn from each other and adapt to their own situation. Lok Awaz Yatra is designed to cater to such needs.

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UN Solution Exchange

Note: These are personal opinions and not of the UN Solution Exchange

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India
TARAgram Datia – Production of floor tiles
Courtesy: Development Alternatives

Focus

Lok Awaas Yatra – *Har Awaas Prakriti ke Paas*

Lok Awaas Yatra (LAY) is a celebration of the success of big and small initiatives of village communities, Panchayati Raj Institutions, Government Departments, Corporate bodies and NGOs around sustainable habitat development.

Designed as an important milestone in the journey of basin-South Asia Regional Knowledge Platform, to draw policy attention to the issues of safe and sustainable development of rural habitat, the Yatra aims to bridge a critical knowledge gap in between 'what should be done' and 'how it can be done'. It has a clear bias in favour of people-based initiatives that make use of low carbon construction technologies and environmentally friendly habitat infrastructure systems to deliver quality habitat to village communities. The Yatra facilitates a deeper, first hand understanding of the 'how' of these solutions for the benefit of rural habitat practitioners in the hope that these good practices can be adapted and applied in larger numbers across the country.

The Yatra has been designed as a series of five regional yatras to enable learning structured around geo-climatic similarities in the central, north, south, east and west regions of India. The blueprint of the regional yatras comprises of 2-4 trails in each region that follow different paths to cover 5-6 good practice projects and converge at a regional seminar where the learnings are shared, analysed and state level rural habitat policy imperatives articulated.

The six key themes of the LAY are:

- Low Carbon Building Technologies
- Habitat Infrastructure including energy
- Water and Sanitation Solutions for Rural Habitat
- Habitat Based Livelihoods
- Social Housing Delivery
- Disaster Risk Reduction

Each regional Yatra is designed to culminate in a Regional Seminar which will identify key enablers for enhancing the quality of rural habitats in the region. The five sub-yatras (with each of their 3 trails) will culminate as a 'lok awaas karmi sammelan' at the national level by the end of 2010.

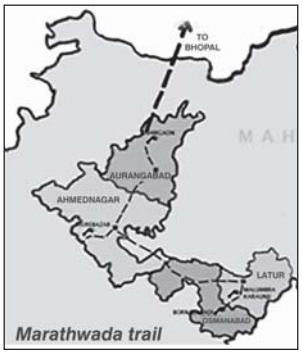
Central India Lok Awaas Yatra

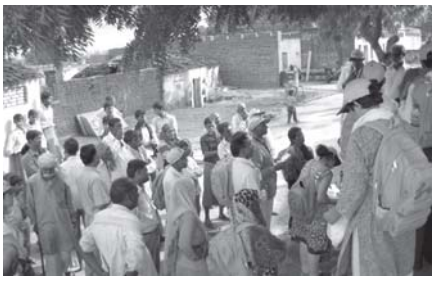
The first in the series of Regional yatras has been the central Region Yatra comprising of three trails covering Marathwada, Vidarbha and Bundelkhand regions of central India. The Yatra was started on 8th September and concluded on 12th September with the Regional seminar at Bhopal.

The Central Region Yatra included projects on alternate, low carbon construction materials and technologies, non-conventional and renewable systems for habitat infrastructure, people-centered post-disaster reconstruction experiences, habitat based livelihoods and innovative leveraging of government schemes.

The yatra comprised of three trails each anchored by a locally active NGO as follows:

i. **Marathwada trail**- anchored by Sahyog Nirmithee based in Latur. The trail covered districts of Latur, Osmanabad, Ahmednagar and Aurangabad. This trail had a strong focus on habitat processes, especially understanding the potential contribution that can be made by different stakeholder groups in improving the living conditions in rural India.





ii. **Vidarbha trail** – anchored by Centre of Science for Villages, in Wardha. The trail covered districts of Wardha and Nagpur. This trail had a strong focus on 'alternate' and energy efficient habitat technologies and their application.

iii. **Bundelkhand trail** – anchored by Development Alternatives in Jhansi. The trail covered districts of Jhansi, Datia and Tikamgarh. This trail included projects that demonstrated learning on both-alternate technologies as well as the process of their application with different stakeholders in a catalytic role.

Details of each of the trails and their projects are available on www.lokawaasyatra.net

True to the spirit of the 'yatra', the participants battled flat tyres, heavy rains and extremely tightly worked out schedules and contributed to the success of this learning journey.

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Case Study

Supply of Affordable Products and Services

Village Mador is located in Newari Block, Orchha in Tikamgarh District (in Bundelkhand), Madhya Pradesh. The village comprises 300 households and caters to a group of 35 families living below the poverty line, and belonging to Scheduled Castes and Scheduled Tribes. These families were primarily dependent on unpredictable wage (from farming or construction activities), earning approximately Rs 60 per day per family. Low and irregular incomes had a direct influence on the quality of their homes. Poor quality materials such as local country bricks for walls, poor baked tiles for roofing made the houses susceptible to vagaries of nature such as rain. As a result, the houses required weekly maintenance and the roofs had to be replaced annually. There were no proper facilities for cooking, which was done in semi- covered or open spaces and there were no sanitation facilities. It was becoming impossible for the villagers to lead such a miserable life; hence they decided to work towards transforming it.

TARA*gram*, the regional appropriate technology resource centre of Development Alternatives in Bundelkhand, came to the rescue of this village. They instilled in them the confidence that 'they could be the change' if they wanted. They initiated the housing and habitat delivery project in the village. The success of the project was due to 'an integrated habitat and livelihood support project' to address shelter needs and reducing poverty simultaneously by providing loans to the people for house construction as well as livelihood opportunities to earn and repay the loans. The stakeholders involved included members of the community of village Mador and PRADAN, a local operating national NGO. An organisation, CAPART allocated Central Government funds through the Innovative Stream for Housing and Habitat Development to Development Alternatives (DA) as the implementing agency. The provision of housing finance was in the form of part grant and part loan. Out of the total Rs 25000, two-third grant is by CAPART and one-third is their own money (through loans).

The concept of 'APNA GHAR' or 'my own home' triggered a feeling of 'ownership', motivating them towards capacity building and livelihood-related activities. As a result, they do not want anything for free; rather, they want to work towards achieving it.

Involvement of the community in the poultry based enterprise through PRADAN, for livelihood generation and capacity building, has provided the villagers with an opportunity to repay their loan. This has given the villagers the motivation to move towards the path of development.

Development Alternatives' Housing and Habitat delivery project has delivered as of 09/2009, 52 houses, 2 community halls, 120 individual poultry sheds, 5 solar street light poles, and 8 hand pumps. The houses have been built in the village using CEEF (Cost Effective and Eco Friendly) technologies. The quantity of building materials required is much less, leading to energy saving and reduced carbon emission. The houses built using these technologies are comfortable since insulation, ventilation and hygiene are taken care of.

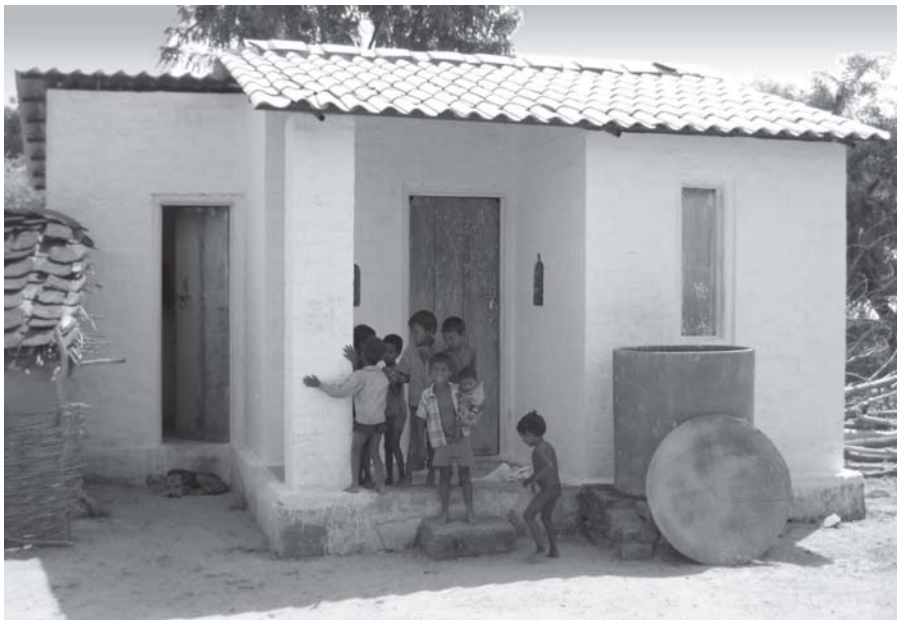
- Use of Rat Trap Bond technique for brick walls: Less material is used and insulation is incremented
- Use of MCR tiles: These tiles are lighter and larger compared to local backed tiles; hence, they require less under structure. They also adjust more easily to different types of under structure. MCR tiles can be manufactured locally
- Use of RCC door and windows frames: These frames provide more stability to the whole structure; therefore, less repairing and retrofitting will be required in the future

The implementation of smokeless chulhas (cooking stove) at the household level is a significant achievement as it has considerably reduced pollution. Closed stoves reduce the quantity of wood required for cooking, hence reducing forest depletion. Use of solar street lamps also contribute towards energy saving.

Provision of recharging groundwater through soakage pits and water tanks for storage has taken care of the problems related to water management.

The successful implementation of the project has only been possible because of community involvement in the entire process. In all, 35 families were involved in the construction of the houses through CEEF technologies – in the form of labour – which amounts to 10% of the total cost. This not only provides them with a livelihood option but also gives them the technical knowledge and skill to carry on such practices to earn an additional income, leading to capacity building and therefore making the village self reliant.

It is thus possible to achieve sustainability in all aspects – social (involving local community and their institutions); economic (providing access to 'value for money' construction services); and environmental (incorporating as many sustainable building techniques and materials as possible).



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Case Study

Energy – Domestic and Livelihoods – Rampura, Bundelkhand

'A truly unique model' said a Lok Awaas Yatri, standing in front of the solar panels installed in village Rampura. 'I couldn't believe my eyes when I saw a solar street light in a village, named Rampura, witnessing the changed face of the rural India.

Rampura in Bundelkhand region, is the first village to get a community based solar power plant (CSPP) in the country. The village inhabitants rebelled against the grid electricity provided by the Government. All of them stood up against the state electricity board and said, 'If we can't get an uncut supply of electricity even after paying for it, then we don't want it at all'. The Government had little faith left in the villagers and believed that the villagers did not have a way out and would sooner or later rely on grid electricity only. In return, the villagers not only found a source, but a renewable source of electricity – a sustainable solution.

Development alternatives (DA), which was active in Rampura village since 1998 when it had initiated the process of total sanitation, guided them to opt for an eco-friendly solution – electricity from solar energy – to meet their daily needs of electricity for various household chores.

With an aim of testing the economic viability of a clean and decentralised power plant and its replicability potential, Scatec Solar from Norway, along with the Bergen Group, India set up a solar energy power plant in the village in January 2009. They installed 60 solar panels to power 24 batteries of approximately 9 KW to provide clean and reliable electricity to 67 households as well as the local micro-industry. This model is not a welfare model; rather, it is an innovative business model which will generate huge returns in the long run.

On acquiring the land from the Government, community participation made the implementation possible in less than 26 days. They villagers constructed two rooms, the power house where all the technology components were installed, and the Mini transmission and distribution line was laid down. In the village, 25 electric poles and 13 solar powers operated street lamps were installed.

Solar panels installed in Rampura

Today, every house is lit up with a CFL, and has at least one fan. The community has access to electricity at any time, and human activities don't depend anymore on sunlight. Children can now study at night. The demand and supply is based on a tariff plan created for the users. The villagers pay for the electricity at a tariff based on what villagers currently pay for different sources of energy, such as kerosene and diesel. The revenues generated cover operations and maintenance costs, as well as the replacement of batteries and other components.

It was amazing to hear how people have become conscious towards electricity consumption, and are controlling its usage, thereby reducing the load. With time a realisation came about the villagers that if they 'have' to pay for the electricity used by them, why not use it for income generating activities, thereby opening up avenues for setting up small scale enterprise e.g., a flour mill.

A Village Energy Committee (VEC) has also been established with local people's representatives plus experts actively involved in the development of the area, a major step to enhance knowledge and skills of rural people in energy management. The VEC committee plans, implements, monitors and controls the project activities. The committee is helping to construct, operate and maintain the centre as well as to mobilise the villagers for various community activities, thereby making the village self reliant through capacity building.

Introduction of computer education is a clear signal of the pace with which this village is progressing towards development. Students from nearby villages are also joining up for computer education. This is a very positive sign for future generations.

With this package of electricity comes the power and pride that the villagers have attained through their efforts. With their undeterred will and determination, the community is now on the path of growth and would soon be one of its kind, a model village, ready to be replicated…

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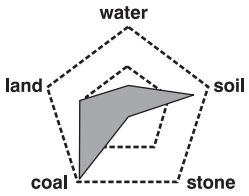
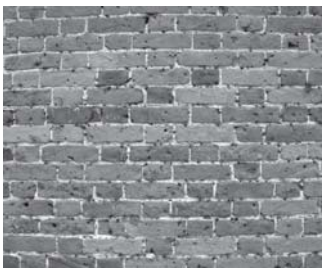
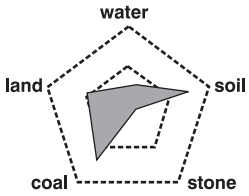
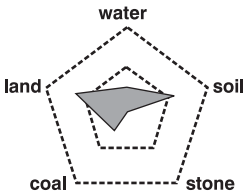
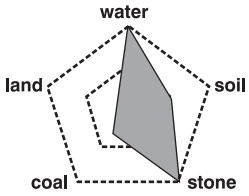
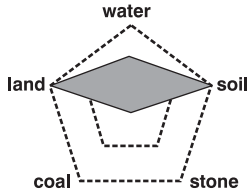
Report

Environmental Performance of Construction Techniques

A comparison of Embodied energy, Carbon dioxide emissions and Resource intensity for wall and roof construction techniques

Embodied energy represents the non-renewable energy consumed in the extraction of raw materials, their processing, conversion to building materials (manufacturing), transportation to site, and construction using the building material. It is expressed as Megajoules of energy consumed in creating a unit area of wall and roof. Transport energy and resulting emisisons have been considered only for transportation of finshed materials to construction site. Carbon-d-oxide emissions are associated with almost every stage of energy input in the construction cycle, but are predominantly caused by burning of fuels during the manufacturing process of materials. The resouce

Wall Construction	Embodied energy, MegaJoules per m^2	Carbon dioxide emissions, kg CO_2 per m^2	Resource intensity per sq.m of wall/ roof	
9" thick brick masonry in English bond in 1:6 cement sand mortar (without pointing), using conventional kiln bricks – Bulls Trench Kiln. This is taken as conventional wall construction practice against which alternatives are compared below.	**676**	**48**		
	80% of the energy input and the resultant CO_2 emissions are from the manufacture of burnt bricks. Energy and emissions form bricks have been calculated on the basis of coal consumed for firing			
9" thick brick masonry in rat-trap bond in 1:5 cement sand mortar (without pointing), using conventional kiln bricks. Maosnry in rat-trap bond is considered sufficient as a replcement for load bearing construction upto 2 storeys.	**472**	**35**		
	As compared to conventional 9" brickwork, the rat-trap bond reduces brick requirement by 25-30% which reduces both the energy input and emissions.			
9" thick brick masonry in rat-trap bond in 1:5 cement sand mortar (without pointing), using Vertical Shaft Brick Kiln (VSBK) bricks.	**225**	**20**		
	The coal consumption is reduced by more than 40% in the Verticla Shaft Brick Kiln as compared to the Bulls Trench Kiln.			
8" thick concrete block masonry in 1:6 cement sand mortar. The mix proportion considered for concrete is 1:3:5. The size of concrete block is 20cm x 15cm x 15cm.	**380**	**36**		
	The high embodied energy of cement is rationalized in the lean concrete mix. Secondly aggregates constitute around 20% of the energy.			
9" thick compressed earth block (CEB) masonry stabilized with 6% cement, laid in 1:6 cement sand mortar cement. A manual block press is considered for CEB production.	**135**	**16**		
	Lowest energy requirement is made possible with firing of soil being replaced by compression using a manual machine. Also, it is assumed that production takes place at the construction site, eliminating transport energy.			

intensity is expressed graphically, based on consumption of key resources of water, soil, stone (combined for aggregate and cement manufacture), coal (both direct use in firing and indirect use for producing coke for steel) and land. Land area is worked out based on average depth for mining/ extraction of resources. The resource intensity graphs are not based on absolute values but are meant to show comparitive environmental impact of alternative technologies as compared to conventional building practice.

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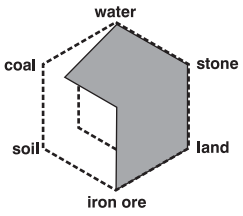
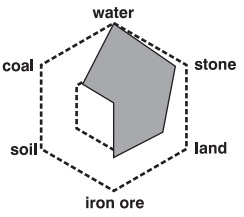
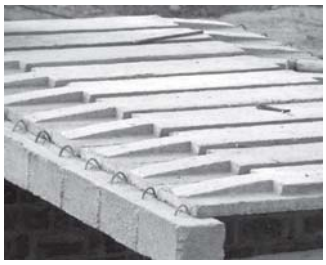
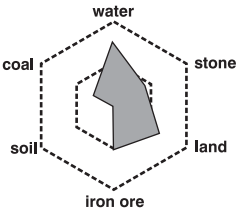
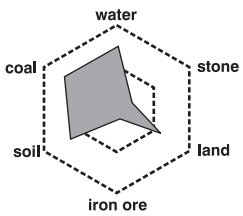
Roof Construction	**Embodied energy, MegaJoules per m²** **Carbon dioxide emissions, kg CO_2 per m²**	**Resource intensity per sq.m of wall/ roof**	
Reinforced concrete roof upto 4.5 metre span, 125 mm thick. A doubly reinforced section is considered in comparison to a room of size 4.5 m x 4.5 m. This is considered conventional practice and is compared to alternatives below.	**770** **80** *More than 90% of the energy input comes from cement and steel together, with steel accounting for 70%. Steel also accounts for 75% CO_2 emissions which result from construction of RCC roof. The coal use accounted for in resources is for production of coke used in the smelting furnace.*		
Planks and joists, precast reinforced concrete –1'x5' panels (partly 30 mm and 60 mm thick), 6"x6" joists at 1500 c/c. Precast beams of 5"x5" cross section carry the planks.	**560** **48** *Dividing continous concrete into smaller spans reduces stresses that concrete is subjected to which can be taken by reduced quantities of raw materials, particularly steel which reduces considerably more than cement. This cuts emisisons by 50%.*		
Ferrocement roofing channels, segmental profile of 30 mm thickness. 2'10" wide, 1' high; cement-sand mortar 1:3. Reinforcement consists of chicken mesh layer, a 1" x1" welded mesh for 15% of the surface area and two rebars at two ends. It is suumed that channels are not transported beyond 20 km from production.	**380** **36** *Segmental profile results in reduced thickness and 50% neduction in steel quantity together with 15% cement reduction. Further, absence of coarse aggregate keeps energy and emissions among the lowest.*		
Precast arch panels made with 30-40mm thick burnt clay tiles and GI wire in longitudinal mortar joints, segmental profile-3'3" wide, 2" rise at the centre, laid between precast concrete beams 5"x 5". It is possible to make these channels in close proximity to the point of use, so transport energy is not considered.	**490** **45** *Use of burnt clay elements in compression reduces both cement and steel tremendously and use of thin elements abates extensive soil use. Emissions from brick firing are at least 50% less intensive than those from extremely high temperature processes in steel manufacture.*		

Regional Knowledge Platform

South Asia

Auroville Earth Institute aims to research, develop, promote and transfer earth-based technologies which are cost and energy effective.

Aga Khan Planning and Building Services, **Pakistan** works to improve the built environment through the provision of technical assistance and construction management services.

Centre for Ecocentric Development and People's Action, Nepal is a non-profit, non-governmental organization working for "People Centered, Eco-Centric Development."

Coastal Area Disaster Mitigation Efforts, India is a network of twenty voluntary organizations working for disaster preparedness of Fishing Communities in India.

Exnora International, India works as a catalyst in bringing about local initiative and community participation in overall improvement in quality of life.

Grambangla Unnayan Committee, **Bangladesh** is a non-profit, non-governmental organization working for people affected by extreme poverty, exclusion and disease.

Maithri is supporting Panchayat Raj institutions for developing perspective plans on basic need fulfillment and natural resource management through capacity building processes.

Orissa Development Technocrats' Forum, India works to facilitate an effective rural housing delivery system through appropriate technologies and sustainable livelihoods.

Trust for Village Self Governance, India is a charitable trust focusing on local self governance in villages for creating sustainable employment through habitat development.

Practical Action, Sri Lanka, works with poor communities to develop appropriate technologies in food production, energy, transport, shelter and disaster mitigation.

Swiss Agency for Development and Cooperation (SDC), **India** is Switzerland's international cooperation agency within the Swiss Foreign Ministry.

Secretariat

Development Alternatives is a not-for-profit sustainable development enterprise that designs and promotes programmes and products which, through the use of alternative technology, contribute to the enrichment of human life.

Gram Vikas, India is a rural development organization, working with poor and marginalized communities of Orissa since 1979 making sustainable improvements in the quality of life.

Unnati is a non-governmental organization working over the last 15 years for "civic leadership promotion and strengthening local self governance."

basin-*South Asia* Regional Knowledge Platform (basin-*SA*) is committed to *"developing knowledge systems and promoting collaborative action within South Asia to enable access by the poor to sustainable habitat and livelihoods."*