

Adapting Strategies to Meet Needs in Post-Disaster Reconstruction

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Summary of the project

Practical Action initiated a project with the objective to make available knowledge and skills that are essential to improve quality standards and sustainability of post tsunami housing reconstruction in Sri Lanka .

Reconstruction required building a large number of houses within a shortest possible time using available limited resources. Practical Action discerned early in the rebuilding phase that there was dire need to ensure construction quality, have competent construction tradesmen, minimize use of construction material and use construction technology that is readily replicable .

Houses constructed in the East (108) and the South (60) demonstrated cost-effective and environmentally friendly technologies (for walls and roof) which minimized use of sand, cement, and costly finishes and provided hands on training to over 300 local masons. Later this expanded to a rigorous training programme with the Vocational Training Authority of Sri Lanka, and technical training institutions in the East.

The two documents of process guidelines produced in 2006 in response to quality concerns of reconstructed houses. Documents clearly explain essential construction standards and ways to assure quality in an easy-to-understand format in Sinhala and Tamil languages . The third document produced in 2007 ; guidelines on house maintenance , was aimed at improving quality and sustainability of reconstruction.

The process guidelines were printed and published in English, Sinhala & Tamil languages and were widely distributed among a variety of stakeholders including implementing agencies and international agencies such as GTZ & UN Habitat. The guidelines provided essential information related to building back better, especially to mitigate future natural disasters.

Key words: Knowledge, Quality, Technologies, Skills, Dissemination

1. Introduction to the initiative

Linking post disaster reconstruction to sustainable development is an important aspect in current disaster management concepts. Debates within disaster mitigation interest groups have raised questions regarding the practicality of adopting developmental approaches to disaster reconstruction. Practical Action (then ITDG) promoted a holistic and integrated approach to post tsunami housing reconstruction, demonstrating options towards building back better.

1.1. Context:

December 2004 tsunami destroyed over 67,000 houses in 12 coastal districts of Sri Lanka. The scale of required rebuilding of houses and infrastructure was unprecedented in Sri Lankan history. A record amount of funding was available for the reconstruction thanks to the generosity of national and international community. The reconstruction program initiated by the Government of Sri Lanka (GoSL) was supported by more than 200 donor agencies, NGOs, private companies and local and foreign individuals. Reconstruction and Development Agency (RADA) was formed by the GoSL to coordinate and facilitate reconstruction. UN agencies supported RADA in information collating and dissemination.

The reconstruction and rehabilitation complexities were however not fully understood at national level, particularly with reference to the construction of permanent housing. Policy decisions of the GoSL regarding coastal buffer zone where no housing reconstruction was allowed, relocation of beneficiaries and the rights of different categories of displaced persons changed over time (2005-2006) causing delays to start of reconstruction. Finalizing beneficiary assessment processes and locating suitable land for resettlement took much longer than anticipated. Insufficient information flow between implementing organisations in sharing expertise and data was evident, and further hindered the recovery process.

1.2. The project

Practical Action is a development agency that has 40 years of extensive experience in promoting the use of cost effective and, environmentally and people-friendly technologies that contribute to sustainable development. In the last 13 years, the agency was also actively engaged in advocacy, action research and methodological development to promote a more holistic approach to disaster management and development, particularly in South Asia. Practical Action decided therefore to actively promote the same in post tsunami recovery in Sri Lanka. Demonstration of participatory and inclusive planning, designing and implementing of rebuilding initiatives was the key strategy adopted, while

sharing knowledge and building capacity to support other agencies to do the same.

In the 2003/2004 Practical Action initiated a successful pilot project adopting a cost-effective brick masonry (Rat-trap bond) and reinforced concrete roofing (filler slab RCC roof) technology in a disadvantaged rural community in Nikaweratiya located in the North Western province of Sri Lanka. These technologies were chosen because of their success in India for over two decades, their cost-effectiveness and the potential for ready replication in any community in Sri Lanka that has access to basic building materials.

The use of less cement, sand, mortar, bricks and reinforcement steel than in similar single and two storey houses using conventional construction technologies was a distinct feature of these technologies. Roofing technology reduced cost of timber in the roofing framework for clay tiled roofs. The approach invited the involvement and contribution (whether in skills, knowledge, resources or labour) of the communities throughout the planning, designing, implementing and monitoring stages. Given the technologies and methodologies used in construction were different to conventional, capacity creation and strengthening of construction personnel was an essential component of the intervention.

Housing reconstruction initiatives were built on the experience in Nikaweratiya. The project began with demonstration of technologies and approaches with an affected community in Matara in the South. The houses built as a result earned acceptance of the beneficiaries and community. The Matara Trust, a local implementing agency had undertaken the reconstruction of damaged houses of this community. Community enthusiasm persuaded Matara Trust to take it up at a larger scale. Practical Action built more houses together with the Matara Trust, while training their technical cadre and engaging local community in construction to build their skills on specific masonry techniques. Eventually Matara Trust took over the rebuilding and built over 100 houses, while Practical Action played only a technical backstopping role. The experience was expanded to other districts subsequently; mainly to Ampara, Batticaloa and in the East, and Hambantota in the South with positive community response, capacity building of agencies and local individuals in construction.

2. Main difficulties and Opportunities

Objectives of the project:

1. To promote the use of cost effective environmentally friendly technologies and adopting participatory and inclusive planning, designing to post tsunami housing reconstruction

2. To strengthen capacity, skills and knowledge that are essential for high quality reconstruction

3.1. The opportunities

- The survey carried out by the Disaster Relief Monitoring Unit (DRMU) of the Human Rights Commission of Sri Lanka in 2005, Peoples Consultation Committee highlighted the gaps in reconstruction outcomes due to lack of participation of affected community. Many house designs did not take into consideration, the related cultural norms and social practices and ended up not catering to the specific needs of beneficiaries. There was also evidence of neglect of special needs of widows and the elderly and disabled persons that occupied rebuilt houses. The participatory approach to housing that Practical Action promoted was an appropriate way to bridge such gaps.
- The recent experience in Nikaweratiya was very useful to Practical Action to confidently promote cost effective technologies and methodologies to housing reconstruction. There were experienced staff and trained technicians and masons in Nikaweratiya who willingly worked with Practical Action in rebuilding work. As a result demonstrations of technologies and approaches could be initiated with an affected community in Matara as early as July 2005, attracting attention to the demonstration houses.
- Practical Action's interventions on holistic housing helped to make the design suitable to its environment and enabled disaster risk reduction. The diverse skills base within the organization was used to actively promote incorporation of aspects such as eco sanitation, home based composting methods, smoke free kitchen and rainwater harvesting etc. The projects that ran in parallel such as livelihood strengthening, natural coastal resource management and energy and transport infrastructure development helped to improve sustainability of housing interventions. Other initiatives sometimes served as an entry point to discuss holistic housing concepts with agencies who contacted Practical Action to find solutions to their location specific issues. Some were, for example, compelled to build in locations with high water table levels or where soils were impermeable. This meant that conventional domestic septic tank systems used were inoperable and posed a health and environmental threat. Eco sanitation promoted by Practical Action became attractive option in these instances,
- In an effort to improve the standards of housing construction in the country's rehabilitation efforts, two Quality Assurance guidelines (QA) for building construction were published in illustrated checklist format.

Most implementing organizations, even the experienced humanitarian agencies seem not to have essential experience in managing constructing permanent shelters in the post-disaster context. Affected families in transitional shelters were eager for normalcy. The agencies which undertook reconstruction were under considerable pressure to deliver efficient housing quickly. In the haste to rebuild, many implementing organizations paid scant attention to construction quality. There was insufficient local resource base to cater to increased demand for housing construction, particularly, inadequate skills in large-scale building and disaster resistant construction technology. Experienced contractors and site supervisors, quantity surveyors, masons, plumbers, electricians, carpenters and steel fixers were in short supply. Sub-standard workmanship became manifest in many housing settlements island wide as a result. Poor construction quality was a conspicuous weakness that caused safety and sustainability concerns.

The quality assurance check lists, referred to earlier, were aimed at improving the above situation and were widely distributed among key players in the post-tsunami reconstruction program. CARE International UN – Habitat, GOAL and Irish Red Cross are some who fed back positively about the usefulness of the checklists. A third QA document on house maintenance was produced with the intent of distributing these among users / occupants of post-tsunami houses. This checklist was compiled to assist occupants of post-tsunami houses with a view to ensuring that ongoing maintenance is carried out after houses are occupied by beneficiaries.

Along with this a program to train technical officers in tsunami-affected districts in the south and east to evaluate the quality of post-tsunami built environments was conducted in 2007 in partnership with GTZ. This program includes preliminary motivational meetings to encourage local authorities to recognise the urgent need to conduct post-tsunami reconstruction evaluation programs within their respective districts in the interests of sustainable development. Thereafter a series of workshops were conducted within each tsunami-affected district in the West & South, at which over 200 technical officers were given training in assessing the quality of post tsunami houses and housing settlements.

2.2. Challenges:

- The cost of basic building material and skilled labour rose sharply and continued escalating over two year period. Use of substandard construction material was an issue. Sand for construction was in short supply and unsuitable sea sand was used at many building sites. Likewise quality timber for construction was in short supply and expensive. Quality fired clay bricks for construction too, were scarce. Access and cost considerations impacted on delaying demonstration work that Practical

Action carried out too, in turn limiting our ability to sharing knowledge with and convincing more agencies than we wished to.

- Many agencies who were impressed with what was promoted could not adopt the approaches. They were pressed by their own and donor deadlines. The contractor led approaches that did not leave room for community participation seemed to be quicker and less complicated than community based approaches, in large scale construction .
- Some agencies took up the technologies, but not the approach. They used cost effective housing technology, but not the participatory approach. Beneficiaries who are not involved are not able to appreciate and maintain or replicated appropriate technology and gain full benefits and potential of the technology. It can even get abandoned or modified by beneficiaries later, leading to resource waste. For example, subsequent plastering of walls will mean that lime, cement and sand would be used and thus be counter productive.

3. Methods and techniques used in the initiative

The project engaged specific methodologies and techniques to ensure that demonstrations of housing reconstruction carried out with implementing agencies resulted in expected outcomes; meeting minimum quality standards and beneficiary satisfaction. These were:

- Developing designs according to the needs of the individual households after extensive consultation with them, using participatory rapid assessment methods. The process enhanced acceptance of designs by beneficiaries and capacity of beneficiaries, as well as the implementing organisation's accountability to the beneficiaries
- Engaging multidisciplinary skilled and capable teams (e.g. civil/architectural, sociology/social science, communication etc.) that consisted of both genders, familiar with the locality and could easily relate to the communities
- Ensuring inclusion of specific needs of communities such as disability/elderly access, culturally driven or livelihood driven features to the designs; e.g. Smoke free kitchen with design adopted from traditional
- Incorporation appropriate sanitary systems, such as eco sanitary toilets to houses in difficult locations
- Including elements in the house design to mitigate common natural disasters and reduce future vulnerabilities of beneficiaries to disaster risk.

- Incorporation of other needs of beneficiaries as much as possible into designing and planning e.g. Livelihoods needs, waste management systems etc.
- Ensuring that the construction is cost effective without compromising quality. Attention was given to utilizing locally available material to the maximum extent possible with less use of asbestos, steel and concrete.
- Using labour intensive construction methods without depending on heavy machinery. Involvement of beneficiary household in construction in some way e.g. provision of skilled, unskilled labour, monitoring procurements, quality of construction etc.

Wider promotion of holistic approach to housing was a key aspect of the project. This was facilitated through the adoption of following methodologies and techniques

- Note worthy in the process of influencing national policy on disaster recovery & reconstruction, was the workshop Practical Action organized in Colombo in the final quarter of 2006. Many issues related to the needs of tsunami beneficiaries had become evident by then. RADA representatives participated in the workshop on the theme “Building back Better”. Key stakeholders in government institutions, INGOs, NGOs and international agencies involved in post-tsunami reconstruction participated as well. The positive outcome of the workshop is evident in the revised policy presented by RADA later next year. An independent body – People’s Planning Committee also made similar and often observation and recommendations, which were also incorporated in the revised RADA policy on post-tsunami recovery and reconstruction.
- Wide communication of the minimum standards and quality assurance methodologies through quality assurance checklists as mentioned above.
- Capacity building: The Vocational Training Authority (VTA) of Sri Lanka which is the national body that includes development of different skills required for construction industry. The VTA was convinced to include cost effective technologies and construction techniques promoted by Practical Action in their curriculum in 2005 and 2006. Practical Action helped VTA by designing curriculum and developing training modules. The VTA produced skilled masons who are able to engage in confidently in the construction of the cost effective housing.
- Knowledge sharing: 10 technical briefs were published in the three national languages (Sinhala, Tamil and English) and disseminated throughout 2005 and 2006. These include Walls Using Interlocking Stabilised Soil Blocks, Walls Using The ‘Rat -Trap Bond’ Technology, Roofing Options-Ferro cement shelving, Roofing Options – Filler Slab,

Timber 'I' Channel Roofing Options, Arches Technology, Technology Options and Costing, Finishes

An info-pack was produced in CD format which contains information on rebuilding after a disaster. Using previous knowledge gained from disasters it offers advice on: Shelter, livelihood development, fisheries, transport and solid waste management.

- Resource Desk/Technical Enquiry Service: Supplied technical and developmental information to inquiring parties free of charge. Grassroots level development workers, community-based organisations, NGOs and larger implementing agencies used this facility. The number of enquiries received on housing related issues was 63 in 2005, and 156 in 2006
- Making available details of the skills base developed to other agencies through the resource desk at Practical Action
- Interested agencies were exposed to the concept by inviting them to visit the houses already built and talking to beneficiaries
- Making available knowledge products that give more details to interested agencies. The knowledge products were such that they promoted use of cost effective components of a house (e.g. roof, arches, walls etc) if the agency for some reason is unable to build the whole house using cost effective technologies.
- Training technical staff, providing technical backstopping to agencies that were interested in adopting housing technologies that Practical Action promoted e.g. French Red Cross is presently building 129 houses in the East and propose to build another 50 subsequently.

4. Lessons Learned from the initiative

- Holistic housing designing with the participation of affected community is possible and effective. The post tsunami realities highlighted that contractor driven houses despite the popular belief were not constructed faster, and therefore time taken to involve community in designing and construction is worthwhile at the end.
- Capacity building as an integral part of the recovery programme will increase its effectiveness. Mobilizing each local community was an approach to efficient construction as there was high competition to access skilled personnel. It not only contributed to accessing some of the much demanded human resources in reconstruction but helped effective

monitoring. Affected communities gained additional skills and experience that may contribute to improve their livelihood in the long term.

- It is possible to incorporate disaster risk reduction features to housing reconstruction without much additional cost if it is incorporated at the stage of planning, e.g. Plans to include plinth beam and plinth height to withstand floods in flood prone areas, as well as including a ring beam at roof level.
- Need to incorporate potential cost escalation in to the rebuilding budgets. The high demand on the construction sector resources increased the costs of construction. Even the experienced agencies made the mistake of not taking this into consideration and ended up by deviating from the original commitments resulting in frustrated and dissatisfied communities, e.g. some houses did not have sanitary facilities.

5. Conclusion

The expertise possessed by Practical Action did indeed prove to be relevant and useful in contributing to Sri Lanka's post -tsunami recovery effort in a positive way. In retrospect it can be said that such an outcome was possible because Practical Action was alert to quickly discern its needs that became evident early in the reconstruction phase, and was proactive in promoting appropriate technologies and standards related to building back better and more holistically. Even though the intended impact and influence resulting from Practical Action's efforts were not fully realized, the measure of success achieved during the post -tsunami reconstruction period has indeed been rewarding.

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Biography



Vishaka Hidellage has been working with Practical Action (then called ITDG) since 1989 and to date held various positions within the organisation. Started as a Project officer - Food Technologist in 1989 she became the Programme Manager of Agro Processing Programme in 1992. She was appointed as the Policy Director in 1997 and as the Country/Regional Director in 2002.

Vishaka obtained her PhD from the Post Graduate Institute of Agriculture, University of Peradeniya - Sri Lanka in Food Science/Economics and holds Masters degrees in Process Engineering and Food Science and Technology. She worked as a Food Technologist in private sector for about 6 years before joining Practical Action -ITDG

During the period at Practical Action (ITDG), she was involved in identifying, modifying, testing and demonstrating number of technologies suitable for decentralised agro - processing options through pilot projects and lessons learnt were widely shared internationally and locally. Vishaka provided the leadership to research, new directions, information and policy influence that includes formulating of research studies based on development issues important to South Asia.

The South Asia office in Colombo works in Sri Lanka, India and Pakistan in partnerships with local partners. Practical Action (ITDG) has worked on demonstrating the use of range of community centered technologies to reduce poverty and marginalization. Some of these are: cost effective environmentally friendly community managed renewable energy, food processing, food and water security, rural transport and disaster management options.