

Understanding Recovery in Andaman and Nicobar Islands

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Photo: AIDMI.

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ABOUT THIS ISSUE

The Andaman and Nicobar Islands is a union territory of India that spans across 500 km in the Bay of Bengal. It is an archipelago that is composed of 572 islands which are categorised under two island groups, viz. Andaman Islands and Nicobar Islands. Known for their beautiful and fragile ecosystems, these islands are also home to many indigenous tribal groups like the Sentinelese people, a pristine tribe that still lives at the Paleolithic level of technology. However, the Indian Ocean Tsunami of 2004 led to widespread devastation in these islands. More than 2,000 people lost their lives, more than 4,000 children were orphaned or suffered the loss of one parent, and a minimum of 40,000 people were rendered homeless. More than 46,000 people were injured as well. Following the Tsunami, major recovery efforts were taken up by state and non-state actors in these islands.

Nearly 14 years after that devastating Tsunami, it is warranted to assess the extent and sustainability of these recovery efforts. This issue of *southasiadisasters.net* is titled, "Understanding Recovery in the Andaman and Nicobar Islands" and highlights the various aspects of the post-tsunami recovery process there. This issue focuses on many themes related with the recovery process in the islands such as the importance of understanding the underlying factors of vulnerability, the role of international humanitarian agencies in assisting the recovery, civil-military cooperation in the response efforts, importance of housing, food and nutrition for a sustainable recovery and rehabilitation, etc. Most importantly, this issue highlights the nature of vulnerability and risk reduction in these beautiful islands. ■

- Kshitij Gupta

INTRODUCTION

Towards Understanding Recovery

Valedictory Address

I am honored to be speaking at the Tata Institute of Social Science (TISS) on the occasion of this round table. TISS is one of the few institutes in the country that has had a tremendous impact on India's development story and trajectory. The institute has been firmly devoted to all aspects of development studies including disaster studies. It has also consistently churned out graduates who drive and achieve positive social change in their respective fields. Some of these graduates work with us and the bring best ideas to the table and help achieve results for the All India Disaster Mitigation Institute (AIDMI).

AIDMI was established in 1995 and within a year or so started experiencing a very real gap between social science research and the practice of disaster management in India. The way in which the Jamsetji Tata School of Disaster Studies (JTSDS) has filled in the gap is both unique and innovative. Generating new knowledge and research around disasters has opened up newer opportunities across India and beyond.

Tsunami recovery has brought in some of the most exciting studies and reports, including the reports by Disasters Emergency Committee (DEC), Tsunami Evaluation Coalition (TEC), Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP), and several universities. These studies have impacted the way aid

flows and actions are taken. And yet tsunami recovery remains an under-studied and under-researched area in AIDMI's opinion. This round table by JTSDS, Mumbai and King's College, London addresses this gap by focusing on island recovery, the recovery process, and recovery-to-development links.

Ever since its inception, AIDMI has been associated with multiple disaster recoveries. The experience of working on multiple disaster recoveries across 12 regions spread across India, South Asia and Asia Pacific has been quite rewarding and enriching. Based on these experiences and my review of 10 years of recovery in the report titled "South Asia Disaster Report 2016: Are We Building Back Better?" let me point to five directions for further research and studies.

One, when does recovery start, after a disaster or before it? Is recovery distinct from ongoing development work or do we make it distinct with funds and project labels? What kind of social base is required to make recovery robust and sustainable? What are the new theoretical considerations? Is there a scope for demand driven recovery as against needs assessment on supply driven recovery? What about plurality in recovery to move from a recovery to many recoveries? Can recovery process bring about financial inclusion of citizens such as those of Andaman and Nicobar Islands (ANI)?

Two, how can recovery become transformative, that is, move on towards clean, green and "new" development work? Dr. Lyla Mehta and Dr. Lars Otto remind us that there is a long way to go in defining transformation. What was the environmental impact of tsunami recovery on islands' water, vegetation, air, settlements, society, coastal ecosystem, and economy? Did ANI recovery miss out on transforming local economy into "green" or "low carbon" or "circular" economy? How can we, in the future, introduce the ideas of "happy money" or "social enterprise" in recovery? Are we making investments in research and innovation to make recovery faster, better and sustainable?

Three, what is this idea of a "community" in recovery? Currently, Terry Cannon is asking us again and again this question about limits to community based approaches. Does community work in islands situation better than the mainland? As there are limited Self Help Group (SHGs) or unions or cooperatives or Small and Medium-sized Enterprise (SME) in Andaman and Nicobar Islands (ANI) is community agency more possible? Do at least in some cases, community based approaches penalise the poor and weak citizens? And did the Japanese occupation of ANI in World War II make any difference to the idea of recovering community? Were there extraordinary local leaders in recovery and what is their legacy?

Four, how is the nature of recovery different in islands from recovery in the mainland? Do islands offer a geography that makes recovery more cohesive? Or does it depend on the distances between the two islands? What does ANI recovery tell us about the changing Centre-State relations? Especially since Rajnath



Singhji called for "Collaborative Federalism" as India's approach to disaster recovery at Sendai in 2015? Is there a case for use of new technologies such as drones in humanitarian recovery in such distant and difficult locations in India?

Five, do we know any more now on "how" and "what" of accountability of recovery process and its results? To whom is recovery process accountable to? Humanitarian sector? Development? Both? And how best to govern the recovery to make it more accountable to the citizens? And what do we do with what John C. Mutter calls disaster profiteers in relief and recovery? And is there a role for surveillance and punishment in the accountability process that can take such profiteering? Was Right to Information used, or can be used, to open up a new space for accountability of the administration to the citizens? Is there a need for third party monitoring of future recovery? Is recovery inevitably Centre-driven as recovery money flows from the Centre?

In the above five directions for further research and studies I have tried to mop up many of the insights we have gained here today in this round table, as well as open up windows for us to have a better and clearer view of recovery in ANI, as well as recovery in India, perhaps in recovery per se.

Let me suggest, Dr. Mahesh Kumble, to capture the discussions of the round table into a book. We all owe a book on recovery to ANI after this round table. Let me suggest considering this round table as a first of the regular annual series of Round Tables on Recovery in ANI. We owe it to the recovery studies and action.

Let me welcome the support from National Institute of Disaster Management (NIDM) to Jawaharlal Nehru University (JNU) and suggest to General N.C. Marwah to kindly repeat the timely action by requesting National Disaster Management Authority (NDMA) to support JTSDS for a recovery studies programme. I hope Dr. Janaki Andharia agrees with me in these suggestions.

Thank you. ■

- Mihir R. Bhatt

The Multidimensionality of the Idea of Recovery

A recovery programme provides an opportunity to "build back better" and improve living conditions and overall well-being of the people who are assisted. It integrates disaster risk reduction through structural measures, policies and regulations and reduces vulnerabilities of the communities. The notion of "recovery" in disaster discourse comes from a bio-medical model of illness that implies reverting back to normalcy after an ailment which disrupts homeostatic functioning of the body. However, societal conditions in a pre-disaster context are not always optimal as this notion of recovery suggests and to that extent post disaster programmes must be more forward looking and developmental in their orientation. In a country like India,

as also in many south Asian regions, it is essential to focus on issues of equity, social justice and ecological security in the recovery process. Therefore, a post disaster situation must also be viewed as a context for introducing sustainable housing, livelihoods and energy solutions through recovery interventions which can contribute to improved development practices. A recovery programme is more than bringing the community back to its feet; it is also about ensuring sustainability.

Post-disaster recovery commences immediately after a disaster event, and programatically it is implemented over a period of two to five years, under the leadership of the national government. It is to be distinguished from humanitarian



Janki Andharika.

response of rescue and relief, which is to meet the emergency needs of community in the immediate aftermath of a disaster. A critical objective of the recovery process is to restore infrastructure and livelihoods in a way that reduces vulnerability and makes communities more resilient when faced with possible new disasters. On



The tribals of Chaura island built this boat locally even as government struggled to provide support for recovery.

small islands regeneration and enhancement of livelihoods in post-disaster situations remains a fundamental challenge for a variety of reasons. High external transport costs, time delays in bringing in goods, reduced quality of information flow and poor governance and monitoring mechanisms- to name a few. Islands also tend to have fragile environments and economies.

Small islands are particularly vulnerable to a number of natural hazards, which are further aggravated due to human efforts at development. Moreover, islands have large coastal zones which make them increasingly vulnerable to coastal erosion, floods and some of the most devastating hydrometeorological and geological disasters such as cyclones and earthquakes. Many islands are of volcanic origin and are located on plate boundaries, as a result of which they experience frequent earthquakes. The Andaman and Nicobar Islands (A & NIs) were severely impacted during the earthquake and tsunami of 26th December 2004.

The southern group of A&NIs – the Nicobar Islands, declared a Tribal Reserve – was worst affected in terms of human casualties and loss of forest, plantations and public amenities. The destruction on the islands was compounded by their relative isolation in both geographic and administrative terms. It was against this back- drop that the Tata Institute of Social Sciences (TISS) took up the challenge of working on relief support, assessments and local capacity-building in close collaboration with the local authorities of the islands.

This special issue contains several papers that were presented at a recent Roundtable conference titled



Nicobari women grating coconut.

"Post Disaster Recovery and Development: Reflecting on Processes in the Andaman and Nicobar Islands after the Tsunami" organised by the Jamsetji Tata School of Disaster Studies of TISS in partnership with Kings College London.

Located in the Bay of Bengal, the A and NIs cover an area of 8,249 sq km. They lie in a Zone V seismic category, experiencing intense tectonic activity and therefore highly prone to earthquakes. These 572 islands of volcanic origin are formed by a sub-marine mountain range and are located between the latitudes 6° to 14° North and longitudes 92° to 94° East. The Indian Ocean is dominated by the presence of mid-ocean ridges where the Indo-Australian and African plates are moving away from the Antarctica plate along the ridges.

On an average, the Indo-Australian plate moves below the Eurasian plate at around 70 mm per year. Along the Andaman-Sumatra Sunda trench, the Indian plate is subducting below the Burmese plate. Often, however, the plates become locked and move

very little for many years, causing pressure to build up. When the accumulated pressure is suddenly released, a major earthquake takes place. This is what happened in December 2004 below Sumatra. The A and NIs experience vulnerability caused by their small size, insularity and remoteness (they are over 1,000 km from the Indian land mass). The capital, Port Blair, is 1,255 km from Kolkata and 1,190 km from Chennai. On the other hand, the northern end of the islands lies just 193 km away from Cape Negrais in Myanmar and Sumatra, the closest landmass, is 145 km away from the Nicobar group of islands at the southern end. Of the total 572 islands, only 36 are inhabited.

The islands experience chronic difficulties maintaining adequate water and energy supplies. The original inhabitants of the A and NIs are the Onge, Sentinelese, Jarawa and Great Andamanese of Negroid descent in the Andaman Islands, and the Shompen and Nicobarese of Mongoloid descent in the Nicobar Islands. The communities have lived here for 20,000 years, but their collective population (excluding the

Nicobarese) has decreased to 500 in the last 150 years as a result of colonial policies and the modernisation activities of independent India. Outbreaks of measles and other diseases have wiped out large numbers of these tribes. Tribal communities live in highly diversified and varied environments, adopting simple technologies. Typically, use of natural resources is largely sustainable with no over-exploitation. The communities live in a synergistic and symbiotic relationship with nature. (The Nicobarese, for instance, despite being coastal communities, do not carry out fishing as a source of commercial livelihood, but only for subsistence.) Their deep relationship with nature has helped maintain their ecological environment despite centuries of habitation. It is this context that foregrounds the articles

in this special issue on Island Recovery.

Post disaster recovery is a complex multi-dimensional process. A flawed recovery programme could end up re-building the very risks that caused destruction. Quite often short-term and myopic programmes with a narrow focus on economic development increase disaster risks by ignoring vulnerabilities or ecological integrity of specific geographies. In the governance of island eco-systems co-ordination across departments often remains the greatest challenge. Therefore, it is important to forge collaboration across government line departments and local communities along with robust land use planning practices that integrate knowledge from diverse disciplines. Tribal communities in A&NIs are a disenfranchised population that finds

it impossible to negotiate or engage with a multi-layered regulatory system which is often insensitive to the local (or tribal) ways of living and being.

What is the situation on the islands, what are the lessons learnt in the arena of recovery and long term development? What are the current concerns? This issue brings together diverse perspectives on the subject. The gaps in literature are many and we need more research to develop a better understanding of how communities recover after a disaster. Robust longitudinal studies on post disaster recovery processes are not many and multiple perspectives on disaster recovery are evolving as they get debated and discussed. ■

- Janki Andharia,

Ph.D, Professor and Dean, Jamsetji Tata School of Disaster Studies, Tata Institute of Social Sciences, Mumbai, Maharashtra, India

DISASTER RECOVERY

Challenges of Post-Tsunami Recovery in A&N Islands

India is one of the **ten worst disaster prone countries** in the World. Out of 35 States and Union Territories in the country, 27 are prone to one or more disasters. Besides a huge number of deaths and millions of people getting affected by various disasters every year, India's **average annual economic loss** due to disasters is estimated to be **\$9.8 billion (>2% GDP)**.

Disaster Recovery requires well-prepared institutional arrangements, better coordination between agencies, Public-Private Partnerships (PPP), more efficient use of Information and Communication Technology (ICT), Decision Support System (DSS) for improved incident response during emergencies

especially complex emergencies. The need for a pool of experts as well as increased community participation and systems in monitoring and evaluation to ensure long term recovery is reiterated.

National Policy on DM 2009 released by MHA has very briefly (barely 4 pages) covered few aspects of the approach towards Relief & Rehabilitation and Reconstruction & Recovery. However, the first National Disaster Management Plan (NDMP) released on 1st June 2016 which has been aligned with four priorities as enshrined in the SFDRR has covered salient aspects of the Recovery Process. NDMP is laid out in the form of a matrix giving out responsibilities of all concerned

stakeholders at various levels. NDMP clearly enunciates that approach towards post-disaster restoration and rehabilitation shifts to one of better reconstruction and taken as an opportunity to build back better (BBB).

In the Andaman and Nicobar Islands, I applaud the imprints left by the TISS Team during the Tsunami relief work and commend the work it carried out as a small team in adverse situations especially during uncertain times, coupled with limited resources and support. TISS was involved in Tsunami relief at the Andaman and Nicobar islands from 2004-2007; thereafter Professor Andharia undertook an extensive review of recovery processes in 2017

and shared the findings with National Disaster Management Authority (NDMA).

TISS's initial report on post-disaster relief identified 2 distinct sets of insights on sustainable development and long-term recovery of the islands. The first part focused on TISS's relief work on Katchal Island which had been severely affected and largely ignored during relief. There were valuable insights on many other Southern Nicobar Islands. Second part of TISS's report provided an analysis of relief efforts and capacity building programmes launched for the inhabitants.

The need to create forward and backward linkages between the Government agencies and the local community is very important. In extreme events, Government agencies and local communities are affected severely and therefore the onus on relief and rescue should be collaborative effort between them, with contributions by both for rehabilitation.

Unfortunately, more often than not, the effort of disaster management has not focused beyond immediate relief and response. The recent study by TISS study is has been instrumental in bringing to the fore the social, economic and cultural issues of relatively insulated societies, especially the tribal areas of A&NI where they inhabit fragile ecosystems. The approach adopted to rehabilitate the inhabitants and the environment must also be unique and in harmony with the demands of that ecosystem.

To maintain a long-term recovery of the region, community participation is key. However, facilitating the community's participation is challenging in a region where there is a lack of awareness about basic citizenship rights among communities. Therefore, the first step to ensure community engagement requires mutual respect between different stakeholders. This approach is indispensable to support a geographically fragile ecosystem

that is subject to frequent disasters of varying intensities.

The 2017 Study on recovery in A&NI covered changes that had taken place, providing NDMA with specific instances of successes and failures in recovery processes on several islands of the Nicobar district. There had been major improvement in the work carried out by the public health centres and the overall administrative response. The local schools have an increased number of Nicobari teachers that have contributed to good results from the students. In addition, road connectivity to the islands has improved significantly. Remote sensing data shows that plantations and ecosystems that had been destroyed are on their road to regeneration. Capacity building of the local community along with their integration into normal life has been significant. Critiques of recovery work include lack of institutional mechanisms that helped ensure better livelihoods, sustainable housing and sensitive integration of public policy for the culturally and ecologically sensitive region of ANI.

The extensive work done by TISS in field of **relief work and rehabilitation programmes** in the aftermath of major disasters viz, Latur Earthquake, Bhuj Earthquake, Tsunami in A&NI and Uttarakhand Floods is indeed laudable. Though reports of their involvement have been documented and their work has been widely published, I think it is pertinent to **consolidate the repository of their experience and formulate a framework which could be of tremendous benefit to policy makers at the National & State level.** TISS may steer this initiative with NIDM & NDMA. ■

- Lt Gen N C Marwah,
Member, National Disaster Management
Authority, New Delhi, India



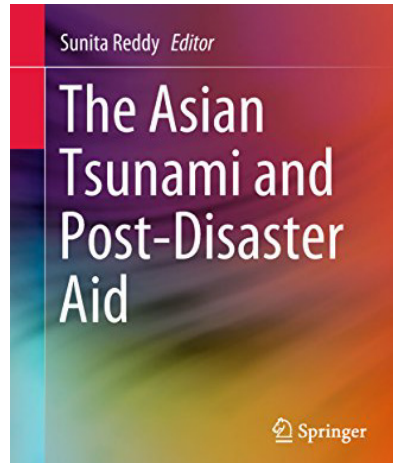
A typical Nicobari canoe- the dominant mode of local transportation.

(Re)Understanding Recovery from Asian Tsunami

What is the best way to understand humanitarian recovery afresh? Make humanitarian programming supple? Perhaps a review of the timely book edited by Dr. Sunita Reddy offers a direction.

The book 'The Asian Tsunami and Post-Disaster Aid' (by Springer 2018) is a welcome addition to the knowledge repository of understanding the unintended consequences of humanitarian aid for recovery.

A wide range of authors, some experts and some practitioners, many both, and all committed to improve the effectiveness of humanitarian action, have contributed 15 chapters to this book covering India – Andaman and Nicobar Islands as well as Tamil Nadu coast but not Kerala or Andhra – Sri Lanka, Thailand, and Indonesia. The chapters cover a wide range of topics ranging from ethno-political issues to accounting for loss and damage, and from learning from nature to



(re)fabrication of hazardous waterscapes to resilience and ruptures.

The book tells the reader that accountability in relief; delivery of basic services of food, water, health, education and finance; and effectiveness of ongoing public and NGO relief systems are far more important than so far recognised in aid circles. Accountability in fact shapes the recovery process and improves the quality of results.

The chapter on conflicting paradigms and the danger of discourse introduces us to re-think the national disaster management framework after tsunami. But the book does not argue for a change in the humanitarian paradigm, but invites the readers to develop a far more nuanced understanding of humanitarian concepts of relief, recovery, and rehabilitation.

Indian Ocean tsunami received such a flow of aid that left almost none without more than adequate resources - organisations and authorities had resources to try out almost any idea or insight gained from past humanitarian action or learning - on the ground. The chapters give a wide range of such initiatives.

The book asks us if we ever think of the un-intended consequences of humanitarian aid. I am reminded of the famous lecturers at Massachusetts Institute of Technology in late 1980s (and their



books) Dr. Albert O. Hirschman and Dr. Judith Tandler. Both pointed out what they called the "hidden hand" that is never visible when development projects are planned but always influence the way development results are formed. It is up to the development (and in our case humanitarian recovery) planner to be able to see this hidden hand and adapt the recovery plans and activities to better achieve the recovery results.

While the humanitarian studies move closer to defining and developing better performance or opposing the humanitarian concepts this book encourages us to reflect more on what we do and how we remember what we do to recover. Memory Interventions: Gujarat and Sri Lanka is the chapter that points this out to the reader.

Andaman and Nicobar Islands are visited from many points of view in this book, including sustainability of aid, social fabric of Nicobarese, and the concept of New Andamans. The reader is able to see both, what is done, and results achieved, but also, what was left out and perhaps why. What are the limits of Rights-based approach in recovery in an island and tribal communities? Why local health traditions are bypassed to bring in health for all concept in recovery? These questions come up for the reader.

Two first of its kind evaluations; one, by Disaster Emergency Committee of UK; and two, by Tsunami Evaluation Coalition offered a solid platform. The UNDP's publication of innovations in tsunami aid and IFRC evaluation

of tsunami are other two publications that built on the above knowledge platform. This book starts from where the above four landmark evaluations and review of tsunami left the debate around accountability, performance, programming, and impact. Something that Amitaji is now pursuing in Kerala after floods.

Dr. Sunita Reddy is Associate Professor at the Center of Social Medicine and Community Health and Adjunct Faculty at the Special Center of Disaster Research, Jawaharlal Nehru University, New Delhi. She has in the end offered us a template of what to do, when, and with what and whom, to make our future humanitarian programming flexible, and adaptive. ■

*Book review by Mihir R. Bhatt
As presented at Indira Gandhi National Centre for
the Arts, New Delhi, October 17, 2018.*

DRR PERSPECTIVES

Andaman & Nicobar Islands: After the Tsunami SEEDS Experiences

When the Tsunami hit the Andaman and Nicobar Islands and other Indian states along the coast of mainland India we at SEEDS faced a huge dilemma. Whether to rush to the badly hit coasts of Tamil Nadu where the damage was extensive and large numbers of people were impacted, or assist the people of Andaman and Nicobar Islands, where relatively fewer people were impacted but the loss was more intensive. Almost impulsively we decided to head out to the islands. A decision we never regretted.

The ecology of the islands posed a unique challenge. Different from the coastal mainland, the small islands community have a distinct coping strategy to deal extreme events. What makes it even more complex is that the large populace of these islands are external settlers who

have moved in the last century or so and significant portion of them are government employees. Local indigenous communities are completely marginalised. The fact that it is a territory directly under the control of the national Government in New Delhi has its own implications. Citizens' voice is weak and there is limited public accountability. Besides, governance, logistics too plays an important role on the socio-economic fabric of the islands. The islands are difficult to access, expensive to service, and usually far from the media's eyes. The results could be seen in the impact of the Tsunami. It destroyed the islands' transport infrastructure, and other small community assets that were painstakingly built. Rebuilding efforts in the islands took much more time, and were far more expensive compared to efforts in the affected areas of the mainland.

On landing in the islands, the SEEDS team was overwhelmed by the local chaos immediately after the disaster, as people from smaller badly hit islands were being evacuated to Port Blair, the capital. The team engaged with the local government in organising information for external aid agencies. Information kiosks set up outside the District control room provided guidance to all visitors who had intended to provide relief support. SEEDS set up two relief camps, community kitchen and temporary play areas for children. The community stayed in these camps for nearly two months.

With water overrunning most of the smaller islands, transition shelters had to be provided. With Government providing design and material, agencies mobilised manpower and support to ensure timely construction. SEEDS' previous



Community Center-Indian Ocean Tsunami Response.

experience of working in Gujarat helped mobilise trained construction artisans from Patan District, who travelled all the way to these islands and provided the necessary help to local workers. A good sense of solidarity enthused local workers and homes could be built in time despite challenges of monsoons, access and amenities. SEEDS took the opportunity to construct a community centre using locally appropriate bamboo and thatch technology. It marked the beginning of our advocacy efforts to promote bamboo based construction for the islands as against pre-fabricated cement and steel structures that were becoming popular and attractive specially after the Tsunami.

Advocacy efforts in the islands required mobilising and organising local citizen groups; a difficult proposition in a geography with weak political leadership, and strong central government control. Nevertheless, with support of small citizen groups, local chamber of commerce, SEEDS was able to build constructive partnerships with the local government including the

Municipal Council to introduce disaster risk reduction practices in the cities and schools. Advocacy efforts relied on awareness, learning and practical pilot demonstrations. A unique citizens resource centre was set up with information on hazard threats to the islands and their causes. It became a popular hit with the local citizens especially school children. Many of such pilots were subsequently taken up by the Government for wide-scale implementation.

Direct engagement with the affected community ranged from learning practices to actual handholding support in rebuilding homes and livelihoods. The Tsunami had a huge impact on the livelihood of small enterprises. Those who could afford had already started moving to mainland India. With inputs and advice from the local business, SEEDS developed a micro-credit programme. The objective of the programme was to help the tsunami affected community in reviving their livelihoods. It was more than just a loan programme; its added value was self-development and resilience

building against future disasters. The programme was a huge success with local fisherwomen, small shopkeepers, and local contractors.

In our experience, working in the Andaman and Nicobar Islands after the Tsunami was a very unique experience. As an external agency spending more than three years in the reconstruction work, we experienced the same set of challenges as the people living in the islands did. We realised how a top-heavy remotely controlled governance could influence local systems of governance and prosperity. We witnessed the implications of lack of media and hence the donor attention on the plight of affected community. And perhaps our greatest lesson as a humanitarian agency was to learn and understand how through our own actions we can potentially destroy an inherently strong local systems of resilience that islanders know best having spent their lifetimes overcoming challenges of their natural environment. ■

- **Manu Gupta**, Co-founder and Executive Director, SEEDS, New Delhi, India

Lessons from Tsunami Recovery in Andaman & Nicobar Islands

Being closest to its epicentre, Andaman & Nicobar Islands were affected, more than any part of India, by the Indian Ocean Tsunami on the boxing day of 26 December 2004. Triggered by massive marine earthquake of magnitude 9.1 in the Richter scale, the tsunami resulted in huge sea waves that inundated large parts of the islands and shattered lives, livelihoods, houses and infrastructure. Government of India launched extensive search, rescue, relief and rehabilitation operations, which were followed by reconstruction and recovery programmes. The outcome of the programmes are clearly visible in reconstructed houses and infrastructure and in overall bouncing back of the life and economy in the islands in less than five years, but the long term impacts of tsunami recovery are beginning to be understood and appreciated only recently.

There was an uneven pattern in tsunami damage and losses in the islands - while damages of infrastructure were localised almost exclusively in South Andaman, more specifically in Port Blair, damages to lives, livelihoods and houses had taken place mostly in Nicobar Islands. 84 per cent of deaths and 72 per cent of damage of houses were confined to 8 islands of Nicobar, each inhabited by aboriginal tribes with their traditional houses, habitats, culture and styles of living. Involvement and participation of these affected islanders in designing and reconstruction of their houses, as per the much touted model of 'owner driven constructions' did not take place, resulting in sub-optimal

use and, in some islands, outright abandonment of the new settlements. Houses were designed by consultants, following the principles of 'building-back-better', using pre-fabricated materials transported from mainland, and assembled by engineers of CPWD, APWD and NGOs locally, at exorbitant costs of Rs. 10 lakhs per unit of 450 sq.ft. The houses looked alien to the native environment of the islands and did not provide much satisfaction to the end users. Many affected families reconstructed their habitats with locally available materials. Maintenance of the houses in subsequent years became another issue as the materials for repair were not locally available. The lesson learnt is that 'building-back-better' can be effective as well as cost-effective if these are driven by communities themselves. Even if innovative designs and materials are to be introduced, these must be done through mature understanding of the local environment and process

of consultations with the affected people.

The other crucial lesson learnt from the recovery programme is scant attention paid to the livelihood recovery of the affected islanders. Livelihood restoration initiatives focused almost exclusively on the community of fishermen and agriculturists of South Andaman. Massive ingress of saline water had rendered almost entire cultivated land in Nicobar unfit for cultivation for several years making the islanders dependent on irregular supplies of subsidised food grains from outside for sustenance. This disturbed the self-sufficient economy of the islands and further affected the health and nutrition of the islanders, particularly of the women and children. This highlights the needs for placing livelihood at the centre stage of long term recovery from any catastrophic disasters, especially in remote communities.

Every disaster prone area should have a pre-disaster recovery plan prepared and updated through a consultative process based on various scenarios. This would help designing recovery programmes during post-disaster situations when issues of long term recovery tend to be forgotten due to compulsions of quick decision making and readily available solutions that short-circuits the process of understanding the needs of local affected communities. ■

- Dr. P.G. Dhar Chakrabarti*

*Retired Civil Servant who headed the National Institute of Disaster Management (NIDM) during 2005-2011

The outcome of the programmes are clearly visible in reconstructed houses and infrastructure and in overall bouncing back of the life and economy in the islands in less than five years, but the long term impacts of tsunami recovery are beginning to be understood and appreciated only recently.

Let us not Increase the Vulnerability of the A&N Islands

Picture credit: Pankaj Sekhsaria.



A 2005 picture of farmlands and houses in Sippighat, on the outskirts of Port Blair submerged due to the earthquake and tsunami of 2004.

In a roundtable on post-disaster recovery in the Andaman and Nicobar Islands (ANI) held recently at the Tata Institute of Social Sciences, Mumbai, Govind Ram, Director, Disaster Management, ANI administration made an insightful observation during his presentation. It was his claim that while more than 3000 people died in these islands in the tsunami of 2004, even three people won't die if a tsunami of a similar magnitude was to hit the islands today. Awareness is the key to this, he explained. People didn't know what a tsunami was in 2004 and many actually walked towards their death when the sea first withdrew. This, he emphasised, will never happen again.

This is an awareness, one can argue, that has been generated sui generis because no additional effort was needed to make it happen; it was only to be expected, in fact. Indeed, an aware and an alert citizenry and administrative system is going to be key in this island chain that is located in Seismic Zone V, is part of the Ring of Fire and where earthquakes and tsunamis are regular occurrences.

That being said, a look at the meta-narratives about these islands in the last decade suggests rather emphatically that this awareness and alertness has been restricted to the local context. It has not percolated upwards from the ground and the sea into the higher echelons of power and of policy making. That this is a matter of serious concern is stating the obvious. Very little is visible in the policy and public discourse today that is related to the vulnerability of the islands and to their large socio-cultural, ecological and geological volatilities. The islands if they are being discussed at all, are almost exclusively located within the geo-political-strategic or infrastructure-tourism development frames and here too with explicit linkages between the two.

There are any number of examples - prominent political commentator Ashok Malik referring to these islands in a piece in the Hindustan Times in 2014 as "a prized piece of mid-ocean real estate that policy gurus in Delhi have consistently neglected and left unexploited", former president, APJ Abdul Kalam proposing a 250 MW nuclear power

station in the islands as part of his vision for the islands' future in a defense seminar in Port Blair in 2009 and more recently, the formulation of a tourism and infrastructure centered plan by the NITI Aayog for the 'Holistic development of the islands', where the initial documents invoked the experiences of Dubai and Singapore but were ominously silent on matters related to the disaster vulnerability, resilience, ecological concerns and future of the indigenous and other communities of the A&N themselves.

My key concern is simple and straight-forward. The idea of development, strategic importance and of exercising power has trumped the geological, ecological and socio-cultural realities and challenges of the Andaman and Nicobar islands, and in this the vulnerabilities of this extremely fragile and sensitive island system are being increased many times over. ■

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Tsunami Recovery in Sri Lanka, South Asia: Role of Japan

The Indian Ocean Tsunami, caused by the Indian Ocean Earthquake of 26 December 2004, devastated India, Indonesia, Maldives, Sri Lanka and Thailand. It was one of the deadliest natural disasters in recorded history in Asia, leading to more than 220,000 casualties.

The tsunami hit the entire coastline of Sri Lanka, particularly the south and east coasts. On the east coast, Ampara, Batticaloa, Mullaitive and Trincomalee districts were severely affected. In total, more than 35,000 persons were killed, 21,000 persons were injured, and over a million people were internally displaced from their homes. Although the Post-Tsunami Operational Management Structure(P-TOM) was agreed between the Sri Lankan government and Liberation Tigers of Tamil Eelam(LTTE) in January 2005, people greatly suffered from the double disaster of the tsunami and armed conflicts during recovery process.

More women died than men in this disaster. Almost three times more women and girls died age between 16 and 30 years old in Sri Lanka. According to the joint research conducted by Japan International Cooperation Agency (JICA) and the Georgetown Institute for Women, Peace and Security in 2016, it was found that due to gender stereotyped roles and traditional norms, as well as a lack of information and early warning system, many women, especially Muslim women, were delayed in escape from tsunami in Trincomalee seaside areas. Therefore, based upon the results of the post-disaster needs assessment, JICA supported early recovery from tsunami through rebuilding communities, providing them with

housing, public places, infrastructures and others in Japan Sri Lanka Friendship Villages (JSFVs), among others. Since there were different ethnic/religious groups relocated to the JSFVs, reconciliation workshops were conducted for both the Tamil and Muslims and men and women. JICA also collaborated with Women's Coop, a local NGO, to provide saving and micro financing activities to revive and generate income sources in afflicted communities.

In the recovery and reconstruction stage assistance, JICA had been mainly focusing on rebuilding hard infrastructures, such as road, bridges, hospitals, school buildings, market places, port and sea-walls. However, JICA started to initiate Community Empowerment Projects (CEPs), which are quick and small-scale delivery and conducted by local governments and NGOs, such as providing skill training and small machineries for livelihood recovery and building multi-purpose community centers. The CEPs are

now called Quick Impact Projects (QIPs) and implemented in other parts of Asia in disaster recovery and reconstruction stages, and implemented for local women to revive their lives for sustaining and building back better (BBB).

The lessons learned from the Indian Ocean Tsunami were applied by JICA during the reconstruction process of 2013 Typhoon Haiyan in the Philippines and 2015 Nepal Earthquake. In both cases, gender and diversity perspectives have been integrated in JICA's disaster assistance. However, as stipulated in Sendai Framework for Disaster Risk Reduction (DRR), JICA still faces challenges to improve gender-diversity data gathering and needs assessment, enhance women and various stakeholders leaderships and active and equal participation in planning and implementing DRR programmes and activities at all levels. ■

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Ms. Dan Maya Gurung is from Barpak, extremely remote mountainous area in Gorkha District, which was seriously hit by the 2015 Nepal Earthquake.

Civil–Military Cooperation in Disaster Response in India



In regions such as the Andaman and Nicobar Islands (572 islands) of India, which are geographically more remote from the Indian mainland, after the tsunami the presence of the Army, the Air Force and the Navy was the single significant factor in mounting rescue and evacuation missions with unprecedented speed which helped save many lives. However, the issue of civil military co-ordination during disaster response is a vexed one.

India is one of the most disaster prone countries in the world, with around 805 million affected people due to weather-related disasters, coming in second only to China among the top 10 countries with the highest absolute number of affected people, according to the UNISDR report (2015) - The Human Cost of Weather Related Disasters. In responding to disasters in India, there are four main actors: national and local government (including the NDRF), civil society organisations, communities, and the armed forces.

However, disaster response and relief is only a secondary function for the armed forces, enshrined in the idea of "aid to civil power". Their capabilities in terms of logistics storage and movement, and deployment of personnel to remotely affected regions are well recognised. In India, disaster management is a state subject and the State Disaster Management Authority has all the power, given that disaster management is their primary mandate. The local police, the local fire fighting departments and the SDRF are the state arms responsible for disaster response. In principle, the armed forces are supposed to operate on the concept of 'last in, first out' but in many instances, it has been seen that the forces are 'first in, last out'. For example, in the 2013 Uttarakhand deluge disaster, rescue operations did not start until the first batch of Indo-Tibetan Border Police (ITBP) could reach the area. If potential helipads and rescue routes had been identified as part of preparedness drills, rescue efforts could have begun sooner.

Are the local authorities becoming over dependent on the armed forces because they are inadequately prepared? Further, is there a gap in the coordination and communication between civil and military authorities, resulting in unnecessary and prolonged deployment of forces in disaster response? A systematic review of these issues is required. Although it has been nearly a decade since the creation of SDMAs was mandated under the DM Act, only 14 of the 36 states and UT have functioning SDMAs. Even among these SDMAs, logistical awareness and speedy deployment of resources remain variable and the level of training and capacities seem inadequate across diverse state departments and at various levels of hierarchies. In recent years there has been some progress in improving coordination through training and mock drills.

In 2017 alone, joint drills were conducted in Hyderabad, Guwahati, Vishakapatnam, Bhubaneswar and Karwar in various mock scenarios such as earthquakes, floods, and cyclones. During Cyclone Vardah for example, in December 2016, the updated DM plan for the state as well as joint preparedness measures by both the SDMA as well as the armed forces, ensured the evacuation of more than 20,000 people and minimised loss of life to a great extent. Continued mock drills such as in 2017 can enhance response capacities to a great extent, lessening the dependence on the armed forces and building trust in the capabilities of the SDMAs. ■

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Reflections on Disaster Recovery in the Andaman and Nicobar Islands

Eight years after I left the island and nine years after the tsunami of 2004, I return to the island of Car Nicobar for a short visit. I have wanted very much to see for myself the resurgence of the islands in the years following the catastrophe and subsequent rebuilding, of which I was fortunate to be a part.

I am both happy and sad at what I see. New homes stand on stilts, local businesses seem to be thriving, shops are flush with items, the roads are busy with honking traffic and the markets are full with shoppers. The happiest moment for me, however, is to see how tall the casuarinas we had planted over the rubble have grown and brought back some greenery along the beaches.

The touch of the tsunami is still evident however. The small salt water lakes formed as a result of the sudden onslaught of the sea still exist as marshes. Also in view are the large pieces of concrete sticking out of the sand, the broken, coloured corals lying around on the beaches, the broken and darkened homes in the abandoned villages and some large tree trunks lying rotting within the green undergrowth. All these are grim reminders of the catastrophe which takes me back in time.

I reflect on the day when I first landed up on the island, having volunteered to help in the rescue, relief and rehabilitation (R-R-R) process. We are a group of 70 fresh hands and legs who had been put together as a team and flown in to the IAF base at Car Nicobar around

New Year's Eve, 2004. Little do we know and fathom what a tsunami is and what a tsunami can do. But as we alighted on ground on the island, it was all there to see.

A giant hand seems to have come out of the ocean and ripped through everything. Trees lie around like matchsticks, and the land looks scorched and brown wherever the water has found its way. Homes are in ruins with their innards lying all over in the open. Among this mass of mangled remains of metal, plastic and concrete, lie the living dead. It is a scene out of a horror film- a scene which makes permanent imprints on our minds.

Having somewhat settled in, our work to rebuild the airbase and the island starts in earnest. There are



severe constraints of manpower as well as resources during the first few days. Then there is this important aspect of managing the men on this difficult and physically and mentally draining job. They have to be kept motivated, well fed and as comfortable as possible so that they continue to deliver at peak efficiency, day in and day out. The other difficulty, though initially, is to get these 70 men woven into an integrated team and also to build liaison with the other groups of people on the island who are also there for a similar job.

Working with death and destruction all around us, we understand the need to prioritise the work and move forward incrementally. And then there are pulls and pressures from all directions which sometimes slow us down—from the politicians and HQs in Delhi, the people in Port Blair monitoring our path and progress, the local administration and of course amongst ourselves. We realise that since we are closest to ground zero, we can take the best decisions based on the real picture.

The most important issue is to get the connectivity—both physical and electronic going. Communication and connect with the mainland and Port Blair is the most important to keep the R-R-R mission going. We get the roads cleared up to the jetties so that the engineers start their repairs to get the ships berthed at the earliest. The runway is cleared part by part and the deep cuts filled by sand so that the aircrafts can execute safe operations. Whilst all this is on, the search for survivors continues.

The rescue mission peters out in about a week's time. Those not found are presumed dead. The injured are rescued from the smaller islands and sent on to the mainland for medical rehabilitation. Some natives leave the island in fear of another tsunami

but come back in a few days; most probably due to the fact that they miss their home and don't feel at home on the mainland. With the 'stabilisation' phase over, we shift seamlessly into the relief and rehabilitation phase. The relief material starts flowing in and presents another set of logistical problems— we require space to store it, helicopters are employed to move it to other islands and also ensure that it reaches the correct hands in usable condition. It is truly a logistician's dilemma.

On the island, as we go through 'routine' life of 'self' survival and helping others to do the same, we start planning for the future. The seeds of the new infrastructure that will come up are sown and we shall see some of them fructifying in the next few months. But before we start reconstruction, we need to clean up the tons of debris lying strewn around. With just a few earth moving equipments available, it is a task that needs to be done on priority. The broken homes also need to be razed to the ground—as such they are beyond economical repair and too close to the sea for comfort now. It is as if we want to wipe out the signs of the disaster as soon as possible so that normal life can begin.

Days pass into weeks; and weeks into months. The pace of work continues at full swing. Now there are tangible results for all to see. The essential services like power and water have been restored to a large extent. The plinths for the pre-fab shelters are being made at a new location and the raw material for the same arrives in bulk by the giant aeroplanes. The islands are well fed and new shelters are coming up, the tragedy seems to be so far relegated in time, and I am sure, it will fade from memory soon. I start writing about what we saw and what we did. So many anecdotes of survival and

so many positive stories of human resilience and endurance...May be it will be helpful later.

The whole experience has been a life changing one for me. I now have respect for all that I have; do not yearn much for the material things in life and understand the fragility of life better. I also learn how to understand human behaviour in stress and distress and also how to extract work under extremely stressful situations. We, unknowingly are exposed to and become experts in various facets of management of men, material and the intangible 'morale' in the time we spend here. These are lessons for a lifetime; never to be forgotten.

At the end of 99 days, we have the air base ready to receive fighter aeroplanes. We have promised ourselves that we would get the base to fully operational status in 100 days. To achieve this seemingly insurmountable task is morale boosting to say the least. We get good press for the same and we work with fresh vigour.

I leave the island exactly a year after I first landed there to experience something that I always wanted to do - to be of some use and help to fellow humans. I thank god for leading me through the trials and tribulations of life in the aftermath of the tsunami.

I have been part of a historic rebuilding but I am sure that nature's work and ours remains ever unfinished. I sit down to write my experiences of the tsunami and the aftermath.

PS- A year later, I am able to release my first book titled "A Few Good Men & the Angry Sea", on the tenth anniversary of the tsunami. ■

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Observations on the Built Habitat and the Techno-Legal Regime of the Andaman-Nicobar Islands

In the aftermath of a disaster, the first responders (alongside the community) are search and rescue teams. Additionally, when an earthquake disaster strikes a major city with high-density multi-storey buildings, there is an urgent need for structural engineers to be present at site to inspect and tag buildings that are safe for occupation or otherwise. In smaller towns or villages (with low density) subjected to significant earthquakes, the immediate rush of "forensic" engineers however could put an unnecessary strain on the already fragile infrastructure. *Thus, it is judicious for engineers to weigh the situation and schedule reconnaissance trips to earthquake disaster zones sensitively.*

As part of the Department of Science and Technology, Government of India Reconnaissance Team, I was at Port Blair within 10 days of the December 26 2004 Indian Ocean Tsunami and Earthquake but restricted my survey to Port Blair and its surrounds in view of the difficult situation in the Nicobar Islands. Some of my colleagues explored the Nicobar islands (and some affected Andaman islands) and detailed reports of our observations have been published elsewhere¹.

Subsequent to this visit, I revisited the islands (including the Nicobar islands) in 2011 to review the reconstruction and disaster preparedness of the islands. I am sharing herein my observations on

the peculiar situation in the Islands that makes safety of the built habitat far more challenging to achieve than in Mainland India.

Like most of mainland India, residents of Port Blair aspire to have reinforced concrete houses- symbols of prosperity and safety. But unlike Mainland India, Andaman and Nicobar Islands did not have a single civil engineering degree college until after the earthquake (there is now a private college). As a result, most of the buildings, even posh two and three storeyed houses were designed by non-engineers (or government engineers who engaged in private consultancy on the side). Needless to say, the designs were empirical and did not incorporate earthquake-resistant features. Since the earthquake shaking of 2004 in Port Blair was not very high (shaking intensity was VI-VII), houses that were sensibly built on a regular grid and on reasonably good soil fared quite adequately and suffered only non-structural damage and some minor structural damage. Buildings which were complex with a lot of architectural gymnastics and no clear load path were punished severely and many such houses collapsed or suffered heavy structural damage and needed to be torn down. The topography of Port Blair is fairly undulating and sliding of the plinth was observed in many buildings. Foundation failures due to erosion and excessive settlements were also observed.



Photo credit: C.V.R. Murty.

Shore-front building on Car Nicobar Island was inundated by the waves, but the frame resisted the wave effects.

¹ The Great Sumatra Earthquakes and Indian Ocean Tsunamis of 26 December 2004 and 28 March 2005 Reconnaissance Report - EARTHQUAKE SPECTRA, Special Issue III Volume 26, June 2006.

But what was surprising was the failure of many important government buildings, some of which had been completed less than 5 years prior to the earthquake.

The passenger terminal building at the Haddo Wharf is a case in point. One would have expected that this building designed by a reputed government institute and agency would have been designed and detailed as per the prevalent earthquake codes of the country. (BIS Codes IS 1893-1984 and IS 13920 - 1993). Shockingly, that was not the case. Similarly, the type-designs prepared by the Andaman Public Works Department (APWD) for government office buildings across the islands did not follow the national earthquake codes and were badly damaged. In successive earthquakes (the 2014 Sikkim earthquake is another example) in India, government built structures have been faring as badly if not worse than privately constructed buildings. This raises the question of liability. How shall the government who is tasked of ensuring the safety of the built habitat, clean its own house? *To my knowledge, no APWD engineers or government designers were held accountable.*

Many important positions in the islands such as that of Chief Engineers of the APWD, ALHW (Andaman and Lakshwadeep Harbour Works), senior Defence Officers and other significant stakeholders are held by people imported from the mainland and have short tenures. Such a situation does not foster a sense of ownership of the challenges of the islands and there is reluctance in the incumbent to initiate something which may not get completed in his/her tenure. This has been a recurrent observation

over the years. There are about five hundred to six hundred civil engineers in all of the Andaman and Nicobar Islands of which about hundred are in the private sector. The rest of the engineers work in the Government or Defence sector. The total annual civil works in 2013 was in the range of one thousand crore rupees. The volume of new works is too low to attract good quality contractors from the mainland and hence the quality of construction suffers. The cost of construction in the islands is many times more than that in the mainland due to unavailability of local material and expertise. This also opens up situations fraught with lack of transparency, not only in financial matters but also in matters of quality of work.

Furthermore, as the islands are away from media glare, poor construction and resulting damage/collapse goes unreported, further emboldening the contractor-engineer nexus to continue with more of the same. There was a heightened awareness of seismic risk but it had not percolated adequately to masons and other stakeholders. There are no functioning regulatory mechanisms and monitoring policies for review of structural design and construction and there are no punitive systems for non-compliance.

Post-Tsunami reconstruction in tribal areas has its unique set of challenges. To share a couple of illustrative examples, houses built on stilt in Car Nicobar with structural steel sections had incomplete or inadequate connection details. The houses swayed significantly in gusty winds. A quick review of some of the works (such as at Mousse Bay) revealed heavy corrosion in liners of newly constructed piles. This is especially disappointing given the

high investment cost in these infrastructure works. A comprehensive audit of the quality of build will identify all the gaps and help pave the way for improved construction in the future.

Majority of lives lost in 2004 were due to the Tsunami (the loss of lives due to earthquake shaking was not high, even though economic losses were very high). It is practically not possible to design homes in the path of tsunami waves (unless the houses are made as fortresses). In view of this, the government has disallowed any housing on the coast. However, the lifestyle of local people requires them to live by the sea. A dialogue is required to find a solution to the contradictory demands of safety and convenience rather than simply denying the functional requirements of the people. And there are indeed workable options, if only the technologists were inclined to look at the situation in a more holistic rather than a bi-polar way. This is where a conversation between social scientists, engineers and the users would help to evolve a win-win solution.

There is a lot that can be done to improve the built habitat in the islands, both in its planning and its implementation. Some of it is low hanging fruit such as bringing in more rigorous procedures and more accountability in the government cadres (APWD, ALHW, Defence) which account for over 80% of the construction in the islands. But this requires a strong resolve in the local and central governments. Else we shall experience the adage, *Those who do not learn from history are doomed to repeat it.* ■

- Alpa Seth,

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Ecosystem Recovery Post Tsunami: Untapped Role of Communities

The 2004 Tsunami caused massive damage to the Indian ocean islands, including in the Andaman and Nicobar Islands to the tune of INR 3300 cr and proved to be a shocking reality check to the state of disaster preparedness and response in the regions most sensitive and vulnerable to natural disasters.

Apart from the loss of life and property, the ecosystem damages in Andaman and Nicobar Islands were more pronounced. The saline water ingress into agricultural land affected crops spread over about 200 km² of land area. The Earthquake shock waves caused uplifting of land by more than 1 m in the North and Middle Andamans and further resulted in subsidence of land by more than 1 m in the Nicobar group of Islands. Coral reefs were damaged in two ways- (i) erosion and breaking up of reefs, and (ii) deposition of sand and debris on reefs. Estimated erosion of coral reefs in the Andaman Islands was 22978 ha and 17180 ha in Nicobar islands. Many beaches were seriously eroded causing interference with turtle nesting. Among the aboriginal tribes in the Andaman and Nicobar islands, Nicobaries suffered the most due to their greater vulnerabilities.

Post Tsunami, while the immediate and primary focus was on rebuilding public infrastructure in the form of buildings, bridges, roads and steps were also taken to ensure power supply, food aid, water supply; ecosystem recovery, coastal protection and environmental measures were relatively neglected which continues till this date. It was

anticipated that the majority of the affected reefs would self-recover in five years or so. Similarly, it was believed that mangrove forests would too be self-replenished. This could happen provided that human threats can be minimised by sustainable management and proper enforcement of legislation with involvement of communities. That has unfortunately not been the case and even now the focus is more technical aspects of disaster preparedness in terms of early warning systems.

Lack of Comprehensive Disaster Risk Management

The Indian National Institute of Ocean Information Services has planned to set up 35 seismic stations on the Andaman and Nicobar Islands and is in the process of setting up an elaborate system of sensors on the Andaman and Nicobar Islands for real-time monitoring of earthquakes. Strong Motion Sensors with Global Positioning Systems (GPS) have also been installed at 28 locations on the islands.

For a long time, redundant land use policies, conventional protective (Policing) measures are still relied upon for conservation. The role of communities in this regard is still an untapped field.

While disaster preparedness is important, it is nevertheless just one aspect of the entire disaster risk management continuum. Focus should therefore also be on other aspects including conservation and management of natural environment and resources. For a long time, redundant land use policies, conventional protective (Policing) measures are still relied upon for conservation. The role of communities in this regard is still an untapped field.

Importance of Communities' Participation

Research has established the role of communities as custodians of traditional knowledge with innovative survival capabilities. They can also prove to be the best channel to be involved in restoration of ecosystems. In one such example, communities including women help in restoring coral reefs in Belize after receiving training in marine ecology coral protection. Training and capacity building with the help of civil society and other partners are needed to train communities in ecosystem restoration. Further, more vulnerability assessments required to be carried out to identify specific vulnerabilities. Additional steps such as the development of integrated coastal management plans and coastal vulnerability maps with communities in planning and implementing and creation of policies beneficial for communities would go a long way in empowering communities and making them the most significant stakeholders in ecosystem conservation. ■

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Andaman Nicobar Islands Recovery: A View from the Communities



Photo credit: S. Blackburn 2014.

Figure 1: Permanent shelters in Little Andaman, built during post-tsunami reconstruction.

It is now widely accepted that disasters are not natural events but fundamentally human ones. Whilst we cannot prevent earthquakes, volcanoes, storms, tsunamis and other extreme natural hazards from occurring, what we can do is make sure we are as prepared and as resilient as possible for when a hazard strikes. In anticipation of the hazard, this means having effective early warning systems, high-quality and accessible public services, and capacity to respond quickly and appropriately to emergent hazards; post-disaster, it means rebuilding communities in ways that protect (not undermine) existing development gains. As emphasised by the globally-recognised Sendai Framework for Action¹ priority to build back better, post-disaster reconstruction and

rehabilitation is an opportunity not only to recover what came before the disaster, but to improve or even transform affected-persons' opportunities for prosperity and well-being in the future. Building back better can mean reducing vulnerability through improvements to physical infrastructure (e.g. enforcing risk-resistant design in reconstructed buildings or investing in essential public services like schools and healthcare). Alongside, it is equally important to protect and invest in the social and cultural life of affected communities, to ensure that all people (rich and poor, old and young, from all walks of life and of all abilities) have full and equal capacity to benefit from reconstruction investments. This approach reflects the Sustainable

Development Goals' indicator to *leave no one behind*² – this is a high priority in post-disaster settings since poor or socially marginalised people are often worst-affected.

Key to this approach is consulting local communities both before and after a hazard event, to understand diverse community needs and priorities. If these locally-specific needs are not prioritised in disaster planning, then reconstruction is likely to benefit the few – not the many – and the potential for progressive development is lost.

This article draws on research into community experiences of post-tsunami relief and reconstruction in Little Andaman (Andaman and Nicobar Islands, ANI), to demonstrate why local voices are

1 UNISDR (2015) Sendai Framework for Action, see: www.unisdr.org/we/coordinate/sendai-framework.

2 United Nations (2016) The Sustainable Development Goals Report, see <https://unstats.un.org/sdgs/report/2016/leaving-no-one-behind>.

Economic impacts

- + Large amount of post-tsunami relief and rehabilitation funding (both from government and NGOs) has led to investment in key infrastructures.
- + Alongside, new NGO activities provide *added funding/support* in under-funded areas - e.g. child and education support, psycho-social care, livelihood trainings, self-help-groups (SHGs).
- + Some communities have better household facilities and *standards of living* now they live in tsunami houses (permanent shelter), e.g. indoor toilet and kitchen, concrete house, running water, electricity.
- + Initial rise in *job opportunities* (but this has now reduced again).
- Many tsunami houses are located far away from the site of their normal livelihood, either family land/farm or fishing areas (coastline); difficult to continue livelihood as before, increased duration and cost of commute.
- *In situ livelihood* options not supported, e.g. houses had insufficient outdoor space for communal agriculture, for drying fish, rearing livestock; kitchen gardens not allowed in some places. This affected households and villages in different ways and to different degrees, e.g. the poorest families were worst affected because they no longer have space to grow their own food.
- In some cases the construction quality of houses was poor (e.g. leaking roofs, cracked walls); increased cost of maintaining concrete houses with non-local materials is borne by local people.
- Key infrastructures cannot deliver essential services as promised (e.g. the hospital lacks equipment and trained staff).

Social impacts

- + Education has gone up after tsunami: families place greater emphasis on education after tsunami, indicated by e.g. more families investing in private education, youth going away for college. This could be associated with increased exposure to educated 'outsiders' (government workers, foreign aid agencies) during relief and rehabilitation, but also mirrors similar trends on the mainland.
- + *More women undertake paid employment* and/or are participating in SHGs post-tsunami. Women feel good that they are more mobile outside the home, financially independent, and have more skills.
- Many felt they were not properly included in decision-making around house design and location; this was frustrating for them. *Failure to take local voices into account* (or the perception that this was the case) has led to some loss of faith in government processes and transparency.
- *Community fragmentation* ("the love has gone") - social groups were divided when tsunami houses were allocated randomly, and many people feel the distribution of houses was not fair. This effect was differentiated, e.g. some communities were permitted to be resettled as one group whilst others were mixed-up.
- In some places *alcoholism* has increased - likely because of combination of unemployment and relief money
- Many lived in temporary shelters for up to 5 years before permanent shelters were handed over - these provided inadequate personal space and were uncomfortably hot, affecting quality of life in negative ways.

Cultural impacts

- + (Particularly young people) are more aware of life outside the islands; exposure to outsiders, government officials; general awareness on the island has increased, increasing aspirations.
- Small size of tsunami houses has affected *family living*: e.g. houses do not accommodate more than one nuclear family, so extended families cannot live together in the traditional way (particularly for tribal groups).

Figure 2: Economic, social and cultural impacts of post-tsunami reconstruction in Little Andaman, from the community perspective.

essential for designing disaster management plans that *build back better and leave no one behind*. Fieldwork was conducted over 9 months in 2014, and included 100+ interviews with non-tribal tsunami-affected persons and agencies involved in post-tsunami relief and reconstruction (governmental and non-governmental). The island lost 60 lives in the tsunami and far more homes and livelihoods. In the ten

years post-tsunami, over 9,500 houses were reconstructed (see Figure 1) plus a range of replaced or new infrastructures (including a new hospital, port, schools, community centres and roads). The research revealed positive and negative outcomes of relief and reconstruction, with differential impacts that produced winners and losers. Figure 1 summarises the economic, social and cultural

impacts of post-tsunami relief and reconstruction from the community perspective.

These findings show that the mode and process of post-disaster response (both relief and reconstruction) have major ramifications not only on the physical landscape, but on the livelihoods, well-being, life opportunities and resilience of affected people. The fact local

livelihoods have failed to recover and a number of day-to-day costs have increased indicates it is insufficient for rehabilitation efforts to focus wholly on infrastructure; rather, reconstruction strategies should aim to promote pro-poor and inclusive development over the long-term – putting local needs at the centre. In part this requires a shift in perspective away from viewing disaster reconstruction as a reactive, one-time 'fix', towards a pro-active vision of reconstruction as playing an active role in the on-going social-economic development of a place. For this, learning from past successes and failures is essential. Five policy priorities for progressive post-disaster reconstruction, stemming from the above findings, are summarised in Figure 2.

The principles are generalisable for most disaster settings - but to fulfil them in practice will be highly place-specific. With regards livelihoods, for example, two neighbouring villages affected by the same disaster may require very different housing styles or village layout, depending on their predominant means of income. In the Andaman context, fishing communities require space to dry the fish (perhaps on a flat roof), and low-income households without private land require space for kitchen gardens (or a communal growing area). Ensuring cultural norms and social networks are not interrupted is similarly sensitive and place-specific: social groups that share caregiving duties or work cooperatively benefit from being rehoused close together, rather than randomly allocated shelters.

Attuning rehabilitation efforts to specific local needs requires grounded consultation with the

community throughout the disaster cycle (not just when the disaster strikes, when time is very short). This has co-benefits for government and for local people: if reconstructed areas are closely attuned to local needs, communities are more likely to be satisfied with the outcome and less likely to abandon permanent shelters or encroach alternative sites to build their own homes. A key challenge for decision-makers, however, is precisely how to incorporate local voices into decision-making processes and how to engage productively with communities. Reconstruction after a large-scale disaster is, after all, a time- and emotionally-sensitive task, and there are legitimate concerns about ensuring fairness when myriad local needs and viewpoints are at stake - both between and within communities. Oft-raised challenges include the cost of in-depth community consultation, and lack of government capacity to support less tangible (yet highly valued) aspects of rehabilitation (e.g. psycho-social care).

Two practical recommendations arise from the research that address these concerns. First is to follow the model of the South Indian Federation of Fishermen Societies (SIFFS) in Tamil Nadu, who undertook a year-long period of in-depth participatory consultation with local communities, then constructed a number of to-scale model houses based on the feedback gathered (see Figure 3)³. Families were invited to view each model house and choose the design they preferred, and were involved in the construction process. From locals' perspective, this approach was hugely valued as it paid close attention to their own preferences

and needs. It respected local voice and agency by allowing them flexibility in choosing their final house design, and helped protect livelihoods and culture. From the government's perspective, this increased local satisfaction with the houses and supported economic recovery, whilst at the same time placing a limit on the degree of flexibility (the overall budget, house size and location remained in their control).

The second recommendation, flowing from the first, is to allow NGO involvement in select areas of reconstruction. Working with NGOs does bring challenges (amongst which, minimising redundancy and duplication), however they also bring expertise, capacity and funding that can support already-stretched government departments (e.g. child support). Many NGOs specialise in participatory methods and could assist governments in consulting local communities. NGOs adopting a rights-based approach can also be beneficial in helping to educate local people (particularly young people) about how to communicate productively with government agencies. This is important since a common barrier to effective local consultation is local people's own fear to speak openly with 'outsiders', and/or lack of

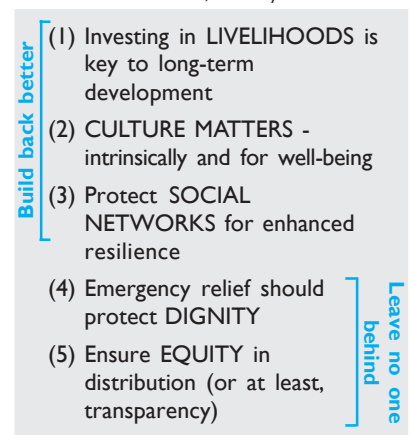


Figure 3: Priorities for socially-progressive post-disaster reconstruction.

3 SIFFS (2009) "Building Habitats: Process Document", South Indian Federation of Fishermen Societies (SIFFS) Tsunami Habitat Reconstruction Project Report. Trivandrum, Kerala: SIFFS. Available at: www.siffs.org/Books/Project%20report.pdf [accessed 31.07.18].



Figure 4: Photo of to-scale model houses in Tarangambadi, Tamil Nadu. House design took account of local livelihood needs, in this case having an accessible flat roof so fishing families had space to dry fish.

awareness of the appropriate channels through which to express their views.

In conclusion, transformative post-disaster reconstruction requires

recognition that attuning and tailoring interventions to specific local needs is central to building back better and leaving no one behind. Evidence from Little Andaman demonstrates that local

people have the energy and motivation to participate in reconstruction decision-making. Listening to those voices - both before and after disaster strikes - is essential. The challenge now is to create spaces and opportunities for their voices to be heard.

This article draws on ideas and findings published in the following paper:

Blackburn, S. (2018) "What does transformation look like? Post-disaster recovery politics and the case for progressive rehabilitation", *Sustainability*, 10(7). Special Issue: Transforming Development and Disaster Risk (eds. F. Thomalla and J. Ensor). DOI: 10.3390/su10072317. ■

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CASE STUDY

Contribution of TISS in Andaman and Nicobar Islands Recovery: A Short Account

In response to the twin disasters—the high magnitude earthquake and the massive tsunami in 2004 which was the most devastating ever recorded, the Tata Institute of Social Sciences (TISS) was involved in providing immediate relief and recovery of Nicobar Islands. The rough waves of Tsunami engulfed the Islands and submerged large portions of land, carrying away villages and their populations in its waters. It devastated the coconut plantation and the tuhets (household) causing displacement and affecting the livelihood of the island. At this critical juncture, TISS responded by sending a team of TISS faculty and students who worked in the immediate aftermath at Katchal— one of the worst affected and least reached islands, providing relief and rehabilitation services.

The TISS team while working with relief and rehabilitation of the islands conducted an assessment on impacts of the Tsunami on livelihoods. One of the critical findings of the assessment was that a significant proportion of leadership was eliminated due to deaths in the Tsunami and therefore, there was an urgent need to create a cadre of trained development workers from the community to mobilise them as dynamic leaders. TISS decided to intervene and initiated a dialogue with Andaman and Nicobar Administration, the Tribal Councils, and communities in 2005 to develop a Certificate Course in Sustainable Development. A MoU between the ANI administration, TISS, and Action Aid International was signed to train 3 batches of selected personnel for enabling them with leadership and community

development skills. Over 100 women and men graduated and moved to their islands to work with the communities in rebuilding Nicobarese economy and society.

TISS also recognised that the disaster had impacted entire plantations, affecting the livelihood of the Nicobarese. To support people in restoration of livelihood, the administration of the Andaman and Nicobar Islands and TISS renewed a fresh MoU in November 2009 to develop livelihood support programmes in the Nicobars. TISS took stock of the existing situation of livelihood, and developed suitable livelihood strategies for the Nicobarese.

In response to the lack of knowledge on basic information on government schemes and early warning signs of

disaster among the Nicobarese, TISS set up five Island Knowledge Centres (IKC) in Nicobar to act as resource and capacity-building centres and provide basic information on government schemes and early warning systems. Each IKC was run by two trained Fellows from the community who acted as a catalyst between the community and the IKC. The IKC fellows were trained to help develop an understanding of different forms of communication and identify various stakeholders in the community.

Further in 2009, with funds from the Sustainable Indigenous Futures of Austria University, TISS initiated the Baseline Survey titled, 'Improving Sustainable Livelihood of Tsunami-affected People of Nicobar Islands through Community-Based Cooperative Unit and Islands Knowledge Centres' for strengthening livelihood strategies, capacity building through IKCs, and exploring feasibility of Renewable Energy. Simultaneously the network of Island Knowledge Centres across the Nicobar archipelago were strengthened to act as a resource and

capacity building centre by providing a variety of services towards building sustainable livelihoods.

To help support and enhance dissemination of information across the islands, TISS also developed an SMS service with support from IBM volunteers. It provided urgent as well as useful information such as job vacancies, ship timings, price of copra and virgin coconut oil through regular and free SMS services to all the islands. Another initiative to share and enhance communication was a Community Newspaper covering people's current issues and concerns as well as expressions of their creativity till date. The newspaper covered the concerns and creativities of the people.

To help resolve the on-going issues of availability of electricity and fuel, TISS conducted a study on the availability, access and use of renewable energy sources in all Nicobar Islands. The study revealed that there was huge surplus of coconut husk which can solve energy crisis, solar lanterns distributed by

NGO were non-functional, and there is great potentiality for bio-gas generation due to availability of bio-gas material. It worked at ways of enhancing community access to these alternative and easily available local sources of energy with the local population.

The TISS work in the ANI, post the Tsunami, thus focused on four key areas to enhance the recovery of the islanders - capacity building of local leadership, livelihood regeneration, setting up island knowledge centres to enhance communication between the islands and mainland, working on alternative sources of energy and seeking to understand the impact of the Tsunami through a baseline survey. It worked with like-minded organisations, NGOs, government institutions, and different Ministries, diverse interns from TISS Mumbai campus who had range of expertise and skills to address disaster response and management. ■

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Moving to the islands for the survey.

Andaman Nicobar Islands Recovery: Food and Nutrition Schemes

A child residing in Car Nicobar, one of the 10 inhabited islands out of 22 Nicobar Islands forming the Union Territory of Andaman and Nicobar Islands (ANI), a group of 572 islands in the Bay of Bengal, may have become a young adult today, if she survived the 2004 Tsunami that had completely devastated it, including the Indian Air Force airbase.

After surviving, she also had the least probability from dying from under-nutrition post tsunami period. It is because she is likely to be from the Nicobarese tribal community. Nicobarese have been mainstreamed and 'modernised' (unlike Shompen tribe also inhabiting Nicobar islands) where children wear crisp uniforms and go to anganwadi centre run by the Integrated Child Development Services (ICDS).

This is backed by evidence. A TISS study on ANI in 2011 funded by erstwhile Planning Commission, of which this author was part of, had found that the tribal ICDS project of Nicobar, which has majority of Nicobarese tribal populations had the lowest rate of child malnutrition in ANI. Tribal project of ICDS in ANI includes all 10 inhabited islands of Nicobar. A majority of children - 94 % were normal in terms of their weight for age; about 5% were moderately malnourished and less than 1% severely malnourished in 2009.

To contrast with other regions of ANI, mainly 3 rural ICDS projects (Rangat, Ferrargunj and Diglipur of North, Middle & South Andaman) and one urban ICDS project (Port Blair of South Andaman), Ferrargunj project had 41% children with some



Children, Anganwadi Workers and Helpers at Anganwadi Centers in Port Blair, the capital of Andaman & Nicobar Islands.

form of malnourishment followed by Port Blair with 38% children moderately or severely malnourished in 2008-09.

For ANI as a whole, there was a sharp increase in moderately malnourished children from 5% in 2004 to 22% in 2008; severely malnourished children increased from less than 2% in 2004 to 8% in 2007 - a period of reconstruction, rehabilitation and recovery soon after tsunami. Clearly, Nicobar contributed miniscule to this statistic.

These observations compel few explanations and offer lessons for

policy and practice in governance of nutrition programmes. Despite vulnerabilities including post disaster recovery, tough accessibility only by sea route, farthest from capital Port Blair, etc., superior nutritional health of children in Nicobar group of islands post tsunami can be attributed to certain key factors. Firstly, tribal households probably became food secure faster as they could resume fishing, farming and animal rearing in addition to disaster aid they received. Therefore, household level food security is crucial. Secondly, ICDS in Nicobar had a near universal coverage (100 per cent) because of absence of any other child care

programmes or private crèches. It means when both rich and poor access a public service, it is less likely that the service delivery will remain poor. Thirdly, strong community participation and organisation through tribal councils ensured accountability for sustaining quality and access. And finally indigenous child feeding practices were followed by mothers and women despite access to international readymade baby food brand like Nestle.

Government figures show that ANI has one of the lowest child malnutrition rates among young children in India at 2.4% in 2009. In

2015, only 0.63% children in ANI are severely malnourished while 10.27% children fell in grade I & II malnutrition. These 'achievement' figures are misleading. Actually, low prevalence of malnutrition in ANI is largely attributed to gradual decline in the total beneficiaries of ICDS that includes children under 6, pregnant women, lactating mothers and adolescent girls. Total beneficiaries reduced from 86% in 2004 to 49% in 2009. In 2009, ICDS reached 20,000 children which reduced to 12,550 children in 2016. In 2016, only a total of 15,827 beneficiaries are registered in ANI (Social Welfare Department ANI), a

shocking 20% decline in beneficiaries since 2009. It means that number of malnourished children may be much more than recorded. In addition, 63% women and 47% children aged 6 months to 3 years are anaemic in ANI (2011). Exit of beneficiaries from ICDS is a serious concern not just in ANI but as a general trend elsewhere in India. Public policy isn't factoring 'exit' at all, seriously under-mining the universal nature of nutrition programme and hence its outcomes. ■

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DISASTER RECOVERY

The House that Jack Built: Rebuilding Homes after the Tsunami of 2004

I actually met Jack. Jack that built that house... that ate the dog, that ate the cat, that ate the rat, that ate the grain in the house that Jack built.

It was March 2005, at Shastri Nagar Great Nicobar. The past three

months in the Nicobar Islands washed over by the tsunami of 2004 were overwhelming to say the least. Ravaged, damaged, washed away, death, tsunami, loss were adjectives that constantly rang through my head like am sure it did many others.

I was ending the evening with Juglu and Ramesh, sons of settlers on that island; we spent the afternoon walking along the edge of a spit of sand along the Galathea river mouth and returned to the 35th km and rested the road. Soon two gentlemen walked around the turn of the road, and walked along the remaining bits of road supporting themselves with sticks. They were from the CPWD (Central Public Works Department) in Delhi, and we learnt, on a mission. They were here to help design houses for victims of the earthquake and tsunami that rocked the Nicobars and rendered more than 20000 people homeless and in the lurch with empty hands in a devastated landscape. We exchanged notes, and they spoke briefly of the plans, showing me designs and architectural knowhow. I asked, why couldn't people build their own houses as they've always done? The response was a vehement 'No!' The Government couldn't put this on



Figure 1. Samson and Captain Gibson in front of their regenerated Nypa patch-Pulo Ulon.



Figure 2. New thatch roof made with *Nypa fruticans* at Pulo Panja village, Little Nicobar Island.

them after such a devastating experience.

In 2011, I was in Chowra on fieldwork, living at an islander's home, one of the single-family units built by the CPWD. I woke up one morning to the smell of burnt timber. The neighbouring house had partially caught fire at night. I learnt from him that family of rats lived in-between the plyboards concealing wiring. They had laid waste electrical wiring which sparked off a fire at night while I snored away barely 15 feet away. The owner complained, his cats couldn't get the rats, as they had total protection living between plyboards of the house that Jack built. He reminisced, earlier with their self-built timber, thatch or tin roofed houses, there was fresh air, no hidden wires,

practically no windows with glass that could break in a storm, wood they could replace, space for more than one family and so on. Making a long list of complaints is possible, and there are many similar tales to tell from the Nicobar Islands.

Rewinding back to 2005 in Campbell bay Great Nicobar Island, I stayed with friends in their tin tenements at the tsunami relief camp at Rajiv Nagar for about 6 months. After they helped each other build these tin shacks, a few elderly friends brought up their issues of reconstruction. Their families were now in single units rather than living together. Getting help wasn't easy as it was slowly dawning on them that it was upon each family to solve their own issues. How were they to recreate plantations, maintain their livestock

and other shared assets? The more pressing question to them was how would they make roofs for their traditional homes? Through our discussion, we decided that I would get them seeds of *Nypa fruticans*, a mangrove palm they formerly used from their creeks to regrow this resource. *Nypa* groves were nearly completely washed away from nearly all creeks. Towards the end of that year we planted 650 seeds across Little Nicobar Island and parts of Great Nicobar in an attempt to restore the species. The following year we did a count and realised the effort had about 5-10 percent success given the vagaries of creeks finding their course. In 2015, I secured a grant from the Department of Science and Technology, GoI, and we reinitiated this effort with renewed vigour and were able to establish



Figure 3. Regenerating coconut plantations and a house built by William the elder using salvaged parts from a shipwreck and timber hewn by his sons and friends - Pulomilo island, Little Nicobar.

close to 2500 young and growing Nypa palms. Collecting bundles of leaves from a creek which still harboured the palms, a single house was constructed to accommodate a joint family as before. By 2017, there were eleven such houses including two large ceremonial thatched houses. Most islanders today continue to use the houses that Jack

built, but also use thatched tenements where possible. All these traditional houses were built by hewing planks, pillars and collecting thatch, flotsam ship rope and buying nails from shops. They accommodate large families, dogs, cats, and in some homes - effigies of ancestors. If only the communities were given the materials and the chance to

rebuild their own houses using their own designs and requirements of family, hearths and livelihood assets, the rats in the house that Jack built wouldn't have been much of a problem. ■

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