basin–South Asia

Regional Knowledge Platform

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Policy as a Key Enabler in Eco-habitat

Editorial

Policy Enablers for Creation for Eco Habitat

Times of crises, it is said, are also times to correct imbalances that characterise the past. Human existence today is threatened by uncertainties with regard to sustained supplies of energy, food and water. Overuse of conventional sources of energy, over extraction of water and inadequate attention to food supply has led us to a situation where we need to rethink the way we have developed. To add to the gravity of the situation, the threat of climate change impacts and natural disasters triggered by the changing climate are questions that we need to answer to our future generations.

Closer to home, while millions of shelterless families wait their turn for a home ,the construction industry is considered to be one of the most inefficient users of energy and is accountable for a fairly large share of carbon emissions that are contributing to climate change. Several policy initiatives have been taken in the past to facilitate and promote adoption of eco-friendly habitat in India such as promotion of Green Building concept, providing a building rating system, mandating Building Energy Codes for larger buildings and promotion of bamboo based houses through the National Mission on Bamboo Application. However, all of these efforts together are still a drop in the proverbial ocean of diminishing energy sources and worsening climatic uncertainties. The stand-alone nature of many such initiatives and the acute need on the ground demand urgent policy attention in order to direct the actions of diverse stakeholders towards a greener path. The sheer number of stakeholders with diverse agendas needs to be brought on a common platform so that all energies can be harnessed in the desired direction.

From the perspective of rural homeowners, adoption of environment friendly, cost effective and hygienic habitat processes while building their houses is a challenge. Resistance to this adoption comes from the combined influence of several factors - unfamiliarity with the technology, lack of easy accessibility, low propensity of the household to try a technique different from one used in construction of his/her neighbour's and readiness to bear the unpredictable risks associated with new technology. The house he/she is building may be their only chance to own a house in their time. As a result, a situation that could have been a win–win from the point of view of the family and the environment becomes a zero sum game – one benefit comes only at the expense of the other.

This need not be so. Some self-motivated organisations have been working to promote these technologies for several years. In the past, they have achieved a few significant successes but their impact has been limited. There is an urgent need for these organisations to engage with policy makers on the one hand and the mainstream players in the construction sector on the other to ensure that the green agenda can be met as a part of mainstream practice.

To move in this direction, a facilitative policy environment is required for specific actions such as awareness creation on greener options, easy availability of green technologies in the market with opportunities for demonstration to allay the apprehensions of homeowners and financial incentives to users and promoters of green technologies. In parallel, research and development efforts are needed to position these products and technologies competitively with conventional products and technologies without any deterioration of comparative critical properties/ performance standards.

A policy framework conducive for promotion of eco habitat by the Government may be the starting point for removing the hurdles posed by the many factors inhibiting the growth of this sector. The past has reposed faith in us and the future looks at us with expectation...it is time we took responsibility.

Shri Sanjay Kumar Rakesh
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Focus

The Journey to facilitate Sustainable Rural Housing and Habitat in India

This is a story about a journey. Actually, many interesting stories are about journeys… In India, a senior politician recently embarked on another one of his many *yatras* for public awareness, and a group of musicians have been travelling across the country to create a variation of beautiful sounds. Many known and unknown individuals have walked thousands of miles to spread the voice of peace, to demand land rights, to promote movements for a clean earth and clean rivers. Seven decades ago, thousands joined the walk in Gujarat, India for a right to self-government…

Journeys are about co-travellers, about learning together. They are also about changing the road and shifting the goal posts. Change is often brought about by travelling side-by-side, getting to know each other and acting together. This journey is as much about the cause it supported as it is about building solidarity and changing our perspectives and views, about paradigm shifts on how we view the end and the means.

We did not start alone. Many of us have been walking from different directions, but toward the same goal: that of a National Rural Housing and Habitat Policy for India. A policy that would be the first of its kind to address the special concerns of rural communities interlinked with their natural environment, their resources and land-linked livelihoods. A habitat policy that would respond to the changing context of rural India within a globalised as well as climate and resource-constrained world while building upon the strengths of rural India and contributing to local rural development in a sustainable manner.

Where we are now in this journey…

The XII Five Year Development Plan is in the making, and the recommendations of the Working Group on Rural Housing have been sent to India's Planning Commission. On behalf of the thousands of people from across 29 states represented by over 100 partners who campaigned for safe and sustainable habitat for all, I am pleased to inform the august audience of this newsletter that the recommendations point to far-reaching changes in the way the government of India enables rural habitat development.

- habitat planning and management has to be led by the Panchayati Raj Institutions
- stakeholder participation in design and implementation with transparency and built-in social auditing mechanisms
- a self-sustaining service delivery mechanism based on local markets

– *Guidelines included in the draft National Rural Housing and Habitat Policy for India, 2007*

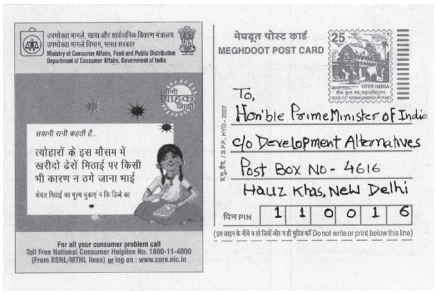
While we do not yet have a comprehensive National Rural Habitat and Housing Policy, a drafting process initiated by the ministry used the base of the document prepared by the **basin**-*South Asia* network partners in India. The draft policy has been up on the Government of India, Ministry of Rural Development website for over a year. The process seems to have been abandoned mid-way by the Ministry, although their directives to state governments for formulating state-level rural housing policies have been sent out. We now have recommendations from the government's own XIIth Plan Working Committee that, if implemented, will integrate concerns of inclusion, encouragement to augment local skills, local job creation, integration of concerns regarding sustainability and disaster safety, quality improvement and, most importantly, systemic measures that will accelerate sustainable growth of housing and habitat in rural areas.

- Enabling a structured access to land, appropriate finance and risk mitigants
- Creating facilitative environment for promotion of appropriate building materials and technologies and development of human resources
- Providing and enforcing a well defined techno-legal regime

– *Recommendations of the Working Group for Rural Housing: the XII Five Year Plan, September 2011*

Let us now go to where it all began…

Many organisations have worked and are still working on low-cost technologies, ecologically-friendly building methods, traditional construction systems, as well as on improving the skills of artisans in the field of rural housing.

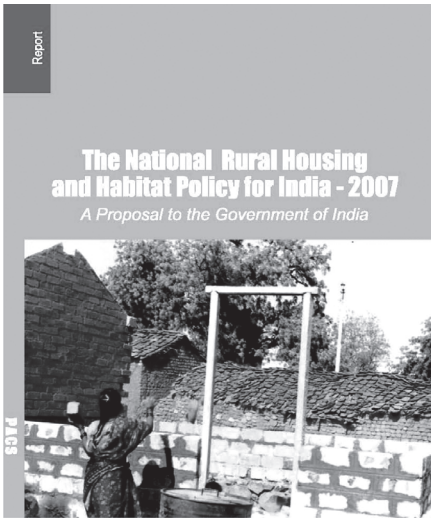


Rural housing in India, however, has been viewed from either of the following two perspectives.

India has indulged either in a romantic view of huts and wells where rural communities can easily access local materials and skills to build their houses and habitats, or at the opposite extreme, we have envisioned a minimum area provision scheme through cash subsidy for the poorest through the Indira Awaas Yojna (IAY) – the Xth Plan.

Many, like us at Development Alternatives, were uncomfortable with the rapid promotion of construction of cookie-cutter brick and mortar boxes through targeted cash transfers across the country that, while catering to the neediest, considered them in isolation from their socio-economic context and local resource base. There was also a certain level of discomfort with the hasty promotion of construction that did not receive safety guidance in the face of floods, earthquakes or cyclones, did not respond to local contexts of available materials, skills and lifestyles and of ways of building and that did not take into consideration contextual changes in rural India.

But most importantly, many saw rural habitat creation (as opposed to housing construction) as a tremendous opportunity to catalyse growth in rural India and strengthen the dimension of sustainability within this growth.

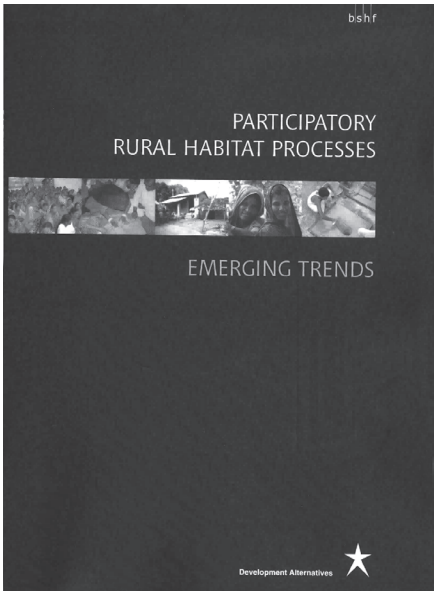


The process of influencing the Government of India's perspective and approach to rural habitat development thus began with a dream. A dream for a healthy, flourishing and happy rural India based on the realisation that since independence, nothing much had improved for many of the rural poor. That is, nothing except that the romantic view of villages as self-contained, self-governed, self-sufficient human communities seemed to change to the view that rural settlements are places where no one really wanted to be. Despite many programmes and public schemes, the poorest still lived in houses that were not safe from the elements, had no basic amenities and had decreased access to resources, skills and services to plan, build and develop safe and sustainable habitats. The Indira Awaas Yojna, one of the most successful schemes in terms of utilisation of funds had failed to create systemic measures for sustainable habitat development, unlinked, even to this day, with an integrated approach for resource-efficient technologies, skills, services, safety norms, sanitation and water management methods within a planned human settlement. The **basin**-*South Asia* habitat policy development perspective was also guided by the view that an integrated approach needs to take into consideration the "whole" rural society – different income groups, humans, animals and human livelihoods with **empathy and affirmative action directed toward the poorest with due consideration of the needs of the environment**.

Just as it is inefficient and inadequate to target habitat development programmes at one narrowly-defined population segment as the IAY has done, it is incorrect to paint the rural housing processes undertaken in India to date with one black stroke. There have been examples of success and models that indicate satisfactory results. These are experiences led by Panchayats, NGOs, financing institutions and others. However, these are just that – models – at best, scaled up to a few thousand houses, and mostly led by single agencies or individual change makers. We, on the other hand, believe that scaling up, or rather, scaling out into viral replication of successful models, requires a facilitative policy environment that brings together different stakeholders and creates genuine opportunities. These models need to be replicated across the country in principle and method. We believed then (as we do now) that effective policies enable the replication of good practices. And good practice informs and improves policy development. We also believe that policies work through programmes, but must also set in place systemic measures facilitating replication and receiving feedback for continuous improvement. It is with this belief that the **basin**-*South Asia* platform in India set out on the long journey to develop a proposal for the Government of India for the country's First National Rural Housing and Habitat Policy. But most importantly, this required a paradigm shift in the way central and state government planners viewed rural habitat development.

Evidence and lessons from the ground as a base for change…

The groundwork began in 2004: with support from the Building and Social Housing Foundation of the UK and the Swiss Agency for Development and Cooperation, **basin**-*South Asia* initiated a documentation of good practices to understand what works, why and how. The documentation, popularly called the Blue book, led to an understanding of systemic measures and was followed by a document that discussed a framework for a policy that would address these systemic measures. While the Blue book was a result of the efforts of a small group of people, the second document – the Red book – brought together many stakeholders who debated on the structure and content of the framework for a recommended national policy for rural housing and habitat creation. The success of partnerships and solidarity further animated the **basin**-*SA* platform to develop a draft policy proposal in a consultative process. This draft document was translated from English into eight Indian languages and was taken across the country for public consultations. The Department for International Development (DFID) of the UK lent its support through the Poorest Area Civil Society (PACS) Programme under its mandate to support access to entitlements, shelter being a basic right.



With over 50 civil society partners, the draft policy proposal document travelled across 21 states, through village and district-level public hearings, state-level and expert group discussions, incorporating views of Panchayats, NGOs, banks, the corporate sector, habitat professionals, as well as district and state-level officials among others contributors. The **basin** platform grabbed every opportunity it could to build bridges and ownership within the government. From there, it moved on to discussions with the then Hon. Minister for Rural Development, the nodal officer-in-charge of rural housing within the Ministry, evidences to the Parliamentary Committee of the XIVth Parliament, presentations to the Planning Commission for the XIth Plan and regular feedback from the public consultations back to the ministry. It was a very intensive engagement indeed.

The public consultations enabled the development of a robust document that found acceptance in the ministry as a base paper for a subsequent government-led process of consultations with state governments and working committees to prepare a draft policy document that was eventually placed on the Government of India, Ministry of Rural Development's website for comments.

While the Rural Habitat Policy for India awaits its fate, the process has contributed to the guidelines issued by the Central Government to States for preparing state-level policies. States like Andhra Pradesh, Tamil Nadu and Kerala had already taken it upon themselves to address issues relevant to rural shelter with a focused and saturation-oriented approach. Other states like Madhya Pradesh, Rajasthan, Bihar and Orissa are fast following suit. Even during the XIth planning period, changes in access to land and setting up of a Shelter Fund under the aegis of the National Housing Bank (NHB) have been made. A finance committee under the leadership of the NHB has developed recommendations for financial rural housing products catering to the poorest as well as to upper-income groups.

The process also galvanised thought toward an integrated and systemic approach that is reflected in the recommendations that the ministry has put forward to the Planning Commission of India for the XIIth planning period. The recommendations indicate that housing and habitat development should be integrated within village planning processes, that capacity building for skills in construction (especially using resource-efficient techniques) must be linked with housing development and that resource efficiency and the use of energy and material-efficient construction technologies has to be prioritised. To implement these recommendations, appropriate changes in norms and the schedule of rates for public works should be undertaken, enterprise development to encourage delivery of skills and materials should be encouraged and safety measures in construction ought to be promoted. The recommendations take the delivery of housing and habitat beyond the Indira Awaas Yojna, by bringing into the rural housing fold financial products for both the poor and upper-income communities, expansion of the scope of habitat development from 200 sq.ft. rooms plus toilets for the poorest to planning for and servicing rural settlements. The recommendations also work out the financial implications for this change. This is, indeed, a big step to which the basin-*South Asia* has contributed actively. It is hoped that the Planning Commission will accept these recommendations and support their implementation.

The Lok Awaas Yatra: another journey…

While policy processes take their due course and the **basin**-*South Asia* platform remains engaged with them, the **basin** platform in India embarked on another journey.

The policy proposal indicated the leadership of state government and the primary role of Panchayats (local self governments) in supporting the planning and implementation of sustainable rural habitat development on the ground. The platform has therefore taken upon itself to create guidelines for sustainable habitat development by the local governments through an innovative process of learning by direct engagement.

The **Lok Awaas Yatra**, a journey for sustainable habitat creation was designed as a series of five exposure visits for Panchayatars (members of local self governments), local district officials, masons and civil society members across the country to visit habitat development programmes led by diverse agencies. Each journey is a set of three parallel trails in a region with 20 to 30 people each visiting selected villages where components of sustainable habitat can be explored, discussed and understood by directly engaging with the project managers and village communities through facilitated discussions. Village groups in each of the three trails conducted discussions on what can be done to improve habitat conditions in their own villages and what kind of information, capacity building, resources and institutional supports will be required. Each three-trail journey was designed to culminate in a state-level seminar where experiences and lessons were shared with State governments.

This journey has reached across regions, building networks of people engaged in habitat development, and has provided lessons for improving the implementation of habitat processes. The feedback on the **basin**-*South Asia* platform from these exchanges is very positive. The members of the platform have worked with a number of states, some of which, such as the State of Madhya Pradesh and Bihar, have initiated processes for integrated rural habitat development. Discussions with governments of Himachal and Orissa for components of ecological construction are ongoing. Clearly, policy processes supported by knowledge for better implementation will facilitate replication of good practices across the country and the region.

In fact, the journey is still in progress: a national seminar is being planned and resources for similar Yatras across the north-eastern part of India and the dry-cold regions of the north are due. Links of these Yatras with other regions of South Asia are also being planned. The **basin**-*South Asia* platform maintains its commitment of using knowledge and partnership processes to facilitate access to improved habitat across the region.

Ms. Zeenat Niazi
Senior Programme Director
Development Alternatives

Focus

Building Material and Technologies for Eco habitat

Housing, one of the basic human needs is on top of the priority list of the Government of India. With the growing population, housing shortage has increased from 15.2 million in 1961 to 40 million as per the Census of India 2011 report. A target of two million houses every year has been set by the Government of India to tide over this shortage. A house alone, however, has no meaning unless it is a part of eco habitat. Eco habitat is an ecosystem that produces shelter and food for people and other organisms without resource depletion and in such a way that no external waste is produced. The National Housing and Habitat Policy, which calls for a "Housing Revolution" rightly stressed on the development of alternate and innovative construction materials and technologies and their wide application with special emphasis on protection of natural environment by stressing upon the use of locally available raw materials besides advocating reduction in the use of scarce natural resources and planning them with a mix of renewable resources.

Massive construction activities associated with the development of habitat have numerous environmental impacts and unless tackled properly may create ecological imbalances. In developing countries like India material producers and builders often use traditional, less energy efficient techniques or old fashioned highly polluting equipment. There is often a lack of knowledge about how to make production clean and energy efficient. Improvements might also be hindered by lack of capital, availability of indigenous equipment and weak management practices both in material production and their usage at construction sites. Inadequate government policies and lack of enforcement mechanisms to encourage designers and builders to adopt environment friendly technologies in construction and standards and building regulations continue to lead to the use of energy intensive materials and technologies.

Complex, highly dispersed and resource demanding nature of activities in the construction sector contributes to the loss of important and limited natural resources like timber, metal and mineral resources which later on imposes severe stress on the environment. Construction activities contribute towards release of ozone depleting substances that damage the ozone layer. There is a need of a concerted, integrated approach for building eco habitat which alone can minimise adverse impacts on the environment and reduce the consumption of natural resources over the building life.

The Impact of Construction on Land, Water Resources and Forests

- **Degradation of Land**

  There is growing concern about increasing land dereliction, caused by extraction of sand, gravel and clay etc, which alternately reduces the land available for habitat development. Brick making activity alone consumes, at present, an equivalent of 300 mm depth from 100,000 hectares (1000 sq. km) of fertile land. Similarly the pressure on raw materials like limestone to manufacture cement and energy requirement to produce these materials are required to be addressed.

- **Degradation of Coastal Areas and Water Resources**

  Construction activities can be detrimental to coasts and water resources, which can become critical in some areas. The extraction of sand and gravel from river beds and beaches can have serious environmental consequences like precipitating soil erosion. The use of coral as an aggregate or building stone is common in parts of India. Logging practices causes increased rate of erosion, increased sediment loads, and also affect habitats for plant and river organisms downstream. It is, therefore, necessary to strictly implement coastal zone regulations for all construction activities.

- **Deforestation**

  Forests are an important natural resource base, which play a crucial role in the conservation of watersheds, prevention of soil erosion and balancing the eco-system. Forests are also sources of domestic energy supply such as wood for cooking and heating and of fuel for brick and lime production in rural areas. There is increasing concern about the destruction of the tropical forests and the adverse impact of this on the environment. Managing the forests in a sustainable manner, so as to minimise the rate of deforestation, is therefore, imperative and should be given highest priority.

Consumption of Non-renewable Resources in Consruction

Non-renewable resources used in construction include fossil fuels, metals and minerals such as stone and clay. Supply of some of these may last only a few decades. Although more pockets of these resources are discovered and new technology might extract more than is possible today, the rate at which the reserves are depleting means consumption must be controlled and renewable resources replace these traditional materials.

Use of Energy in Consruction

The construction sector is a major user of energy. Energy is required for manufacturing materials, for transportation and for construction of buildings. Apart from initial energy usage, there is also need for energy to operate buildings during its life time.

Embodied Energy in Buildings

Embodied energy in buildings is related to the production of raw materials used for construction, while construction activities and transportation account for a smaller proportion. This can be classified in three categories:

- Low energy requirement materials like sand, aggregates, fly ash, soil, adobe
- Medium energy requirement materials like lime, clay bricks & tiles, concrete blocks, timber, and
- High energy requirement materials like cement, steel, glass, aluminium, plastics, copper

Operational Energy in Buildings

A considerable amount of energy is used in buildings during their lifetime. This energy is required for heating, cooling, ventilation, lighting, cooking and other domestic activities.

The energy use patterns inside buildings vary a great deal according to occupants' behaviour, type of structure and location of buildings. In residential buildings, urban and rural patterns tend to be very different. Household income and climate have major influences both on the type of energy sources and end-use patterns.

Architects and engineers have a crucial role to play in designing buildings to minimise energy use for active climatisation and lighting. A good approach is to take advantage of natural means such as solar radiation and winds and use the building as a collector, storage and transfer mechanism. The knowledge of passive techniques is well developed but is unfortunately not yet effectively practiced.

Use of Industrial and Agricultural Wastes in Production of Building Materials

A large number of industrial and agricultural wastes have found wide acceptance as alternatives to clay, limestone and various other argillaceous and siliceous materials in the production of bricks, tiles, cement, concrete slab and ceramics.

Table 1 Indicates a list of well established industrial, mining and mineral wastes and by-products and their use in production of building materials as developed in India.

Table 1: Industrial, Mining, Mineral Wastes and their Application in Building Materials as Alternate to Traditional Materials and Natural Resources

S.No.	Industrial waste/ by-product	Application in building materials as alternative to traditional materials	Traditional material saved fully or partly (20-30%)	Natural resources saved fully or partly (10-20%)
1.	Blast furnace slags (i) air cooled (ii) foamed (iii) granulated	• Dense aggregate in concrete or road • Light weight aggregate for concrete • Portland-slag cement super sulphate cement	• Rock, stone • Traditional light weight (high energy) • Ordinary portland cement (OPC) sulphate resisting portland cement	• Stone • Clay, slate, shale • Limestone, clay
2.	Ferro-alloys and other metallurgical slag	• Pozzolana -metallurgical masonry cement	• Lime pozzolana	• Clays (for pozzolana) • Limestone
3.	Fly ash (Pulverised fuel ash)	• Portland-pozzolana • Concrete filler • Sintered light weight aggregate • Lime-fly ash calcium silicate brick • Cellular concrete (fly ash-lime) • Clay-fly ash brick • Stabilisation in roads, mines, lagoons etc.	• OPC • Fine aggregate • Other L.W. Aggregate • Sand-lime brick • Cement-sand based cellular concrete • Burnt-clay brick • Road materials & other fillers	• Limestone, clay • Sand, crushed stone • Clay, shale, slate • Sand, lime • Cement, sand • Clay • Traditional road material, clay
4.	By product gypsum (from fertiliser, hydro fluoric acid, boric acid)	• Gypsum for cement • Gypsum plaster & blocks • Gypsum plaster fibrous board • Special cements	• Mineral gypsum plaster and blocks from mineral gypsum. • Sulphate-resisting portland cement.	• Mineral gypsum • Mineral gypsum • Clay & limestone (for OPC)
5.	Lime sludge from acetylene, sugar, paper & fertiliser industries	• Raw meal component in cement • Lime pozzolana mixture, (L.P.) • Building lime • Masonry cement	• Raw meal in cement • Traditional L.P. • Lime from limestone • Limestone based masonry cement	• Limestone & clay • Limestone • Limestone • Limestone
6.	Red mud (from alumina in aluminium)	• Cement raw meal • Bricks and tiles • Sintered aggregate	• Farraginous mailer • High strength brick • Stone and other aggregates	• Oxides of iron • Clay, feldspar • Clay, shale, slate
7.	Mine tailings (from zinc, copper, gold, iron mines)	• Filler in concrete • Calcium silicate bricks • Cellular concrete • Tailing-clay brick • Masonry cement (tailing + cement)	• Fine aggregates • Sand (in sand-lime brick) • Ground sand • Clay bricks • Limestone-cement based	• Sand • Sand • Sand • Clay • Limestone

Use of agro-industrial wastes not only helps in tackling the environmental problems but at many instances actually improves the properties and durability of building materials.

Scientific studies for in-depth analysis of available technologies for changeover to alternative fuel sources in manufacturing materials that will reduce Green House Gas emissions need to be initiated. This is being increasingly realised through the establishment of environmental regulatory mechanisms to ensure installation of pollution control systems which have already been developed and are commercially available in the country.

Conservation of Water

Any human settlement requires sufficient source of water for daily and other needs. With the rising population and over

Table 2 highlights energy saving in the manufacture of alternative building materials through use of industrial wastes.

Table 2: Energy Saving through Use of Industrial Wastes

Sl.	Building material	Composition	Material compared	Energy Saving (%)
1.	Portland pozzolana cement	75% OPC 25% Flyash	100% OPC	20
2.	Portland blast furnace slag cement	60% OPC 40% B.F. Slag	100% OPC	30
3.	Masonry cement	50% OPC 50% Tailings/waste chalk	100% (Masonry cement (50% OPC + 50% Limestone)	20
4.	Lime-pozzolana mixture	25% Acetylene gas lime 75% Fly ash	25% Lime 75% Calcined brick	75
5.	Calcium silicate brick	90% FA Tailings 10% Lime (waste source)	Burnt clay brick	40
6.	Burnt-brick	75% clay 25% Fly ash	Burnt clay brick	15

Table 3 indicates resource and energy saving through use of important natural fibres and allied agro wastes. The table also indicates the saving of timber and the binder used in the materials which get substituted by organic – fibre-based composite sheets and panels.

Table 3: Resource and Energy Saving through Use of Natural Fibres and Agro-Wastes in Building Materials

Sl. No.	Waste and source	Commercial product using natural fibre & agro-waste	Traditional resource fully or partly saved	Energy (%)
1.	Coir fibre (coir industry)	Coir fibre-cement roofing sheet & panels	Asbestos	10
2.	Rick husk (Rice mill) board	Rick-husk-cement building particle board timber	Resin (PF or UF) bonded	20
3.	Ground nut hulls Oil mills)	Ground nut-hull-cement building board	Resin-bonded particle board timber	20
4.	Jute fibre (Jute mills)	Jute-fibre-polymer bonded panel; door and window	Timber, metal	10
5.	Cotton waste (Textile mills)	Cotton-lint-cement bonded board	Gypsum, timber	25
6.	Bagasse (Sugar mills)	Bagasse-polymer- bonded boards	Timber fibres (in insulation board)	30
7.	Corn cobs (Corn mill)	Corn cobs-cement bonded boards	Timber, polymer	40
8.	Sisal fibre (Sisal plant)	Sisal fibre-polymer/ cement bonded roofing sheet, door, window	Asbestos fibre Timber	20-25
9.	Rice straw & wheat straw (Farms)	Compressed and paper covered board	Timber Polymer	40
10.	Banana fibre (Banana plant)	Banana fibre + cotton pulp/ paper pulp and polymer insulation boards	Timber Traditional light weight mineral viz. vermiculite or mica	25

exploitation of ground water resources, it is important to conserve water. The concept of **rain water harvesting** needs to be incorporated in building by-laws as a mandatory requirement.

Waste Management

Integrated Waste Management is essential to ensure appropriate disposal and recycling of agricultural, municipal and industrial waste and preventing the indiscriminate abuse of precious land for dumping garbage. Sustainable waste management practices are required not only for municipal garbage but also for industrial refuse or bio-medical waste.

Life Cycle Approach

The analysis required to understand the impact of the construction industry on the environment is very complicated. To assess how different materials and operations influence the environment over a longer period of time, it is worth considering a life cycle approach to materials and buildings.

Products achieving good ratings in life cycle assessments are based on renewable raw materials, produced with methods using low amount of energy and having low pollution, sound and non-hazardous for the users, etc.

Many industrial countries have developed the so-called **eco-labelling schemes** to promote production of environmentally friendly products. Products that meet the requirements get the eco-label, which works as a "guarantee" for consumers that the particular product is environmentally friendly. The increasing awareness among consumers of the importance of protecting the environment has made eco-labels an important tool to market products.

Need for Integrated Approach for Eco Habitat

In view of various details given in preceding paragraphs, it is important to focus on eco-habitat.

Eco buildings are designed to meet certain objectives such as protecting occupant's health: improving employee productivity: using energy, water and other resources more efficiently; and reducing the overall impact to the environment. This is possible if an integrated approach to building design, at the initial stage itself, is followed which involves judicious use of application of:

- Efficient green materials and construction practices
- Bio-climatic/ solar passive architectural principles
- Efficient systems and equipments
- Renewable sources of energy
- Efficient waste and water management practices

The range of eco design features is very diverse with options that include energy efficient materials, passive solar considerations and structural and mechanical components. All these work together to create a building that is attractive and functional, saves utility costs over the life of the structure and has minimal impact on the environment.

Indian Iniiatives for Eco Habitat

Recently, in India, Eco Habitat approach has drawn attention of many agencies both public and private like TERI (The Energy Research Institute), Pune Municipal Corporation (PMC), Confederation of Indian Industry (CII)-Sohrabji Godrej Green Business Centre, etc. Many of these agencies have started their own certification process to rate a building on the degree of its greenness.

TERI's Green Building Rating System (TERI-GRIHA) evaluates the environmental performance of a building holistically over its entire life cycle. PMC is another example of being the first urban local body in the country to take up implementation of Eco Housing Programme with the technical assistance of the United States Agency for International Development (USAID). The assessment criteria which focus on resource conservation measures like site planning, total water management, energy conservation, eco-friendly and energy efficient building materials, renewable energy and solid waste management will help serve as a benchmark for Eco-Housing projects. Designed to serve as a performance assessment tool, the motive is to help quantify the environmental achievement of a building and provide a meaningful differentiation of buildings in the market place.

CII-Sohrabji Godrej Green Business Centre (GBC) in Hyderabad – jointly promoted by the CII, Pirojsha Godrej Foundation, Government of Andhra Pradesh and USAID – is the only building in the world to be awarded the 'platinum rating' under the LEED rating system of the US Green Building Council, making it *the greenest building in the world.*

The Building Materials and Technology Promotion Council (BMTPC) an inter-ministerial organisation under the Ministry of Housing and Urban Poverty Alleviation, Government of India has also prepared comprehensive set of guidelines and strategies for promotion of sustainable habitat to be called 'Guidelines for Green Habitat' (GGH).

Conclusion

A practical and integrated approach, based on achievable targets and realistic courses of action formulated on the basis of understanding of prevailing situation is required.

Based on the Global Plan of Action of the Habitat Agenda guidelines, actions are required to be formulated at national and state level on the following:

- Promotion of locally available, appropriate, affordable, safe, efficient and environmentally sound construction methods and technologies.
- Promotion of more energy efficient technology and alternative/renewable energy for human settlements, and reducing the negative impacts of the energy production and use on human health and on the environment.
- Institutional support in the form of standards and quality control with particular attention to energy efficiency, consumer safety and protection.
- Tax incentives provided by states to promote green buildings. A green building credit can be awarded to tax payers who construct a building that meets certain requirements. The amount of tax credit awarded for a green building may be proportional to the size of the building and the extent that the building is green.
- **Research and Development**: Need to intensify and support research efforts to find substitutes for or optimire the use of non-renewable resources and to reduce their polluting effects, with special attention to recycling, reuse of waste materials and increased reforestation.
- **Exchange of information**: Flow of appropriate environmentally sound, affordable and sustainable building technologies and facilitate the transfer of technology.
- **Regulatory Measures**: Encouragement and promotion of the application of low energy, environmentally sound and safer manufacturing technologies backed by appropriate norms and effective regulatory measures.

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Case Study

Policy Enablers for Green Goods and Services – Reflections from Down Under!

Dr. Chander of Musahiri Tola in Murliganj block of Madhepura in Bihar is not a registered Medical Practitioner but he is commonly known as "Doctor" in the village. The air is cool as I walk back with him from his house to the road connecting us to the highway over the "*chachri ka pul"* (crude bamboo footbridge) over the water logged areas of his village. Its dark and I cannot see my own feet…but Doctor is comfortable escorting me…I do grope for support, unsure of the makeshift footbridge and the unfamiliar context but for Doctor and his neighbours who walk me back to the road, "eyes get trained to see in the dark in any case when there is no hope of a solution".

The scene shifts to Sunderbans, which is still recovering from the effect of cyclone Aila that destroyed affected many the islands located in the middle of the Bay of Bengal have faced the fury of cyclones and floods for many years. The loss of physical assets combined with the reality of meagre earnings is a way of life for the poor living on the islands or as they say "that is their destiny". We travelled through the watercourse for two hours and then by what is locally known as *"bhukamp* (earth-shaking) express" a basic vehicle put together by mounting a series of wooden planks next to each other on an under structure supported on the chassis of a diesel powered three wheeler do I see light at the end of this ordeal? Literally? The village has basic huts located in large homesteads so they are not even planned out as a cluster but they are all lit with at least one bulb that I can see from the approaching road. I am pleasantly surprised to find solar panels on each straw roof as we move through the village. Is this all for real?

SHG women in Degam Village of Saurashtra, Gujarat assembling solar lanterns

The West Bengal Renewable Energy Development Agency (WBREDA), under the National Solar Mission gave an offer to the people of the Sunderbans to buy solar lights and panels at a subsidised rate of Rs. 2000 per BPL family. In such a scattered and sparsely populated area this decentralised way of lighting homes (and lives) was seized by the people. Self Help Group loans, personal savings, family borrowings – all methods were used to make the most of this opportunity and understandably so.

Next I am surprised by SEWA's SHG women who are engaged in assembling solar lanterns for the salt pan workers in the little Rann of Kutch. Salt making is not only a physically tough livelihood in the scorching heat of the Rann, it is also highly isolating. Individual families of 3-5 persons are subcontracted large tracts of land where industrial salt is collected from the saline underground water of the area by evaporative processes. Working at the salt pans requires these families to relocate temporarily to locations outside the "*abaadi"* (settlement) and work in the pans through the cooler hours of early mornings and late evenings. These locations are away from the civilisation with no electricity and communication links; everything else that can be carried from home such as food, clothing, etc is carried and refilled once in 2-3 weeks. Kerosene lamps have been the common source of light and have been equally responsible for the common occurrence of fire in the temporary thatch huts put up by the salt worker families. Many of the SEWA villages themselves have salt pan worker families; the SHG women, thus decided to start a small enterprise to make available locally assembled solar lanterns with cell phone chargers to the families on equated monthly instalments. There is a basic warranty that is offered for six months for the solar collector device and the battery but is good enough for these families to pursue salt making – with safer lighting solutions, cell phone connectivity and even a radio that can be played through solar power!

How was Sunderbans different from the Musahiri Tola of Murliganj? What was different about Mashairi Tola from the Rann of Kutch? Poverty levels are quite similar, physical drudgery is the same, the feeling of helplessness and fatalism was similar,

SHG women in Degam Village of Saurashtra assembling solar lanterns

government funds for the BPL were the same and yet there was a difference. The difference was in the way state policy recognised and provided opportunity for the people to come forward and solve their own problems in Sunderbans and in the way the SHG in the Rann decided to meet a market demand from their own people – in a manner that was friendly to them.

Are the people of Sunderbans or salt pan workers of the little Rann of Kutch concerned about the environmental effects of the technology they are using – solar/ LED/CFL? Or should they be concerned? Is there a concern disposal of LEDs and CFLs? There are no easy answers.

One thing is however very clear, anything that will help alleviate drudgery, uplift the social and economic status and does not come at a huge price – and, is not entirely dependent on a policy enabler will ride on the currents of the market. By implication this means that while the positive effects of a policy are subject to good enforcement, the role of the market in pushing the green agenda by addressing demand for products that reduce drudgery and promote well-being cannot be underestimated. Further the possibility of "sachet packaging" of green goods and services for easier market penetration holds tremendous potential. With such strong potentiality that lies in the market forces, policy enablers need to support investment in awareness creation, development of simple technological solutions and linking them up with diverse channels for people to access these by themselves.

Mona Chhabra Anand
Associate Director
Knowledge Works

Lok Awaas Karmi Sammelan

National Meet on Eco-habitat Development for All

Gandhi Smriti and Darshan Samiti, New Delhi

The **basin** - *South Asia* Secretariat at Development Alternatives (DA) Group will be hosting the Lok Awaas Karmi Sammelan - **National Meet on Eco-habitat Development for All at Gandhi Smriti and Darshan Samiti is scheduled in March, 2012**. The Sammelan is a national level confluence of the five regional Lok Awaas Yatras. The objective of the Sammelan is to share knowledge on '**replicable low carbon solutions for eco-habitat development in rural India and build consensus on policy imperatives for facilitating eco-habitat creation across the country**'.

The Sammelan is an opportunity to discuss strategies for **scaling up and replicating eco-habitat best practices** with the help of PRI Institutions so that more and more people can have access to sustainable habitat. The **impacts and implication of scaling up and its influence on the climate** will be discussed for the greater good of promoting sustainable habitat development.

The Sammelan will provide a forum to policy makers to experience the learnings gained from the Yatras and derive lessons which will help in planning and managing sustainable habitat development via the various rural housing processes. The aim is to reduce the vulnerability at the local level, generate new opportunities for poverty reduction while responding to climate change concerns of national and global support.

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Development Alternatives

Regional Knowledge Platform

South Asia

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

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

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

Development Professionals Forum, India is a team of Social Architects/ Civil Engineers/ Planners. They work in the fields of Disaster Risk Reduction, Planning & Infrastructure Development, Designing, guiding and monitoring post-disasters Shelter and WASH (Water-Sanitation) Rehabilitation programmes, Integrating Housing/ Habitat development with Livelihoods, promoting Sustainable Architecture & Appropriate Technology Transfer across India

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

Forum for Sustainable Development, Nepal is an non-profit national level NGO established by a group of young professionals from different fields with an objective to shape itself into a helping hand in mobilising community power and promoting people's participation in the country's development activities for environmentally, economically and socially sound development.

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

Knowledge Works, India believes that knowledge works!! They believe that access to knowledge of the right habitat solutions - at the right time is necessary for owners and users of buildings to choose options that are responsive to their needs, safe and environmentally sustainable.

Leadership for Environment And Development (LEAD) Pakistan is a non-profit organisation working since 1995 to create and sustain a global network of leaders who are committed to promote change towards the patterns of sustainable development that are economically sound, environmentally responsible and socially equitable in line with Agenda 21.

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

National Centre for People's Action in Disaster Preparedness, India striving to bring sustainable technologies to help people reduce their vulnerability against future disasters.

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

Sewalanka Foundation, Sri Lanka is a registered non-profit organisation that enhances the capacity of rural communities to democratically identify and address their own development needs and provide services that contribute economically, viable, social just and ecologically sustainable development.

Sri Lankan Youth Climate Action Network (SLYCAN) is a youth lead and youth based network that facilitates the youth across Sri Lanka to come under an umbrella organisation that share a common goal with them. The vision of the organisation remains to link the youth and to collaborate in environmental initiatives that would create a founding stone for the betterment of the environmental protection in Sri Lanka.

Tarayana Foundation, Bhutan is a non-profit organisation working to uplift and enhance the lives of vulnerable individuals and communities in Bhutan. Tarayana complements and supplements the efforts of the Royal Government in poverty reduction by espousing the national goal, Bhutan 2020: A Vision for Peace, Prosperity and Happiness.

Climate Change and Development Division, Embassy of Switzerland, India is a part of the Global Programme on Climate Change, focusing on issues of common interests between India and Switzerland. Their current portfolio of programmes includes Global Programme on Climate Change.

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

Secretariat

Development Alternatives, India 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 organisation, working with poor and marginalised communities of Orissa since 1979 making sustainable improvements in the quality of life.

Unnati, India is a non-governmental organisation 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, promoting collaborative action within South Asia and influencing policy processes to enable access by the poor to sustainable habitat and livelihoods."