

**STUDY ON SUSTAINABILITY AND
INNOVATIVE ENVIRONMENTAL
APPROACHES AND FEATURES IN POST-
TSUNAMI RECONSTRUCTION AND
REHABILITATION:**

FINDINGS AND PROPOSALS

**COMMISSIONED BY
ARCHITECTURE AND DEVELOPMENT (FRANCE, INDIA)**



PREAMBLE

The purpose of this document is to forewarn or remind future implementing agents – if they don't already realize it - in situations of post-tsunami (and more generally, post-disaster) scenarios, that they too may be key actors in the future outlooks regarding the economic, social, and environmental development of beneficiary communities. It means moving toward a more concrete understanding of “international solidarity” – by thinking more long term, with beneficiaries – and “habitat”, but especially espousing “sustainable development”.

For this purpose, and having reviewed a sampling of cases in the post-tsunami zone of South Eastern India, a matrix and some recommendations are made to these implementing agents (and their co-financers) so as to make them better guarantors of sustainability for the livelihoods and/or of the territories on which they are intervening. In other words, they should be considered “developers”, not just “implementers”. This presentation's other main message will be that the post-disaster process should be seen as flexible and open to changes – an opportunity for development that a maximum number of beneficiaries need to be aware of. This is especially true in the case where the world outside the affected communities may wish to pour onto the latter extraordinary sums of aid and monies, something in itself that can be a threat, and in some cases (for some communities) another form of disaster – at least in the experience of the Indian post-tsunami zone.

The world, and our behaviour, evolves slowly in response to the greater and greater evidence justifying more cross-sectoral approaches, more inter-disciplinarity, and the espousing of multi-cultural issues – going toward a holistic vision of things. We advance with discrete and well-meant (and often useful) environmental guidelines, and socio-economic studies, but these don't yet serve the real need that a sustainable development strategy proposes to address. Are what we from the outside, are proposing, correspond to the expectations and understanding and capacities of the beneficiaries? This is what will be addressed in this document, with some recommendations based on what was seen, heard and read about concerning the post-tsunami efforts in the south-eastern coast of Tamil Nadu, India.

Since sustainability is the main issue that is addressed here, in zones that are at risk (in terms of environmental disasters), our main concern is how two key players manage to arrive at a common understanding of the issue, an understanding which will lead to a decision that will hold. The one party is the local community which may or may not be represented in the local government body (such as the panchayat). In the case of southeastern India, these communities are the front line potential victims of any future tsunami. They are also the potential beneficiaries of any aid or services that the past or future event can trigger. The decisions these communities will make regarding this issue will depend on the cultural traditions, the educational level, the sensitivities and personalities of the individual members of the group. The other party is the government, at whatever level - local government, District, State, Federal, depending on the issue at hand, and according to the responsibilities at each level that Indian law confers.

This document is destined to NGOs and their funders that have taken on the rehabilitation/reconstruction task in these zones, and whose ethical (not necessarily official) responsibility may be to ensure that a maximum of information flows both ways, and that all parties may be enlightened as to the stakes involved - whether they be local, regional, or national.

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Architecture & Development

Architecture & Development (A&D) is a French NGO with presence in various countries including: Pakistan, Afghanistan, East-Timor, Mali, and Senegal. In India, A&D has been working for over 5 years. In the aftermath of the Tsunami, A&D along with its Indian partners have launched a long term reconstruction program with the aim to promote and highlight a sustainable approach in habitat design and projects implementation.

NOTE TO READERS

Goals and objectives

This mission and its reporting fits within that overall program of Architecture & Development (A&D) and its partners to highlight a sustainable approach in habitat design and project implementation. The goals of this effort are to:

- I. Provide reflection and information to public institutions and a broader audience (through a separately published document edited for general audience)
- II. Share the orientation and observations with A&D and other agencies working on rehabilitation and reconstruction

In order to reach the preceding goals, this study will have the following objectives:

1. To analyze, from the perspective of such a scenario, a pre-selected / representative sample of the existing 1 year old reconstruction and rehabilitation projects in Tamil Nadu / Pondicherry area in India
2. Identify and prepare a checklist of innovative environmental and sustainable development approaches and features in post-tsunami reconstruction and rehabilitation, some of which can be replicated in other disaster and rehabilitation scenarios.
3. Develop an ideal scenario (through documented experiences and mission visit) which would be the starting point for a broader and more systematic future study. The ideal scenario will put forward certain approaches and tools that have been used successfully or that are proposed by the team or other experts that we have met during this study for future disaster related reconstruction and rehabilitation programs.
4. To remind the reader (present or future implementing agents) of the importance of asking questions regarding the knowledge-bases with the beneficiaries: to see how they (the beneficiaries) can contribute, to make the system better perform than any other introduced, turn-key operation, or any existing technology that may be too old, obsolete, inefficient, or dangerous.

Document Design

There have been many earlier studies and evaluations done on the issue of post-tsunami or post-disaster reconstruction and rehabilitation. By inspiring ourselves of their resulting recommendations and models, but

especially from what beneficiaries and certain NGOs have told us, an ‘ideal scenario’ has been developed, which can be seen as a framework. As such, this scenario aims at helping implementing agents to take into account sustainability - integrating environmental, social and economic preoccupations.

Part A first gives the “theory” and concepts behind this initiative, and an ideal scenario – based on previous observations, reports, findings, and a recent assessment. Then each following subchapter, A2 to A5, gives the reader the different components for appreciating the ideal scenario.

In Part B we will see how this ideal scenario fits into ground-level realities, with observations on a sample of concrete cases.

This will be followed by our own conclusions and recommendations. References and recommended documentation are included, at the end, in order to give interested readers the opportunity to further their knowledge of the issues.

There are many reports and evaluations, but there still seems to be lacking the premises necessary for sustainability strategies and action plans - for CBO’s, NGO’s, implementing agencies and financing organizations. But their approaches especially seem to be too linear, such that implementers and their collaborators may tend to forget:

- that development that is “sustainable” is an on-going process - and hence,
- the importance of science, of indicators, and
- the necessary involvement of local populations in the diagnostics and reflections regarding the territories from which they derive their livelihoods.

What also may be lacking is a deeper understanding of economic problems linked to environmental and social issues, and not enough collaboration between scientific institutions or projects and implementations.

We are not looking here for “procedures”, but rather “principles” of action – such as, for example, not bowing to financial pressures, but rather taking as a priority the stability of a human community (and its vision of the future) and that of its natural surroundings and processes.

So, what is important is the recognition that different sources can provide different information – depending on its complexity or its scope. For example, watersheds must be dealt with at a regional and, if necessary, at an interstate, cross-boarder level, for coherence’ sake. Hence the importance of ‘preliminaries’ step that will include taking into account:

- the sources of realistic, credible information,
- the accessibility of this information
- the necessity or not of its being disseminated.

That being said, one may still refer to other models that have already been developed and that may contribute to and reinforce the present sustainable development approach. One in particular, published by the CSR (Centre for Scientific Research, in Auroville) seems to target an audience of NGOs and local populations. The main categories of its “suggested checklist for action” could correspond to or complement nicely the “ideal scenario” proposed in the present document.

The simplified CSR model could complement well the matrix presented in this document, in the sense that it insists on the development of existing (local) human resources – and this is what we assume happens, or is planned for, when outside agencies enter into a community and an ecosystem and start introducing methods and technology.

Targeted Readers

This report has been put together for decision-makers from NGOs/CBOs, Governments, Public Agencies, Donor Agencies, Advocacy Groups that are involved in post-disaster relief and rehabilitation. But it can also be used by local project managers. The intention is to put forward key recommendations for management thinking,

decisions, and changes at different levels. If implemented, we believe this could contribute to improving the carrying out of sustainable rehabilitation and reconstruction work. It also goes without saying that this document has been conceived keeping in mind agencies that know they have, or expect to have, dire time constraints.

Given the quantity and variety of already-existing documentation, our goal with this brochure is also to bring out the most pedagogically useful information and lessons, for the widest audience possible who is concerned with or involved in post-disaster intervention scenarios, so as to help the implementing agents and their beneficiaries to act in as sustainable ways as possible.

The ideas and process put forward suggest that all stakeholders work closely right from the outset. It will be even more effective for any future rehabilitation and reconstruction need, if appropriate platforms and frameworks for coordination and working together are maintained on an ongoing basis. Learning from this and any post-disaster experiences in India and elsewhere should be widely shared.

Scope & Methodology

The scope of this study comprised meeting representatives of the different implementing agencies as well as coordinators (such as the NCRC) in the zone considered most affected by the Tsunami on the Indian side. It included the coastline (the Coastal Regulation Zone - CRZ) and its fisherfolk communities, the agricultural areas and their watersheds.

The tsunami of December 26th 2004, according to the Nagapattinam NGO Co-ordination and Resource Centre (NCRC), "impacted the coast of Tamil Nadu, Kerala and Andhra Pradesh on the Indian mainland, with the tsunami waters exerting their damaging effects up to 2 km from the coastline" (2007:19). Another organization, Praxis, has added that the Nagapattinam and Karaikal districts were "the worst affected areas on the mainland of India".

The study work, implemented in August and September of 2007, included the following main tasks:

- Collating available information on individual projects
- Acquiring additional relevant reports, studies, information on reconstruction and rehabilitation issues from the Tsunami/other disaster affected areas in India and elsewhere in the developing world.
- Short field visits to some pre-selected representative projects along the Tsunami affected Coromandel coast in Tamil Nadu and Pondicherry combined with brief discussions with implementing groups and project beneficiaries.
- Gathering insights and experience from the field and available documentation and incorporating them in a report to highlight the ideal scenario and/or the gaps present along with examples of good practices or otherwise.

Suggested checklist for action:

1. Established principle
2. Needs assessment
3. Capacity building and implementation
4. Local institutional strengthening

A

**TOWARDS A SUSTAINABLE AND
ENVIRONMENTAL APPROACH
FOR POST-DISASTER
RECONSTRUCTION,
REHABILITATION.**

A1. INTRODUCTION

A definition of “Sustainable Development”

Sustainable development must, above all, involve local populations. For they know traditionally, and they may know scientifically, the peculiarities of their territory and ecosystem. Other outside populations may contribute, but the basis of the “development”, that from which projects can be established, is what and how the populations themselves see as feasible, promising, and desirable.

If we take the Brundtland Commission’s 1987 definition of sustainable development, we are left with a principle of action – taking into account future generations’ capacity to meet their own needs – and here, again, we assume on their own territory/ecosystem. The basis of this definition are also the present and future generations, and their ability to learn and to transmit their local and/or scientific knowledge linked to present livelihoods or future opportunities. But we need to insist here on the value that can be implicit behind the sustainability principle, and that is of the importance of being able to use local natural resources (water, soil, air and biodiversity...) for sustenance and for raising a family healthily.

So, learning and transmission are key aspects within a sustainable development scenario, and communication primordial. Because of communication, discussions, negotiations, development is an on-going process – that allows people and communities to evolve and adapt according to threats and opportunities that they may perceive.

Post-tsunami and post-disaster situations are opportunities for having communities and persons ask themselves questions regarding the way they see their future, locally and within the context of globalization. Hopefully they will have gained the understanding to decide the best direction for their future travails.

Towards a dynamic model

Despite the fact that post-disaster scenarios are linear, and that project work is linear in terms of engineering and financial design, sustainable development must be seen as a cyclical, multi-disciplinary, even holistic process.

The graphic model proposed may bring the reader (actor) to look at all the ‘factors’ that contribute to sustainable development – no matter the “phase” (Relief, Temporary, Permanent housing phases) or “step” (Preliminary, Planning, or Implementation steps) he or she find themselves within a post-disaster scenario. This reader/actor may then and ask him- or her-self whether information is flowing properly - as in a kind of dynamic checklist: the way the “ideal table” or “scenario” is structured reminds the user or reader that involvement and participation of “existing” populations with “introduced” interveners are on-going and desirable (although not always easy) – and needs to be encouraged, as a basis for sustainability.

The following graphic is a first representation of the matrix developed in the next chapters, with its three Phases of post-disaster intervention (generally, Relief, Temporary Housing, and Permanent Housing) and its three steps (on the vertical axis ; and the 2 series of factors on the horizontal axis).

This table is a stylized model where the key factors contributing to sustainability are brought out, and that can be used as a template for present and future actions and strategies. It represents the general objectives relative to sustainable development, and serves to pin-point where and to whom the onus of bringing about sustainable development lies, on a given territory. With this representation, we can come closer to the spirit of sustainable development (and the “without compromising the capacity of future generations to meet their own needs”), for it allows some leverage of local populations, with some empowerment, facing outside interveners, experts, and NGOs who may or may not be sensitive and aware of the impacts and influence they have (or implicitly impose), because of their status and the funds they may be bringing in (introducing).

Beneficiary community participation as key, here. The previous matrix makes participation unavoidable – since we are continuously reminded of the necessity of collaboration with the local populations.

Community participation could make all the difference between success and failure of the project. Depending on local factors beneficiaries should be involved in settlement location and design, settlement planning, neighbourhood planning, space allocation and house design. The extent of involvement could be flexible and depend on the local circumstances.

Perhaps it goes without saying that “participation” is the foundation of a community’s life: the interaction between populations within a “community” (in the ecological sense), or the interaction between individuals... But also community involvement, and community participation can be emblematic of the passage from one pre-existing ‘factor’ category to the other ‘introduced’ factor. Community participation can happen, traditionally, in the cases of “existing” factors, and it obviously should be equally encouraged in the cases of “introduced” factors.

To get buy-in it is useful for the community to contribute in some way monetarily or through in-kind service. This could be encouraged by incorporating such participatory practices in the M.O.U. between NGOs, the community and the Government.



RELIEF

STEPS	FACTORS			
	EXISTING FACTORS		INTRODUCED FACTORS	
	Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
1. PRELIMINARIES				
1.1 HR & stakeholders				
1.2 Consortia				
1.3 Research				
2. PREPARATION				
2.1 Planning				
2.2 Design				
3. IMPLEMENTATION				
3.1 Construction				
3.2 Pop. moving in				

INTERMEDIATE

STEPS	FACTORS			
	EXISTING FACTORS		INTRODUCED FACTORS	
	Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
1. PRELIMINARIES				
1.1 HR & stakeholders				
1.2 Consortia				
1.3 Research				
2. PREPARATION				
2.1 Planning				
2.2 Design				
3. IMPLEMENTATION				
3.1 Construction				
3.2 Pop. moving in				

LONG TERM

STEPS	FACTORS			
	EXISTING FACTORS		INTRODUCED FACTORS	
	Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
1. PRELIMINARIES				
1.1 HR & stakeholders				
1.2 Consortia				
1.3 Research				
2. PREPARATION				
2.1 Planning				
2.2 Design				
3. IMPLEMENTATION				
3.1 Construction				
3.2 Pop. moving in				

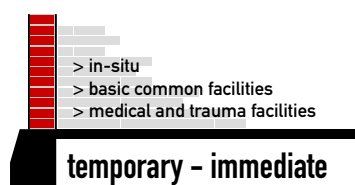
A2. MULTI-PHASED RESPONSE

AN AMBIGUOUS TIMELINE

Built environments can be reconstructed with the objective of going beyond the urgent, relief phase, in order to put forward reasoned and sustainable development (Architecture & Development, 2005). NGOs (and their funders), when they voluntarily decide to engage themselves in relief activities or any of the other post-disaster phases, find themselves in situations that are extremely complex. As implementing organizations, they follow their mission and objectives as best they can, with the corresponding and adapted tools and approaches that they have at hand.

Temporary settlement

In the emergency or relief phase, the effects of the disaster have been felt and action has to be taken to rescue people and property. Different organizations have produced documentation to respond to this crucial first phase (cf. Roberts, 1994:44-60). For example, WHO's Regional Office for South-East Asia – WHO/SEARO - has published "Technical Notes for Emergencies", such as No. 12 on "Planning Emergency Sanitation", with 'stages in emergency sanitation programme design'.



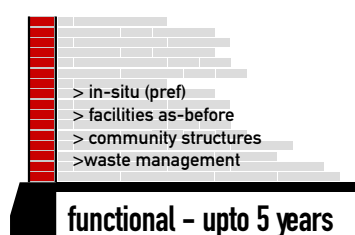
> Ideally in-situ with as much natural materials as possible (as opposed to GI sheets) to provide beneficiaries safe shelter immediately after disaster with provision for drinking and water and other water supply to the community.

> Depending on the community (i.e. what they are used to) - a set of temporary (removable) toilet with maintenance and waste disposal system.

> Other common facilities that will be necessary in a temporary shelter are: common medical/psychological assistants booth for helping with medical and trauma needs

Functional settlement

Intermediate phase: the short-term needs of the people—restoring utilities and essential services. The objective being at this point to restore the community to normality as quickly as possible (Roberts, 1994:44-60).



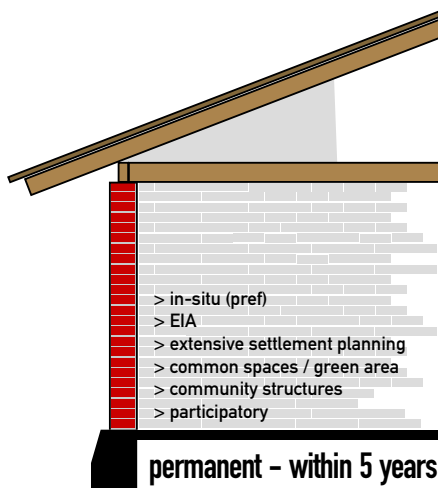
If relocation is unavoidable: (a) relocated settlement should be physically close to the original settlement (if possible), (b) neighbourhoods should be relocated with household and community spaces – with layout similar to their current/past housing instead of rows of linear settlements.

> Ideally this should be in-situ shelters (already provided as temporary shelters) repaired/adopted further for more comfortable living or just maintained but otherwise left intact - with additional community structures to be built.

> Community structure to include: meeting place/hall, public latrine and bathing place (with regular maintenance), sewage facility and its maintenance/operation, solid waste management, continuation of drinking and other water supply, provision of some community lights and basic connections to the houses. (Even for communities not used to latrines – a well maintained common clean facility will be a good opportunity to acclimatise them for latrine use/maintenance in their houses.

Permanent settlement

Long-term phase: continuation of the previous phase but items that could not be addressed quickly are attended to at this point: repair of damaged infrastructure, correcting environmental problems, reinvestment strategies, debriefings to provide input to revisions of disaster strategies (Roberts, 1994:44-60).



What may be called “macro level planning” (which will be covered in the following chapters - in the “Preliminaries” step) must be followed prior to any final choice of - land, allocation, or building related operations.

> To incorporate and consider all analyses and information from macro and micro level holistic planning/documentation efforts (enumerated in subsequent sections)

> Permanent settlement plan must include EIA with spatial information and maps – and pre and projected post intervention scenarios. This would include clear plans/funding source for measures that would help to avoid, minimize, and mitigate impact on ecology, environment, hydrology – and social, cultural, and traditional practices and livelihoods.

> Construction site should ideally be in-situ, or nearest to the original settlement (so as not to affect existing livelihood by any means and to

restrict foot-print). If settlements are planned in unsuitable lands like low-lying area, efforts to fill and raise land should combine with reviving and maintaining natural drainage and ecology of the area.

> Any plans for permanent settlements need to be periodically discussed with primary stakeholders (government/consortium, implementing group, and community/individual beneficiaries) – and final plan to be approved by all.

> Planning should incorporate entire habitation/living space with provision for maintaining neighbourhoods, closeness of joint families, often circular set up of the houses (rather than linear) - and physical facilities like roads, sanitation, sewage, solid waste disposal, common/community spaces, green areas (with emphasis on indigenous vegetation whenever possible). In doing so, efforts should be made to bring in proven alternative / environment-friendly technologies that can be conducive to local conditions.

> Once plans are approved, all parties: government/consortium, donor-agency, implementing NGO/group, and the beneficiary community need to be signatory to a common M.O.U. (Memorandum of Understanding). Prior to initiating work the M.O.U. can be altered with approval from all parties.

In fact, attempts should be made to make all shelter, whether it be temporary or permanent, in-situ. Relocation should only be a last resort option.

A3. THREE-STEP APPROACH FOR PROJECT MANAGEMENT

**A TYPICAL PROJECT APPROACH SHOULD INCLUDE,
FOLLOWING EARLIER RECOMMENDATIONS, THREE STEPS:
(I) PRELIMINARIES; (II) PREPARATION; (III) IMPLEMENTATION.**

It is often observed that the focus of development is just the house and nothing else. Key components of living habitat are often not addressed. Common spaces, green cover, sanitation, waste water management, solid waste management, neighbourhood design which are essential part of settlement get little or no attention. Measures of project success by NGOs/CBOs and donors should include not just the number of houses built, but also the quality of houses and the settlement, and its acceptability within the community. What we are trying to avoid is illustrated bluntly, but partly, in the image below, with the message that “Resettlement should not just be housing”.

But, as has been explained in one of Architecture & Development’s conferences (2007), “integrating sustainable built development concern in a context of poverty, sprawling urban development or disaster management is challenging. It requires a deep understanding of social, cultural, institutional and economical factors affecting project and city contexts.”

There is always a need for planning: competencies, procedures, and planning tools. But within these procedures one needs some degree of flexibility and participation. One shouldn’t have to remain linear in one’s approach – one should always feel ready to come back to previous mistakes and projects – whether “in situ” or not. Especially since all sites are different, and no NGO can answer to all issues. This applies in particular to the need to listen for local and/or traditional solutions to problems as they crop up, as well as to looking out for state-of-the-art engineering solutions, or recent (as well as forgotten) relevant scientific findings... For all these reasons, project managers need to have an open eye and ear to such options. Of course there are pressures, but the pressures one must listen to the most are those emanating from the beneficiaries themselves. If they know that they will be listened to, they will be willing to wait (this has been confirmed on some of the sites visited, and through reports from other sites).

I - Preliminaries step

a. Human resources, stakeholders and their dynamics

Multi-level linkages

Architecture & Development (2005) puts forward the idea of a link-up (an articulation) of activities – local, regional, national, and global – in order to draw out the lessons and to show the experiences according to the different levels of decision-making.

Stakeholder analysis

Stakeholder analysis – at all levels- is necessary in order to establish the various degrees of interest among the different parties, so as to establish a first linkup between actors at whatever level one is working. Such a stakeholder analysis should be done after a first historical overview and investigation of previous events (environmental catastrophes as well as significant disruptions of human communities and their environments, and/or simply of traditional territorial activities) and how the various actors reacted and/or adapted.

Stakeholder analysis is a necessary tool for human resource management, and will help managers and decision-makers determine potential evolutions in an organization and the appropriate position to be filled with existing or potential human resources.

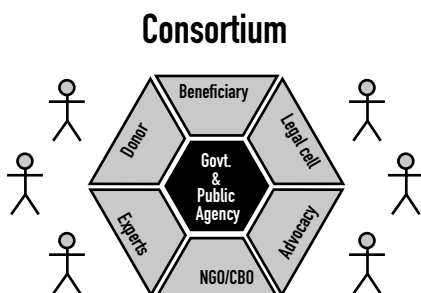
Human resources (and HRD)

A key aspect of this whole perspective (around territories involving existing ecosystems, and livelihood of the existing human communities) presented in this document, is an organization's or a territory's (a village, a district, a State,...) strategy for developing its human resources. In other words, given the different projects on a given site or territory, what are different populations – educated or uneducated, with or without economic activity - and what is their potential for contributing directly to these projects, and/or the potential for their being trained for these same projects.

Human resource development can also address the issue of bringing livelihoods and economic activities closer to an adequate or appropriate management of the local natural resources – in order to have a sustainable territory or region, with healthy natural ecosystems and healthy human communities.

b. Networks, Consortia, and communication

The consortium – or the concept of managing networks, and both their vertical and horizontal communication and links



Planning for framework and guidelines should be carried out centrally by a multi-disciplinary team from the consortium. Hence the concept of "consortium" is necessary in order to ensure that the multi-level links and understanding are at least addressed. It is particularly important to cultivate these "multi-sector links" in the perspective of financial and adapted technological (and intellectual) contributions (as in the case of post-disaster situations) from higher levels of administrations and political decision-makers.

If a central coordinating body in the form of a Consortium (for a given region) is implemented effectively, it can [will] make a tremendous difference in sustainable and balanced post-disaster reconstruction. This Consortium is to be represented by government, and a flexible group of representatives from the NGO, CBO sectors, donor groups, institution/individuals with specific expertise/experience in relief & rehabilitation activities and skills and expertise in ecological, social, and cultural issues and. Ideally, it should be in place immediately or within the first

three months after the disaster. The consortium may perform four key roles:

1. Coordination and Management

- Define areas of operation (physical and thematic)
- Coordination of donor agencies. Help set-up a space like Donor village for Donors to coordinate and share information.
- Financial. Guidelines for phased intervention (too much money at one time is usually problematic)
- Ensure flexibility in operation to adopt to regional, local, and community needs
- Periodic monitoring of projects, operation, donors, and in-built self monitoring through independent bodies with follow-up actions
- Conflict resolution amongst various players.

2. Advocacy and Legal Cell

- Revision and application of lessons learnt in the previous disaster experience (Bhuj, Orissa cyclone, Tsunami) in the recent years.
- Advocacy to formulate guidelines that are sensitive to both broad and local - ecological, social, and cultural issues and offer flexibility in achieving these.
- Interpretation of regulations and guidelines (building codes, others like CRZ notification etc.) that are pragmatic and sensitive to local, regional ecological, social and cultural settings.
- Ensure clarity and transparency at all levels

3. Information and Networking

- Repository of information – macro, regional, and area specific
- Dissemination of information through periodic reports, publications, and ongoing website with daily updates
- Networking/ liaison link with various stakeholders and expert groups and operating as a resource centre
- Negotiator on behalf of stakeholders (e.g. negotiating with appropriate agencies to make satellite imagery available for use by various groups immediately after disaster and in turn requiring any group to submit their maps/spatial information, reports, etc., to the consortium to share with others)
- Multi-stakeholder meeting

4. Planning and Implementation

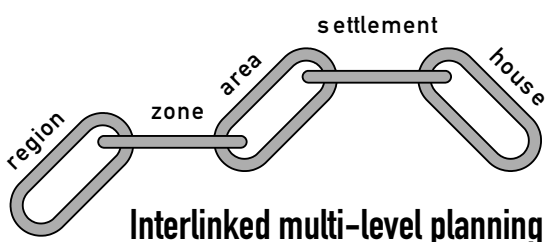
- Regional and local planning
- Blueprint for relief work (checklist and grand plan of relief and rehabilitation)
- Framework and guidelines
- Enforcement
- Allocation of projects, resources and funds

c. Research (and macro-level planning)

Macro to Micro planning linkages

Post-disaster reconstruction work for large regions requires planning at all levels. Ideally, planning activities should take place at regional, zonal, local, settlement, community, and neighbourhood and house levels.

The above categories can be replaced by the local equivalent names: in Tamil Nadu State, for example, the “settlement” can be the Panchayat, and the next level, “area”, would be the District, then State, and Federal Governments.



Macro level information and planning tools by law are mandatory only for reconstruction projects accommodating more than 1000 persons or involving discharge of sewerage of 50,000 litres per day or with an investment of Rs.50.00 Crore and thus requiring an environmental clearance from Ministry of Environment and Forests .

Planning should take into account all macro level issues in addition to micro level factors to ensure flexibility and sustainability. A consortium should make this possible – through the combination of members and their professional and administrative profiles. That being said, adequate systems and communication channels are

required to effectively link micro level planning with the framework created at the macro level by experts.

An example of a “macro level planning tool” could be a Regional EIA or the Strategic Environment Assessment of the Rehabilitation. Both of these serve as planning tools at a larger spatial scale but also down to the site level. Regional EIA is a wider spatial scale EIA because of the spatial lens we are looking at, or the kind of project we are looking at (that cuts across a huge space - in our case rehabilitation).

Strategic Environment Assessment (SEA) “is a systematic process for evaluating the environmental consequences of proposed legislation, policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision making on a par with economic and social considerations.”[RM: REFERENCE? CAN MIN OR NINA GIVE THIS TO US?]

SEA is like doing an EIA but a few levels higher than the project level: more for, and including, the policy, planning or programme levels. So in this case it is like doing an EIA at programmatic level - here specifically the rehabilitation efforts. This could then become one of the guiding tools for planning of housing and settlements.

This should be ideally done when all the exact details of rehabilitation needs and all policies are known and clear.

To use one illustrative example, and as Architecture & Development concluded in its 2005 (December) evaluation of post-tsunami actions in India, the problem of salt-water intrusion requires a global and integrated redevelopment approach.

Data gathering, evaluation and research

A multi-level view of what exists, at different levels

For an assessment to be comprehensive, an overview of what and who is present in, or is projected for, the target territory has to be established and monitored throughout all intervention “phases” and “steps”. On-going prospective on what exists within and outside the target territory (which involves preparing for, and identifying, existing and introduced “factors”) could be considered as the baseline for research that can eventually feed into activities, evaluation and training efforts for the given populations and territory. Also, multi-layered assessment is a key tool in ecosystem research.

Monitoring and performance assessment

Periodic monitoring of all aspects at all levels with findings shared across stakeholders can bring uniformity and spread best practices. The monitoring and research work should be independent but centrally managed to avoid duplication of effort and allocation of research resources to useful studies. One of the key elements in monitoring is to ensure usage of appropriate indicators. For example, instead of measuring the number of houses completed, perhaps the overall quality of settlement and its acceptance within the community could be an indicator for effective implementation. The consortium could be involved in organising and managing the monitoring effort. Donors may assess their respective projects. There should also be periodic independent monitoring of the consortium itself. The monitoring results and recommendations should be distributed and shared. The consortium should have the authority to enforce the findings.

Participative and formative evaluation (or the quality approach with continuous improvement)

Another issue regards the importance of participation and negotiation between scientists, local experts (on traditional knowledge) and engineers, as to what the best solution could be on any of relevant topics to sustainable development – whether regarding environmental issues (sewage, solid wastes, biological diversity, watershed dynamics, ecosystem stability), or on social or economic issues.

II - Preparation step

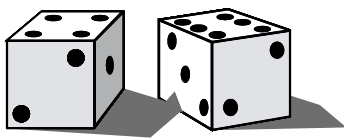
a. Consortium to play a key role in planning

Public agencies and local government do not always have the necessary skills or experience in planning for such events. Collaboration between different stakeholders including government bodies, NGOs/CBOs, donors and local communities can prove very useful. The consortium supported by all stakeholders and equipped with desired skills and experience can become the hub for all planning activities at the macro level thereby not duplicating and dissipating such efforts. Appropriate systems and structures will also be required to translate high level plan into local plan and reconstruction. The beneficiaries should be an integral part of the planning process. They should be signatory to agreements for any development work.

Planning:

Planning is an area often ignored and under-resourced. Key aspects of planning are often overlooked.

Allocation of funds and resources

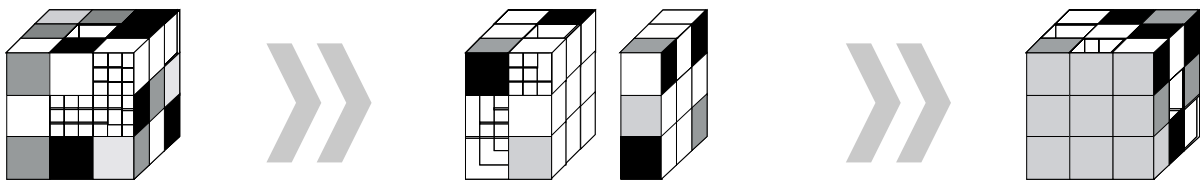


Allocation of resources is typically arbitrary

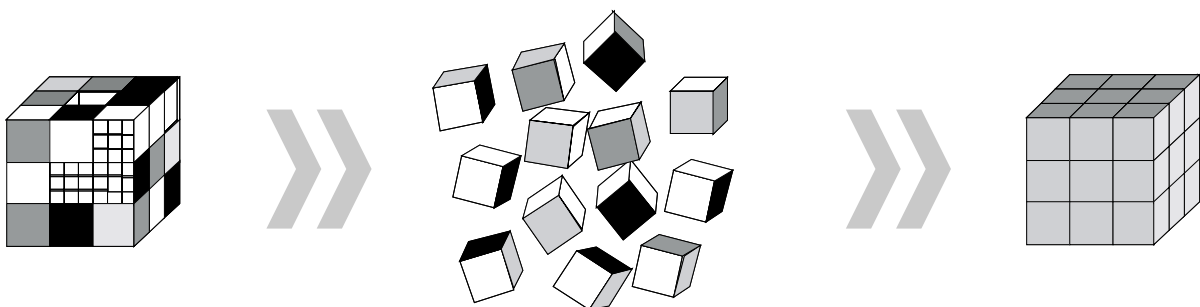
During post-disaster rush for relief and rehabilitation funds are often hastily allocated which leads to duplication of effort and overlooked regions and communities. This often leads to tremendous social, ecological and economic imbalances and stress in the region. Proper planning and coordination between donor agencies, NGOs/CBOs facilitated by the consortium can help avoid these situations imbalances in allocating of funds and other resources.

b. Planning

An all inclusive-extensive approach is crucial in ensuring sustainable outcomes for affected communities and the region as a whole.



Without planning, often many aspects of development get overlooked resulting in only part of the problem being adressed



With proper planning, all aspects are usually considered resulting in higher likelihood of developing and implementing a balanced reconstruction programme

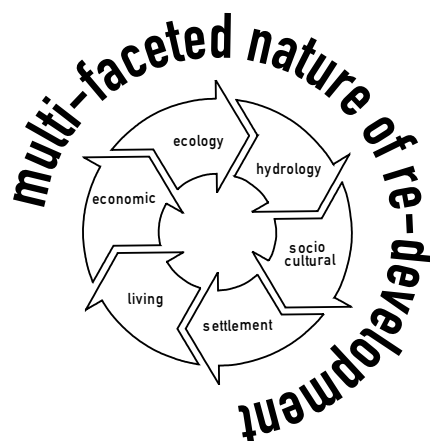
Information and planning tools

Planning tools are useful, if not required, at all project levels - with resources, and information to be gathered, accessed, and contributed by all stakeholders in coordination with the consortium. These information and planning tools include but are not restricted to: Topographic maps; Spatial information; EIA; Livelihood system analysis; Planning tools; Sharing mechanisms; Stakeholder list; Guidelines, documentation, including online documentation on – identifying and listing of beneficiaries, opportunity for appeal, and final listing of beneficiaries.

- Topographic maps and satellite images at various resolution (5-10years old images and most recent ones, with provision to acquire more until the end of rehabilitation process)
- Any pre-existing spatial information, report and documentation on land-use/land cover, forest/agricultural land and practices, social and traditional usage of area.
- Environmental impact assessment (EIA) with special emphasis on (a) biological diversity, and (b) primary social, cultural, livelihood and economic issues. The EIA would to be conducted separately later for each intervention site. EIAs on biodiversity need to consider ecosystems that are and potentially will be affected through rehabilitation activities (e.g. for Tsunami affected areas – ecosystems to consider should include marine, inter-tidal/coastal, adjoining terrestrial and associated freshwater systems). (b) social, cultural, livelihood, and economic analysis should include the primary group of beneficiaries but also associated groups who may not have lost lives, or property but whose livelihood was impacted by the disaster (e.g. non-fishing communities in the Tsunami affected villages).
- Rehabilitation project should particularly assess topography, hydrology, and fresh-water (ground and surface) issues – therefore macro level mapping and information regarding this prior to area-specific project planning is a requirement.
- Public-works that includes building roads, water and power supply infrastructure techniques need to be revisited and altered to abide by recommendation and specification of the EIAs, hydrologic/ limnologic analyses.
- Planning materials should be shared regularly amongst the stake holders with the consortium working as the resource centre.

Planning to cover all aspects of disaster recovery

A master plan can be in the form of guidelines and general framework that should cover hydrology, ecology, socio-cultural nuances, settlement, livelihood, economic aspects, building materials and design parameters (disaster proof, sustainable and as far possible using local materials and local/locally tried technology). Disaster recovery programmes are typically geared for providing permanent housing to the beneficiaries as quickly as possible. Moreover, the success measures of development agencies, donors and government promote this approach. However, in doing so, such interventions should not ignore key aspects of reconstruction particularly the impact on environment and social imbalances to avoid even bigger problems in the long term. Site selection for permanent housing should take these factors into account. In addition, due site planning process should also take into account the diverse nature of communities. Any intervention should address the needs of the minority and indirectly affected communities in the affected area and also of communities that are indirectly affected.



III - Implementation step

Many evaluations and recommendations from other sources have dealt with the issue of sustainable development during implementation of projects - let alone during preliminaries and planning steps. In each of these three steps – and in this final “implementation step” as well – actors should keep in mind the links with the different levels of territorial management- from the macro (State, Federal,...) scale to the micro (village) level. It is at this level where local participation is an important as well – where an approach such as action-training (cooperative and/or participative education/training) gives its most concrete application.

A4. SUSTAINABLE FACTORS

PRE-EXISTING AND INTRODUCED FACTORS IDENTIFIED FOR BRINGING ABOUT SUSTAINABILITY WITHIN A POST-DISASTER SCENARIO

Knowing that NGOs must “stay the course” as much as it deems feasible – in order to be considered worthy of on-going funding (at least to the end of its contract), many realize that they are in a balancing act between bringing in know-how, technologies, approaches and knowledge that will help compensate the affected post-disaster populations for what they may have lost – and respecting existing natural and socio-economic processes, and to restore as much as possible whatever biodiversity or natural systems that were the sustenance and at least part of a local population’s livelihood. It is a balancing act between recognizing the existing or pre-existing state of things, and perceiving what is necessary for further sustenance and sustainable development of these same communities. It is this ‘balancing act’ that we wish to put forward in the present document.

In order not to repeat what is often presented as additional “environmental” considerations, or not to forget to incorporate social and economic aspects, this mission has taken the option of going one step further towards structuring its findings into an accessible framework.

This framework is constructed in such a way that present and future implementing agencies and NGOs will not forget what many of them already know: that basing their interventions on pre-existing knowledge and experience can only be beneficial to the operations the agency is to manage... Hence the dividing of columns of factors to be taken into account, into two categories: “pre-existing” and “introduced”.

“Pre-existing” factors

“Pre-existing” factors (“ecosystems” and “livelihoods”) mean that in those natural or man-made environments one may suppose that there exists local and/or traditional technologies and modes of communication that should be taken into account before trying to introduce new or foreign ones...

“Ecosystems” and “livelihoods” are territorial factors of which the strongest, surest knowledge-base (knowledge, know how, not necessarily within formal, scientific perspective) one must assume exists in-situ.

The question on “pre-existing” factor is important to ask each time one walks into a geographical area, whether at the beginning of a post-disaster scenario, or at a later phase... “What happened, what has been done, before I/we came in?”

Ecosystems

As one researcher and pedagogue reminds us, “one of the reasons for [preserving and] studying natural ecosystems is that they are models of sustainability” (Wright, 2005:77). This is another reason why the “ideal scenario” below has systematically integrated the ecosystems of the affected sites. In this perspective, it may be useful to consider an ecosystem as a (living) community interacting with a non-living environment in a delimited territory. And this can apply to territories where the living and non-living environments are still providing essential ecosystem services, as well as territories that have largely transformed for agricultural production, or become densely urbanized.

The basis of sustainable development must be the territory for which one is defining a strategy or an action plan. So, the application of sustainable development can be at different scales. We will be looking at both the macro perspective – looking at efforts to bring out and to generalize lessons learned – and a micro perspective – in terms of exchanges between local populations and outside experts and scientists, regarding their territories. The latter aspect may be that social-psychological point of view that several of the interviewed NGOs talked about.

Taking into account and comparing both the “micro” and “macro” perspectives are a way of entering into the realm of “multi-level” analysis, something that ecologists are wont to do – given the variability of defining territorial limits to a given ecosystem – with all its potential inputs and outputs.

Livelihoods

Livelihoods’ sociological diversity, and its link to a territory

One study shows that over 98% of the community households (in the post-tsunami zone) are of the view that their location is important to the livelihood (TRRC, 2005b). The same study also reveals the disapproval of G.O.172 by a large majority (95%) of the affected communities. It also shows clearly that these communities are not willing to relinquish their existing properties as required by the G.O. in the case of relocation.

Economic considerations for sustainable development

It is widely believed that more funding and more resources is usually the answer for better rehabilitation and redevelopment. Funding is absolutely essential; however even more essential is integrated planning in allocation, distribution and usage of funds. It is often funding in a short space of time that leads to spending frenzy and creates new economic imbalances. Once the immediate relief is in place, extensive detailed planning at macro level should be carried out with phased allocation of funds. The consortium can also play a role here.

The resource allocation planning should take the following factors into consideration to ensure sustainable development: regional inflation; wealth distribution; sustainability of on-going funding; community expectations for the future; dependency culture; consumerism (and waste generation); local human footprint; social coherence; ecological implications; irreversible changes to local cultures and donor frenzy and even disaster tourism.

Some of the pressure to spend on unnecessary projects can be alleviated by allowing donors to phase redevelopment work or redirect funds for rehabilitation of other disasters with shortage of funds.

Intricacies and nuances of affected region and communities

The planning process should have built-in recognition of multi-layered nature of communities and settlements. They should design and implement programmes that take this into account in an equitable way. The planning process should allow for flexibility in adapting to local paradigms of habitat design whilst promoting development objectives. (E.g. in fishing villages there are multiple clans of fishing folk and non-fishing communities, all with different needs).

Gender factors with housing

The house serves different functions for men and women and therefore used differently by them. Therefore, both men and women should be involved to plan and design settlements right from the outset.

“Introduced” factors

One must constantly ask the question, ‘How appropriate is the outside knowledge being brought in?’ And ‘How much can/should it replace the “old” knowledge?’ - knowing that the old knowledge must not be overrun because of lack of translation or communication tools.

Appropriate Technology

This is where beneficiary communities, implementing agencies, land/or ocal governments, must ask themselves the question whether or not to invest in: construction materials (fly-ash brick, ferro-cement structures,...); energy sources (for clay brick kilns, for example); ecologically appropriate species of endogenous or introduced species of shrubs and trees for bioshields

I.E.C. (Information, education, communication).

Access to information and expertise can be a key to capacity building.

There should be a central repository of information and expertise that is easily accessible locally. The information should include planning tools, appropriate technologies, technology comparison and any other intervention related information. The right experts with relevant experience are usually not available where they are needed. Expertise should be organised centrally and funded as a separate project. It should be made available to all stakeholders. The expertise should include training programmes in all spheres of post disaster intervention; advisory and consulting services; and prototyping (experts for prototyping new solutions and technology can be provided centrally and results shared across all projects). Prototypes should be used to offer multiple options to beneficiaries and create awareness of what is available and their suitability to local needs.

Training on cultural and regional sensitivities should also be available and made compulsory for key decision makers and implementing groups.

In its 2005 (December) evaluation of post-tsunami actions in India, Architecture & Development insists on information, accompaniment, and awareness-raising for all actors of reconstruction, including the beneficiaries, in order to encourage transparency and mutualization.

A5. THE IDEAL SCENARIO

IN A A THREE-FACTOR APPROACH FOR EACH RECONSTRUCTION & REHABILITATION HOUSING PHASE

A first foray into sustainable development within the present area of reconstruction/rehabilitation is this introduction of an “ideal scenario”: bringing together the preceding elements, involving time (‘phases’), management processes (‘steps’), and sustainability ‘factors’. We will start with the chronologically coherent but condensed representation below. Such a table is an example of what some people and organizations would call an ideal timeline. Our hope is that the development of this matrix, this ‘ideal scenario’ model, will contribute to guaranteeing a global and transversal approach for reconstruction (Architecture & Development’s 2005), or wherever there are inputs, “aid”, attempts at technology or knowledge transfer from exterior agents into isolated, traditional, territories.

INTERVENTIONS	TIMELINE				
	Year 1	Year 2	Year 3	Year 4	Year 5
PHASE I - Relief					
Formulation of a Consortium (Guide, Monitor, and Support Relief and Rehabilitation Activities)					
Preparation					
Relief Shelters					
PHASE II - Intermediate					
Preliminaries					
Site planning & Participation for Phase III					
Functional / Intermediate Shelters					
PHASE 3 - Long Term					
Preliminaries					
Permanent housing / settlement planning					
Settlement reconstruction					

The preceding table could be a classic, realistic, scenario, especially if one takes into account earlier recommendations from experienced NGOs and funders (UNICEF, UNDP,...). In our view (and following the reports and comments from many sources during this mission), and in the perspective of sustainability, there lacks in such presentations the basic understanding that factors, such as biodiversity and the basic functioning of local ecosystems, are key to livelihoods, in the zones most affected by high risk natural phenomena (tsunami, floods, earthquakes). Additionally, if we look at all these “steps” and “phases”, implementing agents should limit

themselves to inputting for (investing in) planning and training, but especially insuring that there is maximum opportunities for community participation.

At this point we are presenting only the last “permanent” housing phase, though the three other phases could have been included. This mission has concentrated on looking at the different efforts realized 2-3 years after the tsunami. It is the third phase of a post-tsunami scenario since the site visits corresponded to that period of completed or almost-finished construction of permanent housing. That being said, any of the ‘steps’ could apply at any phase. For example, populations can be “moving in and adapting” in any of the three identified phases. Obviously this will apply to the two last phases, but agencies (both donors and implementers) do and must keep in mind how populations will live, react to new living conditions – be they relief, temporary or permanent.

The next table is one that allows for keeping into account possible ideal scenarios in a given project on a given territory. It allows one to keep in mind and use each of the ‘factors’ systematically and together – as much as possible - while progressing at each step of a project. The idea is that all four factors be present at every step. In real life this is not always possible, and far from it. But one can at least strive toward this vision of sustainability. It can be considered a “sustainable development” table because development will occur whenever there is an amalgam of “factors”: a crossing between factors - from either category. Local, “pre-existing”, communities reach out to different technologies or information. Or outsider (“introduced”) NGOs or other bodies or individuals may propose appropriate technology or communication contents or tools. So included in this matrix are a few possible illustrations where certain “factors” can be taken into account at certain “steps”. Other possible cases are represented afterwards - each coupled with a miniaturized version of the table.

The possible illustrations are:

- For an assessment of human resources (Step 1.1) and their capacities (and technological partners), one ideally could want some type of observatory monitoring income generation (within “Livelihoods”) or cost-benefit ratios for certain technologies (“Appropriate technologies”).
- “Planning” for construction should ideally take into account maintenance issues.
- If we take the “Design” step, all three efforts around housing, settlements, and sewage treatment facilities, ideally require looking at all four factors. For example, for sewage treatment, the sustainability of the system first of all requires looking at the economic capacities of the local community to pay for the system or at least for its maintenance. This is the classic problem of most systems, when communities default on their capacities to maintain the system.

STEPS	FACTORS			
	Pre-existing		Introduced	
	Eco systems	Livelihoods	Appropriate technologies	IEC
1. PRELIMINARIES				
1.1 Human resources, stakeholders and their dynamics		Certain populations or communities may be more or less pre-disposed towards certain technologies...		
1.2 Networks, Consortia and communication	In order to be able to plan for and to cover all aspects of disaster recovery, the consortium members' profiles need to be able to address all four key factors...Also, this could involve the different phases of post-disaster – post-relief phase as well.			
1.3 Research	A first series on: Traditional and ecosystem services for human and natural resources		A second series on: the technical and educational means that are adapted to helping to preserve these services	
2. PREPARATION				
2.1 Planning		Maintenance needs (including action-training, connecting technology and capacities)		
		Economic analysis, allocation of funds and resources		
2.2 Design	Housing design			
	Settlement design			
	Sewage treatment system			
3. IMPLEMENTATION				
3.1 Construction	"Community clusters" should be directly involved in the construction of their settlement and housing (as well in preparation phases and maintenance)...			
3.2 Population moving in and adapting				

Human resources

Another “preliminaries” step could include an identification of profiles of human resources in different habitats or niches of an ecosystem.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders	●	●	●	●
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

Ideally this task would first involve looking first at the Ecosystems and Livelihood factors, followed by the other two. More finely, one could initially measure the intricacies and nuances of the affected region and communities (linking ecosystems and human populations).

A review (ideally, aided by outside service providers) of the implementing agent’s own human resource capacities, could also be a useful preliminary step... This will feed into the building up of a consortium – according to the profiles and attitudes of the various candidates.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders			●	●
	1.2 Consortia			●	●
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

Consortium

A review of the existing networks and interactions (in research documents as well as traditional memories), also in preparation for setting up a consortium – in the perspective of inviting the appropriate local decision-makers, and understanding the implications of such a step.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia		●		●
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

This should include – again, ideally – a review of the implementing agent’s own network(s) and willingness to share information and experiences...

“Research” step and issues

More in a research vein, one could review present representations of existing and past human and natural resources – in research documents as well as traditional forms of knowledge conservation... This could eventually feed into the IEC factor – for training and pedagogical purposes.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research	●	●		●
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

Environmental economics is a real “preliminaries” field, in the ideal, since implementers and administrations at all levels, could benefit from this cross-sectoral evaluation – in the real monetary sense of the word: how much economic value are parties ready to put into certain ecological services?

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research	●	●	●	●
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

Such “values” can be equally real for local populations as well as for companies and researchers.

Otherwise, there seems to be quite a lot of research being done (or that needs to be done), much of it discrete, not necessarily coordinated, with not much follow-up or dissemination to a larger public:

- The existing representations of existing ecosystems – in research documents as well as traditional forms of knowledge conservation (like for marine resources, or with mangroves; or for topographic maps).
- On-going cost-benefit analyses, for research on Appropriate Technology.
- A review of successful engineering works in terms of minimizing impacts on environments, and this could feed into the issue of the need for what, if any, technological improvement(s) on a given ecosystem or territory.
- On-going cost-benefit analyses, for research on Appropriate Technology.

In addition to the issue of dissemination (addressed by IEC, and the integration of the four ‘factors’), the question remains: How to use/apply or encourage technology assessment and adoption/adaptation, given the choices available (which may be numerous, if some form of prospective approach is applied)?

For example, in the area of sanitation systems there are several types of technology available. Sanitation in the post-tsunami zone continues to remain a challenge. There have been many studies and experts that have called for special designs, guidelines and standards of sanitation and treatment facilities for coastal areas, especially areas with high water tables.

It has already been identified as a complex issue due to difficult soil and ground water conditions (UNDP and NCRC, 2006 [IF HAVE FULL REFERENCE – PUT INTO BIBLIOGRAPHY - CHK WITH SUDARSHAN]). But deciding on

which system design to use on a given site requires several vertical and horizontal decision levels, going from the financing to the daily use and maintenance of such systems.

One of the determining factors of design of sanitation and its usage by the community in coastal areas is the quality of water and soil and the availability of water respectively (Green Coast, 2006a; Lakshmi, 2006). Here we can have a fuller appreciation of the functional definition of an ecosystem (as seen earlier) – insisting on the interactions between a living community and its non-living environment.

Recommended is a comparative study of decentralized and centralized systems that could be used in the different phases of rehabilitation in terms of cost to commission and to operate them over time, expertise necessary, service available, and environmental conditions (soil, water, ground water levels etc.). This could then be used as a decision making matrix/tool that would help agencies help make right decisions on sanitation in the early stages of the planning of each phase of the rehabilitation itself.

Planning

The need for preliminary understanding before planning and construction on the coastal zone

The housing guidelines given by the Government of Tamil Nadu have not suggested any additional measures for safety in such sites. Thus some of the sites may remain vulnerable, if additional features such as wetland drainage and planning are not incorporated.

Extent of storm water system planning in housing reconstruction

>>>GRAPH<<<

Thus, it seems that the drainage and watershed studies and planning is site specific and more mitigation oriented [AND AUROVILLE EX? (drainage)]. This will result in a change in the local drainage pattern for surface runoff and many of these sites will also impact adjoining sites due to spill over effects of their impact on the wetland drainage (Hedao, 2005; Hedao 2006).

What is needed is a regional spatial scale mapping of the watershed and drainage with experts such as hydrologists to identify changes post reconstruction and identify vulnerable areas for comprehensive planning along with mitigation options.

Planning for proper management of land masses: seawalls, green-belts (bioshield) creation

Regarding seawalls and filling-in low-lying areas, it should be emphasized here that, it is now being widely acknowledged that many of these hard options have serious ecological and environmental impacts (Hedao, 2005). The structures along with their ecological and environmental impacts also affect the livelihoods of fishing communities.

For a resilient and sustainable recreation of green-belt in the coast line, there is a need to promote a mixed-species tree planting with emphasis on indigenous Tropical Dry Evergreen forest (TDEF) and exotics that can be eventually phased out. Along with that there is a need to provide adequate protection in the initial years from salt-sprays, wind, predation by animals, disturbance, and from drying out.

Often the agencies involved in the housing are not the ones involved in creating green-belt. However, in the areas visited, green belt creation was restricted to either Casuarina plantation, to coconut and few exotic/indigenous plants or trees that the villagers preferred for planting in the settlement zone. For a resilient and sustainable recreation of green-belt in the coast line, there is a need to promote a mixed-species tree planting with emphasis on indigenous Tropical Dry Evergreen forest (TDEF) and exotics that can be eventually phased out. Along with that there is a need to provide adequate protection in the initial years from salt-sprays, wind, predation by animals, disturbance, and from drying out. Proper site selection should be done respecting that sandy beach and sandy dunes are also coastal habitat and there are socio-ecological preferences by communities for the sandy beaches on the seaward side of a settlement.

Training in planning

When we're talking about planning, in the context of sustainability, one should think more in terms of settlement planning, since we are talking about communities and ecosystems – not necessarily individual families, especially in the context of traditional livelihoods. The objective should be to provide forward training for local populations, projecting for future needs and markets, as well as access to capital; permitting linkages for Self-Help Groups to livelihood skills and their enhancement.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning		●	●	●
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

Green-belt /Bioshield Creation

For a resilient and sustainable recreation of green-belt in the coast line, there is a need to promote a mixed-species tree planting with emphasis on indigenous Tropical Dry Evergreen forest (TDEF) and exotics that can be eventually phased out. Along with that there is a need to provide adequate protection in the initial years from salt-sprays, wind, predation by animals, disturbance, and from drying out.

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B

KEY OBSERVATIONS SITE VISITS AND INTERVIEWS

PROJECTS VISITED

Taragabari, Tamil Nadu; SIFFS (South Indian Federation of Fishermen Societies); Swiss Red Cross
Kottucherrymedu, Karaikal, Pondicherry; DA (Development Alternatives); Swiss Red Cross
Kodiyampalayam (next to Chindambaram), Tamil Nadu; CEE (Centre for Environment Education).
Devanapattinam, Tamil Nadu; PMSSS (Pondicherry Multipurpose Social Service Society); Caritas
Chidambaram, Tamil Nadu; CREED (Centre for Rural Education and Economic Development), CARE-India
Chinnamudliarchavady, Pondicherry; Auroville Coastal Area Development Council; Auroville Tsunami Relief Fund.

B. KEY OBSERVATIONS

SITE VISITS AND INTERVIEWS

As the mission did its site visits almost three years after the tsunami, it can be considered that we arrived during the third phase of the post-disaster scenario. (Hence following table represents mostly realizations or projects in that developmental phase – with the fact that many houses and settlement had not yet been moved into...). Different projects concentrated on certain ‘factors’, depending on their capacities, previous interactions with local populations, and the general situation of the project sites.

STEPS	FACTORS			
	Pre-existing		Introduced	
	Eco systems	Livelihoods	Appropriate technologies	IEC
1. PRELIMINARIES				
1.1 Human resources, stakeholders and their dynamics		Stakeholder consciousness raising		
1.2 Networks, Consortia and communication	In order to be able to plan for and to cover all aspects of disaster recovery, the consortium members’ profiles need to be able to address all four key factors...Also, this could involve the different phases of post-disaster – post-relief phase as well.			
1.3 Research	A first series on: Traditional and ecosystem services for human and natural resources		A second series on: the technical and educational means that are adapted to helping to preserve these services	
2. PREPARATION				
2.1 Planning		Maintenance needs (including action-training, connecting technology and capacities)		
		Economic analysis, allocation of funds and resources		
2.2 Design			Sharing, with beneficiaries, of maps of layout of houses (SIFFS, DA)	
		Generally speaking, few links are found between “design” and ecosystems, although, at a local household level, there are undoubtedly good examples of well adapted traditional houses - with regards to local climate and existing tree species (Reference to Slide 12,PPT)		
3. IMPLEMENTATION				
3.1 Construction	Collecting and separating solid wastes for a community (self-hel group) so as to make and sell bio-fertilizers (either through vermi-compost or green manure additives).			
3.2 Population moving in and adapting		Negotiating for delayed deadline in dismantling temporary toilets		

In the following pages, the reported cases are found either at one of the steps of reconstruction, or vertically as an effort to implant one or several factors in the awareness or habits of local populations and/or the implementing agents. The best cases are those that spread throughout the ‘factors’, crossing barriers and integrating into the local ecosystem and livelihoods...

Stakeholders and human resources

The importance of including human resource development strategies

At the CEE site, one issue was the question of future projects regarding changed livelihoods – such as the possibilities of engaging in hotel and tourism activities, with outside capital and turnkey operations being proposed, but without the necessary planning stages that normally could ensure the employment of local youths at various levels – hence preparing for eventual training to fit into the action plan of these outside investors...

Consortium

Note on NCRC

The senior officers of the Government of Tamil Nadu, knowing the value of NGOs in any crisis situation, responded by establishing a strong working relationship with the NGO Co-ordination centre. About 400 NGO's registered at the centre during the first few days. Using these volunteers the NGO Co-ordination centre setup a **two way information flow on the requirements of the villages and the materials available with the Government and NGOs.**

In about a weeks time NGO's formed sectoral groups relating to shelter, livelihoods, trauma counselling, health and sanitation, children, etc, which flagged the critical issues in the sector, and undertook collective responsibility to try and address these on the ground.

The success of these sectoral groups in addressing issues resulted in the need for continuing the Government - NGO co-ordination into the Rehabilitation phase. The rehabilitation phase required a systematic structure lasting about one to two years and the need for physical meetings are reduced. Thus the NGO Coordination Centre was transformed into a rehabilitation resource centre, called "NGO Co-ordination and Resource Centre" or NCRC with UNDP a strategic partner at this juncture. Presently it seems that "environment" is the weakest sector in the Nagapattinam(?) consortium. Two of the interviewed NGOs admit that they are no longer working on such issues.

The NCRC took up critical needs such coordination of knowledge resources, which includes **access to and exchange of sectoral and regional perspectives, technical expertise, reliable data and its synergy with policy formulations**, for all stakeholders in the rehabilitation phase - especially for NGOs and donors in their respective areas of interest.

A consortium could be a more elaborate form of NCRC (NGO Coordination and Resource Centre) with a much extended portfolio and enforcing authority.

Identifying beneficiaries (in preparation for planning)

Identification of beneficiaries, in the beginning phases of post-tsunami work was a difficult task for all. Some NGOs or individuals within that NGO, like CEE who did not have a pre-tsunami presence in their intervention site came up with their own elaborate checklist to identify legitimate beneficiaries. SIFFS could also identify/verify beneficiary due to their pre-tsunami presence in their intervention site – in that case, "livelihoods" and human resources are relatively well known and understood.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders	●		●	●
	1.2 Consortia				
	1.3 Research	●			●
	2. PREPARATION				
	2.1 Planning	●		●	●
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction	●			●
	3.2 Pop. moving in				

In Karaikal (Pondicherry) beneficiary list was prepared by the government and provided to the NGOs like DA working there. In this case, the statistical criteria for establishing a list (the technology) can be an important component – for acceptance or not of the final results (list of beneficiaries).

Building Trust

SIFFS had a long-term pre-tsunami presence in the area that earned them good-will and trust.

DA came into the area post-tsunami as an external NGO. They could build some trust through a separate set of community development/involvement activities (involving children, women, and local people).

Determining social profiles (?)

Indian villages along or near the coastline visited, including fishing villages, are not unanimously habited by fisherfolk. Any disaster impacts the fabric of the entire village and all its community. Relief and rehabilitation projects in any given area should also represent this diversity and be equally gender sensitive. SIFFS and DA had some targeted programs for women. However, each of these projects per se targeted only the fishing community in a given area. CREED worked with non-fishing tribal group. However, no single project represented all the communities in a given village/area.

On Research

The NCRC has shown that it will not only facilitate the collaboration between agencies, but also encourage interaction between disciplines, and even support or undergo research (Example of the April 2007 Mapping and Study of Coastal Water Bodies in Nagapattinam District).

In another case, Tsunami Rehabilitation Information NETWORK (TRINET) was set up in March 2005 as a response to the broad information requirements in the state of Tamil Nadu for tsunami rehabilitation and reconstruction phases to help in sharing information between different groups working on various aspects in the different districts of the state. It has conducted series of workshops on different sectors of rehabilitation- water and sanitation, coastal protection and management, agriculture, habitat reconstruction etc.

Besides the above there have been various networks promoted by donors and their implementing partners. One worthy of mention is the Tsunami Advocacy group consisting of Oxfam funded implementing partners. Under this network there are also sectoral sub-groups /working group. The main function of this network is to highlight engage advocacy issues with the government in the various sectors of rehabilitation.

Are there some cultures/communities that use their territories as a resource, a context for education? Perhaps the new buoys for Tsunami warning system could be an example of beginning this?

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research	●	●	●	●
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

I put this in all three factor squares, in 'Research', because, first of all, of the 'observation' component, in contributing to scientific data, and which may contribute to our (many stakeholders') understanding of the ocean's behavior as an ecosystem...

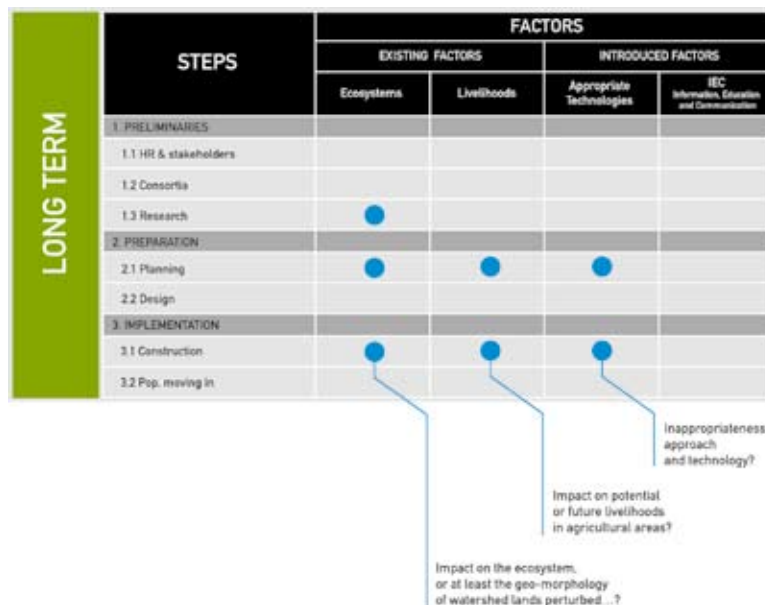
Coastal Engineering – Sea Walls

In one of the sites visited the harbour and port department had constructed a sea wall. Local fishermen in the village were unhappy. There seemed to be no local mechanism for participation and decision making these measures. They are now landing their craft further north more than 150 M away from the village.

Communities have generally not been positive towards building of sea walls in Tamil Nadu, as they feel it is a hindrance to the landing and movement of their boats (Viswanathan, 2005). John Kurien feels that sea walls in Tamil Nadu are likely to be the “death knell” of the catamaran, as they need sandy beaches to land in and would otherwise break (Sridhar, 2005).

Sand-mining

At level of State and District levels, in terms of the exchange of information, and sharing of expertise (and hopefully at the Research and Planning steps), the key issue here is the impact of sand mining, meaning the displacing geological material (sand and other substances) from one site to another, on the topographical and hydrological dynamics of a watershed. Impact on an area that sand mining may require – given the general paucity of legal sources and quarries – requires a scientific understanding of a region’s geomorphology and hydrology, and of the potential impacts of any projects modifying these characteristics.



At a more local level, the impact on livelihoods will most certainly have to be taken into account – given the variety of land uses and the dependence that many communities have on natural water availability, as well as the risks they face in terms of flooding. The problems being the transfer of soil substrates for low-lying construction zones, without EIAs. And possibly no consultation with beneficiaries (fisherfolk, agriculturalists in other zones, regular water users...).

Irrigation canals

A similar issue is that of the irrigation canals – and how are such projects (with SIFFS in particular) are coordinated or not with the different levels of government?

Despite the preceding observations there could be efforts of transferring information and knowledge regarding ecosystems (existing factor) and IEC (Introduced factor)

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research	●		●	
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

NCRC study on Coastal Water Bodies

The NCRC study on Coastal Water Bodies mapping all the Irrigation channels and drainage channels at various levels, standing water bodies such as ponds, tanks, ooranis and alams and different kinds of groundwater sources such as wells and bore wells is a excellent example of regional level planning. This study was designed to not only restore the efficiency of the irrigation and drainage channels and other water bodies but also improve their potential for additional storage of fresh water but also identify and map the many threats and problems such as siltation, damages to bunds and other structures like shutters and notches, deliberate encroachment for cultivation, aqua-farming, habitation and weed infestation. Any water resources development should be tackled only on watershed and drainage basis looking at rain water/runoff water coming from the catchment area with a complete understanding of the hydrogeology of the area.

Habitat and Settlement Planning

A similar study should have been done to look at the watershed and drainage of the whole rehabilitation area for identifying suitable sites for housing. Even though this was not done, the same can be still done not only to identify vulnerable areas but also to design mitigation options at regional scale in a systematic planned manner.

Sea walls

The choice and impacts of sea walls (vs. alternatives such as bioshields) must be examined as a case where divergent opinions - and their respective arguments (and/or research) - could be examined under the auspices of neutral bodies. The points of view of local populations need to be taken into account, but information on scientific data is not sufficiently disseminated. But the debate is necessary before further building of sea walls proceed.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research	●			
	2. PREPARATION				
	2.1 Planning	●	●	●	
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction	●	●	●	
	3.2 Pop. moving in				

X? (ecosystem, or at least the geo-morphology and coastal dynamics perturbed...)

X? (impact on livelihoods)

X? (inappropriate technology)

Appropriate technology

Appropriate technology is a topic that ideally should be in a Preliminaries' research (and cross-Phase monitoring) step, that may feed into Preparation steps, including both Planning and Design. There may be choices to be made regarding energy sources, which bears on monetary costs (within Livelihoods) as well as environmental costs – depending on the type of technology and natural resource used.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research		●	●	
	2. PREPARATION				
	2.1 Planning		●	●	
	2.2 Design			●	
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

It is the general case, in Tamil Nadu, for the provision of energy for brick kilns. In some cases, Neem was being used – although it is a tree that is on the [endangered species] list and is officially protected by the government of India. The alternative is importing coal... (a bilan carbone should ideally be done)



Fly ash bricks



Fly ash brick mould

Multiplicity of appropriate (or adapted) technology projects. (But no comparable data or results)

Several implementing groups (CEE, DA, SIFFS? CREED) have used fly-ash compressed brick for construction. SIFFS in their prototype housing have tried out mud construction. DA, CREED?, SIFFS used hollow bricks (rat-traps) for better insulation. In terms of non-building technology, SIFFS considered providing dry-toilets but due to lack of media/societal training on dry toilets, the beneficiary groups rejected it. It has also tried out DEWAT system in their prototype housing.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design			●	
	3. IMPLEMENTATION				
	3.1 Construction			●	
	3.2 Pop. moving in				

Environmental planning

Site selection, elevation and wetland drainage

In general it seems that 70 % of the housing rehabilitation sites are in low lying areas (Biju, NCRC, pers. Comm.). Within these sites in low lying areas 42.2% of village sites have a water logging problem (UNDP and NCRC, 2006). This also seemed to be the case in at least 3 of three of the case studies sites visited.

Land filling and landscaping is not permitted as per the CRZ. In fact, one study reveals that of the reconstruction sites sampled the storm water drainage has been studied only in one-third of the prior to construction sites (UNDP and NCRC, 2006).

Introduced high tech, and waiting for the appropriate opportunities and preparedness for sustainable development to be engaged with this introduction.

Resource centres and Village Knowledge Centres (VKCs) : the greatest opportunity and the greatest challenge

We will concentrate here on the VKCs since these are the entities visited (one in Kodyambalayam, and the other one serving the Cuddalore district). Such entities address principally the IEC issues and should spread out programmatically on to the other factors, if they want to contribute to sustainable development.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction		●		●
	3.2 Pop. moving in		●		●

VKCs are good initiatives, but they still have a great potential – if only the other stakeholders present buy-in and contribute to the exchange and dissemination of information and knowledge. Here again the role of a consortium in coordinating and monitoring can be crucial.

Ideally, VKCs are local spaces for counselling and resources whose objectives are to make information available to affected populations, and to favor exchange of experience and community solidarity, thanks to the use of IT. The few systems we have seen, for the moment, seem limited to specific audience and usages. Nothing tells us, however, that things aren't moving along quietly (through networking, collaborative alliances, etc.). The establishment of VKCs, in the few cases visited, seemed to represent discrete efforts – although information dissemination and conference exchanges were indeed realized - but with not enough interaction and communication, beyond the implementing agency's immediate partners. It was not clear whether a strategy had been set up for further development of the VKCs as a tool – involving other stakeholders.

The importance of IEC is evident when examining NGO Perceptions of Post-tsunami housing reconstruction and CRZ. None of the NGOs we visited had an understanding of the CRZ and reconstruction. They were all under the impression that either no construction is allowed in the CRZ or that no construction allowed in the 0-200 M of the CRZ. (This perception is misplaced- please see Annexure –I on CRZ and reconstruction). This is the perception shared by almost all NGOs involved in tsunami reconstruction. The probable reason for these perceptions comes from the wording of G. O 172 as well as the fact that the government did not create any awareness nor issue any formal clarifications to NGOs on the Chief Ministers announcement in the legislative assembly or of the discussion and clarifications at the 12th April 2005 meeting. This resulted that very few NGOs have taken up in-situ reconstruction of houses. This is also due to the fact that according to the G. O 25 it was government who was providing the land for the housing reconstruction (GoTN, 2005b).

Desalination plant

The desalination plant was not planned for using brine locally (rather than just dumping it behind the plant, and therefore not designed for an ecological use of its by-product. Although the training and employment of local persons was done for the plant, the ecosystem was not taken into account. This is a case of transfer of high technology, where the potential contribution by a traditional logic efficiency of resource use was not apparently addressed.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning		●	●	
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction		●	●	●
	3.2 Pop. moving in				

Lack of a closely monitored “multi-layered” approach: the case of public facilities

In the post-tsunami experience in Tamil Nadu, the local government was to provide settlement infrastructure for larger building projects. However, in many cases, due to a lack of appropriate planning at higher echelons of the administration (District, State, and Federal?) NGOs had made their own provision, as there were delays due to lack of central planning, coordination and plain bureaucracy. Facilities provided ranged from public toilets, street lights and water supply.



Power and road provided by the government



Street light and hand-pump provided by an NGO

Sewage Treatment



Overflowing sewage

In absence of any comparative study or expert opinion based on technology and what can work in India/ the region, most implementing groups including ones with excellent in-house technical expertise like DA, are confused about best option that could be applied. DA after evaluating several possibilities chose soak-pit option as the simplest and most affordable. Other NGOs like CREED used soak-pit system for its simplicity and availability of in-house expertise.

In some areas government has provided or promised to provide centralized treatment systems. In the case of Devanapattinam this has proven disastrous (see picture below, of sewage outflow through pipes and into street).

In Devanapattinam only half of the households and therein only the women use the toilet. Even then the sewage system, built recently spending a large sum, oozes out sewage into the

settlement area and street making it very unhygienic and unliveable.

A comparative study of decentralized and centralized systems in terms of cost to commission and to operate them over time, expertise necessary, service available is necessary.



Kitchen and bath sewage



oak pit sewage system

Solid Waste Management

Groups like CEE tried to tackle the problem of increasing generation of solid waste and their disposal and management – however, they do not have a clear solution in view. DA and SIFFS have provided for waste bins which are collected and deposited in a municipality bin/ dumping ground. However, a sustainable, environmentally friendly solution to solid waste is not available. Identifying a decentralized solid waste management system that works in rural/urban condition is necessary along with a dire necessity for awareness generation campaign against littering and promoting reduction in the solid waste.



Absence of solid waste management system

The fear is that such environmentally centered problems not be sustainably addressed, because often solid wastes themselves are introduced from the outside (especially packaging). So somehow, this solid waste problems has to be dealt with through 'livelihoods'. This is what is being attempted by PMSSS, in Devanampattinam...

However, work on many such projects had started much before or without any environmental clearances from the Ministry of Environment and Forest (Bhalla, 2006; Bhalla 2007). The government has stated that its will construct the sewage treatment facilities in housing sites with more than 200 houses (which roughly comes to 1000 persons). In most of the cases including 2 of sites we visited, there has been no decision yet on the type of sewage treatment or timeline for its construction yet, though the houses are already constructed (in some cases already occupied).

Crossing the line between 'Introduced' factors and 'Existing' factors – another form of 'participation'

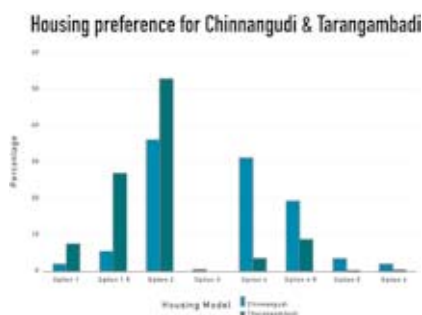
Initial efforts in participation for Habitat and Housing Rehabilitation

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning		●	●	
	2.2 Design		●	●	
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

The SIFFSs project is unique in its scope of the people oriented approach it has adopted and is pioneering considering the nature and extent of involvement of community in a mass housing project of this scale.

The process involved extensive peoples' participation at all stages of the construction project, ranging from taking an informed choice on the location of their house, to the design, implementation strategy to monitoring the construction process. Plots were allocated to families and Cluster Committees are nominated to manage the construction process. The emphasis was to capacitate the communities to own and manage the newly created structures.

The social and cultural aspects of the people concerned were taken into account while planning the houses. Ten models of houses were developed and seven were selected through interaction with the communities. Model houses were built to help the communities evaluate the models and suggest modifications. Face to face counselling sessions were done in order to assist communities in their decision, but also as a feedback mechanism. This also enabled any customization of the houses as required the beneficiary. The chart below illustrates the variation and diversity of choices with the same community/caste on the type's houses within two adjacent villages.



Settlement map with green areas and open spaces – displayed and communicated

The involvement of the communities in each component of the house and habitat including design along with extensive process documentation is remarkable and stands out as a best practice.

Adaptation of prototype housing

With a self-initiated housing adaptations, to help these beneficiaries move further toward SD, introduction of building materials that can be sustainable and locally produced (if not already done) – to help preserve the local ecosystem, while recognizing its maximum sustainable yield – and include such initiatives as contents for IEC activities.

Indeed, with initiatives coming from the beneficiaries themselves, the best to propose would be their choice of communication and/or dissemination approaches – so as to encourage other families to do so as well...

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
1. PRELIMINARIES					
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
2. PREPARATION					
	2.1 Planning				
	2.2 Design	●	●	●	●
3. IMPLEMENTATION					
	3.1 Construction		●	●	●
	3.2 Pop. moving in	●	●	●	●

One size and one design fits all is how housing development is usually carried out for beneficiaries. Acceptability rises significantly where community is involved in the design and construction of the settlement and their houses. The NGO CEE offered to customise within limits, according to recommendations from individual beneficiaries.

SIFFS offered multiple small scale models of the prototypes. Based on community input, four designs were short listed and made into real houses for beneficiaries to choose from. Future use and alterations plans were discussed in detail with them and provisions were made so that changes could be done at a later stage.

Prototyping should be a requirement for each project involving the beneficiaries and the final design should be shared with the consortium.

Use of Information, Education, and Communication (IEC) factors

Two examples of the use of IEC factors in the Construction step (of this 3rd phase) would be:

* Opening tendors (bids) in front of community members
(PIX : COMMUNITY MEETING UNDER TREES)

* Keeping permanent information on the stages of construction. This can be an important tactic for information dissemination – but should in any case be done in agreement with local stakeholders.



Settlement details



One may wonder, though, at the informational value of the posters – especially if they are not written in the local language.

Further examples of crossing over the ‘factors’ – moving closer towards sustainability

Buildings and programs sensitive to local practices (through appropriate technology and know-how), through community involvement

SIFFS separated the people's need for housing from the social agenda and positive intervention of providing beneficiaries with a toilet. They constructed and handed over houses without toilet but provided for a community toilet and its maintenance. They made provision to add a toilet to each house if people got used to using toilets and requested it themselves. Several beneficiaries are making such requests now.

In other projects where each house of the fishing community was provided a toilet irrespective of their familiarity with it, they mostly remain unused.

On a similar note almost all communities prefer to cook outside even though all houses that were provided include indoor kitchen.

Allowing for livelihood schemes and customization within settlements

The quickest way to bring the community back on its feet is to restore existing means of livelihood and create innovative ways for them to participate in the local economy. CREED offered beneficiaries space to grow vegetables and farm chickens close to their house. Livelihood schemes were taken into account for settlement planning. DA and SIFFS had training programmes for new skills targeted particularly at women and young men in the community. This had enhanced their employability both within and outside the community.



customisation using materials from temporary housing

CEE consulted with beneficiaries on the kind of housing they needed, and helped build customised alterations into the house. Extra building and material costs were borne by the owner. Another level of customisation took place after the beneficiaries took over the houses. SIFFS proactively encouraged this during the planning period.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in	●	●	●	●

With a self-initiated gardens, populations are moving in and adapting with regards to their living space (housing) and food sources (such as kitchen gardens). In this way, beneficiaries move further toward sustainable development, with the introduction of more local plants and herbs (if not already done) – to help preserve the local ecosystem. Such initiatives feed as well into the contents for IEC activities.



Kitchen shed



Vegetable plot

In-situ construction

In the case of CEE, except for a few families where household and land were lost, in-situ housing was provided - which also kept the ecological foot-print to a minimum. SIFFS emphasized on providing in-situ housing whenever possible. In their intervention area, they provided in-situ housing as first preference, and when that was not possible, neighbourhoods were relocated to maintain the integrity of the community and ease of settling down.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consultation				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning		●	●	●
	2.2 Design		●	●	●
	3. IMPLEMENTATION				
	3.1 Construction		●	●	●
	3.2 Pop. moving in		●	●	●

In case of both CEE and SIFFS whether the construction was in-situ or otherwise, individual families knew their identified/allocated land or housing during pre-construction and construction period. Both had considerable amount of community involvement in terms of shared labour, supervisory and managerial involvement during construction.

While in the case of CREED, as represented below, the ecosystem was taken into account – both in terms of livelihoods (re-establishing mangroves – for this forestry and agriculture based community) as well as for using local trees and shrubs for “greening” the new settlement.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consultation				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning	●	●		●
	2.2 Design	●	●		●
	3. IMPLEMENTATION				
	3.1 Construction	●	●		●
	3.2 Pop. moving in	●	●		●

However, the opposite might be beneficial too. In Devanapattinam mixing up of clans within the community in post-tsunami allocation apparently forced warring groups to reside as neighbours, which perhaps has caused a reduction in violent confrontations/murder between clans - that was common earlier. One lesson learned from this is that flexibility according to the local situation will be best.

Community participation for the planting of indigenous species (but “introduced” from outside)

In the case of the NGO Architecture & Development, a “micro-projects approach” in Karaikal was used to introduce tree nurseries and tree planting in a settlement area. This is an example of promotion of local species and localised planning where local PRA tools were used for developing list of local species in the area as well as a survey conducted to document the preference of these various species. A nursery was developed to propagate and promote these species both in the existing village as well as the new ex-situ site. There is also plan for a micro project to promote a green belt close to the ex-situ housing site.

Community participation was attempted in this case of the introducing choices of species of plants. Somthing that had, up until this post-disaster phase, never been attempted. Here we have the technology – the introduced species; the dissemination know-how – the plant table, with their criteria; and eventually, knowledge of the local ecosystem, that we can assume is known by the local beneficiary populations.

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC: Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning	●	●	●	●
	2.2 Design	●	●	●	●
	3. IMPLEMENTATION				
	3.1 Construction	●	●	●	●
	3.2 Pop. moving in	●	●	●	●

The ‘design’ step included a cross-factor setting up cross-sectoral “micro-projects” around tree nurseries (for replanting and public spaces)

Giving a choice of trees (via a decision-making matrix – a tool) in a locally-managed nursery (self-help group), can positively contribute to a positive participatory approach, involving all four factors – especially if they are endogenous varieties.

So, finally, at the ‘Population moving in and adapting’ step, the setting up “micro-projects” allows for the interaction between the sectors involved in a reconstruction project...

Biological agriculture (and green manure...) for land reclamation

In some ways, we are in an in situ project frame, so that the design step for the use of biological agriculture (and green manure...) for land reclamation, depends mostly on the willingness of the local farmers to proceed.

It seems to be a worthwhile project, normally including all factors in its development. But such ideas are seductive. It’s at the realization that the real tests occur – though it is not an implementation step *per se*...

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC: Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research				
	2. PREPARATION				
	2.1 Planning				
	2.2 Design	●	●	●	●
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

But innovations are hard to introduce and have survive the initial interest, and it isn’t sure that such an approach

will survive the final phase, given that funds and facilitation will not necessarily still be available. Other potential obstacles are the lack of support by relevant ministries and their decentralized offices – such as Agriculture, and Rural Development.

Mangrove case on research and action-training

Here we find all four factors within a Preliminaries step (Research), and an example of a transfer between ecosystems & livelihoods (existing factors) and ecological engineering and information and training efforts (Introduced factors).

LONG TERM	STEPS	FACTORS			
		EXISTING FACTORS		INTRODUCED FACTORS	
		Ecosystems	Livelihoods	Appropriate Technologies	IEC Information, Education and Communication
	1. PRELIMINARIES				
	1.1 HR & stakeholders				
	1.2 Consortia				
	1.3 Research	●	●	●	●
	2. PREPARATION				
	2.1 Planning				
	2.2 Design				
	3. IMPLEMENTATION				
	3.1 Construction				
	3.2 Pop. moving in				

This case involves the Irulas (tribals) residing in the coastal hamlets of Cuddalore. The MS Swaminathan Research Foundation (MSSRF, Chennai), and the Tamil Nadu Forest Department, jointly started in the late nineties the Mangrove Management project. MGR Nagar, one of the Irula villages, was identified to participate in the restoration of the Mangroves and was trained in the restoration techniques. A Mangrove Protection Committee was formed and a saving bank account open where half of the daily wage of each person was credited into the account to run a micro-credit programme with savings and bank linkage to bring them out from the debt burden. However this committee and account became defunct when the MSSRF project came to an end and the project handed over to the Forest Department. Just before the end of the project, the Mangrove Protection Committee had a savings of Rs 11.5 Lakh and could have been an interesting mechanism for financial and institutional sustainability. However the money was returned to the members at the end of the project with MSSRF and the site handed over to the Forest Department. The real positive aspect of the programme is that this village is now known for its skilled man power in mangrove restoration work and techniques with persons from this village have now been employed by the Forest Department for restoration work in many other sites in different districts in Tamil Nadu. Post-tsunami, the Forest Department have undertaken the task of restoration of 700 hectares of mangrove plantations in the coastal areas of Tamil Nadu. Most of the restoration is being done with help and training of local communities and care should be taken to set up mechanisms for financial and institutional sustainability for the both the restoration and protection efforts within the community.



Mangrove plantation as bio-shield

CONCLUSIONS

Any disaster and the interventions that follow may have a very destabilizing effects on the local and sometimes regional socio-cultural, economic, livelihood, and ecosystem processes. Groups, including NGOs/CBOs and other institutions, participating in post-disaster implementation can ensure that the ecological, environmental, and socio-economic fabric of the intervention sites and their surrounding regions, are maintained or enhanced by transferring potential negative impacts into positive ones.

And yet, today, despite the courageous and well-intended actions undertaken, a series of issues and questions come up that can serve as indications for the path to follow:

- * What we have also seen in this summary of post-tsunami projects is that solid wastes, sewage outflows, sea walls, un- or mis-used water tanks.... are all examples of no or poor transfer of know-how (between introduced and existing "factors"). Hence the importance of knowledge transfer, education and information dissemination...
- * Regarding the environmental preoccupations of architects, land-use and settlement planning, DA and SIFFS both have provided for common community area, park, common facilities, and some green zones planned within their intervention area. CREED and SIFFS both provided trees as preferred by people to plant around their housing units. This corresponds well to recommended checklists for proper environmental approaches. But the point of this document is to go further. Hence, "livelihoods" rather than just 'housing' or 'settlements'. One couldn't even integrate such environmental tables with the present matrix, since the 'factors' don't correspond to (they go beyond them) these issues...
- * Also, the NGOs' (SIFFS and others) involvement within a semblance of acceptable socio-cultural parameters is not sufficient to approach some sense of sustainability.
- * And finally, could governments replace or take the role of (neutral) 'consortium', in their various levels they may be needed and appear?...

Other more specific conclusions are the following:

Sea walls do not prevent erosion they only transfer the problem further north. (Bhalla, 2006; Bhalla 2007). The impacts of these hard options on neighbouring coastlines create a situation where hard options are then required in these new areas creating a vicious spiralling situation. Thus in locations sea walled and areas adjacent to some engineering structures there is a loss of beach space. This lack of beach space makes it unsuitable for basic livelihood activities such as landing boats, drying and repairing nets/motors. In these cases, most of the time the fisher folk are forced to land keep boats and store their gear fairly distant from their houses and sometimes end up anchoring their boats in open water. (Bhalla, 2006). Experts have repeatedly stressed that all hard options should be viewed as a last resort when all other measures

are not likely to be effective (Sannasiraj, 2006). In fact other methods of shoreline stabilization such as ecological restoration, plantations should be used.

Similar lessons learnt from other sources (DGCID in 2004) are:

- "Understanding constraints is just as important as analyzing needs"
- "Post-crisis reconstruction is more complex than emergency relief"
- "Existing partnerships can create some true added value"

Preliminaries, again, seem to be key, but who can do these 'preliminaries'? A coordinating body - like the NCRC. But who will set this up, what entity should have the role of promoting such a template, an ideal scenario including 'preliminaries' at each phase? The obvious response should be "government". But is 'government' ready? And how can consortium become a viable resource network?

Other key questions that must be asked are those regarding the priority between government vs. community ownership; and how needs are expressed and understood is a problem... Hence the importance of the 2 categories of 'factors'.

This framework, this model, has been constructed in order to encourage what Architecture & Development (2005) calls the multisectoral, multidisciplinary and multicultural dimensions.

RECOMMENDATIONS

There is indeed a need for :

- A central coordinating body in the form of a Consortium. (This is the most important recommendation)
- More research – for which local communities are sensitized enough to be able to request it - that can put forward the richness and variety of ecosystem services of a given territory, so as to back up decision-making (as, for example, the choice of shrimp farms vs. other forms of agriculture, or the site selection of tourist amenities).
- Improvement of links between the scientific community and policy-makers (and the administration)...; ensuring efficient and effective flow of information between the scientific community and decision-makers (from OECD, 2002:7).
- Developing a multi-disciplinary and holistic evaluation of costs and benefits(from OECD, 2002:7).
- More local comparative data on experiences applying appropriate technology
- Media/social awareness generation programs plus a repository of information on various types of alternative technologies, for building, settlements, green-shield creation, sustainable resource use (e.g. type of net use to catch fish).
- Finding ways to make information available in order to reinforce the capacity of civil society to take initiatives...(reference again to IEC).
- Developing management training (planning tools,...) for government and civil society managers and decision-makers... Do sample training around topics that involve both vertical and horizontal levels and factors – such as solid waste management (for starters).

Also implementing agents should continuously keep in mind the existing or pre-existing entities and elements on the territory, as well as this same agent's status and representation as an outsider, with technologies introduced from elsewhere – representing either innovation or potential disruption of the pre-existing social and ecological systems.

And, as much as it is feasible, rehabilitation and reconstruction be done in situ, that is on the sites where local communities were already present before the tsunami.

Other sources on the same topic provide complementary recommendations (DGCID in 2004):

- “Ensure that capacity analysis is an integral part of the initial assessment”
- “Distinct, even conflicting objectives need to be managed” (“It is not always easy to reconcile ‘rapid reaction’ and ‘quality’, ‘satisfaction of local populations’ and ‘satisfaction of local authorities’, especially in contexts where needs are high and the political situation is fairly sensitive. Transparency, awareness campaigns and popularization are essential”).

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Bibliography

Guidelines for EIAs:

- Biodiversity tool kit (World Bank),
- Safeguard Policies (World Bank),
- USAID-EIA guidelines,
- Swedish International Development Agency (SIDA) – EIA guidelines.

Other documents and models

Other tools that contribute to a sustainable development approach

- Stakeholder analysis
- Life cycle analysis
- Participation tool kit (on how to involve a local population), as the one developed by the World Bank
- Biodiversity tool kit : 10 points (World Bank) [RM: FIND]
- Safeguard policies framework (World Bank and USAID) [RM: FIND]
- 10 points for assessing villages [RM: FIND]
- Representational tools (maps): PRA (Participatory Rural Appraisal, applicable throughout, for all factors)

