LOK AWAAS YATRA

har awaas prakriti ke paas

Handbook on Eco-Habitat

for

Village Panchayats

South Asia

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Mitu Banerjee

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Authors:

Zeenat Niazi and Mona Chhabra Anand

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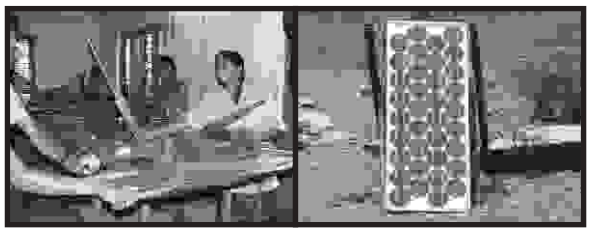


Handbook on Eco-Habitat

for

Village Panchayats

MESSAGE

जयराम रमेश
JAIRAM RAMESH

सत्यमेव जयते

ग्रामीण विकास, पेयजल एवं स्वच्छता मंत्री
भारत सरकार
कृषि भवन, नई दिल्ली-110114
MINISTER OF RURAL DEVELOPMENT,
DRINKING WATER AND SANITATION
GOVERNMENT OF INDIA
KRISHI BHAVAN, NEW DELHI-110 114

MESSAGE

A lot of concern has been expressed both nationally as well as globally on the need for moving towards eco-habitat practices. Contextual relevance, environmental and social responsibility must form the foundations for strategies and actions designed to achieve the goal of "Shelter for All" in a sustainable manner. This book titled the "Handbook on Eco-Habitat for Village Panchayats" explores these themes and the power of cumulative local actions on global environment and vice-versa.

Panchayats have a tremendous potential to spur sustainable development processes at local levels. The need to support and empower Panchayati Raj Institutions for leading local interventions has been discussed at length especially since the passage of the 73rd Constitutional Amendment. However, there has not been enough effort to realize the potential role Panchayati Raj Institutions can play in pursuing eco-habitat development at the village level.

As the global call for environmental action intensifies, this book is welcome as a timely input for, not only Panchayati Raj Institutions but other local actors who are in a position to influence habitat practices. I recommend this book for anyone who is interested in acquitting an understanding of the subject.

Jairam Ramesh
(Jairam Ramesh)
31/8/12

ABOUT LOK AWAAS YATRA

From September 2009 to December 2010, the **basin**-*South Asia* platform organized the Lok Awaas Yatra, a set of five journeys across North, South, East, West and Central regions of India. These were excursions seeking knowledge to understand good practices in eco-habitat development. Over 420 people travelled on 14 trails in the five regions visiting over 60 habitat initiatives led by Panchayats, Civil Society Organizations and state social housing programmes. The journeys brought together *Yatris* (co-travellers) from different walks of life; Panchayat members, district government officials, village artisans, NGOs, professionals and students. Each journey or a regional *Yatra* comprised of three trails (except in the North where there were two). Over a five-day period, the *Yatris* visited three to five grassroots initiatives with focus on the different aspects of rural habitat. They explored best practices in:

- Energy and resource-efficient construction technologies
- Water, sanitation and renewable solutions for rural habitat development
- Habitat-based livelihood generation
- Social housing delivery
- Disaster-safe construction
- Models for financing rural habitat development

The *Yatris* debated on the environmental, social and economic sustainability issues and management systems related to the projects on ground. Discussions ranged across the elements that were transferable to other regions and supporting institutional frameworks that would be required for replication of good practices. Each *Yatra* culminated in a state-level seminar where the *Yatris* shared their experiences with state government functionaries. Lessons from the *Yatra* have been documented in a compendium titled "Understanding Rural Habitat - Lessons in Sustainability", which is a desirable accompanying reading along with this *Handbook on Eco-Habitat for Village Panchayats*.

The Lok Awaas Yatra has revealed the enormous potential of rural India in promoting eco-friendly habitat development. It has highlighted the need for technical resource centres, local enterprise based solutions for making habitat goods and services available and the need to invest in institutional measures at Panchayat and district levels for converging action and funds to respond to housing and habitat needs in a contextually relevant manner.

About the Handbook

This handbook is the result of a *manthan* or assimilation of lessons that were generated during the two-year-long Lok Awaas Yatra initiative of **basin**-*South Asia* Regional Knowledge Platform. The partners of the **basin**-*South Asia* and local stakeholders from their field areas visited various housing and habitat initiatives across the country to learn about the diverse eco-habitat development practices.

It is hoped that this document will inspire and guide local governance institutions across the country to actively plan and implement eco-habitat development in their villages. Eco-habitat as an approach is not just a question of whether we want to adopt it or not; it is a necessity – so that our future generations can continue to live in a safe and healthy environment. With our current pace of consumption of natural resources, changing climate and the effect of frequent natural phenomenon on the living environment, there is definite need to take another look at our approach to development.

Local leaders and administrative machinery have a large role to play in securing the future of our children, our communities, our villages, our nation and ultimately the planet. It is important that we recognize the current conditions in our villages that limit human potential. On the surface, these appear to be related to food insecurity, lack of adequate incomes, degrading water tables, weather-related uncertainties and natural hazards. However, they all have deep causalities embedded in the way we have planned our settlements, used our natural resources, constructed our homes and buildings and lived our lives. The current unsustainable ways of habitat planning and construction clearly need to be reviewed.

The Lok Awaas Yatra initiative has provided an opportunity to revisit and question some of the "conventional" practices of rural habitat development. The case studies mentioned in this document are by no means the ultimate or the only experiences of eco-habitat. They are, nonetheless, an inspiration for an alternative development pathway and perhaps happier and more secure lives and livelihoods.

In this Handbook, eco-habitat is referred to as contextually relevant, environmentally and socially responsible housing and habitat development. It includes the concept of energy and resource efficient construction, non-polluting and environment-friendly technologies, job creation and local wealth generating habitat practices, that result in safe and sustainable rural habitat.

ACKNOWLEDEGMENT

The Lok Awaas Yatra that took place over a period of two years from 2009 to 2010 laid the base for this *Handbook on Eco-Habitat for Village Panchayats*. The *Yatra* covered almost all the regions, over 14 trails, and 60 housing projects. These projects form the rich base of knowledge that the Handbook has attempted to capture for knowledge and information as also to aid replication by other Panchayats and grassroots actors.

We are grateful to the communities of all these 60 villages and to the many local government and civil society agencies that have worked hard to actualize these initiatives and facilitated the *Yatris* with information, process details and lessons of both successes as well as shortfalls. We would like to acknowledge the 420 *Yatris* across the 14 trails, who travelled on these journeys in an endeavour to acquire knowledge, inquired about planning, implementation, management and sustenance of habitat interventions and brought refreshing perspectives to these issues. We would especially like to mention the young and energetic documentation team of Pankaj, Rizwan, Arshiya, Akshay, Mohit, Varun, Geetika, Anuradha, Suneet, Vinit, George Shailendra, Kiara, Swati, Vrinda, Dhwani and Akash, who very enthusiastically and diligently documented the case studies prior to, during and after the *Yatras*. They captured the discussions between the *Yatris* and project stakeholders on the ground to provide fodder for this Handbook.

The film crew of DustyFoot Productions, One World South Asia as digital partners, and Knowledge Works as knowledge partners have supported the documentation and sharing lessons for feedback and inputs. We would like to acknowledge their continued support through the entire process of the *Yatra*.

Both the *Yatras* and the Handbook would not have been possible without the generous funding support from various benefactors and partners. We would like to thank the Building and Social Habitat Foundation (BSHF) of the UK for the support to **basin**-*South Asia* Platform, enabling the secretariat to conceptualize, coordinate and implement the *Yatra* and this Handbook; the Climate Change and Development Division of the Swiss Embassy in India for the Central Yatra; Christian Relief Services for the Eastern Yatra; the Building Materials and Technology Promotion Council (BMTPC) and National Housing Bank (NHB) for documentation supports across all the five *Yatras*; and the Rural Housing Knowledge Network of the Ministry of Rural Development, Government of India managed by the Indian Institute of Technology, Delhi for publishing and printing support.

Finally, we would like to thank the teams and partners and members of the Lok Awaas Yatra and the **basin**-*South Asia* and the in-house team of Development Alternatives, especially Indira Mansingh for conceptual guidance, Soma Biswas, Rizwan uz Zaman, Kavneet Kaur, Suneet Anand and Jay Vikash, who have provided design, layout, documentation and editing support along with essential coordination across the various people to make this Handbook possible.

Zeenat Niazi and Mona Chhabra Anand

GLOSSARY

Below Poverty Line (BPL): An economic benchmark and poverty threshold used by the Government of India to indicate economically disadvantaged individuals and households in need of government assistance.

Pucca: Permanent, of durable quality

Kuchha: Temporary, of less durable quality

Panchayati Raj: A system of democratic and decentralized governance in India

Gram: Village

Tehsil: The second tier of local governance. A tehsil is the executive agency for land records and related administrative matters in a state.

Zila: District

Gram Panchayat: A unit of local self-governance at the village level in India

Gram Sabha: Village level entity consisting of all adults whose names are in the electoral roll of a Panchayat

Rat-trap bond masonry: Type of brick masonry in which bricks are placed on edge, reducing the number of bricks required per cubic meter of masonry.

Truss: A structure comprising one or more triangular units constructed with straight members whose ends are connected at joints.

Purlin: A horizontal member in a roof system supporting the roof covering that itself is supported on rafters or beams

Gharat: Traditional water mill, typically seen in the Himalayan states in India

Dhani: Vernacular housing typology of western Rajasthan

Nirmal Gram: Status and an award conferred by the Government of India on those villages that are 'open defecation free'

Samiti: Association or committee

Sarpanch: Elected head of the village level local self-government called the Gram Panchayat

Yatra: Journey (usually pilgrimage)

Yatris: Travellers

Contents

Chapter 1

Introduction: Eco-Habitat Development and its Relevance

Why should we incorporate environmental and social concerns in our endeavour to plan and build human settlements? What does eco-habitat development mean for the millions of rural families in India?

This section introduces the concept of eco-habitat development and explains the relevance of the eco-habitat approach for rural families as inhabitants of their village as well as global citizens.

Eco-Habitat and its Relevance

The Challenge of Housing: Shortage and Demand

The habitat construction sector presents an opportunity to significantly reduce carbon dioxide emissions and mitigate global climate change impacts. In addition, there also exists a tremendous development potential of green job creation, improvement in the local economy along with improvement in living conditions of the millions of poor communities.

Despite five decades of social housing programmes, housing shortage in rural India continues at about 47.43 million. Of these, about 42.69 million households, approximately 90 per cent of the total shortages, are understood to belong to families Below Poverty Line (BPL).[1]

Besides the natural growth of population and, therefore, the directly proportionate need for additional houses, this wide-ranging shortage of housing can be attributed to the limited capacity of homeowners to access quality housing that is lasting and requires minimal maintenance.[2] The result is obsolete housing stock that needs to be replaced. Housing shortage is also caused by damage and destruction due to natural calamities. Many of these disasters, especially floods, have been linked to changes in the global climate caused by environmentally unsustainable development. Rural housing shortage in India is thus a combined effect of limited supply as well as an increase in demand.

While this articulation may be helpful in identifying factors that are visibly contributing to housing shortage, lack of access to housing is also a manifestation of absence or weakness of representative political structures, lack of credit worthiness to be able to raise finances and severely limited access to technological solutions and skills. The issue is, therefore, more complex than it appears and does not come with easy answers.

According to Development Alternative's estimates[3], current housing shortage translates to approximately 950 million sqm of area to be added in 2012 with an additional annual requirement of about 1 million sqm in order to meet the annual shortage. It is clear that the national goal of "housing for all" is not just ambitious;

it will have serious implications in terms of the environmental costs of development. These costs would be in terms of converting more permeable soft ground to hard impermeable concrete surfaces, huge quantities of agricultural soil being used for brick making, large-scale energy use for producing steel and cement, and many other implications that are yet to manifest.

Although there is a real threat of worsening environmental degradation in the process of construction of such a large number of houses using conventional materials and technologies, there also exists a tremendous potential of local development in terms of creation of local jobs, improvement in the local economy as well as improvement in living conditions. However, this requires a shift in the way we visualize housing and habitat development and also encourages us to challenge ourselves into adopting a "green approach" or an "eco-habitat approach" that is socially relevant, environmentally responsible, financially affordable and at the same time accessible to all.

A paradigm shift in the way we visualize the development of our human settlements is required. We must challenge ourselves into adopting a "green approach" or an "eco-habitat approach" that is socially relevant, environmentally responsible, financially affordable and at the same time accessible to all.

[1] As per the estimates of the Working Group on Rural Housing under XI Five Year Plan.

[2] According to ASSOCHAM, prices of cement, steel, bricks and other input material have risen by over 30 per cent during 2009 - 2011.

[3] Considering a minimum of 20 sqm of *pucca* housing area per, as per the minimal norms under IAY

The Environmental Challenge and the Potential of an Alternative Paradigm

A research by Development Alternatives estimates that rural India will need to consume 1700 million metric tonnes of cement, 14 x 106 million fired bricks, 300 million tonnes of steel and 2000 million litres of water for basic housing alone to meet the estimated "housing gap", considering the current simple specifications for construction of *pucca* houses. The additional infrastructure and public facilities required to ensure a dignified basic living and working environment will probably be four times this figure.

Behind the scenes, another spectre is the quantum of mining, river dredging, stone quarrying, timber extraction, loss in agricultural soils and CO_2 emissions that will be the result of this development.

Is there another way of ensuring that everyone in rural India can enjoy a dignified quality of life with minimal strain on environmental resources? That is where this Handbook on eco-habitat approaches will provide a guide to village and district Panchayats.

Habitat initiatives facilitated by a variety of agencies explored during the Lok Awaas Yatra have amply demonstrated this potential. The fundamental premise of an eco-habitat approach is that various aspects of human settlements in rural habitat can be viewed as a system where intra-system flows of energy in the form of material, financial and human resources, wastes, etc., can be designed in order to optimize energy and material utilization and minimize waste generation.

Fundamental to this process of change is:

- Political and administrative will and facilitative frameworks to move away from conventional practice and pursue energy and resource-efficient approaches to habitat development
- Visionary leadership within the local governance institutions to provide guidance and lead the process of change
- Mainstreaming environment-friendly technology through enhancing the availability and community access, information and finance to products and services.

Fundamentals of Eco-Habitat Development

A Vision of Eco-Habitat

Before we go any further, it is important to articulate a vision of eco-habitat development for rural areas in the country.

A possible vision of eco-habitat development in rural India can be articulated as:

"habitat development that provides sustained opportunities and options for rural families to improve their lives and livelihoods in harmony with the natural environment contributing to reduced economic and social inequities."

It is important to note that eco-habitat approach promotes development that is not at the expense of social and economic well-being of the people. It promotes and contributes to their enhanced well-being in manner that is culturally and geo-climatically appropriate, environmentally responsible and socially empowering in the long term.

The focus of eco-habitat development is qualitative and quantitative improvement of the physical environment comprising of houses, basic amenities and habitat infrastructure. However, it places physical development firmly within the local, social, economic, political and ecological context. Moreover, it also views the local village development actions in the perspective of a global goal of sustainable development.

Principles of Eco-Habitat Development

A principle is defined as a "basic truth or law that guides processes and action and helps confirm to a perspective" (Oxford Advanced Learner's Dictionary, 1998). In the context of habitat development, a framework for the overall social, environmental and economic sustainability of human settlement development is necessary.

To translate the vision of eco-habitat development into a tangible reality, it is important to identify those non-negotiable principles that guide the decisions on specific actions to be taken in this direction. These are given below:

1. Principle of Integration
2. Principle of Inclusion
3. Principle of Responsibility to Local and Global Contexts
4. Principle of Risk Reduction

Nurturing community solidarity through inclusive processes, as has been seen, for instance, in tribal communities, is potentially a strong building block for creating habitats that are equitable as well as in harmony with nature. Leadership of Panchayati Raj Institutions (PRIs) and village councils is critical as these local bodies are responsible for management of local resources and community assets as well as welfare measures at the grassroots, especially for the poorest sections of the communities.

1. Principle of Integration

The principle of integration promotes access to housing, basic amenities, livelihood, community infrastructure and natural resources together as part of rural habitat development. Any one of these, without the others, is ineffective in improving the quality of life. Together, their cumulative effect is much higher than the sum of their individual effect.

As an illustration, a *pucca* (permanent or of durable quality) house very often serves as a work space for many households in rural areas, facilitating income generation. Access to a safe house with clean surroundings has a positive impact on people's physical and mental health and also supports access to education. Community level livelihood infrastructure and facilities promote village industry, enhancing incomes and improving access to credit for water and sanitation services. Water conservation and management leads to increased availability of water for drinking and ablution further leading to greater uptake of sanitation facilities, thus improving health and human productivity. The reverse is also true; *kuchha* houses are vulnerable to natural phenomenon of cyclones and earthquakes, causing development retardation in the case of such events. Poor sanitation leads to polluted ground water and adverse health effects. Development of rural regions reduces out-migration to cities, curbing the tremendous pressure on urban land, infrastructure and services.

Thus, in the larger perspective, there are direct links between a safe and secure habitat and other aspects of quality of life. These links have a strong potential for facilitating a better standard of living and reducing vulnerability. Habitat planning, therefore, needs an integrated approach, even though the actions may be directed towards individual items such as housing, roads and water supply.

2. Principle of Inclusion

The principle of inclusion, first and foremost, advocates the inclusion of individuals and families in a village as a critical prerequisite for sustained change. This refers particularly to marginalized and vulnerable groups, especially women, families from scheduled tribes, castes, the disabled and the aged in all stages of planning, execution and management of habitat-related interventions.

Rural habitat development in India has traditionally been an 'owner-driven, community-based process' with great dependence on local resources and skills. However, with increasing population and resulting pressure on natural resources coupled with an aspiration for 'urbanized' lifestyles, the result is reduced community involvement in habitat and housing. This has given way to individual initiative rather than a community based process, very often translating to decisions that may or may not be in line with common concerns. At the same time support systems to aid the individual such as credit support, access to information, etc., have not developed adequately and at the same pace.

Some habitat components such as sanitation cannot be effectively achieved till such time as all households in every village construct and use toilets. Even if one household does not avail of toilet facilities, the threat of ground water contamination and ill health will remain. Thus, the engagement of all the households in decision making, community support in addressing individual household difficulties in complying and, therefore, inclusion of every household in the process of habitat development is crucial.

The principle of inclusion also encourages participation of all the local stakeholders who have a role to play in sustainable rural habitat development. For instance, the involvement of the private sector can serve as a catalyst for a balanced, market-driven approach to habitat development with a focus on small-scale as also local entrepreneurship. Civil Society Organizations (CSOs) support community mobilization and access to information; technical support agencies bring in critical know-how; and local banks are key players to extend credit facilities to drive housing demand. Mutually beneficial partnerships among these players will lead to effective planning and implementation of sustainable habitat development.

3. Principle of Responsibility to Local and Global Contexts

The principle of local responsibility advocates that habitat solutions must address concerns of the local context with a longer term perspective and contribute to local development in the short, medium and long term. This implies that habitat solutions must be designed so that they conform to the social, cultural and geo-climatic needs of the context and the local natural and human resources with a sense of responsibility.

In the present context of changing climate and dwindling natural resources, this principle demands that habitat development be carried out in the spirit of "think globally, act locally". While habitat planning and development action must be in harmony with the local context, it also needs to respond to larger regional and global concerns that, in turn, may influence the local social, cultural economic and even climatic context.

The principle, therefore, refers to the need to balance environmental, social and economic concerns in both the short and long term. It encompasses all the assets that a community can use – social, natural, human, and financial – for habitat development and stresses on their sustainable utilization. Habitat development and building activity have tremendous impact on the quality of natural environment. Issues of land utilization, extraction of sand, soil, stone, etc., and dumping of waste make construction activity an environmentally challenging task. Beyond local environmental concerns, this principle reaffirms the potential of housing and infrastructure construction to mitigate global climate change impacts. Therefore, all efforts and actions to check exploitative practices such as excessive mining and carbon emissions that are affecting the environment add up to enhance global sustainability. At a more practical level, we are running out of reserves of non-renewable resources such as fossil fuels and virgin building materials. Thus, it will be a strategic decision to explore the improved ways of using natural resources that allow conservation, reuse, recycling and regeneration of resources. It has been mentioned that construction and habitat development can contribute to local value creation through jobs, skills and economic growth. This principle guides habitat planning and implementation in a manner that builds up capacities and utilizes local human resources, promotes local entrepreneurial initiatives and contributes to local wealth generation.

4. Principle of Risk Reduction

The principle of risk reduction advocates that habitat development should not only follow a 'do no harm' approach, it should also reduce the risk of loss of life and assets in the face of natural hazards that the area is exposed to. Natural phenomenon related to climatic influences such as floods and cyclones are becoming more frequent, hitting with greater intensities and occurring in newer geographical locations across the country. Thus, disaster risk has emerged as an important consideration in the planning, design and execution of habitat infrastructure. Scientific knowledge of natural hazards and the risks to lives and livelihoods of people have resulted in the understanding that disasters are not pre-destined but are related to conditions of existing vulnerabilities like social and economic conditions of the people, planning and location of human settlements, type of construction of houses and infrastructure and level of education and awareness. Vulnerabilities can be reduced by addressing these factors to mitigate disaster risk. Thus, habitat planning, house design and choice of construction technology must be responsive to local vulnerability conditions.

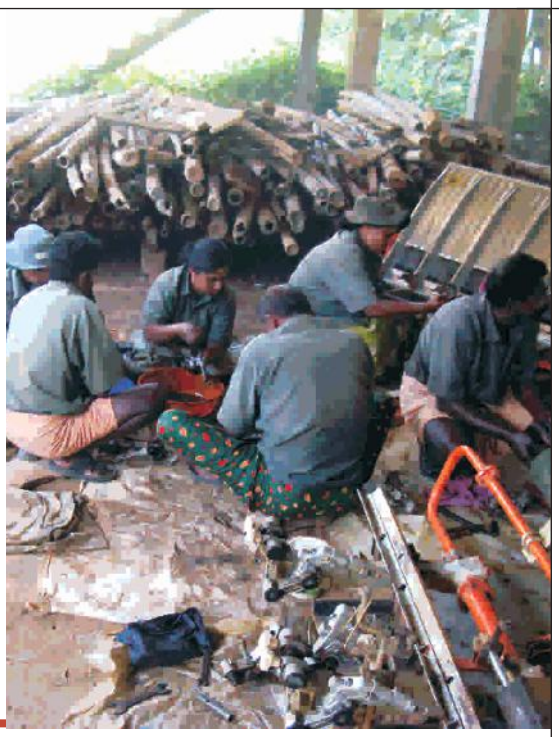
Moreover, some habitat decisions also exacerbate the effect of simple natural phenomenon to convert them to disasters. For instance, deforestation has a clear role in the occurrence of landslides and flooding due to increased silt deposits in rivers. Building heavy structures on loose rock and construction work on steep slopes also leads to landslides. Absence of systematic drainage systems or disturbing the natural drainage system can also lead to landslides and floods. As a result of these actions, vulnerability of building stock and risk to human life increases. Much of the damage suffered during a disaster is preventable if the principle of risk reduction is followed.

Chapter 2

How can Panchayati Raj Institutions Develop Eco-Habitats?

Local leaders, especially Panchayat members at village, block and district levels have a key role in promoting the process of change. This leadership role involves first and foremost, a cognizance of the impacts of contemporary approaches to development and the added value of the eco-habitat approach. It then requires a search for actionable ideas that are locally appropriate and also implementation strategies and partnerships.

Along these lines, this section discusses how members of Panchayati Raj Institutions can lead the process of eco-habitat development.



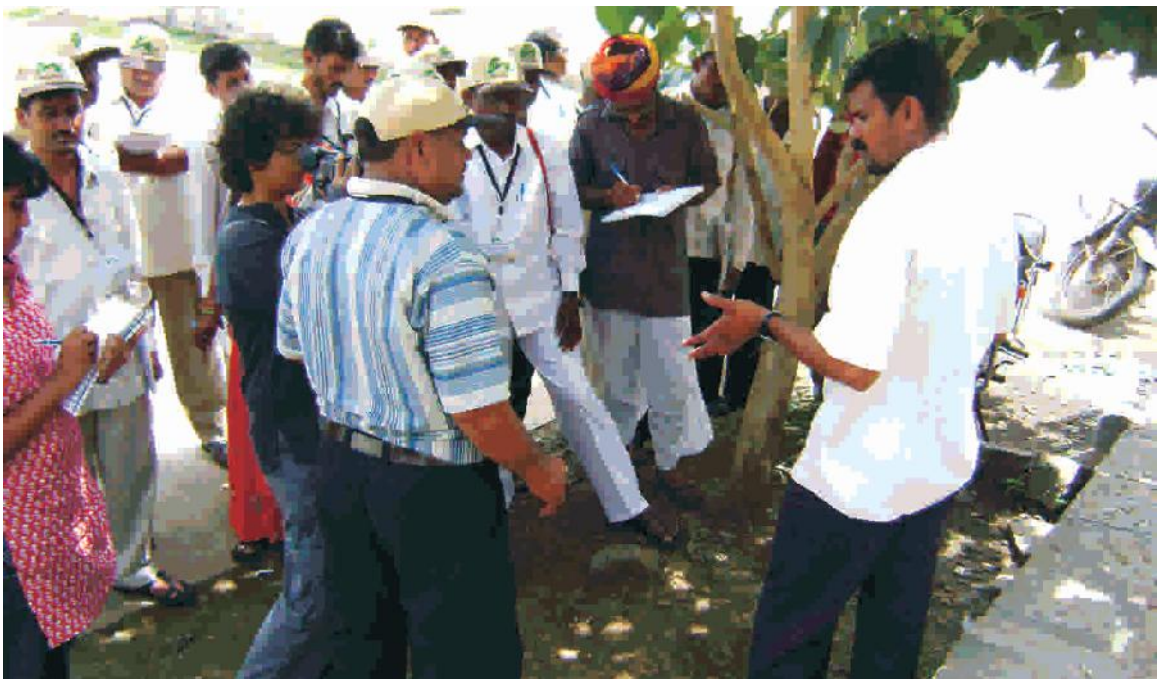
How can Panchayati Raj Institutions Develop Eco-Habitat?

The 73rd Amendment in the Constitution of India has mandated the a three-tier Panchayati Raj Systems wherein the Panchayats at *Gram*, *Tehsil* and *Zila* levels are expected to plan, manage and implement local development activities based on local plans developed at the *Gram* level and consolidated at the *Zila* level. With identified sources of funds and 29 areas of functioning, the *Gram Panchayat* is in a position to wield considerable influence and direct the development of the village. Despite on-going debates on effective devolution of funds, functions and functionaries, many states, have, over the years, strengthened the decentralized local governance. However, even here, *Gram Swaraj* is far from becoming a reality. Beyond truly leading local governance, there lies a tremendous potential at the *Gram Panchayat* level to direct development on a path of sustainability. The *Gram Panchayat* is the right scale and at the right level to understand the needs of the community and respond to them in a manner that integrates the human, natural, physical, financial and social systems of the village, thus driving sustainable development at the local level.

A growing set of experiences indicate that facilitating collective vision for a safe and sustainable future of the village is the first step in this process. This is followed by developing a common understanding of gaps and potentials towards achieving the envisioned goal. A perspective plan needs to be prepared for at least a five-year duration. Broad plans for a 10-15 year perspective with five-year milestones can act as road maps detailed out by subsequent Panchayat governments, especially when these have been developed collaboratively. Detailed action plans are prepared every year and matched with sources and quantum of available funds. Implementation strategies, transparent tracking monitoring and learning systems and a review of plans every year based on the progress made and new developments make for a dynamic local development process.

The need to move from a 'development as usual' to a futuristic sustainable development-oriented paradigm will require the Panchayats to see themselves in a position of leading a change. Exposure to good practice, regular orientation and peer-to-peer learning are some of the ways for Panchayats to be inspired and strive for positive action.

Habitat development is not an ideal, closed system. Resources such as soil, stone, timber and water are extracted and converted into building materials, buildings, drinking water, roads, etc. Also, there are links with other rural and urban human settlements leading to exchange of materials, waste and human resources. The environmental impact of such exchange is also wide ranging. It is desirable that extraction of construction materials leads to minimal impacts and wastes are reused / recycled, thus minimizing environmental impacts.



Adopting an Integrated Planning Approach

Habitat refers to the space and environmental conditions wherein a person, animal or plant normally lives, grows and achieves its full potential. It, therefore, integrates conditions and facilities required for all aspects of well being. 'Habitat' in the context of rural human settlements is an integration of housing, potable water, sanitation, domestic energy for lighting, cooling, heating and cooking; infrastructure for education, health, entertainment, economic activities as well as local environmental resources for people and their livestock.

Focus on housing alone is insufficient to ensure quality living environment where the complete human potential of a household can be realized. Integrated development of housing together with civic as well as social infrastructure at the village level is essential for sustainable improvement in the quality of life. Village infrastructure comprises roads, irrigation and water supply, power supply, health centres, schools, anganwadis, places of worship, libraries, veterinary clinics, etc.

Development of human settlements and habitat may be done in a manner that enhances their positive social and economic impacts. Job creation and skill development augments the human and economic capital, improved physical assets enhance human productivity and health – leading to generation of local wealth and well being and reducing / mitigating negative environmental impacts.

How Can We Do This?

Some of the important steps to be kept in mind are:

i. Through a micro-planning exercise, we need to identify the various needs of the village in relation to housing as well as civic and social infrastructure. We shall have to ensure that all the members of the village community are represented in the micro-planning process, so that the micro-plans include the interest of different groups, especially with regard to access to land for building, management of common property, natural resources and waste. This is important as we need to safeguard resources such as local agricultural soil, local forest, local hillocks and, in the process, may well find that certain processes such as overflow of septic tanks, drainage, etc., can contaminate sources of drinking water like lakes or ponds.

   People need to be informed of unsustainable habitat practices that require energy intensive processing and lead to air pollution. A classic example would be of brick making in clamps, which can be replaced by other materials such as fly ash blocks or stabilized compressed earth blocks that have a reduced environmental impact and also generate local livelihoods.

   Habitat development decisions should be taken in consultation with all the stakeholders.

ii. It is important to ensure that concerns of disaster vulnerability are considered in the micro plan. Decisions in relation to siting of new hamlets in flood- and cyclone-prone areas, plantation of bio shields in areas prone to natural calamities, height of plinths, etc., need to be made at the community level considering the disaster risk profile of the area.

iii. Once the micro plan has been drawn and agreed to, the next step is developing community based disaster management plans which are a key component of the habitat planning in the Gram Sabha and identifying the flows of resources and wastes that will be involved in the process of construction of housing and habitat infrastructure. We also need to analyze various options that may exist for minimizing the use of resources and reducing waste generation. For this, technology selection tools can be used from the Rural Housing Knowledge Network and **basin**-*South Asia* portal. The choices made must be guided by principles of eco-habitat. We need to look for those options that enhance local incomes, promote local skills, can be manufactured locally, reduce / minimize negative impacts on local ecosystems and reduce risks to natural disasters.

iv. Central and state governments provide assistance for different habitat components through various schemes such as Indira Awas Yojana, Total Sanitation Campaign, Drinking Water Supply and Sanitations Scheme. Specific works may also be explored under MGNREGS that can help in resource generation through the process of developing / constructing and maintaining different components. Building material production can be explored under the National Rural Livelihoods Mission and capacity development from the Backward Regions Grant Fund.

v. It is also crucial to revisit and finalize the micro plan by integrating requirements and funds.

Hivre Bazar

Hivre Bazar, a village located in Nagar Taluka of Ahmednagar district faced acute water crises and land degradation during the 1970s. Lack of water management led to reduced agricultural productivity and, as a consequence, to massive migration towards the cities. By the end of the 1980s, the Village Panchayat led by Shri Popat Rao Pawar started an Integrated Development Programme with watershed development at its core. The programme was to be led through community participation in the form of Shramdaan (voluntary labour), as a sense of responsibility towards appropriate use of local resources.

In Hivre Bazar, the Gram Panchayat became involved in the preparation of plans for future growth and development of the village. The community itself took an active part in planning and managing the development process. It started with the Employment Generation Scheme under which people enrolled themselves in a bid to earn livelihoods. Through this, the villagers got livelihood opportunities within the village, which resulted in the physical development of the village by the way of creation and regeneration of productive assets like water conservation structures, forests, etc. Scientific tools for ground water mapping were used to help the village understand the scarcity of the critical resource, while water budgeting led to setting up efficient and equitable management practices. The resources from the Rajiv Gandhi Water Mission were used to ensure that every household had access to drinking water and toilet facilities and that street drains were constructed to keep the village clean.

Planning and Design for Ensuring Security of Assets

Habitat development in rural areas is not a one-time event. Human settlements grow and develop over a period of time as families expand, livelihoods change and economic conditions alter. Therefore, the location, size and quality of homestead and houses must be viewed with a long-term perspective. Settlement planning should be similarly undertaken keeping in mind the needs of the future generations. Disaster vulnerability is emerging as one of the key considerations for planning of settlements as well as designing of individual houses. Nearly one-third of India is prone to multiple hazards. More than eight thousand kilometers of coastline in the east and the west coast of India covering a large part of 13 States and Union Territories, inhabited by nearly 200 million people, face the hazards of tropical cyclones, and the associated storm surge and heavy rainfall, both before and after the annual monsoon. Sixty per cent of our country is prone to earthquakes and a large number of settlements in river basins face the threat as well as the reality of floods every year. These facts warrant attention but do not necessarily imply the use of high energy materials and technologies. These may be a part of local solutions in terms of building design especially in case of areas that are repeatedly exposed to natural hazards. For instance, the use of lofts / attics in the flood-prone areas of Bihar, Odisha and Tamil Nadu are a characteristic of the housing typology in these areas. Planned development can optimally utilize such traditional knowledge and build upon it.

How Can We Do This?

The simplest and the most effective solution to reducing disaster risk would be to not have any settlements in hazard-prone areas. However, this may not always be the most practical solution. Hence, there is a need to understand and apply proven strategies and solutions in addressing specific risk conditions, like ensuring enough height of plinth in flood-prone areas, constructing at least one room or the core house with materials that can withstand the effect of probable cyclones, and implementing correct construction details and processes for resistance to earthquake intensities in areas that witness a lot of seismic activities.

The following steps need to be kept in mind to ensure a safe habitat development:

i. Identify the probable risks in the local area. These risks could be natural and unavoidable such as earthquake and cyclones; they could also be the result of human action / inaction. For instance, faulty planning of habitations is a common cause of localized flooding during monsoon or any hazardous industry. Segregate the identified risks on the basis of whether they can be prevented or not.

ii. With the help of a local engineer at the District Rural Development Agency or any other technical agency, for each of the identified risk, enlist the measures that should be taken to mitigate or reduce the risk. For planning or siting new buildings, housing clusters, roads, etc., ensure that basic risks mitigation are followed. For example, respect the CRZ (Coastal Regulation Zone) to keep a minimum distance from the coastline, avoid blocking or changing natural land drainage, do not disturb, rather build up natural bio-shields of mangroves in cyclone-prone regions. Numerous such measure based on levels of risk and disaster vulnerability of the area have now been defined.

   For those risks that emanate from human action, seek technical solutions from the resource agencies available locally. For instance, localized flooding due to faulty planning can be mitigated by a technical solution like an effective drainage system that complements natural drainage.

iii. With the help of the local technical resource agency, understand the specific measures that need to be undertaken in designing and constructing new buildings in order to minimize disaster risks based on the existing building typology while also identifying retrofitting measures required to make existing buildings safer, e.g., structural framing, avoiding heavy roofs in earthquake zones, well tied roofing in cyclone prone regions, etc.

iv. Ensure that the information on safety features is adequately and widely disseminated within the village in simple, preferably pictorial narration. This information may already be available with the technical resource agency. It will have a positive effect in sharing this information during various events when people congregate either for meetings or to celebrate festivals.

v. Build the skills of local artisans / masons in constructing disaster-safe buildings. For that, we can plan specific skill building programmes in the village micro plans; or connect with the National Skill Development Corporation schemes and programmes, or even the local RUDSETI initiative.

Flood Resilient Shelter Construction Catholic Relief Services

Loss of shelter is a major issue for families living in areas affected by recurring floods. Natural disasters are an annual occurrence in India. Rebuilding shelters year after year in the aftermath of floods and cyclones is a priority for families that erases any savings that the family might have made. The disaster-affected families often unknowingly rebuild using non-flood resilient housing techniques.

Catholic Relief Services, India (CRS India) has carried out a flood-resistant, shelter pilot programme to address the need for low cost, longer-term shelter solutions for communities living in flood- and cyclone-prone areas of West Bengal and Odisha.

In the pilot programme CRS promoted two low-cost shelter models using locally available materials, one utilizing pre-fabricated concrete pillars and the other working with compressed stabilized earth blocks (CSEB). Local artisans and beneficiaries easily understand the flood-resilient construction techniques demonstrated in both models and have replicated these new techniques of cross bracing and pillars two feet below the ground during construction of other shelters in the area. Both CRS shelter models are environmentally adaptable and can withstand 4-5 feet of water or normal monsoon conditions.

CRS is advocating that if the State Governments of Odisha and West Bengal integrate the shelter model into their rural housing schemes like IAY and Mo Kudia (my hut) and train the local artisans on construction of both the shelter models, CSEB production units can be set up at the community level for easy access and availability of material.

Using Green Construction Materials and Technologies

Energy and resource efficient or 'eco building technologies' refer to construction materials, techniques and technologies that hold a strong potential for sustainable development at the local level. Resource efficiency also includes soil and water footprint of any building activity. Optimal use of materials and selection of low carbon technologies significantly reduce the carbon footprint, are economically advantageous and can provide employment at the village level. Using these technologies, the energy consumed in construction can be reduced by 25-33 per cent, resulting in significant decrease in CO_2 emissions. Eco-building technologies also reduce the pressure on natural resources, by reducing both material and energy requirements.

Low carbon construction includes the following measures:

- ***Building Elements:*** For example, compressed stabilized soil blocks, sun dried earth blocks with terracotta face tile, fly ash bricks, hollow concrete blocks, bamboo reinforced panels, micro-concrete roofing tiles, corrugated bamboo mats, RCC planks and joists, funicular shell, roofs, rubber wood, reconstituted door frames, ferro-cement channels.
- ***Technologies:*** For example, Vertical Shaft Brick Kilns, prefabricated toilet systems, eco-san toilets, slow sand filtration systems for water.
- ***Techniques:*** For example, rat-trap bond masonry, bamboo trussed roofs, conical tile centenary vaults, filler slabs, arch panel roofs, stabilized earthen vaults.

The technologies identified above are available and can be operated by micro, small and medium scale enterprises promoting village industry and livelihoods. Furthermore, local artisans can be taught the skills to apply the identified technologies, thereby promoting skill development and local job creation.

How Can We Do This?

i. Identify a technical resource agency, building centre or individual in your area with experience of developing / promoting eco construction technologies. This resource person or agency can be linked to your local administration / NGO / private entrepreneur and may already be engaged with you for habitat planning. Seek the advice of this technical resource to understand to low carbon / eco-construction through simple literature or actual visit to nearby examples demonstrating the application of eco-technologies.

ii. Understand the expected structural performance of various building elements or components on account of their use / function and exposure to local disaster risk. Based on this understanding, make a list of building materials and technologies that can satisfactorily meet the expected structural performance standards. For example, single storey to two-storied buildings do not require reinforced concrete frames and simple corner reinforcements and plinth and lintel level connection rather than RCC columns can make the structure disaster safe in most regions.

iii. Analyze the shortlisted options in order to understand the ingredients of each as well as the process involved in manufacturing / producing these materials and technologies. Prioritize those that have a greater proportion of materials and ingredients produced through low energy local processes.

iv. From the options identified, shortlist those that can be sourced from shorter distances, closer to point of use and are available in abundance. Finally, decide in favour of those that can be produced locally by village-based entrepreneurs as also those that use local wastes and reduce the dependence on virgin material.

v. Identify sources for financial support for these enterprises that can be taken up by the Panchayat / local SHG / individual entrepreneur. Also identify those people who can be involved in production and organize their training by a suitable resource agency. Ensure that these entrepreneurs have a sufficient market by sourcing material from them for all kinds of construction works in the village.

vi. Ensure that low carbon materials and technologies are affordable. Their costs need to be worked out over the life of the building, including operation and maintenance. The cost should also include the expense for transportation of materials and production by families / communities at site.

vii. Once you have a list of preferred technological options, use this for the construction of housing and rural social infrastructure such as schools, *panchayat bhavans*, etc. This list can be revised once every 5-7 years and updated with new improved / emerging options.

viii. Plan for skill development of local masons so that a skill base is available. Alternatively, insist that local contracting agencies invest in and engage masons skilled in the use of eco-construction technologies.

Centre of Science for Villages

The Centre of Science for Villages (CSV) was set up in 1977 to act as a technology transfer centre for reviving the rural economy. CSV works to salvage traditional sciences through appropriate technology transfer and introduce practical and innovative scientific products for rural areas that benefit both the people as well as the environment.

The techniques developed by the CSV range from mud housing technology to various methods of energy production and food growing. CSV actively works in the areas of hygiene promotion and development of local alternate industries. These techniques, primarily based on locally available materials, are simple to use, cost effective and environment safe.

The two campuses of CSV (Kumarappapuram and Dattapur) in Wardha showcase a wide variety of alternate technologies. At these locations, CSV also provides training to artisans, SHGs, micro entrepreneurs and development practitioners on alternate technologies.

Sustainable Water and Sanitation Solutions

A safe and sustainable source of water that is easily accessible to all sections of the community is a critical factor for sustenance of life. Unsafe and unreliable water supply has huge opportunity costs associated with it. In India, as per the 2011 census, 36 per cent of rural households lacked access to potable drinking water. Ensuring access includes water supply infrastructure, affordable sources for safe drinking water and equitable distribution. Availability of adequate supply is often a challenge and must be addressed through rainwater harvesting, storage and ground water recharge measures.

Similarly, access to sanitation is extremely crucial for living a life with dignity. This is especially true for women and young girls who go through tremendous hardship both physically as well as emotionally just to meet the most basic needs of personal sanitation. As per the census of India 2011, 49.2 per cent of rural people in India do not have access to toilets.

Although the government - both at the centre and the state level - has initiated schemes for provision of water and sanitation in rural habitations, operation and maintenance issues continue to cloud sustained access. To address this situation, action is needed at multiple levels. Most importantly, there is a need for cohesive community structures / institutions that can seamlessly continue to take responsibility for ensuring responsible use and maintenance of the projects. Create awareness about the benefits of using sanitation facilities and safe drinking water and the ill effects of not doing so; ensure the availability of an adequate water supply and sanitation options that are affordable and environmentally benign and enhance their access by facilitating skills, finance, operations and maintenance measures.

How Can We Do This?

The following steps need to be kept in mind to ensure sustainable water and sanitation:

i. Understand local ground water characteristics, the relationship of ground water with geological formations, height of water table, quality of water, etc. This has a bearing on the selection of technology solutions for provision of potable water sanitation. You could take the help of a resource agency / local administrative machinery to do so.

ii. Water availability is ultimately a function of recharging ground water sources through active or passive means. Therefore, the first preference should be to use water sources that do not require underground water to be drawn using energy intensive processes. As far as possible, avoid bore wells. Hand pumps are a viable option in case any other surface water sources are not potable.

Ensure that every possibility of conserving rainwater for use or for ground water recharge is utilized. Take the help of the local technical resources to decide on the processes involved.

Regularly check the quality of drinking water for potability. Simple tools are available for this. In case the water is contaminated with bacteria or has excessive arsenic, fluorides, turbidity or salts, look for possible contaminants in the form of leaking and leaching septic tanks, open defecation, fertilizers in water or excessive drawn ground water. Seek solutions to treat this problem and use household level treatment / filters.

iii. Construction for toilets and bathing spaces needs to be prioritized by families themselves for improving their living conditions. Solutions that promote privacy, especially for women and young girls and provide primary barriers to fecal contamination are a necessity today.

iv. Ensure that the suggested solutions are not water intensive for excreta disposal. Ensure that human and animal waste does not pollute ground water resources that, in many cases, may be shallow. Look for ecological sanitation solutions that use waste as a resource and try to reduce treatment and management costs. In addition, management of solid wastes from the households needs to be strategized, given the increasing quantity of non-biodegradable garbage in rural households.

v. Leverage financial assistance from relevant government schemes such as National Rural Water Development Programme and Total Sanitation Campaign. Converge them with water augmentation schemes for Integrated Watershed Management and Rooftop Rainwater Harvesting.

vi. Effective water and sanitation solutions can emerge only through an integrated approach which simultaneously addresses both water and sanitation as an important element of environmentally sustainable development.

vii. Ensure that a designated community based group or committee takes total responsibility for the operation and maintenance of water and sanitation infrastructure. In addition, an inclusive approach that strives to bring the entire rural community under the fold of sanitation measures can ensure a higher degree of success.

Karvanji

Karvanji is located in Lohara Taluka of Osmanabad district, Maharashtra. The village was relocated as a part of rehabilitation initiatives after the Marathwada earthquake of 1993 that affected 232 households in Karvanji. After reconstruction of the shelters, the most important need identified by the people was access to safe, piped water supply. The solution was found in the Jalswarajya scheme of the Government of Maharashtra under which the government provided 90 per cent of the capital investment needed for installing a water system. The rest of the amount was contributed by the community. A piped water distribution system was thus laid out with an overhead tank and underground water pump. A panipatti (fund) was created and monthly contribution is being made by the villagers for maintenance of the system at the rate of Re 1 per day.

Percolation pits have been constructed, with rainwater as the main source of recharge. This helps in maintaining the ground water table level and, thus, reduces the pressure on ground water. The implementation of the scheme rested with the Gram Panchayat. In addition, a Jalswarajya Committee has been formed with representatives from the community to manage the entire scheme. Three sub-committees have been created to look into the various aspects of the scheme. This delegation of responsibility enhances the community ownership of the scheme and also ensures accountability.

Using New and Renewable Sources of Energy for Cooking and Lighting

To meet their domestic energy needs, a large majority of the rural population still depends on traditional biomass such as agricultural residues and wood, charcoal and cattle dung. According to the Census of India, 2001, about 91 per cent of rural and 31 per cent of urban homes depend on traditional fuels like fuel wood, animal, crop waste and charcoal for cooking. About 64.1 per cent of the rural households depend on firewood, 13.1 per cent on crop residue, 12.8 per cent on cow dung cake, 5.7 per cent on LPG, 1.6 per cent on kerosene, and 1.1 per cent on charcoal/coal. Conventional use of fuel wood in cooking, apart from being low in calorific value, also involves drudgery, mostly of women, in collection of this resource. This process of cooking has low thermal efficiency and produces very high concentration of air pollutants that causes respiratory diseases and eye infections. About 50 per cent of the rural households depend on kerosene for lighting. Access to dependable electricity for lighting, heating and cooling, mechanical power, etc., has so far been possible for less than 50 per cent of the population mainly in rural areas.

Given the low density and scattered typology of rural settlements in many parts of the country, access to even conventional sources of domestic energy is severely limited. With a view to fulfilling the energy needs of the rural population within the context of climate change and the need to diversify energy sources, renewable energy sources hold tremendous potential. Solar power, bio-gas, water-mills (*gharats*), windmills are all sources of renewable energy that can be managed in a decentralized manner and provide sustainable livelihood opportunities for the people. Decentralized options of renewable energy are not only environment friendly, they also hold the potential to substantially reduce the cost of energy generation and supply.

How Can We Do This?

The following steps are recommended:

i. A pre assessment process is essential to identify the need of a village for a decentralized renewable energy intervention. The criteria to the same can include the status of electrification of the village, a generic load profile of the village, availability of local resources in the village as also the financial capacity of the village. Such an assessment is done with a macro view before planning an intervention.

ii. Once the basic need is established, it is essential to mobilize the community and generate awareness in the community about the importance of renewable energy and energy planning. At this stage, it is also important to understand the needs and aspirations the needs of the community with respect to their development priorities. The same can be done through a visioning exercise.

iii. It is essential to form a village energy committee (VEC) in the village. This committee will be incharge of planning and executing the implementation of a decentralized renewable energy intervention. It should contain representation from key stakeholders, namely women, farmers, key entrepreneurs and the PRIs. This will ensure ownership of the intervention within the community.

iv. In the next stage, the detailed assessment of the energy needs of a village with respect to cooking, lighting and irrigation enterprises by the VEC is essential. These assessments can be conducted through the use of different available formats.

v. At this stage, it is also important to identify the resource base of the village. This should be done in a participatory mode by the VEC using different available tools such as maps and GIS. This exercise of resources identification and mapping can also be done with the help of the land revenue department officer.

vi. Based on the demand supply and development priorities of the village, a village energy plan should be prepared by the VEC. This plan provides guidelines for designing the intervention in order to meet the energy needs of the villages. Technology selection is an important component of this plan which is done on the basis of demand estimation, power generation capacity, financed analysis and installed capacity estimation. Under the implementation model, a suitable techno-commercial and social model for the proposed intervention is designed. A monitoring and evaluation plan is additionally required to assess the impact of the intervention. Also an operation and maintenance plan for the decentralized renewable energy solution should be prepared along with a capacity building plan for the villagers, particularly for Operation and Maintenance to ensure sustainability.

Rampura Solar Village
Bundelkhand

Rampura village is 17 km away from Jhansi, in block Badagaon of Jhansi district in the Bundelkhand region of Uttar Pradesh. There was an absence of grid electrification in the village. Most of the energy demand in Rampura depended on fossil fuels and biomass, thereby polluting the environment.

A community based solar power plant (CSPP) was installed in 2009. The plant demonstrates a village habitat development model with emphasis on renewable energy promoted by SCATEC (Norway) and Development Alternatives (DA). It represents a major step towards rural electrification in India. The CSPP has installed 60 solar panels to power 24 batteries of approximately 9 kW each that provide clean and reliable electricity to 150 households and local micro-industry such as flour mill, water pumping and distribution, sewing machine, cash crop drying, etc. In Rampura, the power is distributed through a local mini-grid; the power in the first stage was used for lighting, fans and entertainment, educational purposes (TV, radio).

The payment for the electricity is a tariff based on what the villagers currently pay for different sources of energy, such as kerosene and diesel. The revenues generated cover operational and maintenance costs, as well as replacement of batteries and other components.

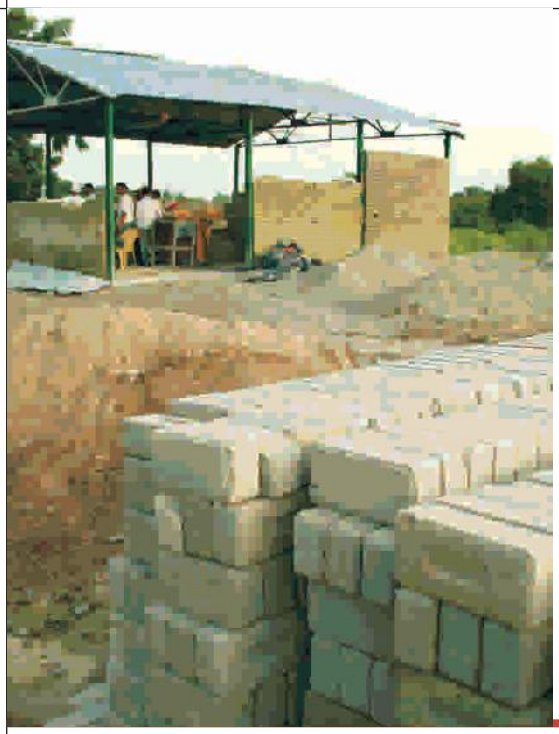
A Village Energy Committee (VEC) has also been established with local people's representatives and experts, actively involved in the development of the area, a major step to enhance knowledge and skills of rural people in energy management. The VEC plans, implements, monitors and controls the project activities.

Chapter 3

Drivers of Eco-Habitat Approach

Eco-habitat for all in rural India is an ambitious task. We believe it is not impossible and given political will and well-designed institutional measures within an enabling environment, community and market energies can be leveraged to engineer a paradigm shift in our perspectives to accelerate the development of safe and sustainable human settlements.

What can drive this change? Beyond critical components for eco-habitat development, what are the triggers that can initiate a healthy dynamic process? How can we overcome the barriers for a sustainable growth in the rural housing and habitat sector?



Drivers of Eco-habitat Approach

Innovative options for financing are also available to non-IAY families through various institutions. Habitat for Humanity has been providing housing assistance to the poor through a model based on owner contribution in the form of cash and / or sweat equity. Different loan products have also been developed by some banks such as the State Bank of India, for different segments of rural families besides the BPL. For encouraging effective conversion of house asset as productive housing National Housing Bank has been promoting 'Productive Housing in Rural Areas (PHIRA)' in partnership with banks and micro-financing institutions. Micro-finance institutions have also been providing finance to poor families.

However the reach of these institutions is still limited and there is a need for expression of demand from villages-possibly as an aggregated group of borrowers so that lending agencies can provide financing easily. Also, continued saving from families as part of SHGs or any other community groups acts as a lever for attracting finance.

The Potential of Creating Green Livelihoods: Local Skills and Enterprises

People need homes and people need jobs. Creation of homes and buildings requires building materials and services. Resource and energy efficient construction materials and technologies for manufacturing materials, toilet systems, energy installation, etc., can be delivered through local entrepreneurs. Skills and services can also be sourced locally. Sustainable technologies need sustainable entrepreneurs. Local production and delivery not only reduces costs, it also reduces transportation energies and, most importantly, generates local jobs and creates local wealth. It creates supply of eco-products and services in a market mode and is a positive economic driver for accelerating eco-habitat development.

Numerous such technology options amenable to enterprise based delivery now exist, including stabilized compressed earth blocks, fly ash bricks, eco bricks, roofing tiles, planks and joists, door window frames, toilets and *chulhas*. Panchayati Raj Institutions can opt to use these technologies in the construction of social housing and public buildings, thus creating a market for local enterprises. In parallel, they can also support the setting of local building material enterprises by facilitating land and infrastructure and encouraging village youth and self help groups to take up such activities.

How Can We Do This?

New opportunities for livelihood creation are a key requirement across rural India today. The building materials production and services delivery provide promise an opportunity for creating large numbers of jobs and options for self employment. Women's Self Help Groups and young men and women can be motivated and supported to set up building materials production units catering to the needs of a cluster of villages and block towns. All construction works including social and private housing, social infrastructure such as schools, public health buildings, *Panchayat Bhavans*, community buildings, village roads, etc., are a potential market for these entrepreneurs.

Local technical agencies, the district industries centre, district NABARD offices and other such institutions are places of information where possible enterprise options can be explored. Market assessments, making enterprise business plans, loan applications for setting up the units and facilitation of land, water and electricity for setting up the units need to be provided. The Panchayat can facilitate, motivate and assist in ensuring a minimum market of public construction works, land and infrastructure for setting up the enterprise and also linking the rural entrepreneur to the local banks. In addition, public works require maintenance and servicing. Supporting and encouraging community groups or individual youth to set up maintenance services for water supply systems, roads, sanitation, etc., are also emerging as regular livelihood opportunities in the habitat sector.

Panchtantrika
A Dynamic Women's Enterprises

Panchtantrika, a fly ash brick enterprise was located in Khaparkheda village. The unit lies in the close proximity to the Khaparkheda Thermal Power Plant, about 20 km from Nagpur. The thermal power generates a lot of waste which was simply dumped at various sites, polluting the environment. Recognizing the worth of industrial waste, NABARD and Development Alternatives (DA) jointly came forward with a proposal whereby a community based enterprise linked to the waste from the plant should be promoted.

To set up the enterprise, members from five women SHGs were brought together, convinced and supported by a local NGO called Van Sampada. The overall capital requirement for the unit was Rs 10 lakhs, of which five lakhs were provided in the form of subsidy by the District Rural Development Agency (DRDA), Nagpur and five lakhs were availed as loan from the Dena Bank. The fly ash brick making technology and hydraulic brick making machine was sourced from TARA, which also imparted training to the women entrepreneurs.

Marketing of the bricks is done by the entrepreneurs themselves with initial and time-to-time support from Van Sampada and the TARA plant is being utilized to make fly ash bricks. Panchtantrika employees 25 women and produces about 8,000 bricks a day in two shifts. The production cost of one brick is less than Rs 1.50 and the bricks are sold for about Rs 2.00 – Rs 3.00. About one lakh bricks are sold every month. After deducting the salaries, the running cost of the enterprise and the bank installment, the net profit of the enterprise comes out to 60,000 – 70,000 a month, which is deposited in the bank.

Financing Housing and Habitat Development

Quality housing by poor and middle income families in rural areas is severely constrained by their ability to raise finance for construction. Availability of finance for housing as well as habitat infrastructure can be a critical factor to initiate the creation of well-designed sustainable habitat interventions.

The concept of social housing is born out of a legal and moral imperative on the part of state to promote the "right to shelter", especially for the poor communities. For those below the poverty line, the central and state governments together provide assistance in the form of Indira Awas Yojana (IAY). The scheme at present provides Rs 45000 to BPL families in plains areas and Rs 48500 in hilly or difficult areas. This amount in the form of assistance does not cover the cost of an adequate minimum housing unit with adequate privacy, toilet, bathing, facility and cooking area. State social housing schemes add on to this amount.

Housing credit is an obvious answer. Financing rural housing has been found to be a key driver to enhance housing activity among all income groups in a village, as is evident from experiences in Andhra Pradesh, Tamil Nadu and now Madhya Pradesh. The poorest have the option for a top up loan on their IAY or a state housing scheme grant at a differential rate of interest of four per cent. The families above the (official) poverty line can also access loans based on the priority lending of the banks. It has not been easy, but it is also definitely not an impossible task.

Credit can also bridge the financing need for constructing toilets and accessing solar home lighting systems. Besides housing, habitat infrastructure is critical for achieving an acceptable quality of life. We have found that Panchayats can be financed to build public infrastructure so as water supply systems, mini grids and roads can be repaid through the Panchayat development fund.

How Can Panchayat Support Access to Finance?

Financing is required for both individual and public asset creation. The annual village development funds are used for public assets such as piped water supply systems, roads, waste management systems, etc. If the annual funds through all schemes – both plan and non-plan budgets – are not adequate for total coverage of the village, credit support can be sought. For this, engagement with the local bank and the district or state office of the bank will be required.

Funds may also be leveraged through MGNREGS, BRGF, MP / MLA Development Funds or similar schemes directed at local development. Most of these schemes require local plans and proposals to be developed by the Panchayats, validated by the *Gram Sabhas* for submission to the sanctioning authority. It is important to note that village level committees or other institutional mechanisms set up to take responsibility of execution and / or future maintenance have a critical role to play in the proposal that is submitted. Similarly, contribution by the users of these assets is also an important consideration before a project is sanctioned.

With respect to individual assets such as house construction, house repairs, toilets, solar home lighting systems and finance can be facilitated either to individuals or to groups. Many banks offer both facilities. As a first step, Panchayats should encourage and facilitate complete financial inclusion which means that they must help all the families in the village to have access to bank accounts and encourage the habit of savings that will increase the bankability of the individuals. Financial inclusion of individuals and groups alike requires due diligence with respect to proof of address and identity, affidavits for homestead ownership or *patta papers* that the Panchayat should facilitate. Estimation of budgets for house construction, drawings and also identifying down payment and individual contribution components will require assistance from a local technical resource person, agency or a trained mason. Sanction of loans further requires checks on the accounts in order to look into the credit repayment ability as also willingness of repayment. Panchayat support here in terms of personal guarantees and motivating repayments is critical. In order to reduce the burden of loans, the integration of funds from various sources is useful. Where families require top-up loans for Indira Awas Yojana or Total Sanitation Campaign, the timely aggregation of the same is necessary so that families can benefit from these measures. If families are simultaneously linked with livelihood opportunities, their repayment capacities and credit worthiness will improve.

Post loan sanction, Panchayats can facilitate support for effective utilization of the loan and regular repayments so that the banks have a favourable relationship with the village society and are inclined to continue to extend credit facilities to other members as well.

Gram Vikas' MANTRA for an Integrated Approach to Rural Development, Odisha

Gram Vikas works in the tribal villages of Odisha where people are deprived of basic services including proper house, water and sanitation, schools and hospitals. This community now has appropriate houses, piped water supply, toilets, bathrooms, clean roads and water bodies. The basic health condition of people has improved significantly. All this has been achieved through the Movement and Action Network for Transformation of Rural Areas (MANTRA) which promotes complete habitat development.

Under habitat infrastructure, disaster-resistant and low cost housing of 45 sqm have been constructed. There is cost sharing with part contribution from beneficiaries and part from Gram Vikas. The latter provides training and facilitative support to beneficiaries and masons who are engaged in the construction activities. Beneficiary contribution is in the form of cash, materials, and unskilled labour and the villagers gain ownership of the houses or other services they receive.

Gram Vikas is aware that people cannot pay for their houses all at once even if they are willing to pay for the service they receive, so housing loans ranging from Rs 15,000 - 40,000 are made available to the beneficiaries from the Housing Development Finance Corporation (HDFC), payable in 15 years at an interest rate of nine per cent. Gram Vikas acts as guarantor to obtain funds from banks and the people themselves repay the costs over a period of time. The repayment schedule has been customized as per the needs of the community and housing is an accessible dream for all.

Meeting Aspirations and Demand Creation for Eco-Habitat

A home represents the strongest aspirational need of a family. Therefore, a *pucca* house, with basic amenities that not only fulfills the need for safety and security against the elements, but also establishes a social position and enables a family to further other goals such as pursue a livelihood, support better health and education are outcomes that housing and habitat are seen to fulfill. For example, young women and their families who have expressed the demand for privacy and dignity with respect to sanitation have driven toilet construction as a pre-requisite for marriage.

Along with its aspirational value, the concern for affordability is highest on the list of criteria for the selection of building materials and technologies. Eco-construction can become cost effective and affordable, provided the systems for local supply are in place, local artisans are available to construct and there are opportunities for families to contribute their own labour in the construction process. This means that technological options for eco-construction are simple and easily understandable. It also means that village families are aware of and appreciate the long-term benefits of eco-construction thus ascribing value to it.

The fulfillment of these aspirational needs drives habitat development. Aspirations need to be directed towards sustainable choices. For instance, influencing the perceptions of *pucca* on the basis of performance of a roof can and will facilitate the application of resource and energy efficient new and local options such as ferro-cement channels and fly ash bricks. Therefore, awareness building, demonstrations and endorsement of the eco-construction technologies by local and district governments goes a long way in instilling confidence and creating a demand for eco-habitat.

How Can Panchayats help in Creating Awareness for Eco-friendly Choices in Habitat Development?

The first and foremost step is your own conviction and there can be no better way than to see for yourself. Participation of Panchayat leaders in the *Lok Awaas Yatra* has amply demonstrated that exposure to projects where solutions work and peer to peer discussions are the best way of transferring knowledge and building confidence in technologies and options that may be replicated in other villages.

In parallel, the Panchayats – through the process of micro-plan preparation – can create a vision of a safe and sustainable village which all families may aspire to. Solutions for eco-habitat may be sought through interaction and engagement with a host of technical agencies across the country.

Agencies such as the Panchayat Academy run by the Trust for Village Governance, Tamil Nadu, the National Institute of Rural Development, Hyderabad, Kerala Institute for Local Administration, local building centres in various districts and technical agencies such as Center for Science of Villages, Wardha, TARAgram, Development Alternatives in Orchha, Madhya Pradesh, Shikara Technology Park, Bachhau, Gujarat, Appropriate Technology Center Sundernagar, Himachal Pradesh and many others provide assistance to Panchayats for training, exposure visits, technology selection, etc. The Rural Housing Knowledge Network Portal of the Ministry of Rural Development is building up a data base of such agencies in India.

The next step is to identify the buildings and infrastructure that can be constructed using eco-technologies and through demonstrations or initial construction and help instill confidence amongst the village families regarding eco-habitat. As the process unfolds, Panchayats can continue to build pride in the village about sustainable development of their village and support the processes by facilitating funds, skills, enterprise creation, integrating funds from schemes and bringing in technical expertise.

Sustainable Habitat in Village Mador Tikamgarh

Village Mador belongs to one of the most backward regions of India characterized by dwindling natural resources, limited livelihood options and poor economic growth. Development Alternatives (DA) initiated the "Sustainable Habitat Project in village Mador" with the objective of providing a *pucca* house with basic amenities and community facilities to 35 tribal families in the village. The project was funded by the Council for Advancement of People's Action and Rural Technologies (CAPART) under the Government of India's Innovative Stream for Housing and Habitat Development in April 2005.

One of the innovative technologies used in the homes in Mador is the rat-trap bond for masonry. It is a specific type of bond in which bricks are laid in such a way that voids are formed in the walls, reducing the number of bricks required by 25 per cent, as well as mortar required, bringing down the overall cost.

This type of bond also helps in insulation, as the heat gets trapped in the voids and keeps the inner walls of the house cool, maintaining an ambient temperature, both in winters and summers. Bricks produced at Vertical Shaft Brick Kiln further reduce energy consumption by about 50 per cent in material for manufacture, leading to upto 60 per cent reduction in the carbon footprint of the building as compared with conventional masonry systems using clamp-based bricks. Furthermore, the walls do not require finishing as the exposed brick themselves are appealing and form beautiful patterns. This saves the cost of plastering, painting, and maintenance.

Chapter 4

Overcoming Common Challenges in Eco-Habitat Development

Although proponents for eco-habitat have stressed its potential over five decades now, the progress in this arena leaves much to be desired. The challenges point to the need for a paradigm shift in how we view development, a concentrated effort to put in systems and institutional mechanisms in place to facilitate appropriate action at the grassroots and partnerships to scale up good practices.

Overcoming Challenges in Eco-Habitat Development

The challenges ahead are complex but not insurmountable. The Lok Awaas Yatra demonstrated how many Panchayats and local actors have found innovative ways to address the twin issues of adequate and sustainable housing and habitat solutions. Visionary planning, community mobilization, aggregating various opportunities from various public sector programmes and schemes on the ground, partnerships with financing and technical support service providers and linking the process of development to the aspirations of a '*pucca* house', a sustainable income / livelihood and social status are some of ways in which eco-technologies and construction materials are being brought into the mainstream. However, the first step has always been a conviction in the need and potential of sustainability in development processes by the practitioners themselves.

1. Limited capacity of the government machinery to facilitate delivery of integrated habitat interventions.

Government machinery both at the state and the centre level works through well-defined ministries and departments with clearly defined mandates. Various attempts to ensure coordinated functioning of different departments at the village level have been successful to a limited extent. As a result, implementation of housing, water, sanitation, domestic energy, roads, and other state-supported intervention in a synchronized fashion is not very common. The desired quality of life has thus not been achieved in spite of financial human resource investments.

Experiences of some NGOs such as Gram Vikas and Development Alternatives and Panchayats such as Odanthurai demonstrate that if local leaders or any other agents of change do indeed make the effort of synchronizing state-supported interventions on housing, water sanitation and other habitat components, marked improvement in quality of life is possible.

Panchayat Led Action in Odanthurai Village

Odunthurai Panchayat used to be like any other Panchayat with poor living conditions and lack of basic amenities. Close interaction between the district administration and the villagers was grossly missing. This situation, however, changed over the last decade. The Panchayat has demonstrated integrated habitat development through local action, creation of community infrastructure and promotion of sustainable development. It is the first Panchayat in the country to install a 350 KW windmill.

The turbine installed by the Panchayat not only provides electricity to the villages but also generates surplus which is sold to the State Government. The village also has a Village Poverty Reduction Committee (VPRC) that has been set up by the state government in collaboration with the Gram Panchayat. It aims to ensure the economic well being of all the families, and eradicate poverty by bringing in improvements in income levels to such an extent that there are no Below Poverty Line families in the village.

The Panchayat has led the development process with support from the State Government. The community also contributes towards funds required for any project or helps in paying back the loan taken from the banks.

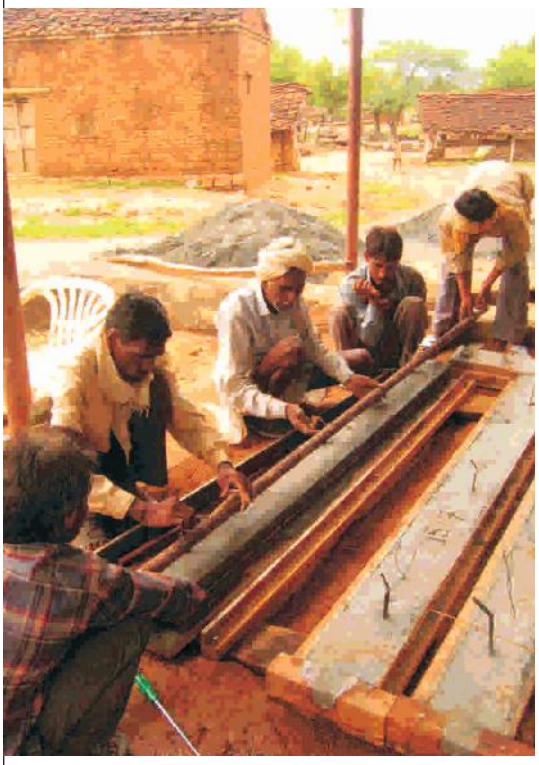
Odanthurai has created borewell motors and a biomass gasifier. The financial position of the Panchayat is also improved through improved tax collection with the cooperation of people as also government grants for the projects.

2. Limited Options for Training and Certification of Manpower

Although the need for trained workforce for delivery of sustainable and safe housing has been well established, creation of such a cadre of construction workers is still largely dependent on externally funded initiatives by NGOs. Government-owned training institutes also deliver such training programmes but they have a limited outreach. As a result, the availability of a trained work force is being pursued in a manner that is unstructured and, therefore, largely ineffective.

As demonstrated by the experience of NGOs like Pan-Himalayan Grassroots Development Agency, Development Alternatives, Gram Vikas and Centre for Science for Villages, availability of trained work force can be a critical factor in the delivery of safe and sustainable habitat. Training itself per se is a small part of the puzzle. Creation of demand for their services, continuous upgradation of skills and certification are other important issues that need to be addressed. Some states have now initiated formal and rigorous training of a construction work force. Agencies such as the Building Materials Technology Promotion Council support training processes.

The Working Group on Rural Housing under the twelfth five year plan has laid special emphasis on this aspect in order to achieve the desired quality of construction.



TARA Karigar Mandal, Mason's Guild, Bundelkhand

TARA Karigar Mandal (TKM) is a federation of Artisan's Common Interest Groups (CIGs). The artisan CIG members have common interests to come together to share information and work cooperatively around green building technologies. The group comprises of masons and other building construction workers, helpers, semi-skilled workers, plumbers and carpenters. The TARA Karigar Mandal was established on the World Habitat Day 2007. Regular meetings, training on skill development and facilitating and creating job opportunities have helped in strengthening the group.

The Mandal was registered as a Mutually Aided Cooperative Society into 2012. Better livelihoods and better income opportunities catalyzed the formation of the Mandal. The Mandal's activities have enhanced the level of skill and technology in the area. Quality control, training and certification, collective negotiating power for better and sustained livelihoods and accrued social benefits for the member masons are some important areas where the association is now working.

Over the past five years, the 120 mason strong Mandal has generated over 50 lakhs worth of business with more that 5,000 mason days of work. The local value of mason has increased twofold. They have also trained masons in 17 districts of Madhya Pradesh under the Mukhya Mantri Awas Yojna.

3. Skeletal Techno-legal Regime

Although there has been a lot of research on sustainable technologies by several institutions across the country, only a few of them have been included in the state Schedule of Rates (SoR). This can be stumbling block if taken at face value. In the experience of some of the NGOs pursuing eco-habitat approach such as Centre of Science for Villages, Development Alternatives and Unnati, creative thinking can help in opening up avenues for use of such technologies despite the near absence of a techno-legal regime that supports implementation.

The Building Material and Technology Promotion Council (BMTPC) provides certification for eco-technologies. States like Madhya Pradesh, Kerala and Karnataka actively promote eco-construction in social housing programmes. Gujarat has shown that many new ways of building such as compressed earth block can be brought into the techno-legal regime, as was done after the Kutch earthquake with technical inputs from the Auroville Earth Institute. Panchayats such as Poonamallee in Tamil Nadu and post-disaster projects have demonstrated that eco-habitat technology applications – if accompanied with suitable design checks and balances can be used at scale and recieve approvals from the regulatory authorities.

Unnati Sabha Bhavan, Chava

The Sabha Bhawan is a rural technology centre started in 2003 by the village community in Chava in Barmer district. The Bhawan has been established and developed by Unnati and Prayas with support from Oxfam India.

The centre is built and managed by the community, being directly handled by the Gram Vikas community with an aim to upgrade the traditional housing system. The Sabha Bhawan promotes appropriate technologies like ferro-cement channels, brick domes, compressed stabilized earth blocks, and cement blocks that have also been demonstrated in the campus. All these technologies are very low carbon and environment friendly. Moreover, they are based on renewable local material and skills.

The capacity of the employees working in the Sabha Bhawan has been built for producing alternate materials and building units. Replication of the technologies can be seen in the dhanis around the centre: the round vernacular form can be seen constructed in Cement Stabilization Earth Blocks.

4. Limited Demand for Eco-Habitat Solutions

One of the major challenges in eco-habitat development at the village level is the limited demand for such interventions from the grassroots. There are several factors that affect demand, some being lack of awareness on the part of rural households that is often clouded by an aspiration for more city-like lifestyles, limited affordability, limited time to invest in implementation, etc. In addition, the risk perception of rural households towards natural hazards is also found to be low and often justified either as the 'will of God', fate or sheer lack of economic capacity to even consider the alternatives.

This situation has been handled by local level agents of change – leaders, NGOs and others through rigorous engagement with the people to help them develop an understanding of issues with a longer term perspective, beyond what the eyes can see.

Technology Demonstration Unit

Balikuda block of the Jagat Singhpur district in Odisha was affected by the 1999 super cyclone and the 2001 floods which caused immense loss of lives and property in addition to the housing shortages. However, due to inadequacy of the government grants, insufficient building materials, a lack of appropriate technological expertise and services of skilled masons, construction of durable houses suffered a major setback. As a result, the poor were unable to complete the reconstruction of their houses.

However, in 2001, the UNDP offered the services of skilled personnel and technological know-how to promote sustainable reconstruction. The funding for the project came from the Swiss Agency for Development and Cooperation (SDC). The technology demonstration units have been constructed to demonstrate cost-effective, economically and socially sustainable construction technologies. These TDUs have been built using locally available materials. They are also used to train masons and unskilled construction workers in the villages. The TDUs likewise provide evidences for villagers to see the necessity of implementing appropriate building technologies. These technological demonstrations will build trust in them and inspire the confidence to apply these skills in constructing their own houses.

The demonstrated technologies have been used in the construction of many individual houses and government buildings. Many villagers of Jagat Singhpur district have been encouraged to adopt these cost-effective technologies promoted through the demonstration units set up by the UNDP in about 40 villages of the area. Till date, more than 1800 houses have been constructed all over the state.

Chapter 5

Partners and Stakeholders in the Process of Eco-Habitat Development

Different stakeholders involved in habitat development ranging from home owners themselves to central government ministries can play an effective role in realization of the vision of eco-habitat development.

Green Habitat and Involvement of Stakeholders

1. Women, Men and Village Communities

Women as well as the men need to participate in the *Gram Sabhas* and push for collective and transparent decision making on habitat interventions in the village. They are the most critical stakeholders for the sustainability of any habitat interventions at the village level, whether it is simply in terms of responsibility, use of infrastructure components such as common tap stands and periodic contributions that are very often required for common services.

2. Village Panchayats in Consultation with *Gram Sabhas*

Village Panchayats, according to the Constitution of India, are the drivers of change at the local level. They need to take the lead in preparing village level Rural Habitat Action Plans based on housing, infrastructure and related livelihood needs of the people such as work sheds and energy. It is critical that this be done with a long-term view to habitat needs as well as resources.

Panchayats also need to promote participatory planning and funding based on the potential of local level stakeholders for innovative mechanisms of habitat development.

Creativity and innovative thinking will be the key to addressing the various infrastructure needs at the village level. Village Panchayats need to draw upon the support from technical and resource organizations within the government and outside for advice on design and quality monitoring specific infrastructure needs. Convergence of various schemes of the government is possible but might require additional efforts from the Panchayat in order to bring the desired benefits to the village.

However, it is equally critical that Panchayats take interest and responsibility of monitoring the implementation of these schemes at the ground level. To be able to meet this challenge, it is important that the Panchayat members have the necessary minimal technical capacity to monitor the interventions. It is, thus, important that efforts be made to pursue the capacity building opportunities for Panchayats as well as households for participating in planning, design and monitoring of construction.

Finally, Panchayats need to undertake the management of village and community infrastructure, including water bodies, roads and energy infrastructure.

3. District Governments and Their Instruments

District panchayats and functionaries of line departments need to approach housing from a perspective of habitat development — housing, together with infrastructure services, roads, safe water supply, treatment and disposal of waste, energy, public transport, power supply, and health, educational and recreational facilities.

This level of governance can play a key role in facilitating innovative and effective convergence of habitat interventions and programmes sponsored by the centre and the states. It is also important to harmonize development interventions through effective sharing / balancing and redistribution of resources across the district.

District level functionaries also need to devise capacity building programmes for district and village level functionaries, especially with regard to sustainability and safety of habitat interventions. The establishment and effective functioning of an Information Centre for disseminating information related to habitat development in simple local language at the village level would be the first fundamental step towards this end. This Centre could be combined with the ongoing programme of Village Knowledge Centres.

4. State Governments and Their Instruments

At the state level, the government needs to promote eco-habitat development solutions that are appropriate for various geo-climatic regions of the state. Through this effort, re-engineered indigenous technologies and local materials could be included in the menu of options for safe and sustainable habitat development.

The state governments need to ensure convergence of various rural habitat schemes at the village level. State governments also need to provide opportunities for training of PRIs for effective design, implementation and monitoring of safe and sustainable habitat and livelihood initiatives of the State and the private sector.

There is a need to promote and provide incentives to the local private sector and corporate sector for undertaking eco- habitat development projects in villages. A good example would be decentralised production of building materials, especially through fiscal incentives and facilitate training of habitat services providers for power generation, water treatment and waste treatment and disposal.

In addition, there is a need for further research and development of low carbon technologies and models of delivery of these technologies on ground. This task could be undertaken through revival of building centres and bolstering their capacity to function as habitat resource centres at the block / district level in a financially self-sustaining mode.

Finally, state governments can facilitate eco-habitat development through suitable schemes located in a holistic state level policy for development of safe and sustainable housing and habitat. If required, states should mobilize resources from international development / funding agencies exclusively for the purpose of safe and sustainable development of rural habitations.

5. Central Government

The central government is a crucial enabler of eco-habitat by providing a comprehensive policy framework that guides the actions of all other stakeholders – both within and outside the government machinery. The central government can also ensure integration of the habitat policy with land use policy, water policy, mining policy, environment policy and any other such policies that have a direct link with habitat development.

The central government also needs to develop and enforce appropriate ecological standards to protect the environment and provide a better quality of life in human settlements.

6. Non-Governmental Organizations (NGOs)

NGO's can be instrumental in raising awareness and shaping public opinion in favour of safe and healthy habitat environment and orient the families, government functionaries and other stakeholders towards holistic habitat development. They can do this in several ways for instance, working with PRIs to help them develop a holistic perspective as well as providing opportunities for their continued capacity building on safe and sustainable habitat. Similarly SHGs, artisans and other agents of planning and implementation at the village and district levels can benefit from association with technically competent NGOs for holistic habitat development.

NGOs can help aggregate rural customers for making large-scale habitat interventions effective and manageable and also private investments viable. NGOs can also facilitate Social Audits of habitat development initiatives at the village level.

7. Private and Corporate Agencies

Private entrepreneurs and corporate agencies need to develop and participate in innovative models of habitat delivery to realize the potential of rural areas as viable markets for sustainable habitat products and services. There is further need to customize habitat-related products and services for rural markets and promote local entrepreneurship for the same. Towards this end, research and development activities need to be initiated for identifying and promoting low-carbon building materials and sustainable technologies for habitat. Similarly, capacity development of rural work-force as well as their absorption in industry can be undertaken by corporate agencies.

Corporate agencies also need to work with PRIs and local NGOs for developing as well as investing in viable rural habitat initiatives that can be effectively implemented. They can help in capacity development of rural work-force as well as facilitate their absorption in industry.

8. Research and Technology Transfer Agencies

There is a need for technical guidance for local habitat actors to integrate new and sustainable technology alternatives with conventional and traditional building practices. It is important that locally available raw materials are used as far as possible and the use of scarce resources is reduced to the extent possible, so that the stress on the natural environment is reduced.

Research and technology development for disaster safety of new constructions as well as strengthening of the existing ones is also imperative. This needs to be done in a manner that regionally applicable solutions for specific disasters can be developed and promoted at a large scale.

Research and technology transfer agencies need to share information and technologies with the other stakeholders and facilitate awareness on new, innovative and sustainable methods of construction. Such agencies need to work with NGOs, ITIs, private agencies, technical agencies and trained SHGs for imparting training and knowledge to rural communities and other stakeholders. These agencies also need to assist the states to include the specifications of safe and sustainable indigenous as well as new building materials in their schedule of rates and promote them vigorously.

YATRA PARTNERS

Central Region

Centre of Science for Villages, Wardha

Sahyog Nirmitee

Development Alternatives

TAAL

Eastern Region

GOAL

Gram Vikas

Ashraya

मेघ पाईन अभियान
Megh Pyne Abhiyan

Western Region

उन्नति
UNNATI

SEWA
SELF EMPLOYED WOMEN'S ASSOCIATION

CEPT
CENTRE FOR ENVIRONMENTAL PLANNING & TECHNOLOGY

Northern Region

HESCO

Southern Region

Maithri

TVSG
Trust for Village Self Governance

Habitat for Humanity India

SHC

LBC
LAURIE BAKER CENTRE

Supported by

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NATIONAL HOUSING BANK

Department of Planning and Development
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CATHOLIC RELIEF SERVICES

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Knowledge WORKS

Media Partner

oneworld.net

Audio Visual Partner

DUSTY FOOT PRODUCTIONS

Organised by

basin South Asia

basin-*South Asia* Secretariat

Development Alternatives

Notes

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Development Alternatives

Development Alternatives, an independent sector action research organization has pioneered sustainable development in India since 1982. The DA Group has to its credit three decades of experience in the field of energy and resource-efficient building technology development and designing and implementing habitat initiatives in rural areas.
www.devalt.org

Knowledge Works

Knowledge Works believes that knowledge works!!

Founded by a group of architects and development planners, Knowledge Works (KW) is committed to human settlements that are safer, and more sustainable and sensitive to the needs of the inhabitants. Knowledge Works provides viable solutions to homeowners, businesses, intermediary agencies and support agencies to contribute to development that is sensitive to the environment and promotes sustainable development.
http://knowledgeworksconsulting.com/

uth Asia

Rural Housing Knowledge Network is an initiative conceived and supported by the Ministry of Rural Development, Government of India. The objective of this network is to develop a knowledge portal which serves as a dynamic updatable repository of information and experiences pertaining to rural housing with the goal of promoting safe and sustainable rural habitat in India The RHKN project is led by a team of researchers at the Indian Institute of Technology, Delhi with support from a growing team of partner organizations. www.ruralhousingnetwork.in

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

Currently, 22 members across South Asia share their knowledge of rural habitat development through the Platform. They work with their partners and associates across the region to disseminate good practices and influence policy development for pro-people, pro-environment houses and settlements. www.basinsa.net

Contact:
basin-*South Asia* Secretariat at Development Alternatives
B32 TARA Crescent, Qutub Institutional Area, New Delhi 110 016, India
Tel: +91 (0) 11 2654 4100, 2656 4444
Web: http://www.devalt.org, Email: basin@devalt.org