Community Based Planning in Post-Disaster Reconstruction:
A Case Study of Tsunami Affected Fishing Communities in Tamil Nadu Coast of India

by

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I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract:

In the past few years, natural disasters have been taking more lives and, especially more in the lesser-developed countries. There have been debates in the scientific world on what could be the best ways to mitigate disasters and reduce their impacts. In addition, there is a growing concern about finding the best way of restoring normal lives in the disaster affected communities. Traditional top-down approaches practiced by local governments, aid-agencies, and NGOs have now been replaced by community-based disaster management approaches. International aid-agencies such as the World Bank, UNDP, CIDA, USAID etc., emphasize on the involvement of the community for development purposes and long term sustainability. However, experiences from catastrophic disasters such as the Indian Ocean Tsunami of 2004 or the Hurricane Katrina of 2005 revealed post-disaster scenario to be chaotic and at times insensitive to local cultures and needs of victims.

Literature review of past theories indicated the widening gap in disaster management approaches for establishing effective models to deal with recurrent mega-disasters. To address some of the gaps and issues related to disaster management strategies and approaches, an ongoing reconstruction process of the Indian Ocean Tsunami of 2004 was evaluated in the coastal regions of Tamil Nadu, India. Four underlying objectives were set. The first was to review the evolving disaster paradigm and related theories and concepts in literature and to build connections with planning models and community based planning. Gaps in the literature were identified and a 'common framework' to study both the domains of environmental planning and disaster management was designed. The 'framework' was designed using other interdisciplinary planning frameworks, and suffices the second objective of this dissertation.

The third objective was to assess an ongoing reconstruction process using an appropriate methodology and suitable indicators. Environmental issues and disaster related problems have risen over the last decade with its effects worsening in the developing countries. Despite technological advancements, it seems almost impossible to make disaster related losses negligible. However, losses can be minimised with proper interventions and community preparedness. Case studies were carried out within disaster affected fishing communities in the coastal areas of Tamil Nadu, India, almost three years

after the Indian Ocean Tsunami. A methodology was developed to design indicators to assess the reconstruction process and with the use of various survey instruments such as household questionnaires, semi structured interviews, documents and observation, findings of the study were analyzed. Survey results and discussions with various stakeholders who took part in the rebuilding process indicated that, the relocation of the community to new neighbourhoods had brought about many new challenges to be faced by the community members. On one hand, residents of the new sites benefited from the ownership of new housing units provided to them by the government and from the establishment of other new facilities such as schools and markets. However, on the other hand, the distance from the place of work had implications on livelihoods of the households, as well as gave rise to numerous social issues including increase in crime. In addition, community members had to travel long distances for health care and expressed their need for basic facility such as potable drinking water. Thus, the fourth and final objective was to explore the implication of the case study finding for the reduction of vulnerability of communities and strengthen community based planning for disaster management.

Post-disaster reconstruction could be a move towards more improved and sustainable development in lesser-developed countries, for which there needs to be an understanding of the complexities in different societies. Document analysis and discussions carried out during this study revealed conflicts among various agencies, duplicities, bureaucracy and wastefulness of time in disaster events. Further, the study findings reveal that the protection of coastal areas and relocation has long term implications on livelihoods.

The research concludes that the reconstruction process should be considered as a development opportunity. Planning and disaster experts should be encouraged to open avenues for innovative solutions that not only reduce the vulnerability of communities, but also focus on the sustainability of development programs. A more holistic approach to redevelopment is recommended with the use of innovative community based disaster planning (CBDP) approaches, which could not only reduce local vulnerabilities, but also strengthen adaptive capacities. Further, effective early-warning systems and evacuation plans should be developed as a part of routine emergency management and development

projects. Above all, the restoration of capacities of communities and reduction of their vulnerabilities is only possible through cross-cultural studies, knowledge sharing, and the willingness of planners, politicians and the disaster managers to take actions to prevent future disasters.

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To my parents who kept encouraging me to pursue the highest level of education and become an independent professional, and whose blessings and guidance has brought me this far.

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Acronyms:

AUDP   Asian Urban Disaster Mitigation Program

ADRC   Asian Disaster Reduction Center

CBDM   Community Based Disaster Management

CBO   Community Based Organization

CUSEC   Central United States Earthquake Consortium

DM   Disaster Management

DRR   Disaster Risk Reduction

FEMA   Federal Emergency Management Agency

HFA   Hyogo Framework for Action

IDNDR   International Decade for Natural Disaster Reduction

NGO   Non-government organization

UN   United Nation

UN/ISDR   United Nations International Strategy for Disaster Reduction

UNDP   United Nations Development Program

Chapter 1: Introduction

1.1. Context

An alarming increase in the occurrences of natural disasters have been detected over the past few years with about 650 natural hazard events reported in the year 2004 (Munich Re Group, 2004). The Indian Ocean Tsunami (December 26, 2004) put an end to about 320,000 lives and left millions of others displaced, especially in the South and Southeast Asian countries. During the first half of 2008, the world witnessed over 100 disasters across the globe (see, Table 1.1), thus making 2008 the second worst year for natural disasters in the decade. The graphical representation (see, Fig. 1.1) shows that in the world the larger number of deaths (OCHA-Geneva, 2008) and destruction of property and public infrastructure were caused by storms and earthquakes. Statistics also reveal that the South Asian subcontinent is the worst affected location in terms of number of casualties and other economic losses.

Table 1.1 2008 First semester natural disaster occurrence and impacts: comparison

Continent	Occurrence	No. Killed	No. Affected	Damages (In Million $ US)
Africa	25	352	1,682,974	1.26
Americas	25	340	12,264,082	3,220
Asia	**37**	**228316**	**116,549,382**	**30,627.99**
Europe	12	27	5,874	995
Oceania	2	8	3,000	90

Source: OCHA-Geneva, 2008

Currently, there is growing concern that natural disasters are on the rise and that global warming will cause more weather related disasters in coming years. In 2007, fifty percent of the total population affected by natural disasters globally was in the Peoples Republic of China (Schlein, 2008). Impacts of natural disasters are manifold due to the added pressure from environmental degradation, poverty, landlessness, political and social inequities. Thus, poor communities have less capacity to survive and manage on their own, leaving them more vulnerable to natural disasters (McEntire, 2001).

Figure 1.1 2008 First semester natural disaster occurrence and impacts by disaster types

Occurrence | No. Killed | No. Affected | Economic damages (Billion $US)

■ Drought   ■ Earthquake   ■ Extreme temperature   ■ Flood   ■ Mass movement wet   ■ Storm   ■ Volcano
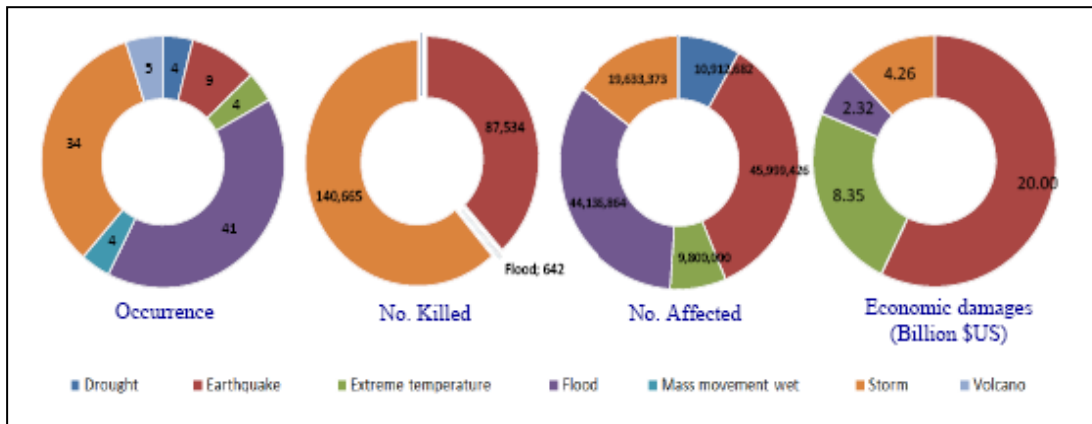
Source: OCHA-Geneva, 2008

Although there has not been a mega-disaster since the Indian Ocean Tsunami of 2004, scientific debates were raised on what causes such natural disasters that have such catastrophic impacts on less developed countries (LDC), and how such impacts can be mitigated in future (Munich Re Group, 2004; Kumaran & Negi, 2006). The Tsunami of 26 December 2004 caused large-scale destruction in nine countries[1] leaving the local population and governments in shambles. The international community was shaken by the unpreparedness and helplessness of the affected communities. Immediately after the disaster, people from all corners of the world responded in the form of relief supplies, volunteer services, both in kind and aid. In rural areas, the entire fishing villages were washed away. The agricultural land remained flooded with saline water for many months making it unusable for agricultural purposes. People lost their jobs and homes, families were often separated, and many had to start a new life living in 'rehabilitation camps' and shelters for months/years. Governments, NGOs and international disaster response agencies united to help victims increase their coping capacities and bring back normalcy of life (Nirupama, 2009). Research carried out during the early years (2005&2006) report a number of issues related to the impacts on the economy, health, inequalities in community-based response, recovery and disaster relief, particularly in Sri Lanka and

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[1] Indonesia, Thailand, Myanmar, India, Sri Lanka, The Maldives, Kenya and Somalia

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India (Havidan et al., 2006). By 2007-2008, the initial phase of relief and rehabilitation was almost over and the reconstruction process was in full-swing (Shaw, 2006).

1.2. Research Problem

Traditionally, the local governments, aid-agencies and NGO's used the 'top-down approaches' in post-disaster reconstruction processes. However, over the years, community-based disaster management systems were encouraged by the international research community to produce better results in post-disaster scenarios (Newport & Jawahar, 2003). Gilbert F. White (1961), Robert W. Kates (1962) and Ian Burton et al., (1993) assert that disasters are related to problems with development and human behavior. Further, the extent of damage can also be attributed to the unprecedented population growth (for example, unauthorized housing close to the shore-line) and economic development (for example, ports and hotels). According to Mitchell:

> Urbanization is one of the most important factors propelling worldwide growth in natural disaster potential. People and material investments are pouring into cities that are already exposed to significant physical risks, or are expanding into areas at risk, or are pushing against the limits of bio-geophysical systems and socio-technical systems (1993, p.29).

Disasters can be viewed from various lenses. One of them is 'the vulnerability approach' that has been widely discussed recently (Steckley, 2006). The vulnerability approach helps to understand the causes of disaster impacts, its effects on a certain population, and future risk (Anderson & Woodrow, 1989) of hazards. Vulnerability is a multidimensional approach, and focuses on how a society interacts in terms of education, government, values, laws, beliefs and cultural practices, in response to different hazards (Baumwoll, 2008).

After the initial phase of relief and rehabilitation is over, the reconstruction phase is crucial in understanding the needs of the community to develop better-suited approaches. These approaches are required not only for the management of post-disaster situations but also for capacity building, resilience, sustainability of the process and preparing communities for future uncertainties by use of effective preparedness and mitigation programs (Umemoto, 2001). Recent studies show that such initiatives were ineffective in meeting the needs and understanding the priorities of the disaster affected

communities (Benson & Twigg, 2004; Michel, 2005; Davidson et al., 2007). Disasters, such as the 2004 Tsunami and Hurricane Katrina of 2005 prove that estimations and preparations sometimes fall short of the actual ramifications of the disaster (Birkmann & Fernando, 2007). Even in the developed countries, few studies predicted that the coastal communities of the United States of America were highly vulnerable to hurricanes. While in other parts of the world, conflicts and controversies can arise from creating buffer-zones in coastal areas (Duryog Nivaran, 2006).

Therefore, having expertise does not guarantee preparedness for disaster and the ability to reduce risks to hazards. There is also a need to understand traditional developing societies, and the practices, beliefs, and norms deeply embedded within the community's psyche. During the relief phase post- tsunami, simultaneous projects were launched by numerous local and international organizations for housing and infrastructure, repairs, and creation of livelihood opportunities. Additionally, a wide range of social programs were initiated to enhance community actions and capacities. However, these communities were often unaware of long term benefits of such initiatives (Davidson et al., 2007). Community members at times fail to adapt to the new environment after being relocated in post-disaster situations. They preferred returning to original homes within a few months, being psychologically attached to the original locales and homes which lead to further vulnerabilities. Here is was what one of the victims said a few days after the tsunami:

> Three days after the tsunami, we went back to our own homes. Initially, we were scared, but we are fishermen, we can't stay too long in the refugee camps. We need to continue our livelihood, because the tsunami aid is not going to continue to sustain us for the coming years. So we took the initiative to return home together (Housing by People in Asia, 2005, p.9).

Communities demonstrated the capacity to confront challenges in the aftermath of a disaster. This knowledge can provide the foundation for the development of 'resilience' among the communities prone to natural hazards. A number of studies focus on developing 'risk reduction approaches' (see, Paton, 2003 & Camilleri, 2003), 'vulnerability reduction' (see, Hellstrom, 2005; McEntire, 2005), and 'developing more comprehensive disaster management approaches' (see, McEntire, 2005). However, very few studies reflect on developing 'effective monitoring tools' in order to understand the

vulnerable communities post-disaster, which could form the basis for 'sustainable reconstruction' (Birkmann & Fernando, 2007). There appears to be little or no connection between urban or rural planners and disaster managers. There is, however, a need for coordination at the operational level (that is, who does what and where) and 'strategic coordination' at the policy level (Bennett et al., 2006). Most of the development projects are completed in urgency within the stipulated time frame, without actually investigating the long term benefits of such projects or developing effective monitoring systems for the programs. Time and again it has been stressed that disasters stems from human and societal changes which translates into vulnerability (Blaikie, 1994; McEntire, 2001 & 2005; UN/ISDR, 2005 & Baumwoll, 2008). If this is true, then shouldn't disaster planning be linked to community development and planning?

A number of widely practiced mitigation measures can be imbedded into day-to-day activities in a typical community either in the developing countries or the developed. The separation of disaster planning from 'routine planning practices' and decision making opportunities is one of the main weaknesses in disaster management (Quarantelli, 1997). Every economic policy or land use decision either increases or decreases the potential for a disaster. For example, the flourishing tourism industry (for example, hotels close to the shore-line) could generate a negative impact on coral reefs due to pollution hazards. When the need arises disaster issues are compartmentalized and attention is paid to individual events. There is in fact a proliferation of different agencies managing different types of disasters. Gaps have widened over the years and the disaster management arena is struggling to establish effective models for dealing with recurrent disasters. Studies from recent disaster events reported conflicts among agencies, duplicities, bureaucracy and wastefulness of time (Michel, 2005; Davidson et al., 2007). Planning and environmental issues are addressed in different domains from disaster issues and consequently, there is no 'common framework' under which these domains can be studied. Environmental problems and disaster issues have worsened over the years within different communities in the developing countries. Although it is almost impossible to make disaster related losses negligible, the losses can be minimized with properly planned interventions.

1.3. Research Goal, objectives and questions

1.3.1. Research Goal:

In an effort to address some of the gaps and problems discussed above, this study evaluated an ongoing reconstruction process, post-tsunami disaster of 2004, within the coastal regions of the state of Tamil Nadu, India. The goal was to understand the level of participation of the community in the reconstruction process and the effectiveness of the various recovery programs, with the aim to develop better-suited approaches to manage post-disaster situations and to foster capacity building, resilience and sustainability of the process. This research was undertaken at a stage when the tsunami affected communities were relocated to new neighborhoods and were provided with new infrastructure and renewed livelihood opportunities. Through various interviews, document analysis and participant-observation, the researcher forms a comprehensive understanding of the current scenario of the reconstruction process in the context of developing countries. The reconstruction programs have posed tremendous challenges to local governments, the international community, professionals and the civil society in bringing them together to establish a common platform, exchange experiences and jointly participate in the reconstruction process (Shaw, 2006).

This study describes the nuanced stories and the perception of the community members about their involvement in the development process during the reconstruction. The findings highlight the complexities and challenges faced by the communities, and examine whether or not vulnerability to future hazards was effectively reduced. Some of the key outcomes of this study are; a multidisciplinary framework, an appropriate methodology to evaluate a reconstruction process using indicators and strategies and recommendations for future development. Further, a long-term recovery strategy needs to incorporate environmental and culturally sensitive issues into the reconstruction programs specific to the affected communities. The recommendations from this study build upon the research findings within the broader field of disaster planning.

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1.3.2. Research objectives:

1. To review the evolving disaster paradigm and related theories and concepts in literature and to build connections with planning models and community based planning.

2. To develop an interdisciplinary planning framework that can be used in post-disaster management.

3. To assess an ongoing reconstruction process using an appropriate methodology and suitable indicators.

4. To explore implications of the case study findings for reduction of vulnerability of communities and strengthen community based planning for disaster management.

1.3.3. Research questions:

The main research questions that would be explored are:

1. Specific research questions for the first and second objectives include:
   What are the known theoretical approaches in disaster management? What are the gaps in the application of community based approaches? How are disasters and development connected? In what ways can the strengths and weaknesses of planning models be applied to disaster management? Can disaster management be viewed as a sub-set of planning models? Can an interdisciplinary framework strengthen community based disaster management?

2. The underlying research questions for the third objective include:
   What factors increase the vulnerability of a community to a disaster? What methodology could be used to develop appropriate indicators to assess a reconstruction process? Has quality of life changed and vulnerability reduced after post-disaster reconstruction in the study area? What are the perceptions of fishing communities towards post-disaster development in their region? What is the level

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of involvement of fishing communities in the planning and development process of the new relocated areas?

3. Research questions for the final objective include:

   What strategies were successful during the reconstruction program? Can some of the successful programs be duplicated in other locations? What are the socio-cultural factors that need to be addressed during post-disaster planning and development? Can lessons learned from on-going reconstruction processes be recommended for facilitating an improved community based disaster management program?

1.4. Thesis outline

This thesis is organized sequentially to address the objectives and research questions. Chapter 2 explores the literature in terms of examining the linkages between 'disasters and development', addresses the gaps in the literature on disaster management, and investigates the connections between 'planning theory and disaster management'. In addition, Chapter 2 presents the conceptual framework for the study. Chapter 3 reviews the methodologies used in this research project, provides a rationale for the methodology used and describes the approach used for data analysis. Chapter 4 provides an overview of the past occurrence of "Tsunamis" and describes the case study area chosen for the fieldwork. Chapter 5 presents the study findings for post- disaster reconstruction programs based on interviews with members of three relocated communities in the coastal areas of Tamil Nadu, India. Figure 1.2 graphically represents the methodological approach used to carry out the research.

Figure 1.2: Framework of the Proposed Research
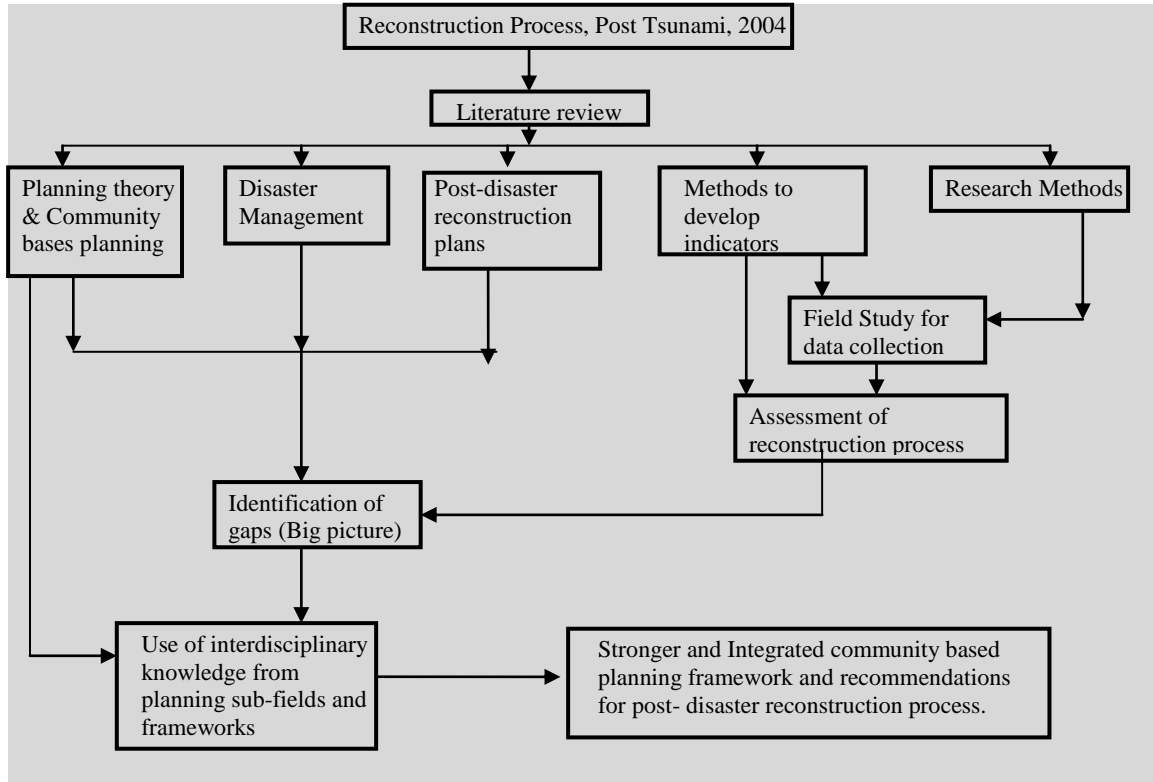
A systematic method is used to identify indicators to assess the following: (a) whether the community is physically and psychologically restored; (b) if the reconstruction process has been able to rebuild the capacity and livelihoods of the affected population and; (c) if the planning intervention was sustainable and culturally sensitive to the community. Chapter 6 provides the details of inferences drawn from the meetings with six different communities and ten NGOs and government agencies that were actively involved in the reconstruction process, post-tsunami. Chapter 7 presents a series of discussions based on findings of the study and concludes by summarizing the findings and highlighting the empirical and conceptual contributions made by this study. In addition, based on the question that emerged from this study, and the analysis of its limitations, Chapter 7 proposes the directions for future research.

Chapter 2: Literature survey

2.1. Introduction:

This chapter develops the foundations of the study through four major sections. First it looks into the context of disaster and provides a synthesis of theories and concepts related to disaster management literature. Second, it examines current literature regarding community based planning leading to identification of significant gaps in community based approaches in post-disaster reconstruction. Third, the chapter introduces various interdisciplinary frameworks that could be useful for strengthening of community based approaches in post-disaster reconstruction. Finally, a conceptual framework is designed to orient the rest of the study.

2.2. Definitions:

In the previous chapter the importance of this research has been highlighted. It is therefore necessary to clarify and bring out the meanings of various terms in order to explore the theories that guide the research. Based on the understanding of the core concepts and approaches, examination of the needs and motivation behind the work in this field, provides the momentum for this research.

<u>Disaster</u>

The term *disaster* is derived from the Latin roots *dis-*and *astro,* meaning 'away from the stars'. Historically, a disaster event was understood to be caused by unfortunate astrological configuration (Coppola, 2007, p.25). Disasters that were thought to be the "acts of god" have recently been associated to "acts of man" (Drabek, 1991). Quarentelli (1998) critiques viewing disasters as a "phenomenon", rather to be viewed as "an extreme event with a natural, technological or social cause that has consequences in terms of casualties, destruction, damage and disruption" (Quarantelli, 1998, p.2). The debate continues until today, with a plethora of definitions arising from various sociological, anthropological and cultural perspectives (Gilbert, Kerps, Hewitt, Dynes, Stallings, Oliver- Smith, Perry & Quarentelli, 2004). An international disaster, as defined by the UN (1992) is "…a serious disruption of the functioning of the society, causing

widespread human and material or environmental loss which exceeds the ability of the affected society to cope using its own resources"(Coppola, 2007, p.25).

Emergency

It is a broader term that includes disasters, catastrophes (major disasters) and smaller disruptive events. It can be defined as "…an imminent or actual event that threatens people, property or the environment and which requires a coordinated and rapid response. Emergencies are usually unanticipated, at least in terms of exactly what happens and when and where they take place" (Alexander, 2005, p.159).

Hazard

It is the probability that in a given period, within a particular location, extreme potentially damaging natural phenomena occurs that induces air, earth or water movements, that affects the zone. The magnitude of the phenomenon, probability of its occurrence and the extent of its impact can vary and in some cases can be determined. For example, rain is an essential resource but when too much or too little falls, it can become a hazard, resulting in flooding or drought (CRHNet, 2005). The relationship between the natural environment and human populations has remained a subject of investigation for many years. Mitchell (2001) defines hazards to be caused as a result of human to ecological interaction that can generate disaster. In a way, the cutting down of trees lead to reduction in precipitation, hence drought; or many a times construction over slopes has resulted in landslide related disasters, which are examples of human interaction with the environment and its consequences (Pandey & Okazaki, 2005).

Risk

It can be related directly to the concept of disaster, given that it includes the total losses and damages that can be suffered after a natural hazard: dead and injured people, damage to property and interruption of activities. Risk implies a future potential condition, a function of the magnitude of the natural hazard and of vulnerability of all exposed elements in a determined moment (UNCHS-HABITAT, Nairobi, 1981).

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Vulnerability

It refers to the propensity to suffer some degree of loss (e.g., injury, death, and damages) from a hazardous event. Whether considering a community, an individual, an economy or a structure, vulnerability depends upon coping capacity relative to the hazard impact (Blakie, 1994; Mileti, 1999 & McEntire, 2001). Risk incorporates the notions of both hazard and vulnerability and can be used to compare various

Disaster Risk = hazard x vulnerability (Wisner et al, 2004).

Community

A community is defined as "a group of individuals or families that share certain values, services, institutions, interests, or geographical proximity" (Barker, 1999, p. 89). This definition included various types of communities that were based on geographic location, relationship or interest-oriented communities. Although different people and groups would have their own differences, but a community is a niche where members can interact with each other and exchange support (Yoon, 2005). In particular a community defined by its geographical location is particularly important in the context of a disaster, as the members of the disaster affected community would have shared some common experiences of the aftermath.

2.3. Theoretical aspects within Disaster Management:

Disaster management has evolved as a popular field of research in the past few years. David Alexander wrote that "….more than half of the existing disaster research had been conducted over the last two decades, so there has been a considerable evolution in theories and techniques of mitigation and management" (Alexander, 1997, p. 285). Disasters can be categorized into *exogenous* and *endogenous* types. Processes, which involve biological, economic and psychological distress to part of the community, while the other section of the community grows by material gains and social satisfaction, are *exogenous disasters*. When the society experiences and shares severe danger, suffers injury and destruction or the disruption of the social structure and functioning of the society, it is termed as *endogenous disasters* (Moe & Pathranarakul, 2006, p.339). In whatever form a disaster occurs, it needs to be managed and the society needs to prepare for it, either to reduce its impact or to recover from its impact. This process is termed

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disaster management or emergency management.[3] *Emergency management* activities help individuals, communities, private sector organizations, and governments to assess the risks associated with natural hazards and to prioritize measures to reduce these risks (Mileti, 1999).

2.3.1 Comprehensive Disaster Management:

Some of the early works of developing a 'disaster life cycle' dates back to around 1975 (Mileti et al., 1995). It was later expanded and developed into the four phases of *Preparedness*, *Response*, *Recovery* and *Mitigation* by Drabek (1986). This was known as the four tiers of Disaster Management (see, Table 2.1) or Comprehensive Emergency Management (CEM).

Table 2.1: Description of the four-tiered Comprehensive Disaster Management

Preparedness	Process of education, involves warning the affected people, development of operational plan, training of personnel of rescue and relief techniques and stock piling of supplies.
Response	It is the short period, immediately after the disaster has struck and when services have been provided to the community to stabilize it and assure that the life –support systems are operational.
Recovery	This is the post-disaster phase where the community undergoes rehabilitation and reconstruction. The reconstruction phase is marked by large-scale efforts to replace damaged buildings, revitalize economies or restore agricultural systems to their full pre-disaster production capacity.
Mitigation	Mitigation refers to measures, which can be taken to minimize the destructive and disruptive effects of the hazard, and thus lessens the magnitude of disaster. It can take place before a disaster, during the emergency or after the disaster, during recovery or reconstruction.

Source: Based on Darbek, 1986; Mileti et al., 1995; Quarantelli 1998; Godschalk et al., 1999; Alexander, 2002; Wamsler, 2006; Coppola, 2007

This concept of Comprehensive Emergency Management (CEM) was seen as a way to ensure that organizations (FEMA, AUDP or World Bank, etc.) worked together to systematically plan for emergency situations (McEntire, 2004). Further Moe & Pathranarakul (2006) combined the four phases into two categories (see, Table 2.2) as those activities that are planned and conducted before a disaster to be known as *pro-active approaches* and those activities that are executed after a disaster has occurred to be

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[3] The term Disaster Management is interchangeably used with the term Emergency Management (Moe & Pathranarakul, 2006)

called *re-active approaches*. Generally, any project cycle would consist of initiation, planning, executing and completion of a plan. The following table relates the phases of a project with the phases of disaster management.

Table 2.2: Relation of a project cycle to disaster management phases

Project Life Cycle phase	Disaster Management phases	Time	Activities	Approach
Initiation	Prediction	Before	Mitigation	Pro-Active
Planning			Preparedness	
Executing	Warning	During	Response	Reactive
	Emergency Relief			
	Rehabilitation (Short term)	After	Recovery	
Completing	Reconstruction (Long term)			

Adapted from: Moe & Pathranarakul, 2006

Disaster Management literature shows that, activities such as mitigation and preparedness were initially stressed on more than response and recovery, since they ensured that risks associated with certain hazards are eliminated either scientifically, or based on policies and programs (Petak, 1987; Johnson, 1987). However, this approach of disaster management had weakness in failing to provide alternative explanations for the *social constructs* of disaster (Bolin & Stanford, 1999; Quarantelli, 1998). Activities like mitigation, preparedness and response phase of prediction and warning are grounded on the identified risk (Moe & Pathranarakul, 2006,). Depending on the level of impacts from disasters, response and recovery activities can be carried out for warning, emergency relief, rehabilitation, and reconstruction phases in the disaster management. Research also suggests for an impact assessment for successful implementation of a disaster management plan which was one of the basic threads followed through this research in identifying significant gaps in a disaster management plan.

2.3.2. Mitigation:
Disaster mitigation includes any sustained action that can reduce or totally eliminate the impacts and risks that are associated with a disaster (Mileti, 1999 & Coppola, 2007). It is the only process, which takes place well before the disaster event.

Disaster mitigation is "…essentially the transfer of power as it increases the self–reliance of people in hazard–prone environments to show that they have the resources and organization to withstand the worst effects of the hazard to which they are vulnerable" (Boyden & Davis, 1984).Following the World Commission on Environment and Development in 1987, the concept of Sustainable Development[4] was integrated into the framework of 'mitigation'. Mileti (1999) recognized how disaster policy could include a long-term perspective through safer urban development and careful environment management. Subsequently, this concept gained importance within the field of disaster management. A few years later, the United Nations followed a similar mandate of *Sustainable Disaster Mitigation* (see, Table 2.3). Some of the key objectives of the mandate are listed as:

Table 2.3: Key objectives of United Nations mandate on Sustainable Disaster Mitigation

Sustainable Disaster Mitigation
-To achieve a sustainable reduction in disaster risk and protection of development gains. -To reduce the loss of life and livelihoods due to disaster. -To ensure that disaster recovery serves to consolidate sustainable human development. -Build capacity of local communities for the recovery process by working through Government and civil society structures and the mechanisms that are already in place. -Bridge the gap between the disaster relief operations and the start of rehabilitation activities. -Building multi-hazard resistant social and economic infrastructure, especially shelters thereby increasing livelihood security and sustainability. -Co-ordinate with donors, NGO networks and to facilitate the preparation of community –based risk management and disaster preparedness plans.

Source: ISDR, 1994

Mitigation programs were criticized for treating the symptom and not the cause (Davis, 1984). Say for instance the symptom could be unsafe or vulnerable cropping patterns whereas the causes could be underdevelopment and poverty or lack of education. In a similar manner a number of scholars had different opinions on integrating *Sustainable Development* with *Mitigation*. Some would say that sustainability overlaps with disaster mitigation but did not fit perfectly into, disaster issues (Kreimer & Munasinghe, 1991; Mitchell, 1999). Few others questioned if sustainable development could sustain the disaster policy and research community (Aguirre, 2002). Where many felt that it was a

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[4] Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, 43).

slippery and ambiguous concept (Wisner et al., 2004; McEntire & Floyd, 2003) and that it was mostly related to natural disasters (McEntire, 2005). Nevertheless, sustainable mitigation is one of the most important mandates used by International Aid Agencies and smaller local organizations in post-disaster reconstruction to reduce vulnerability of communities to disasters. More recently, UN/ISDR made a commitment, followed by an official statement in the HFA, which aimed at integrating the *Johannesburg Plan of Implementation of the World Summit on Sustainable Development* with the current DRR activities (Baumwoll, 2008).

2.3.3 Community Based Disaster Management:

It was around the mid-1980s that disaster management approaches were criticized as being top-down, expert led and technology driven. It did not address community's needs and priorities (Maskery, 1989). In more recent years there has been a shift in the disaster management approaches with the inclusion of the affected community in the process. Community Based Mitigation and Community Based Disaster Preparedness (CBDP) are two bottom-up approaches, which were supported by empirical studies of being successful disaster management approaches (see, Maskery, 1989; Allen, 2006). These recent methods support the inclusion of local knowledge (Allen, 2006) and mitigation strategies to reduce vulnerability (Baumwoll, 2008).

Community based mitigation was described by Maskrey (1989) as involving governments with local communities in developing their own mitigation programs. This can be achieved by the formation of small groups, which are autonomous in their functioning, known as community based organizations (CBO's). Communities could in a way prioritize their own needs and articulate strategies for recovery as well as reconstruction (Maskery, 1989, p. 84). International organizations such as International Red Cross and Red Crescent Societies (IFRC) and UN agencies have now adopted the techniques of Community Based Disaster Management (CBDM) and are mainstreaming risk reduction strategies into development and education. Community based disaster preparedness approach includes *resources, coping* and *adaptive strategies* of the community members (Benson et al., 2001; Goodyear, 2000; Masing, 1999; Rocha &

Christoplos, 2001; Tobin & Whiteford, 2002). Some of the features that constitute community based disaster management are summarized in the following table:

Table 2.4: Features of CBDM approach

Features that constitute community based disaster management
-The focus is on the local community in order to increase community capacity and its resource coping strategies.
-Activities revolve around reducing vulnerable conditions and the *root causes of vulnerability.*
-Disasters are viewed as unmanaged and unresolved problems of the development process.
-The community members are the key actors as well as the primary beneficiary of various initiatives.
-The community participates in the whole process of disaster risk management, from situational analysis to planning and implementation.
-A multitude of community stakeholders are brought together to maximize the local resource base.
-Local organization is linked vertically with national and international level organizations to address the complexity of vulnerability issues.
-The framework is dynamic.
-Lessons learned from practice continuously feed into project planning

Source: Maskery, 1989; Allen, 2003, 2004, 2005 & 2006; Burby & May, 1998; Blakie et al., 1994; Benson et al., 2001.

From the 1990s to the twenty-first century, number of other NGOs and various other international organizations continued working on the CBDM model. Its best practices have been compiled in a new publication called *'Building Disaster Resilient Communities: Good Practices and Lessons Learned'* (Geneva, UN, 2007). The understanding of the current trends in the field of disaster management is further enhanced with the growing importance of improving mechanisms for reducing disasters. The following section expands on research scholarship that leads to the improvement of existing approaches.

2.4. Holistic Approach for Disaster Management:

The historical roots of disaster management dates back to around two hundred years when the federal government in the West (United States of America) participated in disaster activities that were *war related* (Drabek, 1991; McEntire, 2007). After the Second World War this 'tradition model' got recognition at the national and local levels and by planning professionals. It was termed as the 'professional model' or *Comprehensive Disaster Management*. However, over the years, debates in disaster

research identified inadequacies in Comprehensive Emergency Management (CEM), as overlooking the *social constructs* of disaster reduction (Newport & Jawahar, 2003; Trim, 2004). McEntire (2004) & Pearce (2003) developed a framework (see, Figure 2.1) that had the benefit of viewing *vulnerability* as the product components of *risk*, *susceptibility*, *resistance* and *resilience*. The 'holistic framework' helps in understanding some of fundamental theories of Disaster Risk Reduction (DRR), Resistance, Resilience, Susceptibility and Vulnerability Reduction. The following section is a review of relevant literature for each of the above terms in relation to disaster management.

Risk Reduction

Risk is a resultant of proximity or exposure to triggering agents (Buckle et al., 2000; Reynolds, 1993) and combines both characters of 'opportunity' and 'danger' to imply that uncertainty always involves some balance between profit and loss (Weichselgartner, 2001). When disaster management focuses primarily on the physical phenomena, risk may remain high as it does not include the relationship between disasters, development and environmental processes (Haque, 2003; Martin & Taher, 2001; Vargas, 2002). Studies suggest that risk reduction is a pro-active approach and needs to be integrated well into disaster management (Jeggle, 2001; Moe & Pathranarakul, 2006). In the year 2005, the (UN) World Conference on Disaster Reduction in Hyogo, Japan, outlined three goals to be achieved by risk reduction strategies (see, Table 2.5).

Table 2.5: Risk Reduction Strategies

Strategic goals for Risk Reduction
-Effective integration of disaster risk considerations into sustainable development policies, planning and programming at all levels, with a special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction.
-The development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience to hazards.
-The systematic incorporation of risk reduction approaches into design and implementation of emergency preparedness, response and recovery programs in the reconstruction of affected communities

Source: ISDR2, 2005

By comparing recovery-based efforts with prevention and risk reduction efforts, it was concluded that the former focuses on the disaster events and uses hardware and equipment to manage disaster situations. In a way, planning in this approach is carried-out in urgency and uses definite facts related to matters of security.

Figure2.1: Holistic Framework
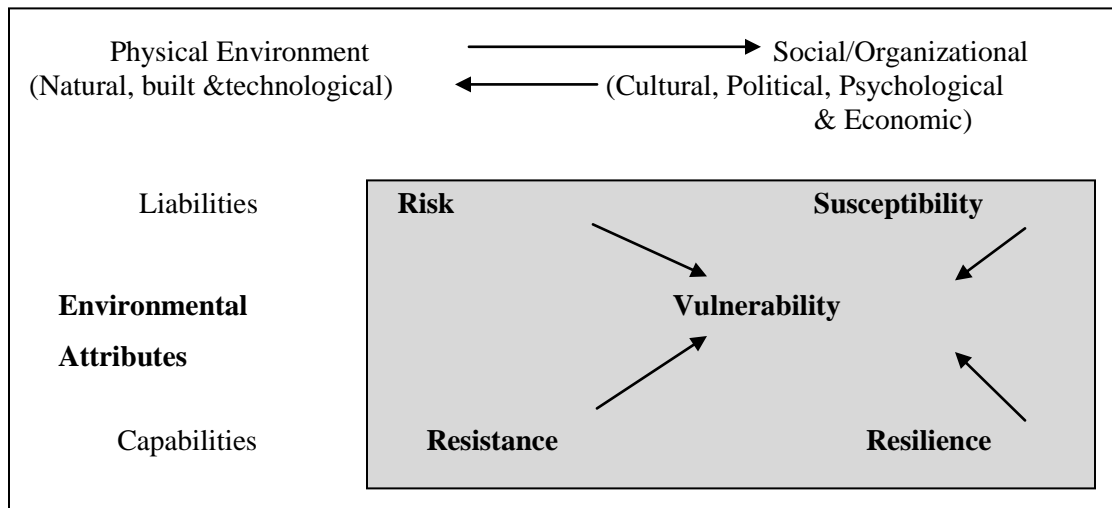
Adapted from: McEntire (2001)

The risk-reduction approach on the other hand focuses on vulnerability, risk and development issues. This approach is dependent on related practices, abilities and knowledge base of the community. Planning is carried out with longer time frames and includes matters of public interest and safety (Jeggle, 2001; Moe & Pathranarakul, 2006). However, risk reduction programs could be politically governed as it involves land development issues and building regulations. The flow of information could be one-dimensional within institutions[5] or at some instances the community may not have access to any information (Pearce, 2003).

Disaster Resistance
Resistance to disasters means measures such as building codes and resistant infrastructure, by which one could resist the strain or force exerted by natural or human

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[5] Either within planning organisations, which proposed the project or institutions that execute the project. (Moe & Pathranarakul, 2006)

induced agents (Norton & Chantry, 1993). Geis (2000) stated, "… it was the best means for developing the effective disaster management programs" (p.153). However the approach did not capture the undercurrents for effective disaster management like, social and political factors[6].

Susceptibility

Susceptibility to disasters is usually associated with the term 'proneness' of individual or groups to disasters. This could be due to social, political or economic and cultural factors (Buckle, 1995; McEntire, 2001).

2.4.1 Vulnerability Reduction:

The term vulnerability and susceptibility are closely linked as it describes the impact of a hazard on a group. Recent literature indicates vulnerability reduction being widely used in relation to risk, hazards and disaster management. The term takes its origin during the 1970s-80s and is deeply rooted within the framework of societies as it is influenced by power at local (Baumwoll, 2008), national and international level and argues that disasters are not solely caused by natural or environmental forces (Blaikie et. al,1994). According to the holistic framework, McEntire (2001) suggested that vulnerability cannot be viewed in isolation from social, cultural, economic and political realms, which determine settlement patterns and impact of disasters. For example, a high density population or buildings in hazard-prone areas increase society's physical vulnerability. Similarly, the ability of a country to support itself in the face of a disaster and the susceptibility of a country's economy to disasters is reflected in economic vulnerability (Coppola, 2007; Baumwoll, 2008). Although, there is no common conceptualization of vulnerability (Cutter, 1996), McEntire (2001) considered the merits of this concept and suggested to introduce *invulnerable development* in order to minimize disaster impacts. This added a temporal dimension to vulnerability, which is determined by taking into account activities *before, during or after* a disaster. Disasters, irrespective of being 'technological' or 'natural', came under the common theoretical framework of 'vulnerability reduction' (Weichselgartner, 2001). This framework had the benefit of

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[6] Strategies adopted by international and national agencies, FEMA, other development agencies

being useful not only in disaster management, but also in other disciplines such as sociology, political science and economics.

Disaster Resiliency

Resilience is defined as "the intrinsic capacity of a system, community or a society predisposed to a shock or stress to adapt and survive by changing its non-essential attributes and rebuilding itself" (Blaikie et. Al, 1994, p. 5). The term originated in the fields of psychology and psychiatry in 1940s and is relatively new to the field of disaster management (Baumwoll, 2008). The theory of resiliency was integrated into disaster mitigation[7] during the 1900s (Coppola, 2007). Resilience is determined as the coping capacity of a community to react or recover effectively from agents that cause disasters (Buckle et al., 2000; Mileti, 1999). According to Mileti (1999), "… resiliency has a slight broader, more flexible connotation than resistance to disasters" (p.264).

Table: 2.6 The difference between vulnerability and resilience

Vulnerability	Resilience
Resistance	Recovery
Force-bound	Time-bound
Safety	Bounce-back
Mitigation	Adaptation
Institutional	Community based
System	Network
Engineering	Culture
Risk assessment	Vulnerability-capacity analysis
Outcome	Process
Standards	Institutionalize

Adapted from: Maneyna, 2006

Resilience was interpreted in divergent ways by scholars due to its 'flexible connotation' and its theoretical integration of social, psychological, political and

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[7] The United Nations International Strategy for Disaster Reduction (UNISDR) to "build resilient communities by promoting awareness of the importance of disaster reduction…with the goal of reducing human, social and economic and environmental losses …related to technological and environmental disasters" (UNISDR,n.d).

economic factors (see, Buckle et al, 2000; McEntire, 2005). Although, resilience overcomes problems of the terms resistance it could also be applied to response and recovery phases after occurrence of disasters. Table 2.6 presents the comparison of vulnerability and resilience which clearly indicates that resilience moves towards adaptation and creating something stronger. Much recently, there has been a paradigm shift in disaster management from developing disaster resistant communities to developing disaster resilient communities (McEntire, 2005). Finally, there is limited discussion in the literature about integrating various approaches into a single plan.

2.4.2. Multi-Hazards Approach or All Hazards Approach for Disaster Management:

The general theory behind the *All Hazards Approach* is that a single framework can be developed for a wide range of disasters that have some commonality in occurrence (Waugh, 2004). This could include the need for *emergency warning or mass evacuation plan,* which can be addressed by a single plan. This single plan can provide the basis for responding to unexpected events. Planners usually consider the type of disaster[8] and develop disaster management plans accordingly, and during the process overlook risks to other hazards[9]. The plan quality has been affected by the lack of homogeneity in emergency planning document and the absence of appropriate standards (Alexander, 2005). This approach is relatively new and emphasizes functionality, accountability and adaptability to different conditions. It is versatile in terms of being applicable to either a natural or technological disaster (Waugh, 2004; Alexander, 2005). Consequently, a single plan could give guidance to deal with a variety of issues. Therefore, a single plan saves costs during the execution and plan formulation. Any disaster requires some warning system which can be implemented through a single plan that is common for a hurricane or a tsunami. The Indian Ocean Tsunami of 2004 was subject to a wide range of experimentation and miss-management due to the proliferation of organization, all having

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[8] Other studies like, Urban Vulnerability, Vulnerability of Mega cities (Anderson, 1992; Jones & Kandel, 1992; Mitchell, 1998).

[9] Post –reconstruction work undertaken in Tsunami affected area, have relocated people to low lying areas where due to rains frequent flooding occurs (Mascarenhas, 2006*;* Narayan, Sharma & Maheshwari, 2006; Kumaran & Negi, 2006).

different plans for development. This has been the case not only for the Indian subcontinent, but also for other countries such as Indonesia, Srilanka and Thailand. The duplications of plans and the chaotic scenario post-disaster, described a number of times in literature could be avoided with the use of an all hazards approach (Michel, 2005; Flint & Goyder, 2006).

2.5. Theoretical Gaps and Planning implications:

Disasters can globally affect any community (Hurricane Katrina in the West or the Tsunami in the East). The scale of destruction and the consequent impacts varies depending on the location as well as on the preparation level of the community to face any natural hazards. Literature reveals that there is the recognition of *Community Based Disaster Management Approaches* that are based on local knowledge, capacity building and use of indigenous technologies. International aid agencies and Non- government organizations promote this approach in disaster-affected communities to ensure that projects attain a certain level of sustainability and the local community builds a sense of ownership to the various initiatives undertaken by these organizations. However, once the aid-agencies move out of the disaster affected areas, these communities are in the hands of local government and national agencies. It is at this stage when the conflict of power emerges in order to make decisions *for community benefits* (Davidson et al., 2007). This is mostly due to the lack of coordination between the local government and international aid agencies and also, within different national agencies (Warner & Ore, 2006).

In a post-disaster scenario, time and resource constraints, may not permit extensive community consultations. Hence, some of the initial phases such as the response phase which consists of immediate help and relief to communities, are mostly undertaken by the top-down approach. However, during the long term reconstruction phase, which can take years to bring back normal life within communities, it is ideal to use the *Community Based Approach* (bottom-up approach). The major gaps lie in understanding complex societies and their needs and priorities. There is a need to strengthen community based approaches so that disaster impacts and causes are reduced, communities become part of the planning process, their adaptive capacities are increased and reconstruction processes becomes sustainable.

The *Holistic Framework* developed by McEntire (2001), drew attention towards the factors that need to be addressed while planning for disasters. However, this framework was somewhat simplistic and provided a static view of vulnerability (Enarson, 1997). The factors of risk, susceptibility, resistance and resilience are not mutually exclusive of each other and need to be addressed in totality to reduce vulnerability. The recent trends (see, Chapter 1) in natural disasters clearly demonstrate that there is a need for action to reduce disaster impacts. Disaster risk reduction is multifaceted and can have moral, social, economic and political motivation (UN/ISDR, u. d). The UNDP emphasizes the need for connections between disasters and development and suggests that successful development can be achieved only by endorsing disaster management. Blaikie, Cannon, Davis and Wisner (1994 & 2004), Maskery (1989), were among the authors who updated the initial attempts to relate disasters and development and emphasized on focusing towards vulnerable populations[10].

2.5.1 Disaster and Development:

According to the literature, disasters can be viewed in two ways: (i) disasters occur due to faulty development interventions (see for example, Pelling, 2003). Some other literature builds on connections between man- made inventions and hazards that are technological, leading to disasters (see for example, Oliver-Smith & Hoffman, 1999). More recent scholarship relates human activity and climate change, resulting in disasters (see for example, Warner & Ore, 2006). The International Panel on Climate Change (IPCC) has produced data that shows that climate change like rising temperatures has lead to heat waves, droughts, forest fires and famine (Aalst, 2006). This trend can be viewed as a negative aspect of development. (ii) Consider the case of a community that has been struck by a disaster (Indian Ocean Tsunami, 2004, Hurricane Katrina, 2005 or Earthquake in Pakistan in 2005). Post-disaster development can open numerous avenues and opportunities to improve upon mistakes, prepare communities for future eventualities and increase their adaptive capacity. Dynes (2002) gave some thoughts in this context in

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[10] Blaikie, P., Cannon, T., Davis, I. and Wisner, B. (1994). *At Risk: Natural Hazards, People's Vulnerability and Disasters*. Routledge, London.

a preliminary work on disasters and development[11]. At the international level, disasters are now viewed as opportunities for sustainable development (Shaw, 2006). However, recently, post-disaster reconstruction efforts and community based development initiatives were criticized in a number of ways.

The reconstruction scene appeared to be very chaotic (Michel, 2005; Flint & Goyder, 2006) as resources were scarce. Simultaneous projects were launched by numerous local and international organizations for housing and infrastructure repairs, for livelihoods creation and for a range of other social programs. However, communities were totally unaware of the long term benefits of such initiatives (Davidson et al., 2007). Thus, there is possibly a need for a *common platform* for post- disaster development. Numerous communities were unable to adapt to the new environment after the relocation. They returned to their original homes within the few months of after the relocation that lead them to further vulnerability. This shows a failure of the systems that targets capacity building and sustainable development for communities (Rofi et al., 2006). Development initiatives undertaken by either the local government or the International aid agencies lack cultural sensitivity (Flint & Goyder, 2006). It was also identified that there was a need for coordination at the operational level (who does, what and where) and *strategic coordination* at the policy level (Bennett et al., 2006). The indigenous knowledge should be considered in the process of disaster reduction, by educating, preparing and consulting communities before a disaster occurs (Baumwoll, 2008).

The above discussion indicates that there is a need to '*strengthen community based disaster management*' in the context of post-disaster reconstruction. Interdisciplinary knowledge can be utilized to understand the complexities in societies by bridging the communication gaps between various stakeholders of the reconstruction process. A strengthened *interdisciplinary community based approach* could show promise to the communities affected by disasters. The following section builds upon planning literature and identifies some of the existing interdisciplinary community based planning frameworks applicable to post-disaster reconstruction process.

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[11] Dynes, R. R. (2002). Disasters and development again, *Preliminary Paper*, University of Delaware. (acquired from : http://www.udel.edu/DRC/prepapers.html)

2.6. Interdisciplinary Approach for Disaster Management

Over the past decade there has been a paradigm shift in planning strategies from top-down, expert led to bottom-up and community based strategies. However, community based approaches have been criticized for as being used as a *soft approach* by international aid agencies (Davidson et al., 2007; Michel, 2005). Post-disaster situations could prove to be a challenging task for planners (Umemoto, 2001). This is mainly as:

(a) Development interventions need to be planned to attain long term sustainability;

(b) It requires increasing community capacity in order to deal with emergencies; and

 (c) Plans need to be developed delicately, keeping in mind *the cultural map* of the community (cultural sensitivity).

2.6.1 Integrating community based planning and disaster management planning:

From the theoretical point of view, planning theory and disaster management are rooted within different ideologies (Pearce, 2003). Although they are both associated with critical factors such as, community and infrastructure, both tend to take a predictive approach to planning. Community planning has a long evolutionary history, whereas disaster management emerged around 1950s and was earlier a profession often undertaken by the military. Nevertheless, terms like community planning, sustainable development, coping capacity and many more that are now widely used in the context of disaster management have their origins in planning theories. Disaster management was traditionally associated with short-term situations (e.g. rebuilding damaged homes). However, in order to strengthen approaches and shift trends in emergency management there is now a need to look into various planning frameworks and identify any potential relationship of the planning models/theories with disaster management. The following section introduces planning theory, identifies the connections between the traditional planning models with disaster management and finally explores planning frameworks that could be integrated with disaster management.

2.6.2 Historical context of Planning Theory:

The scope of planning as an activity is very wide and involves professionals from various fields, politicians and public administrators in public institutions, professionals who develop urban spaces (developers, bankers and industrialists) and stakeholders who represent the private/ public sector and the community. Planning is dynamic and is constantly changing based on worldviews and exists in the diverse forms (Healey, 2003). As a result of the constantly changing worldviews, community-based planning evolved as a sub-discipline. Community-based planning means processes in which people residing in a defined area work together with planning professionals to develop plans for their collective future-to protect and make improvements in immediate environments and quality of life (Healey, 2003). The roots of such planning initiatives date back to the late 19th and to the early 20th century in the western world when the urban planning profession gained importance in the academic realm due the poor and degrading environment of the industrial cities.

The great revolutionary ideas such as the Garden City, City Beautiful and the Radiant City, changed the perception of the common people to start thinking about environmental quality, social justice, aesthetics in city plans and planning practice at large (Campbell & Fainstein, 1996; Fishman, 1998; Fishman, 2002; Grant, 2006; Rohe & Gates 1985). Subsequently, property development acquired the prime function in planning and bureaucracy got entrenched within the profession (Qadeer, 1997, p. 483). It was around the mid-20th century, when the planner was seen as a technical and a scientific expert, who would develop alternatives and determine what, would best serve the public interest (Alexander, 1992; Leach, 1982). The Rational Comprehensive Planning (RCP) approach first developed by Meyerson and Banfield in the early 1950s and involved goal setting, identification of policy alternatives, evaluation and implementation of decisions. RCP approach favored technical knowledge and centralized decision-making process. However, RCP approach had its drawbacks such as treating a planner as *an applied scientist* and promoting a top-down approach in planning (Brooks, 2002, p.80). Despite of the criticism of being unrealistic, unjust and ineffective, the RCP approach still remains to be the most widely accepted form of planning used in many

specialized fields, including disaster management (Fainstein & Fainstein, 1996; Sandercock, 1998; Brooks, 2002).

Aside from the societal changes, the modifications also occurred in planning approaches. When on one end, neighborhood planning was practiced in full swing in most parts of the United States; on the other hand, Arnstein (1969) developed the 'Ladder of Citizens Participation'. This was the origin for *community based planning* within the planning theory. Emphasis was laid on the utilization of the community and local knowledge as input in the role of many different actors in planning. Advocacy planning model (Davidoff, 1965; Brooks, 2002) was also developed around the same time. Davidoff (1965) emphasized the role of the planner to determine what is best for the public. The planner was to act as an advocate or a mediator-between the community and the government. This approach stressed the public interest as well as the values of the planner.

Subsequently, transactive planning model, developed by Friedmann (1973), promoted learning between planners and communities. Community diversity, public interests, and the strengths of community and local knowledge were recognized. Much recently, another body of planning literature evolved, that is based on power relations, consensus building and collaboration. It is known as *communicative action theory* (Healey, 1996; Healey, 1997; Healey, 1998; Innes, 1995; Innes, 1996; Innes & Booher, 1999; Susskind & Cruikshank, 1997; Margerum, 2002). Among the similar concepts is that of *equity planning*, which focuses on disadvantaged groups, specific race and ethnicity (Krumholz & Forester, 1990; Metzger, 1996).

2.6.3 Disaster Management as a sub-set of Planning Models:

Community based planning is an interdisciplinary[12] approach and can be related to disciplines such as geography, sociology, economics, law, architecture and public administration (Kelly, 2004; Alonso, 1971). Community-based planning is derived from the advocacy, transactive, participatory and collaborative planning traditions. Although

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[12] Alonso (1971) defined interdisciplinary approach as "..take a physical planner , a sociologist, an economist; beat the mixture until it blends; pour and spread"

community planning and disaster management make contributions towards the safety of the community (Pearce, 2003) it has not been linked well. In 1997, Myers noted that:

> People who work to manage natural hazards must repackage themselves and what they know form the local community's viewpoint, across adjustments and across hazards, but in context of non-hazards community goals. Our research is telling us that local stakeholders' capacity to manage their own environment, resources and hazards must be increased, and that it is the locals that must decide what they are willing to lose in future disasters (p. 1).

While examining local plans, related either to environmental or social issues, plans and planning problems is usually treated as isolated incidents within the spectrum of community participation. In addition, disaster managers see development projects differently to community planners. Pearce (2003) provides the example of an old unreinforced building that is a heritage site and a tourist attraction for people becoming a hazard to humans if it collapses. It is evident that community planning activities takes place before a disaster, whereas disaster management occurs after a disaster. However, the goals are the same (safety and security of the public) and encourage community participation (CUSEC, 1993). Therefore, the processes that involve discussion on development plans should accommodate both disaster managers and community planners. At the same time, plans need to be adaptive to changes, have an interdisciplinary knowledge base and include experiences from within the community (Brody, 2003). The following Table is a synthesis of how various planning models can be integrated with disaster management.

Table 2.7: Planning models and Disaster Management

Planning Model	Strengths and weaknesses	Disaster Management
Rational Comprehensive Model: Dominant land use planning model in professional planning ***Sources:*** Banfiled,1955; Hodge, 1998; O'Sullivan, 1981; Hotovosky, 2006 Dearden & Mitchell, 1998; Brody, 2003.	***Strengths:*** -Staged approach- based on ecological/socio-economic profile. -examines alternative solutions. -best solution based on criteria developed. -Reliance on planner as a Technician. -Showed evidence of errors ***Weaknesses:*** - Time consuming - Redundant and complex - Unable to include public inputs. –Dependency on quantification technology	-Most practiced by government and local agencies during times of emergencies. - Appropriate approach that can be used mostly when there is time and resource constraint. - Can be applied in the relief and response phase of disaster management. -Also used for monitoring and evaluation of projects. ***Example of Applicable Disaster Management Models:*** Comprehensive Emergency Management (Darbek,1986; Mileti et al., 1995& Quarantelli,1998)
Incremental Model: Attention given to the environment when there is a crisis –crisis management. ***Sources:*** Lindblom, 1959; Stollman,1988; Campbell & Fainstien, 1996; Mitchell, 1997; Blum, 1974.	***Strengths:*** -Environmental problems handled individually. - Used to achieve realistic short-term goals ***Weaknesses:*** -Planning responds to fragmented environmental regulations as highly political. - Doesn't address a radical shift/change in policies and practices	- Can be applied for crisis situations such as natural disasters. -Can be used in achieving short-term goals during the initial few months of a post-disaster situation. ***Example of Applicable Disaster Management Models:*** Comprehensive Emergency Management (Darbek,1986; Mileti et al., 1995& Quarantelli,1998; Godschalk et al; Alexander,2002; Wamsler, 2006 & Coppola, 2007)

Adaptive Model: Recognizes the dynamic nature of the ecosystem. *Sources:* Holling, 1978; Harris, 1996; Sonntag, 1983; Brody et al., 2003.	*Strengths:* -Reliance on computerized techniques. -Responsive -Recognizes succession and continuous approaches to human activities -Anticipatory, predicts future events *Weaknesses:* -Being highly dependent on statistics which could be easily manipulated.	- Is applicable mostly for long term goals, towards later stages of Disaster management. -Allows experimentation and feed back into the process. -Appropriate for developing mitigation plans that requires continuous updating. -However has limitation of pushing the community to further uncertainties. *Example of Applicable Disaster Management Models:* Comprehensive Emergency Management (Darbek,1986; Mileti et al., 1995& Quarantelli,1998; Godschalk et al; Alexander,2002; Wamsler, 2006 & Coppola, 2007) Pressure and Release Model (Blaikie, 1994 & Wisner et al, 2004)
Contingency Model: -Produce alternative courses of action to meet unexpected occurrences that may have adverse environmental consequences. *Sources:* Alexander,1988; Christiansen, 1985	*Strengths:* -Used for developing alternative plans for crisis situations. *Weaknesses:* -Not being able to get public confidence.	-Used for crisis situations such as natural or technological disasters. -Pre-disaster based and can be used to develop alternative options to prevent or mitigate a disaster. *Example of Applicable Disaster Management Models:* Comprehensive Emergency Management (Darbek,1986; Mileti et al., 1995& Quarantelli,1998; Godschalk et al; Alexander,2002; Wamsler, 2006 & Coppola, 2007)

Advocacy Model: -Planners are advocates of the community needs *Sources:* Davidoff,1965; Faludi,1996; Marris,1994; Hotovsky, 2002	*Strengths:* -Ideology, planner cannot be neutral. -Cannot serve two masters. -Planning congruent with client values and goals -Environmental outcomes the "survival of the fittest" *Weaknesses:* -One-dimensional and focuses more on to an extent that that leads to manipulating environmental data to fit clients needs.	-Applicable at later stages of disaster management – reconstruction phase. - Is applicable for bottom –up community based approaches. - Requires extensive stakeholder participation and consultation. *Example of Applicable Disaster Management Models:* Community Based Disaster Preparedness (Allen, 2006), Community Based Disaster Mitigation (Maskery, 1989; ISDR, 1994 &2005), Vulnerability approach or Access to resource Model (Wisner et al., 2004).
Participatory Model: -Public input into decision-making process. *Sources:* Arnstein, 1969; Susskind & Cruikshank,1987; Friedmann, 1987 Pearce, 2003; Davidson et al., 2007	*Strengths:* -Participatory democracy. -Dispute resolution, mediation, and negotiation. -Pluralistic view looks for win-win, planning alternative. *Weaknesses***:** -Does not ensure environmental quality.	- A bottom- up approach. -Most appropriate for achieving long term goals and solutions. -Can be used extensively during the reconstruction phase for policy formulation, design of layouts and capacity building. *Example of Applicable Disaster Management Models:* Community Based Disaster Preparedness (Allen, 2006), Community Based Disaster Mitigation (Maskery, 1989; ISDR, 1994 &2005), Vulnerability approach or Access to resource Model (Wisner et al., 2004), Sustainable disaster mitigation (ISDR,1994; Mileti,1999), Holistic Approach (McEntire, 2001)

Transactive Planning: Developed so that people have more control over planning. *Sources:* Friedmann, 1973; Mitchell,1997	*Strengths:* -Face to face dialogue and interaction. -mutual learning from the people affected by the decision *Weaknesses:* -Conflicting personalities among people (power relations). -Unwarranted personal trust.	- Applicable for community based approaches during post-disaster reconstruction. -To achieve long term sustainability of the process and capacity building of the community. *Example of Applicable Disaster Management Models:* Community Based Disaster Preparedness (Allen, 2006), Community Based Disaster Mitigation (Maskery, 1989; ISDR, 1994 &2005), Vulnerability approach or Access to resource Model (Wisner et al., 2004)
Collaborative Planning: Based on power relations, consensus building and collaboration. *Sources:* Innes, 1995; Innes, 1996; Healey, 2003	*Strengths:* - Provides a forum for the local community to mutually debate, rationally consider, and reach a consensus on public issues relevant to plan making *Weaknesses:* -Time consuming.	- Appropriate for use during post-disaster reconstruction for planning and design alternatives. *Example of Applicable Disaster Management Models:* Community Based Disaster Preparedness (Allen, 2006), Community Based Disaster Mitigation (Maskery, 1989; ISDR, 1994 &2005), Vulnerability approach or Access to resource Model (Wisner et al., 2004)

Source: developed by the Author

Table 2.7cont'd: Planning models and Disaster Management

Mitchell (1997) emphasizes that the use of planning approaches is dependent on the situation or the context. This is true, since each planning model is unique, although applicable to different phases of disaster management. The literature is scarce regarding integration of disaster management and community planning. Although Pearce (2003), suggests the ways of integrating disaster management and community planning through public participation; the relevant literature overlooked existing frameworks within the planning discipline which could make disaster management plans (a) comprehensive, (b) adaptive, (c) have clarity in goal setting (incremental), (d) cater to community needs and benefits (advocacy, participatory, transactive and collaborative models), (e) should cope with uncertainty (contingency), (f) be sustainable, and lastly be (g) culturally sensitive.

Although community participation in planning has been used extensively in many disciplines; it is still relatively new in disaster management and planning, particularly in developing countries where democratic participation is usually absent from decision-making processes (Mitchell, 1994; Tosun and Jenkins, 1998). Mileti (1999, p. 2) clearly stresses on the need to utilize community planning and public participation in order to achieve sustainable hazard mitigation. His arguments emphasize the following: (i) maintaining and enhancing environmental quality, which means that human activities should not reduce the carrying capacity of the ecosystem; (ii) maintaining and enhancing people's quality of life; (iii) fostering local resilience and responsibility; (iv) recognizing that vibrant local economies are essential; (v) ensuring inter-and intra-generation equity, which ideally means not to destroy future generation's opportunity by allowing the present generation to exhaust resources and finally (vi) adopting local consensus building. The following section discusses some of the most important concepts in planning that emphasize use of community based approaches.

2.7 Concepts that focus on Community Based Planning Approaches

It is important to understand what the term "development" means prior to discussing the various planning frameworks.

2.7.1 Development Planning:

The term "development" is commonly used to refer to a process through which a society moves from one condition to another or to a progression from a simpler or lower to a more advanced, mature, or complex form or stage. The development could mean economic growth, structural change, autonomous industrialization, capitalism or socialism, self-actualization, and individual, national, regional and cultural self-reliance (Harrison, 1988, p.154). Traditionally, development was defined in terms of western-style modernization achieved through economic growth (Redclift, 1987). The development was based on economic performance, measurements or indicators, such as GNP or GDP. Social and cultural factors were only recognized to the extent to which they facilitated growth (Brohman, 1996; Malecki, 1997). Around 1960's, the understanding of development started to change. According to Goulet (1968),

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development can be properly assessed only in terms of the total human needs, values and standards of the good life. The three core values present for the 'good life' are the sustenance of life, esteem, and freedom. Similarly, the United Nations Development Program for Human Development Report (UNDP, 1990) defined development as the enlargement of people's choices, the most critical being to lead a long, healthy life, to acquire knowledge and to have access to the resources needed for a decent standard of living. As development has various dimensions and because this term is used within various contexts, it does not have a single, universal definition (Pearce, 1989). However, regardless of how development is defined and whether it is considered as being a process or a state, it is unlikely to be achieved effectively or efficiently in the absence of sound planning. Development Planning accommodates different cognitive styles that emerge from very different responses to environmental & societal conditions (Wolfe, 1989). Citizens are in charge of planning, development, decision-making and also provide socio-economic benefits to the community, making community development possible. Development planning is not recommended for short-term initiatives (Wolfe, 1988). Briggs (1999) suggests that participation is a means of community development, which can be achieved by training leaders to make outcomes *effective, efficient and equitable* (Boothroyd, 1986). Participation helps in capacity building and self-determination within a community (Briggs, 1999).

2.7.2 Sustainable Development:

The concept of sustainable development has become 'the term' since the publication of *Our Common Future* (World Commission on Environment and Development, 1987). The most cited definition of sustainable development is the following: "Sustainable development is development that meets the need of the present without compromising the ability of future generation to meet their own needs" (WCED 1987, 43). This concept received much emphasis across diverse disciplines and has become a preoccupation for academicians, planning practitioners and policy-makers since the 1980s. Sustainable development stresses on maintaining natural resources for present and future generations and emphasizes cultural diversity and durable concern for social

issues of justice and fairness, and a strong orientation towards a development that is environmentally beneficial and long lasting (Ahn et.al, 2002; Yang, 2007).

Primarily, the concept of sustainable development has ecological, economic and social dimensions that can be interpreted as; (i) *Ecological Interpretation* that addresses a need for change in current practices in ecosystem management due to depleted natural resources. This requires the use of conservation strategies and maintenance of carrying capacities of those ecosystems (Robinson, 2006; Holling, Gunderson & Ludwig, 2002); (ii) *Economic Interpretation,* suggests that sustainability of economy is achieved by adaptation of economic systems to various uncertainties and changes in the environmental condition (Black, 2005) and ensuring global and intergenerational equity; and finally, (iii) *Social interpretation,* recognizes the extent to which social values and identities, relationships and social institutions can be maintained and adapt to changes in the environment for the future (Brown et al., 1987; Black, 2005). Multiple interpretations, of sustainable development have lead to its criticism (Fowke & Prasad, 1996). This concept gets some clarity with the definition developed by Holling, Gunderson & Peterson (2002) as, "…sustainability is the capacity to create, test, and maintain adaptive capability. Development is the process of creating, testing and maintaining opportunity" (p.76).

The definition closely underscores; (i) that sustainability is linked to adaptive capacity of a system; and (ii) there is a need to create, test and maintain opportunity in order to achieve the process of development. Given the popularity of sustainable development, it is not surprising that it has been introduced in the disaster management field. The introduction of the concept of sustainable development shifts the focus from response and recovery to sustainable hazard mitigation (Pearce, 2003). Although there is less integration between the disciplines of community planning and disaster management, the shift to sustainable hazard mitigation is a bridge that connects both discourses. Sustainable development, be it for hazard mitigation or for general development programs cannot be achieved without effective public participation in the decision-making process. Traditionally, disaster management evolved at the same time as rational comprehensive model, where actions were top-down in nature and the public had little to contribute in decision-making process. Over the years, international organizations have

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emphasized the need for more enhanced co-ordination between small local groups such as the CBO's and the local or national government of any particular country that undertakes a development project. If community planners and disaster managers ignore the local community, then they reduce the chance of providing reasonable solutions to disaster-related issues, especially in the context of the developing countries. There has been a significant debate on public participation for sustainable development, due to the enormous amount of time needed to reach a consensus.

Dorcey and McDaniels, stated that:

Some studies were seen as unproductive in resolving issues and too time consuming and costly. The experiments with public involvement were criticized for delaying the process, overemphasizing the interests of the active publics, usurping the role of elected officials. There were commonly delays of up to two years in responding to recommendations, which frustrated the heightened expectations that had been created by the public involvement and sometimes meant that the recommendations were overtaken by the events (1999, p.13).

Nevertheless, new theories are being applied and with increased education and awareness, a technique such as co-management which is based on citizen's empowerment, is also being applied within the disaster management field (Dorcey and McDaniels, 1999; Pearce, 2003). Another planning model that embraces the uncertainty (Bunch, 2000) of the environment and involves people from various backgrounds is the Adaptive Planning model. When a disaster, man-made or natural, affects the ecosystem, it is interesting to note that the adaptive planning model has been seldom used within disaster management.

2.7.3 Adaptive Planning:

Adaptive planning is an evolving field (Brody, 2003) with its main concept being, *handling the unknown* by learning from trial and error [13] (Holling, 1986). Having an adaptive approach to planning and management is considered to be one of the most effective frameworks for facilitating policy learning (Holling 1978; Armitage, 2005).

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[13] Trial and error requires: a) the experimenter should not destroy the experimenter or cause irreversible changes in the environment. b) People should remain to learn and benefit from the experiment and c) people should be willing to start over in case there is a failure of the experiment (Holling, 1978).

Adaptive capacity is defined by Armitage (2005) as "…ability of a system (social or ecological) to adapt to change and respond to disturbances" (p.706). According to Armitage (2005), the four dimensions of Adaptive Capacity are, (i) learning to live with uncertainty and change by allowing or encouraging small scale disturbance events before there is a buildup of pressures leading to some sort of collapse; (ii) supporting and promoting diversity and highlighting the positive connection between diversity and redundancy as a risk diffusion mechanism; (iii) combining different types of knowledge, including western scientific knowledge and local or traditional knowledge across multiple scales and; (iv) maintaining opportunities for self organization of social, institutional/organizational and ecological systems in the direction of sustainability.

Adaptive planning approach recognizes uncertainty and surprises in systems and depends on the collection of information in case of shortage of resources (Lessard, 1998). The strengths of this approach are the flexibility of the process, continuous learning and self-evaluation, usually under public scrutiny. Adaptive planning recognizes organizational cycles and tries to link diverse interests and functions (Lessard, 1998; Thom, 2000). However, one of the main weaknesses of this approach is that in an uncontrolled system, the cost of the experiment could be high and lead to further uncertainties (Wilhere, 2002). The key to adaptive planning and management is people. Gunderson et al. (1995, p.505) rightly notes that "…an individual with professional understanding who has an intuitive knowledge that the process will help and knows the institutional environment well enough to nurse the process through to completion".

In developing countries, planning (disaster management in this context) comprises of participants that are primarily government planners, scientists, and engineers as well as local and international consultants. Local NGOs and academic researchers are not seen as major contributors (Bunch, 2000). Much can be attributed to the lack of commonality in views and political values. However, communication is by far the most important technique suggested in the literature (Holling, 1978; Dorcey and McDaniels, 1999) that can result in an "Effective Decision Model" (Thomas, 1995, p. 38). The main tool for communication among the various parties could be in the form of public meetings, workshops, and surveys which depends on the degree of public involvement. Adaptive planning has an experimental approach (Holling, 1986; Wilhere, 2002) which is much

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needed in the developing country situation (Rondinelli, 1993a, 1993b; Bunch, 2000) which have high levels of uncertainty, complex management styles and rigid bureaucracies. These factors might act as barriers to the development processes. Recent practices show a slight change in managing development programs and more specifically those related to hazard and disaster management. Scientific methods such as adaptive planning favor information and knowledge as well as emphasize communication among stakeholders. But a proper integration of disciplines cannot be achieved unless various planning frameworks are closely studied and its applicability to disaster management is explored.

2.7.4 Community Based Planning Frameworks:

In the lesser-developed countries, the poorest people live in marginal, often harsh rural environments, directly dependent on local ecosystems (Tyler, 2006). Disaster management, climate studies, natural resource management, urban and rural planning are highly specialized fields. Usually there is little contact between different professional cultures. For instance, understanding disaster management in the context of adaptive planning is a useful tool, as natural disasters are now recurrent events that are spaced out through the time (Brody, 2003). The experimenter[14] (in this case the planner) could have an opportunity to learn and improve from one flood or hurricane to the next one in the context of a given geographical area. Developing mitigation plans or reconstruction plans require technical skills of planners who work with the community, as well as the support from policy makers. Brody (2003) suggests that policy changes concerning hurricanes, floods, and other natural disasters may be based on instrumental forms of learning. Although, this approach is based on scientific experiments, the experimenter is considered to be a part of the larger community, who ensures participation from a diverse set of stakeholders and community members, NGO's and the neighborhood groups.

The sustainable livelihood framework has its strengths in being focused on a process of regeneration of the community (Hinshelwood, 2003) and emphasizes the use of stakeholder participation, the factors affecting livelihood generation and integration of micro and macro issues. The *sustainable livelihoods framework* developed by the

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[14] As defined by Holling (1978)

Department of International Development (DFID, 1999) is widely used for understanding livelihoods, particularly of the poor. Participation, poverty and sustainable development were some of the changing perspectives leading to this framework (Sen, 1981; Swift, 1989; Chambers & Conway, 1992; Moser, 1998). Sustainable development framework gained popularity in a number of development organizations.[15] These organizations used this framework as an operational tool for poverty reduction. The concept of livelihood is drawn upon "…the means of gaining a living, including livelihood capabilities, tangible assets and intangible assets" (Chambers & Conway, 1992, p.9). The sustainability dimension is "…when a livelihood is sustainable and it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base" (Scoones, 1998, p.5). The components[16] of the sustainable livelihoods framework shifted development practices from need-based, resource centered approach towards focusing on people and their capacity to initiate and sustain positive change (Brocklesby & Fisher, 2003). Although people's participation, empowerment and participatory learning continues to dominate community development practice, the idea of 'working with communities' sometimes generates negative reactions. Therefore, the above approach is not very popular among some of the government based development organizations, especially in the context of developing countries (Cohen, 1985; Guijit & Shah, 1998). However, some of the strengths of this framework[17] are: (i) A shift in focus from technology to people (peoples centered); (ii) A shift from emphasis on technical product to process of regeneration of community (Hinshelwood, 2003); (iii) emphasis on multiple interactions between various factors that affect livelihood; (iv) assistance to stakeholders with different perspectives to engage in a coherent debate about the many factors that affect livelihoods; (v) integration of macro and micro issues. One of the major weaknesses of this framework is the failure to consider social variables

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[15] United Nations Development Program, Food and Agriculture Organisations, British Departments for International Development, Oxfam, CARE International, Development Alternatives in India.
[16] The four components are: 1) people conceived to be living within a vulnerability context in which they are exposed to risks, shocks, and seasonal changes.2) People have number of capital assets and this is used to assess peoples overall asset base.3)Assets are drawn on within people's livelihoods activities , i.e. the choices they make to generate livelihood outcomes.4) Policies, institutions and processes are held to shape people's access to assets and livelihood activities , as well as the vulnerability context in which they live.(Brocklesby&Fisher,2003).

[17] The DFID framework was used in this case(see, www.livelihoods.org).

of rank and birth-group power, that may cause development models to be out-of-place and beyond the community politics and cultural premises about equality and inequality (see, for example, Rew & Rew, 2003).

The natural resource management and adaptive co-management framework, stress how natural resources can be managed by increasing the adaptive capacity of a community (Armitage, 2005). The strengths of this approach lie in promoting place-specific governance in which strategies are sensitive to feedback (both social and ecological) and oriented towards system resilience and sustainability (Dietz et al., 2003; Berkes & Folke, 2000). Natural resource management also relates to attributes of *power* (relations between resource users and institutions, distribution of rights and benefits), *scale* (socio-political and economic effects and changing livelihoods systems), *knowledge* (western &traditional), *culture* (norms, values & relationships), and finally *nature* of the community [18](Armitage, 2005).

Some of the design related frame-works were explored, one such being the Eco-Design Framework (Thompson & Steiner; 1997). The main principles of eco-design are; (i) the use of alternatives in design; (ii) integration of technology and economics; (iii) preservation of our traditional wisdom; and (iv) achievement of true progress and true comfort (Ludwig, 2003). This design framework acknowledges that humans are a part of the nature, design solutions are context specific and the best solution can evolve from within the people facing the particular situation (Shipworth, 2003; Ludwig, 2003). A summary of the benefit and limitations of applying an interdisciplinary framework to disaster management is presented in Table 2.8.

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[18] Ethnic, religious, class differentials etc.

Table 2.8: Applicability of an Inter-disciplinary framework in Disaster Management

Planning Frameworks	Description	Benefits and Limitation in relation to post-disaster reconstruction (current research)
Bioregional	Framework to study the complex relationships between human communities, government institutions and the natural world.	**Benefits:** Of understanding a phenomenon from a local context, to a regional context, to a much larger global context. In understanding indigenous people. Combining science and place base knowledge. Restoration and conservation of existing landscapes. **Limitations:** Aspects such as global politics are beyond the scope of the research. Disasters are not always caused due to climate change and climate related hazards are beyond the scope of this research. Communities affected by the Indian Ocean Tsunami are not entirely rural or indigenous communities.
Socio-Ecological (adaptive co-management)	Used primarily to analyze the link between social and ecological systems for resilience and sustainability.	**Benefits:** In understanding relationship between natural resource users and institutions, distribution of rights and benefits (power) socio-political and economic effects and changing livelihoods systems (scale) Integration of western &traditional knowledge norms, values & relationships to the environment (cultural ties) **Limitations:** Based on feedback from experimentation (trial and error). Involves much longer time frames could lead to further uncertainties.
Sustainable Livelihood	Widely used as a tool to understand livelihoods particularly of the poor.	**Benefit:** Important tool in the context of developing counties where maximum impact of disasters is on the marginalized population. Understanding a process of regeneration of community Understanding various factors that affect livelihood. Understanding stakeholder participation for livelihood generation. **Limitation:** Does not focus on the technical product which is an integral part of reconstruction process. Does not consider social variables of rank and birth group which are of equal importance in the context of developing countries.

Community-based natural resource management (CBNRM)	These frameworks (community-based natural resource management) are people centric, stress on opportunities for collective action in rural context where livelihoods are dependent on common resources.	**Benefit:** The communities mostly affected by Indian Ocean Tsunami were mostly dependant on natural resource base such as fishing and agriculture. Stress on collective action **Limitations:** Focus on rural communities. Community to be studied could have mixed characteristics of rural as well as urban population.
Eco-Design	Stress on natural environment along with culture of the community while planning and designing.	**Benefits:** In understanding the use of alternatives in design. Understanding integration of technology and economics. Preservation of traditional wisdom as well as use of new knowledge. **Limitation:** In applicability within existing built environment. People using traditional wisdom may not be having access to new knowledge which drives them to further vulnerabilities. May not leave too many options for livelihoods generation.

Sources: Developed by author, based on McGinnis, 1999; Berkes & Folke, 2000; DFID, 2000; Dietz et al., 2003; Shipworth, 2003; Ludwig, 2003

Table 2.8 cont'd: Applicability of an Inter-disciplinary framework in Disaster Management

Each of the above listed frameworks has been used in the past for various social and environmental issues. Some of the frameworks are directly linked to the *products* of community design in the post-disaster reconstruction. For example, the *bio-regional framework* is linked to conservation and preservation of landscapes, which also is based on place specific knowledge (policies, physical plans). The *eco-design framework* can be linked with physical plans and layouts (mitigation measures, housing layouts, evacuation plans etc.). It is advisable to use new technologies alongside traditional ones, instead of completely avoiding them from use (Ryn & Cowan, 2007). In some rural areas of Indonesia, which were also affected by the Indian Ocean Tsunami of 2004, communities developed plans, where natural barriers from sea are made with mangrove forests, coconut and pine plantations. Villagers have also planned special escape pathways and evacuation centers in the nearest hills or high-grounds to protect themselves from high tides and tsunamis. Traditional building material such bamboo is used for construction

and houses were designed to be on stilts to protect people from high tides. These villages are now termed as Eco-Villages (Housing by People in Asia, 2005). A few other theories, such as "design with nature" (McHarg, 1992) and "sense-of-place" (Farnum, Hall & Kruger, 2005) were revisited to explore creative solution to reduce vulnerability of those populations that are at risk to disasters. It is understood that using one or the other framework exclusively would not provide new directions of disaster management. Each of the frameworks addresses cultural sensitivity, including the ecological design concept, which strikes a balance between short-term and long – term comfort, nature friendly designs, and long term sustainability. An all inclusive interdisciplinary framework (see, Table 2.8), provides the basis for discussions and assessment of post-disaster reconstruction. The results are presented in Chapters 5 & 6.

2.8. Summary:

Disaster management literature shows a change in focus from dealing with specific hazards as the main cause of disasters to vulnerability as the root cause of disasters (Blakie et al., 1997; Pearce, 2003; McEntire, 2004). McEntire (2001) and Pearce (2003) argue that there is no common conceptualization of vulnerability. The "holistic framework" that was developed by McEntire (2001), directs attention to vulnerability as a dependant component of disaster, which is further determined by the degree of risk, resilience, susceptibility, and resistance to disasters. Recently, Gallopin (2006) conceptualized vulnerability as the component of exposure to perturbations or external stresses, sensitivity to perturbation, and the capacity to adapt. *Sensitivity* is understood as the degree of modification as a result of the impact of internal or external disturbances. The ability of the system to respond and adjust to disturbances is seen as the *capacity of response*. Finally, *exposure* is considered to be the degree, duration or extent (time and spatial scales), in which the system is affected by the perturbation resulting from the given disaster. Gallopin (2006) conceptualizes vulnerability in a broader environmental context, including disturbances in systems due to disasters. However, the framework

developed by McEntire (2001) is much more contextual[19] in terms of understanding why vulnerability to disasters increases in certain communities (see, Table 2.9).

Table 2.9: Vulnerability issues

Physical	A) The proximity of people and property to triggering agents. B) Improper construction of buildings. C) Inadequate foresight relating to the infrastructure. D)Degradation of the environment.
Social	A) Limited education (including insufficient knowledge about disasters).B) Inadequate routine and emergency health care. C) Massive and unplanned migration to urban areas. D) Marginalization of specific groups and individuals.
Cultural	a) Public apathy towards disasters. B) Defiance of safety precautions and regulations. c) Loss of traditional coping measures. D) Dependency and absence of personal responsibility.
Political	A) Minimal support for disaster programs among elected officials B) Inability to enforce or encourage steps for mitigation C) Over-centralization of decision making D) isolated or weak disaster related institutions.
Technological	A) Lack of structural mitigation devices. B) Over-reliance upon or ineffective warning systems. C) Carelessness in industrial production and d) Lack of foresight regarding computer equipment/programs.
Economic	A) Failure to purchase insurance. B) The pursuit of profit with little regard to consequences. C) Sparse resources for disaster prevention, planning and management. D) Growing divergence in the distribution of wealth.

Sources: Based on McEntire, 2001

The above issues are some of the factors leading to vulnerability and are relevant to conditions in the developing countries. In order to reduce vulnerability, a deeper understanding of the societies that are often traditional and complex is needed. Vulnerability in the context of developing counties is much more complex as the affected *population* by far outnumbers the *available resources*. A complex society could mean; (i) resources imply natural (land, water & forest), economic, and human resources (knowledge and skills); (ii) culture, described as traditional *beliefs*, *values* and *practices* are still followed and are deeply embedded in community psyche; (iii) although, *education* has changed people's perception of *gender*, *birth groups* and *class factors* still persist and finally; (iv) birth groups and class factors has also raised questions on issues related to *social equity and power* (e.g., the poor get huts after reconstruction and the rich get mansions). There is a sizeable gap between disaster management studies and planning (community) practice initiatives which results in faulty planning practices, especially for

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[19] Context – a) Developing countries, b) Specific to disasters issues

the development of programs undertaken in developing countries. Post- disaster reconstruction shows that there is a need to link both the planning and the disaster management disciplines.

In light of the literature review and the research objectives, a conceptual model was developed for studying post- disaster reconstruction (see, Figure 2.2).The conceptual model was developed to guide the research, keeping *vulnerability* as the core issue to be addressed throughout the research. So far there has been very little research has been conducted that suggests an interdisciplinary approach connecting planning literature with the disaster management literature. The model suggests that *vulnerability (what needs to be addressed)* of communities needs to be addressed as the core issue. Literature review emphasizes that time and again concepts of sustainability, resilience and adaptability need to be revisited in order to reduce vulnerability to disasters (*why is it important*). And finally, the connections between disaster planning and development could be established by using interdisciplinary frameworks (*how*).

Figure 2.2: Conceptual Model for Post-Disaster Reconstruction and Development
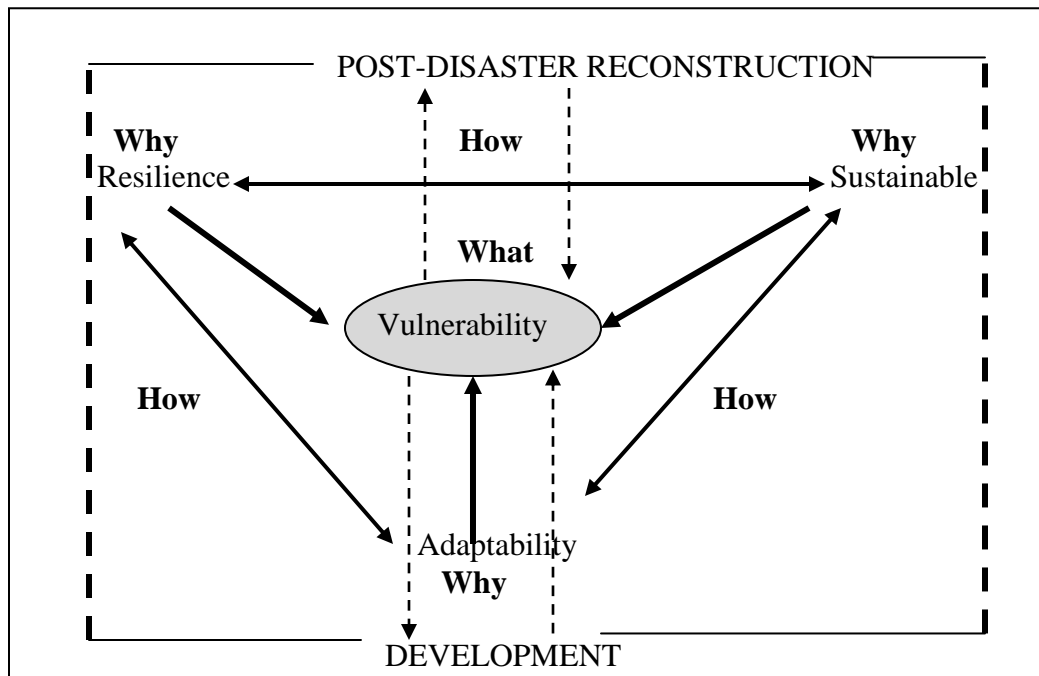
(The thickness of the lines shows the order of significance of each of the factors. The dotted line signifies the gap (interface) between disaster planning and development)
Source: *Developed by the author*

In this chapter, the theoretical context is presented through a detailed review of disaster management and planning literatures relevant to post-disaster reconstruction. The research will attempt to speak for marginalized or disadvantaged stakeholders such as the Tsunami victims of India, and explore means to involve them into a more effective disaster management process.

Chapter 3: Methodology

3.1. Introduction

This chapter addresses the study methodology, outlining research design, data collection, analysis methods and study limitations. Section 3.1.1 discusses the details and experience in the field research and the research approach adopted in the field work. Section 3.2 describes the method used to develop an evaluative framework which uses indicators to assess the reconstruction process. Section 3.3 presents the research design and the research chronology. Section 3.4 outlines the data collection process and methods used in the research. Section 3.5 explains the data analysis methods employed. Section 3.6 discusses the influences, research challenges, limitations and section 3.7 concludes with a brief summary of the chapter.

3.1.1 Field Research Approach:

In a post-disaster condition, the first two years are devoted to the relief and rehabilitation of the affected population. The subsequent reconstruction process may take longer than a traditionally accepted five-year period (Shaw, 2006). The reconstruction phase of disaster management is crucial for capacity building of the community, making improved development changes, and preparing communities for future uncertainties by effective preparedness and mitigation programs (Umemoto, 2001). This requires employing cross-cultural knowledge, conducting constant monitoring and updating of reconstruction plans (Shaw, 2006). This could be achieved by critical evaluation of (assessing) an on-going reconstruction process (such as the post- Tsunami of 2004), by utilizing the knowledge from literature as well as learning from and understanding the experiences of the concerned community (Brody, 2003). However, this poses challenges of (a) how to assess (measure) 'success' of a reconstruction process and (b) who defines 'success'.

Babbie (1989) describes field research as a social research method that involves direct observation of social phenomena in their natural settings (p. 288). Many of the techniques used in this research method have been developed through the work of anthropologists (Silverman 1985). Field methods are more like an umbrella of activity

beneath which various techniques may be used for gaining the desired outcomes (Schatzman and Strauss, 1973). From February 2008 to September 2008, intensive field research was conducted in the Tamil Nadu coast of India. The cultural background and previous research experience of the researcher in India contributed much to the study. The researcher grew up in India and was familiar with the local government systems and economic settings. Knowing the local culture and value system assisted her to launch the field research quickly. The fact that English is an official language in India proved to be extremely convenient as majority of the population in Tamil Nadu could speak English as well as Tamil. Translators were used by the researcher in rural areas to gather field level data (household interviews and focus group interviews). The researcher made two visits to the study area. The first visit aimed to make field level arrangements as well as to conduct pre-tests with a sample community. During the second visit, the researcher spent four weeks in Chennai (urban study area) and another four weeks in Nagapattinam (rural study area). As a consequence, field level data collection was completed. During the second visit, the researcher was able to meet a number of people involved in the reconstruction process. This discussion contributed to this research and towards field work. Field level enumerators were trained and worked along with the researcher in all the three communities during data collection phase as well as during community meetings. Local NGO's were approached to develop the contact between the researcher and the village authorities. The village head played a crucial role as a mediator to disseminate information to the participants of the research. By securing the support of the village authorities and the population, the field work completed smoothly.

3.1.2 Research Approach:

A multi-case study approach was adopted in the research to collect data. A case study is an in-depth examination of a single instance of some social phenomenon, such as a cultural group, a village, or a family (Babbie, 2004). This method is known for its simplicity, flexibility, and capacity to collect qualitative data (Borse, 2004).

By using this approach, different perceptions and patterns of the study evolved and a comparison was made between the rural (Nagapattinam, Tamil Nadu) and the urban population (Chennai, Tamil Nadu). Using a multi- case approach verses a single-case

study design; generalization of the study can be made to a broader theory and not to a specific population. The single case approach is criticized as being externally invalid (Hostovsky, 2002), condition specific, and not valid be generalized to other research settings (Yin, 1994; Miles& Huberman, 1994). A single case study is used in case of exploring a pilot study. Where as in this research there were number of areas investigated. The case study approach is preferred for asking questions such as "why" or "how", that could be qualitative in nature (Yin, 2002, p. 1). It can be defined as holistic method to gain an in-depth understanding of a phenomenon in its real life context, using various sources of evidence. Flyvbjerg (2006) notes that, "context-dependent knowledge and experience are at the very heart of expert activity. Such knowledge and expertise also lie at the centre of the case study as a research and teaching method or to put it more generally still, as a method of learning" (p. 222). It is sometimes argued that case studies are likely to reflect the bias of a researcher, who is the primary instrument of research design, data collection, and analysis. However, Flyvbjerg argument about the potential for social sciences research to develop relevant theory is explained by saying that:

> The closeness of the case study to real-life situations and its multiple wealth of details are important in two respects. First, it is important for the development of a nuanced view of reality, including the view that human behavior cannot be meaningfully understood as simply the rule-governed acts found at the lowest levels of the learning process and in much theory. Second, cases are important for researchers' own learning processes in developing the skills needed to do good research. (Flyvbjerg, 2006, p. 223)

Nevertheless, bias is not restricted to this method and can enter any method (Yin, 1994). For effective data collection in a case study, Yin (1994) lists some principles: a) using multiple sources of evidence, b) creating a case study database separate from the final report, and c) maintaining a series of evidence, that is to say, "explicit links between the questions asked, the data collected, and the conclusions drawn" (p.83). Triangulation of data was utilized to limit personal and methodological biases and achieve a convergence of results (see, Fig.3.1). Triangulation has been proposed as a means for improving the credibility, dependability and objectivity of study findings (Yin, 1993; & Decrop, 1999). Different data sources were used for triangulation including both primary and secondary sources of information.

3.2. Indicators method to assess the reconstruction process

In order to collect primary data from the field, indicators to assess the reconstruction process were first developed. An *Indicator* can be defined as "…a parameter, or a value derived from parameters, which points to or provides information about and describes the state of a phenomena/environment/area with a significance extending beyond that directly associated with a parameter value"(Pizzonia, 2006, p.4). There were a number of theoretical approaches to develop indicators, most of which focused on the assessment of vulnerability. One of the key models that elicits factors that causes severe damage and how vulnerability could be reduced is the most commonly used the 'Pressure and Release' (PAR) model (see Fig 3.1). The Pressure and release model[20] (PAR) developed by Blaikie et al, 1994 and Wisner et al. (2004) was a simple tool utilized to understand; (a) how the impact of disasters increases when natural hazards affect vulnerable people; and (b) how vulnerability is generated by economic and political systems. The PAR model was developed with an idea that disaster is an intersection of two opposite forces; a) those processes that generates vulnerability on one end and; b) the natural hazard event (or a natural process). The impact on a community is as a result of increasing pressures from both the directions as well as vulnerability to hazards (severity of impact based on the dynamic pressures). The conceptualization of pressure 'release' was to relieve pressures, for which vulnerability has to be reduced.

The 'pressure release' concept suggests not just to focus on the technical aspects of reducing impacts of natural disasters, but to try and achieve an outcome that is *safe*, *sustainable*, *renewed livelihoods*, and a *resilient* community (Wisner et al., 2004 & Blaikie et al., 1994). Some of the factors that reduce the pressure on the community such as local institution, education, training, local markets, reduction of debt or repayment of loans are examples of some of the indicators that were evaluated during the research. The pressure release model (see, Fig. 3.1) gave the researcher a platform to understand factors that need to be addressed to reduce the impacts (pressures) of disaster and achieve safe conditions for a community.

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[20] Pressure and Release Model: Disaster Risk=Hazard xVulnerability

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Figure 3.1 Pressure and Release (PAR) model: The Progression of Vulnerability

THE PROGRESSION OF VULNERABILITY

| 1 | 2 | 3 | | |
| ROOT CAUSE | DYNAMIC PRESSURE | UNSAFE CONDITIONS | DISASTER | HAZARDS |

Limited access to

Power
Structures
Resources

Ideologies

Political systems
Economic
Systems

Lack of
Local Institutions
Training
Appropriate silks
Local investments
Local Markets
Press freedom
Ethical standards in
public life

Macro- Forces
Rapid population growth
Rapid urbanization
Arms expenditure
Debt repayment schedules
Deforestation
Decline in soil

Physical Environment
Dangerous locations
Unprotected buildings and infrastructure

Local economy
Livelihoods at risk
Low-income levels

Social Relations
Special groups at risk
Lack of local institutions

Public actions and institutions
Lack of disaster preparedness
Prevalence of endemic disease

Risk=Hazardx Vulnerability

R=H x V

Earthquake

High winds (cyclone/hurricane/typhoon)

Flooding

Volcanic eruption

Landslide

Drought

Virus and pests

Tsunami

Source: Wisner et al., 2004

The PAR model developed by Wisner et al, 2004 in a way defined the complex systems of interaction between hazards and human systems, which again has impacts on the pattern of assets and livelihoods (for example after the tsunami of 2004, people were relocated). Further Wisner et al 2004, proposed a second dynamic framework which was called the 'Access' model (see, Figure 3.2), which was very significant for this research especially in developing the indicators listed in Table 3.2 of this chapter. The 'Access' model expand on the factors that lead to unsafe conditions as result of dynamic economic and political processes that are responsible for allocation of assets, income and other resources in a society (Wisner et al, 2004). The model clearly suggests how social systems lead to conditions such that different communities are impacted in divergent ways due to hazards.

Source: Wisner et al., 2004

The distribution of impacts of disasters are also determined by the pattern of distribution of wealth and power (Wisner et al, 2004). Therefore the current research identifies a need to understand how such factors such as 'access' to resources of all kinds has an impact on vulnerability of communities. Based on the sustainable livelihoods frame work (DFID, 2000) 'access' involves the capacity of a individual, family, group, class or community to use resources that are required to secure livelihoods to lead a normal life and for disaster affected communities to adapt to new conditions. The 'Access' model (see, Fig.3.2) has two tenets, the first called the *social relations*, which includes "the flows of goods, money and surplus between different actors (for example, merchants, urban rentiers, capitalist producers of food, rural and urban households involved in various relations of production and endowed with a particular range and quality of access to resources)" (Wisner et al, 2004, p. 100). The second tenet is termed as *structures of domination* which is based on the politics of relations between people at

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various levels. These may be in the form of relations within household members (men and women, children and adults and seniors and juniors). This tenet is particularly important in the context of the Tsunami affected communities of India, where relationships between various groups (such as employer and worker or members of different class, ethnicity and religion) play a dominant role. At the same time, relationships such as these are particularly important in post-disaster scenarios. Structures of domination also play a vital role in making communities more resilient to shock and stress. Relationships at the highest level such as between the community members and the government are of particular interest at the time of community consultation (Wisner et al, 2004). The Access model was developed originally drawing on the five dimensions of Sustainable Livelihoods (human capital, social capital, physical capital, financial capital and natural capital). The Access model is "essentially dynamic, and iterates through time to provide a precise understanding of how people are impacted by a hazard event and their trajectories through that event" (Wisner et al, 2004). The smallest decision making unit for this research is at the 'household level'. The Access model developed for analyzing vulnerability is also developed for the household level, which again can be used for interactions between various groups. Access to resources model lists various material (tools, equipment, reserves of food and jewellery) and non-material 'resources' (such as knowledge, skills, and membership to an organization etc.). These resources are also listed in the Sustainable Livelihoods framework (DFID, 2000). Access to material resources also has other components such as, rights (property rights, rights accruing to women in marriage etc.) which could change in a post-disaster scenario (Wisner et al, 2004). In the context of complex societies such as, those where transactions include taboos, untouchability and gender division, this model plays an important role in elicitation of factors that may push communities to further vulnerabilities. Access to common property (CPRs) such as trees, pastures, ground or surface water and wildlife are of also great importance. Markets are another area for assessment, as essential goods and services often rise after a sudden disaster, such as food, shelter, clothing and health (Wisner et al, 2004).

More recently Birkmann (2006), Bogardi and Birkmann (2004) and Cardona (1999) developed another framework that underlines that vulnerability assessment needs

to take into account factors such as exposure, susceptible elements and coping capacities of communities. These factors instead may have a bearing on the likelihood of harm and injury due to a hazardous event such as the tsunami. This framework was based on the concept of sustainable development (UN, 1993; WCED, 1987) and addressed vulnerabilities in terms of the three pillars of sustainable development; social, economic and environmental factors (Brikmann & Fernando, 2007). The following is a description of the method used to develop indicators for assessing an on-going reconstruction process, post-disaster.

Evaluative method for Indicators

Evaluative methods are usually descriptive methods used to deal with complex conditions (Walliman, 2005). One of the properties of such methods is that the evaluation should be action oriented and define a course which can be practically followed and stimulate the carrying out of its recommendations (Guba and Lincoln, 1989, p.8-11). The purpose of using this methodology in disaster related research can be primarily to examine projects or ongoing programs and to prescribe changes to improve and develop the situation and give better description to it (Robson, 1993, p.170-9). Evaluations can be primarily categorized as *formative* or *summative* evaluations. Formative methods of evaluations are those that strengthen or improve a process or an objective being evaluated. It helps by "…examining the delivery of the program or technology, the quality of its implementation, and the assessment of the organizational context, personnel, procedures, inputs, and so on" (Trochim, 2006). Whereas summative evaluations are those that examine the outcome of a process or an object and describes "…what happened subsequent to delivery of the program or technology; assessing whether the object can be said to have caused the outcome; determining the overall impact of the causal factor beyond only the immediate target outcomes; and, estimating the relative costs associated with the object or process" (Trochim, 2006). For the purpose of this research, the summative method was appropriate for developing the framework for indicators. Cuny (2001) suggests that there are many ways to assess a program in the context of disaster management. However, every program generates specialized criteria, which is used to decide whether the project has met its goals and objectives. Usually,

assessment of post-disaster reconstruction processes are carried out by various aid agencies, local NGOs or the government mostly on a project to project basis (such as housing and settlement, or health care). These assessments are again based on short-term or immediate and long-term or developmental goals (Cuny, 2001). Evaluation of disaster response has been again critiqued as not having a structure that is much required for maximizing its utility (Cuny, 2001). Agencies have some type of formal program assessment and reporting purposes in order to identify how well these organizations have achieved their goals and objectives. These are done mostly in terms of impacts assessments that include the 'seen' and the 'unseen' factors. Numerous empirical studies also exist within the discipline of disaster management that have evaluated various components or stages of post-disaster management using different methodologies (for example see, Gokhale, 2005; Birkmann and Fernando, 2007; Steckley, 2006 and Baumwoll, 2008) and different models. These studies were also driven by their discipline and the area of interest for exploration; therefore they were specific to some aspect of post-disaster conditions of the affected community.

One of the main objectives of the current research is to develop indicators that can be used for evaluations of reconstruction processes in future. Since the focus of the study is also to integrate planning theory and disaster management theory within the frameworks of community based planning, the methodology used to develop sustainability indicators (Reed, 2006) was assessed to be appropriate for the study. At the same time the vulnerability models (PAR and Access to Resource), the Sustainable livelihoods framework (DFID, 2005) and the Eco-Design framework assisted in developing the indicators. The researcher used a *pragmatic approach* to measure success of the reconstruction process by developing an evaluative framework for indicators.

In order to develop the indicators to assess the reconstruction process, firstly, four objectives developed based on the literature review were pre-set. The processes involved in post- disaster reconstruction are directed towards:

a) Physical and Psychological Restoration of the community;
b) Capacity Building and Livelihood Restoration;
c) Sustainability of the Planning and development intervention; and
d) Cultural sensitivity of the initiatives, and social capacities of the community.

Reed (2006) and Mitchell (1995) listed out certain criteria that are important while selecting the indicators (see, Table 3.1). The evaluative framework (see, Table 3.2) was designed based on the major part of the criteria listed in Table 3.1. Each of the criteria was numbered and correlated to the indicators listed in the evaluative framework to ensure accuracy and consistency (see, Table 3.2). Some other indicators were selected based on the development indicators and quality of life indicators laid down by the World Bank organization (see, www.worldbank.org).

Table 3.1: Criteria to select indicators based on objective criteria and ease of use criteria

No.	Objective criteria	No.	Ease of use criteria
i.	*Indicators should be* – bias free	viii	Be easily measured
ii.	Accurate and consistent over space and time	ix	Make use of available data (existing data)
iii.	Assess trends over time	x	Have social appeal and resonance
iv	Provide timely information	xi	Be cost effective to measure
v	Be scientifically robust and replicable	xii	Be rapid to measure
vi	Be relevant to the local environment	xiii	Be clear and unambiguous and easy to understand and interpret
vii	Have a target level, baseline or threshold against which to measure them	xiv	Simplify complex phenomena and facilitate communication of information
		xv	Be limited in number
		xvi	Measure what is important to stakeholders
		xvii	Be easily available to decision makers
		xviii	Be diverse to meet the requirement of different users
		xix	Be linked to practical action
		xx	Be developed by the end user

Source: Reed et al., (2006) & Mitchell et al., (1995)

Based on the above table, some of the more critical criteria were selected while designing the indicators. Some of the more suitable criteria were those that provided timely information, easily measurable, unambiguous and easy to understand and interpret and relevant to the local environment.

3.2.1. Developing an evaluative framework from specific indicators:

The researcher considered that there are certain inputs[21] during the reconstruction process, which result in certain outcomes. The evaluation of these outcomes[22], becomes the indicators (parameters), used to measure the success of the process (Pizzonia, 2006). The general framework presented in Table 3.2 was developed based on the reviewed literature on sustainable development indicators[23] and other reports by UNDP[24] and Geo Environmental Indicators (Pizzonia, 2006).

Table 3.2 General Framework for developing indicators

Objectives for reconstruction	Inputs (processes)	Outcomes (Indicators)	Examples of measurable Indicators	Criteria for selection
Physical &Psychological Restoration of communities	Housing	Type, quality, need based	Type: Detached, semi-detached, row housing, multiple floors or single floor Quality: Temporary thatch, permanent (tin roof), concrete	i, iv, vi, viii, xiii, xvii, xix
	Infrastructure	Water supply quality and quantity, road network, electricity, sanitation	Source of water supply: Municipal, hand pump, dug well Sanitation: Out side the house, community facility, no facility Road: distance of house from sea, permanent or temporary road.	i, iv, vi, viii, xiii, xvii, xix
	Education	Schools repaired or newly built	Distance of schools in minutes School providers: Government, NGOs, religious organization	i, iv, vi, viii, xiii, xvii, xix
	Food and Health	Food supply in the Markets, Health care centers, counseling centers, mental healthcare centers, orphanages.	Markets: Distance in minutes (walking) Distance of health care and counseling centers in minutes, benefited or not Providers of the facility	i, iv, vi, viii, xiii, xvii, xix

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[21] Inputs*: the human, material and financial resources required to conduct the activities that permit the production of outputs. The term 'inputs' is used in the "Logical Framework Method" (LFM) developed for environmental projects and widely accepted by international aid institutions such as CIDA (1997).

[22] Some of the results could be in the form of statements and some of them would be statistical data

[23] See- www.hq.nasa.gov/iwgsdi/Welcome.html (sustainable development indicators)

[24] See – UNDP- country wide program for India-2003-2007, http://hdr.undp.org/

Livelihood restoration and capacity building	Jobs	Return to former jobs/businesses or industry, or employed in new jobs	Exact nature of work, Type of changed work Time taken to return to jobs or businesses	i, iii, iv, vi, viii, xiii, xvii, xix
	Incomes/Earnings	Consumption basket	Monthly earning, earning of other members, investments, savings, earnings from other sources, able to pay back loans, total credits	i, iii, iv, vi, viii, xiii, xvii, xix
	Social Networks	Community Based Organizations (CBO's), Formation of Self-help groups, training centers, information centers.	Part of a CBO, distance of information centers, type of information	i, iv, vi, viii, xiii, xvii, xix
	Banks	Local micro finance, return of loans and credits, savings	Sudden need of financial assistance, help received from government agencies	i, iv, vi, viii, xiii, xvii, xix
	Food	Access to food and nutrition	Period when family has to go without food, during tsunami, for a few days in a year, never enough, surplus	i, iv, vi, viii, xiii, xvii, xix
	Education	Enrolments in schools, training for new skills, increase in knowledge about hazards and future risks	Children enrolled in school, dropped out, in other schools Types of new skills, preparedness programs by government or NGOs	i, iv, vi, viii, xiii, xvii, xix
Sustainability of Planning and development intervention	Technology	Warning systems, Technology transfer (IT), Use of scientific and local knowledge for physical reconstruction.(local material, community mapping),future risk and hazard analysis.	Methods used for awareness, word of mouth, radio, television Type of building material, type of fuel used for cooking, safety measures taken to protect from hurricanes or storms, Waste management	i, iv, vi, viii, xiii, xvii, xix
	Policies	Changes made to Urban and rural development policies, (coastal regulations) Implications of policy changes.	Awareness of policy changes, byelaws, ownership laws Affect of relocation and distance from sea in terms of added costs and loss of jobs	i, iv, vi, xiii, xvii, xix
	Organization	Multi-stakeholder participation	Level of participation as member, representative, leader or chief Frequency of meetings, decisions made	i, iv, vi, viii, xiii, xvii, xix
Cultural sensitivities and social capacities	Religion	Cohesion and sensitivity	Celebrate festivals together, existence of religious sites	i, iv, xvii, xix
	Gender and age	Gender sensitivity, female education, special care for old and young (old age home and day care centers)	Women work along with men, girls encouraged to go to school, existence of old age homes and day care centers	i, iv, vi, xiii, xvii, xix
	Social institution	Castes, cultural groups, families and households, religious groups, social conflict resolution, improvement of relationships.	Overall quality of life	i, iv, vi, xvii, xix

Source: Developed by the author

Table 3.2 cont'd: General Framework for developing indicators

Based on the general framework for indicators, semi-structured interviews and questionnaires for surveys were designed to collect data for the research.

3.3 Research Design

Both qualitative and quantitative techniques were used to collect data for each of the indicators. Ethics clearance was obtained from the University of Waterloo's Office of Research Ethics. The research was based on the case study approach that provides the opportunity to investigate the issues proposed in the research by focusing on selected communities. Key informants were selected based on the criteria laid down by Neuman (1991). A key informant is "...a member with whom a field researcher develops a relationship and who tells about , or informs on, the field" (Neuman, 1991, p.369). The criteria for selection was:

1. A person familiar with the case through years of intimate experience and who was in a position to witness key events,
2. A person currently involved in the case
3. A person who can spend time with the researcher
4. A member of the community who suggests non-analytic perspective of the case.

Figure 3.3: Triangulation: multiple data collection methods & sources to investigate Post-disaster reconstruction process in fishing communities.
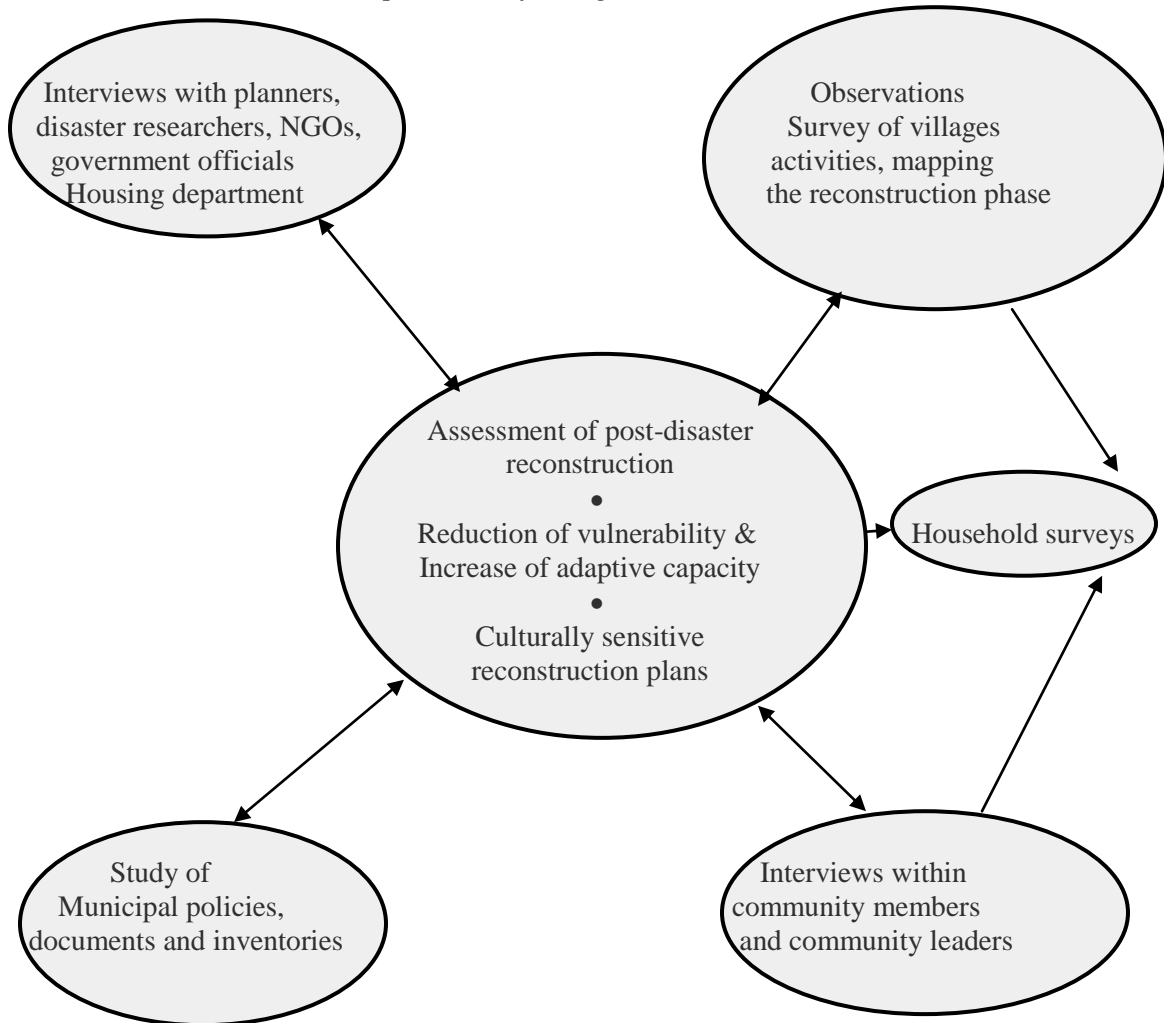
Adopted from Yin 1994, p.93

3.3.1 Research Chronology:

The research design consisted of four phases. Since the research involved population that was recovering from a natural disaster, questionnaires and research methods were pre-tested in two sample communities before the actual field work took place. This was the first phase of the research. The second phase involved the identification of areas where household surveys were to be conducted, developing local contacts, and the collection of the initial data. In the third and the fourth phases the surveys and interviews were carried out with the community, as well as with the representatives of the local NGOs /CBOs and the Government.

Table 3.3: Research Chronology

Phase one: Pre-tests	Phase two: Recognizance Survey	Phase three: Survey of Fishing communities	Phase four: Focus group interviews
a. Six household surveys and one community meeting was conducted to test the questionnaires and the recruitment process that was used later in the actual research	a. Identification of the areas where household surveys were to take place b. Collection of secondary information, such as demographic data & maps for the study areas. c. Development of the contacts for field level assistance	a. Recruitment of the participants and permissions to conduct interview from village heads'. b. Household interviews c. Observation of study area (notes & photographs)	a. Information dissemination for community meeting, meetings with NGOs and with Government officials. b. Focus group community meeting. c. Meeting with the representatives from local NGOs. d. Follow-up meeting with Government representatives e. Secondary data collection

3.4. Data Collection

3.4.1 Phase I: Details of the Pre-test:

Based on the recommendation from the research and the ethics committee, the researcher carried out pre-tests few months prior to the actual research. During a sort term visit to her home country (India), the researcher spent a few days making pre-arrangements for the research. The researcher visited parts of Tamil Nadu in order to decide which of the rural communities to be surveyed, as well as to arrange local enumerators who helped out during the household interviews and translation of community meetings. The researcher spent 3-4 days in two rural communities in the southern part of Tamil Nadu (Nagapattinam). With the help of the local NGOs, the researcher was able to get permission from the *village head* to carry out six household surveys and one community meeting. With the assistance of two enumerators, who were trained to carry out pre-tests, most of the material prepared for the field work, such as the

recruitment letter, information letter, and the survey forms were tested in these communities. The enumerators were graduate students from the Government Arts College (Kumbhakonam) perusing masters program in geography and belonged to the region where the actual research was to be carried out. They were fluent in both the local language (Tamil) and in English (official language in India). The field instruments such as the recruitment process and the individual house-hold survey and community meeting was timed while being tested. Consequently, some alterations were made to reduce the length of the household questionnaire. During the training session, the researcher went through each question in the household questionnaire, ensuring that the enumerators were able to understand how they were to pose the question and how they were to respond to the participant. Since, the study involved participants who were impacted by a natural disaster, it was probable that they would recall the past memories and go into a state of distress. Therefore, care was taken the enumerators were sensitized in case such situation arose. They were trained to be polite, patient and have a caring attitude during the interview sessions. The researcher accompanied the enumerators to all the pre-tests. Notes were taken for all the observations made in the field. A total number of six samples were randomly picked from the two communities.

On the first day of the pre-test, three households were selected from one village. Some of the houses were numbered. The first house, the tenth house and the thirtieth house were interviewed. In all cases the person who answered the door would agree to go through the interview session. The information letter was read out to them and handed to them before the interview started. A written consent letter was not required in every case, and sometimes an oral consent was accepted. The participants co-operated in all the cases, mainly because the researcher was a student and did not represent any commercial organization. Three interviews were carried out in the first day and another three in the second day. Each of the six interviews took around 30-40 minutes. There were no cases of distress. On the contrary, sometimes the participants were eager to tell their stories, fearlessly. Only one focus group meeting was carried out on the 3rd day of the pre-test with one of the communities out of the two villages. The focus group meeting was held as a pre-test in the office of the village head and was attended by five members of the community. The members were aware that this was a pre-test and not the actual research.

They were also told that their participation was voluntary and that they could refuse to be involved at any point of the session. The community meeting continued for thirty minutes, and the session was concluded with a thank you note from the facilitator and the remuneration was handed out to the participants. During the session there was no incidence of distress. Knowing that communities suffering from a disaster would in the future benefit from this research, people were very enthusiastic and supportive to the study. The local village head made the researcher aware that the government opened psychological counseling centers and health centers in every village after the Tsunami (although most of them ceased to exist by the first quarter of 2008). The researcher included referral list of some of these psychological counseling centers in the research. Results of the pre-test were discussed with the thesis committee as well as with the ethics committee to obtain the final ethics clearance.

3.4.2 Phase II: Reconnaissance Survey:

The researcher conducted an extensive recognizance study in order to identify the study areas and the population to be interviewed. Visual surveys, pre-tests and examination of some of the secondary data (demographic, maps etc.) helped in developing the strategies for the field work.

Discussion

The researcher spent the first few days developing contacts in the capital city of Tamil Nadu, Chennai. Most of the government officials who were involved in the reconstruction process (post-tsunami of 2004) had their offices in the capital city. The researcher also spent some time developing a network within the research community, some of whom were working as faculty members in the Madras (Chennai) University. Discussions with both government officials and independent researchers who were working on Tsunami affected communities, helped the researcher in identifying some of the areas were relocation was completed or reconstruction was still on its way. Following the discussion, two such areas located in the northern fringe areas of Chennai were visited for a visual survey.

Visual Survey

The researcher conducted visual studies in two locations, Tsunami Nagar and VOC Nagar in the Northern Fringe areas of Chennai. The researcher was accompanied by a free lance worker, who had been working on the issues of tsunami rehabilitation with various organizations over the past three years, and therefore was familiar with the location of these communities. The researcher drove through the entire Northern coastal stretch of Chennai and took photographs to get an initial visual impression of the surrounding neighborhoods and districts. The researcher also took note of the small fishing communities that were still residing in the most vulnerable locations, its proximity to the sea, urban/rural features and the surrounding landscape. During the pre-tests, a similar visual survey was carried out a few months before the actual research took place in rural parts of Tamil Nadu. The visual survey alerted the researcher to the facts and changes with regards to the post-tsunami reconstruction process. For example, a number of fishing households were returning to their original homes despite being provided with new homes (see, details in Chapter 5 & 6). In addition, the visual and document surveys helped the researcher to determine the sample size for the household survey and to plan the schedule for the field work.

Survey locations

Document analysis of demographic information, visual surveys and discussions helped the researcher in deciding the locations where household surveys were carried out. Three areas, comprising of one urban setting and two rural setting were finalized for the survey. The urban location, *V.O.C Nagar*, was a newly built area, comprising of 920 relocated households. The two rural locations were *Akkarapetti* and *Kechanukupam* in the Nagapattinam district of Tamil Nadu (see, Chapter 4 for details). Both locations comprised of 250 households, with some new housing and some in-situ housing. Sample sizes were decided based on the total household numbers.

3.4.3 Phase III: Household Survey of Fishing Communities:
Population and Sampling

In this study the "population" implies primarily fishing communities that were affected by a natural disaster and were being rehabilitated. These fishing communities were involved in the fishing industry as wage workers, as boat owners, net makers, fish sellers or fish catchers. However, the entire households were not necessarily involved in the fishing industry. Results from interviews that are discussed in chapter 5, showed, that occupational patterns were changing in both urban and rural areas. The worst impact of the Tsunami on housing and habitat was detected in the coastal areas of the State of Tamil Nadu. Therefore, one of the major issues to be investigated was Post-Tsunami housing in urban and rural locations. The second major issue investigated by the researcher was the changing livelihood pattern and lastly, infrastructure and cultural sensitivity in design and development of communities.

Sampling types and Sample Design

The next step was to decide on the sample size which was calculated based on the population of the community. The main purpose of sampling is to select a set of elements from within a population so that the description of those elements reflects or shows the same trends for the entire population (Babbie, 1992). Sampling is carried out when information can be gathered only from a fraction of the population or from a group that is a part of a phenomenon or event that is being studied (Walliman, 2005).

Sampling types

There are primarily two types of sampling techniques, probability sampling and non probability sampling (Babbie, 1992 & Walliman, 2005). Probability sampling techniques are widely used in the academic field is also the primary method used for selecting samples in social science research. The logic of probability sampling technique is that if "all members of a population is identical in all respects, such as demographic characteristics, attitudes, experiences, behaviors, and so on- there would be no need for careful sampling procedures (such as quota sampling or purposive sampling)" (Babbie, 1992, p. 235). Whereas, the non-probability or purposive sampling techniques are used

when the researcher selects a typical sample using snowball technique and, "…contacts a small number of the target population and get them to introduce the researcher to others in the population" (Walliman, 2005, p. 279). For the purpose of this research the probability technique was used to select the participants. Since the case study areas selected for the field research were homogenous communities that had been through the same experience after the Tsunami and were residing in relocated neighborhoods at the time of the research. Therefore, purposive sampling technique was not applicable for this study.

Sample Design

Stratified sampling technique was used as it gives the most reliable representation of the whole population. The simple random sampling and systematic sampling although ensure a degree of representativeness, stratified sampling is a method that is used to reduce the degree of error in the sample. The function of this method is "… to organize population into homogeneous subsets (with heterogeneity between subsets) and to select the appropriate number of elements from each" (Babbie, 1992, p. 257). In this method, each of the elements has an equal chance of selection, independent of any other event in the selection process (Rubin & Babbie, 1989). Flipping of the coin was one of the techniques used in selecting the sample, in which the "selection" of a head or a tail is independent of previous selections of heads or tails. Samples can also be selected by rolling a perfect set of dice.

Sample size

The sample size ranged between 10%-20% of the population. For a smaller community a larger sample size was selected. For example, the rural community *Akkarapettai* in Nagapattinam consisted of a little over 250 households. The number of household interviews carried out in this community was forty eight. On the other hand the urban location in Chennai (VOC Nagar) had almost 920 households in one location. Therefore, a smaller sample was selected and was evenly distributed within the population. A 10 % sample was selected for this community, which consisted of up to 85 household interviews.

For distribution of sample, every increase in sample size improves the distribution of estimates of the mean and thus reduces the *sampling error* [25](Rubin & Babbie, 1989). This means that the greater the sample size, the lesser is the chances of an error in the results. The next step was the distribution of the sample selected. The population for each of the sample was homogeneous in nature. Afterwards, it was needed to decide the house numbers to be surveyed. This was done after the total number of household to be surveyed was calculated. The first house number that was selected for each location was based on the coin toss system. For example, if the coin was tossed for ten times, out of which the head appeared eight times of ten, then the first house number was 8. Subsequently, house numbers ending with 8 were surveyed, for example, 18, 28, 38 and so on. In case an interviewee was unavailable at one of the selected houses, the immediate next house number was selected for the survey. In each of the cases single member of each household was interviewed. In most of the cases the person who answered the door was the participant. A total number of 202 sample surveys were carried out in both the rural & urban locations.

Recruitment process

The village heads/community leaders played an important role in the recruitment process of the participants for both the household level survey and the focus group interview that took place in the rural areas. In the urban location, the participants were informed of the interview by a representative from a local NGO. In most of the villages in India, communities have their own system of governance, which is also known as the *Panchayat system*. This is an elected group of representatives and other elders and members who are appointment by the community members themselves by a voting system. This elected body usually comprises of a village head (leaders), financial manager, women representatives and other elders and members who are actively involved

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[25] Probability theory gives a formula for estimating how closely the sample statistics are clustered around the true value. The formula contains three factors: the parameter, the sample size and the standard error (a measure of sampling error): $s = \sqrt{\dfrac{pxq}{n}}$ where p and q represents the population parameters in percentage (10% or 20%), n= the number of cases in each sample, s= the standard error (Rubin & Babbie, 1989)

in the general development of the community. Decisions at the lowermost tier (village level) are mostly made by this governing body. The village head was initially contacted by phone and permission was taken to meet and provide more information about the research. A recruitment script was prepared which was used for the conversation over the telephone (see, Appendix A). The contact information of the village heads was obtained from the local NGO's who were working in the same area for the past three years or more. It was only after obtaining the permission from the village head (see, Appendix B) that the interviews could be undertaken. In all the cases, the village head proved to be very supportive in informing the households of an upcoming interview session and in discussing various issues with the researcher pertaining to the welfare of the community. Each of the participants from the fishing villages received a cash amount of Rs.150/- (INR) which equals to $3.06 USD approximately as remuneration[26]for the time taken to complete the questionnaire.

Training process of enumerators

Since the participants from rural areas spoke mostly Tamil (the local dialect), the local enumerators helped the researcher to complete the household surveys. A rigorous training session was conducted by the researcher. As the participants of the household surveys experienced stress in their lives, the local enumerators were sensitized before they went out into the field. The enumerators comprised of the nine graduate students from the Government Arts College (Kumbhakonam) who had a background in regional geography and environmental planning. These students had previous experience of conducting field level surveys and had worked in similar location in the past and were therefore familiar with the survey areas. The training session was carried out for two days. Some of the students had previously worked with the researcher during the pre-test. During the training sessions the researcher went though the questionnaire thoroughly, explaining the logic and rationale behind each question. The students were told how to deal with the sensitive issues, such as questions which could have reminded the participant of the past (see, Appendix C). The local enumerators were given time to

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[26] Which is almost equals 1 wage days (Normal rates in India being Rs.150/ day (INR) = $3.06 USD for 8 hours of work.

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discuss their doubts and queries. In an interactive session, the enumerators were asked to enact the role of a participant and conduct a sample interview. Based on the results of pre-tests and discussions with the Ethics committee, it was decided to prepare a checklist that would serve as guidance for the enumerators during the surveys (see, Appendix C). The checklist, the stationary and other field equipment was provided to the enumerators. The researcher accompanied the enumerators during the entire period of the household surveys, and from time to time met with them on site to discuss issues that emerged during the interview.

Interviews

There were two levels of interviews that were carried out with the rural community. The first level was the household level interview, which was conducted as a door-to-door survey. Enumerators were handed in information letters and a script to be read before starting any survey. Most of the time oral consent was accepted in the interviews. The second level of interviews was undertaken after the household survey was completed. In most of the household interviews, the researcher and the enumerator would be welcomed into the living area and the enumerator would patiently go through the questionnaire. It took around 30 minutes to complete each of the interviews. Some questions were common to the study area (such as housing related) hence, the enumerator could fill it up himself/herself (see, Appendix A). In some questions approximate figures were noted down and the participant was not forced to answer them (such as questions related to finance). Although, culturally in India, people are much more open to talk about their financial issues, sometimes the participants were hesitant to give out their actual income. The researcher had provided the enumerators with a list of psychological centers to be used in case there were participants who went into distress and required counseling. But, the experience was similar to the pre-tests and there were no cases of distress. At times, the participants were very eager to talk about their experiences. In all cases, the participants were aware that they could refuse to participate in the study or decline to answer any question. After completing the interview, the enumerator checked through the questionnaire to ensure that all the sections were completed and afterwards, ended the session, thanking the participant and handing in the remuneration amount.

It was interesting to notice that, mostly women and children came forward and took part in the survey mostly in the urban areas. Even though, culturally, in India men would take a lead in all household duties and speak on behalf of the family; throughout the research women were found to be more enthusiastic to talk about their experiences in some of the location in Chennai. This worked well for the researcher, as a comfort level developed between the participant and the interviewer. The reason for more male participants in the rural areas was possibly as the surveys were carried out during the day in the urban locations, when men would have gone to their respective jobs and women would have stayed behind. Whereas, in the rural areas the surveys were started at around 8.00 am in the morning, a time when men would be just getting ready to leave for work. The researcher had prepared a separate sheet where codes were listed against names of the participants. This was done in order to maintain anonymity in the research. A similar methodology was followed in the urban study area in Chennai (VOC Nagar).

3.4.4 Phase IV: Focus group interviews:

Once the household level interviews were completed, a second round of interviews comprising of a focus group of 5-6 community members, was carried out. A total number of six community meetings could be completed during the field work. Certain issues required a collective response from the community. The community meetings were successfully carried out in the form of group interviews and with the assistance of the community leaders/village heads. The community meeting sessions (see, Appendix B) were facilitated by the researcher with the help of the translator (one of the house hold enumerators). The group met at a convenient location, either at the nearest school (an empty class room) or in the community center. The focus group interview was an interactive session where community leaders got an opportunity to listen to the issues raised by the community. Following the introduction to the study, the researcher proceeded with the session. Notes from the session were taken by the translator and the focus group questionnaire was utilized to guide the discussion. There was no audio or video recording of the session. The community meeting carried on for 30 minutes at the end of which the facilitator handed in the remuneration. During all the sessions, there was no incidence of distress and people were very enthusiastic and supportive, knowing that it

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would benefit communities suffering from a disaster in the future. There were no cultural issues, as the researcher belonged to the same country and the translator in the sessions was also from the same area. Once the interviews were completed with the affected community, the researcher conducted the interviews and discussion sessions with the representatives from the government and non- government organizations which were directly involved in the relief and reconstruction of the disaster affected communities. Standardized questionnaires were used to conduct the interviews. These interviews were short and lasted about twenty minutes. The appointments with the representatives of government and non-government organizations were made over the phone. Certain results of the preliminary analysis of the household data and focus group interviews with the community were also discussed during these interviews.

Table 3.4: Summary of the interviews conducted for this study

Types of Interviews	Location	Total interviews	Total respondents
Household interview	V.O.C Nagar,Chennai (Case study-1)	85 households	85
	Akkarapetti (Case study-2)	48 households	48
	Kechanukupam (Case study-3)	67 households	67
Community meeting	Tsunami Nagar	1 group	8
	V.O.C Nagar	1 group	5
	Semencheri	1 group	5
	Tillaghar Nagar	1 group	6
	Akkarapetti	1 group	8
	Keechanukupam	1group	5
Meetings with NGO's	Chennai	4 representatives	4
	Nagapattinam	1 representative	2
Meeting with CBO's	Tharangamvadi	1 representative	2
Meeting with Government Representative	Chennai	2 representatives	3
	Nagapattinam	2 representatives	2

3.4.5 Secondary data collection:

Throughout the various phases of the research, the secondary data was collected in various forms, such as news paper articles, online information, statistical reports,

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maps, and published government documents. Some of the useful sources of information were universities that were involved in various tsunami rehabilitation related works for the past three years. The purpose of the document review was to gain the general knowledge about the reconstruction process and to identify the key decision-makers and stakeholders in the planning and the development processes. Site plans were studied and interpreted in the form of notes. Planning policies such as those of the Coastal Zonal Regulation were scrutinized. Inundation plans obtained from the District collector's office gave an understanding of the level and extent of the impact. The secondary data sources also helped the researcher in identifying the communities to study as well as in designing interviews and survey questions. Photographs and field notes were also taken to support the documentation process. Newspaper, journals and online information was reviewed. In addition to it videos and brochures provided by various organizations were helpful in understanding the current scenario of the reconstruction process in the Tamil Nadu coast. Qualitative data obtained from this method of data collection was categorized into themes and summarized for further interpretation. Descriptive information obtained from the content analysis, helps in cross checking of research findings (Babbie, 1989; Marshall and Rossman, 1989).

3.5. Data Management and Analysis

One of the advantages of field research is that the interaction between data collection and data analysis can have a greater flexibility unlike other research methods. Both qualitative and quantitative analytical methods were used during the data analysis.

Qualitative method of analysis

This method of data analysis is still in its early stages unlike other statistical methods. Turner (1994) suggests that, "it is perhaps not desirable that there should be homogeneous, classifiable types of qualitative analysis; researchers must structure their analytical approaches to fit the nature of data with which they are faced" (pp. 208-13). Miles and Huberman (1994) further added that the component of analysis should contain, data reduction, data display, drawing conclusion and verification (Walliman, 2005). One of the methods used to organize shapeless data is the development of *coding*. The coding

system is important to form typologies of a wide range of data and for conceptualization. Codes are essentially, "…labels or tags used to allocate units of meaning to the collected data" (Walliman, 2005, p. 311). There are primarily two types of coding; a) the process where information is extracted from transcripts or notes under various headings and; b) the open coding system used for ideas: reflective notes or memos, rather than merely bits of texts (Miles & Huberman, 1994; Strauss and Corbin, 1990; Strauss, 1987). Once coding is achieved then the coded information is categorized for more meaningful information and groups. This again laid the platform for cross analysis with the quantitative data. The data from the participant observation were recorded in the form of notes taken either during the interaction or immediately after. Notes taken during the interviews were organized by themes and summarized in paragraph form. Data was first translated, coded and then stored in a digital format in computers and secondary storage systems.

Quantitative analysis

Statistical data was first tabulated and later analyzed using the methods such as frequencies (means, modes and percentages) and cross-tabulations, using SPSS software. Results obtained from the statistical data were interpreted in the form of graphs and tables which indicated the positive and negative indicators of the reconstruction process (see chapter 5). A qualitative content analysis was carried out on the coastal regulation plans, official documents, newspapers and journal articles to learn about the most important issues in the reconstruction process are from the perspective of professionals and the public. Such type of content analysis provides descriptive information and cross check of research findings (Babbie, 1989).

3.6. Study influences and limitation

Role of the Researcher

Having spent most of the early years in East Asia, the researcher acknowledges that this research was shaped around some of her own experiences and personal interests. Being a part of the same culture had enabled the researcher to interact well with the participants, although help was needed to carry out translations at the field.

Institutional Influences

As a graduate student at the University of Waterloo, the researcher was able to conduct the research in India with significant institutional support. The institutions that had shaped the research include: the sponsoring agency (Canadian Common Wealth Scholarship Program), the researcher being an affiliate of the University of Waterloo, and the host organization in India (University of Madras & Tamil Nadu Relied & Rehabilitation office). The University of Waterloo played the role of being the accountable institution throughout this research. Being the primary investigator for this research, the researcher had to follow the university regulations and protocol, and had to obtain clearance from the Office of Research Ethics. Since the research was being funded by the Canadian Common Wealth Scholarship Program, the agenda of this institution also shaped and influenced the research project. The sponsoring agency had approved the research proposal and the researcher had to complete course work related to the research methods and pass the comprehensive exam before preparing a schedule for the field research. Although, these institutions have increased the authenticity of this research, it caused some limitation. The lengthy and tiresome process of the Office of Research Ethics contributed to the delay in starting the field work. Although the suggestions and the advice of the ethics committee is much appreciated, however due to the long intervals at which the committee meetings took place to review the changes made in the application, somewhat delayed the process for initiating field level research.

The limited funding from the sponsoring agency permitted the researcher to conduct field work for a period of 3, whereas such a research requires at least 5-6 months of field work. As a result of which, the researcher could make less room for fruitful discussions with the community, and the research could only make indirect contribution to the community. Finally, the structure and power relations between the host institution and the community also influenced the research. The Relief and Rehabilitation office located both in Chennai and Nagapattinam, were by far the most powerful government organization after the Tsunami. They were responsible for the new policies, for the development and execution of the reconstruction plans. This organization helped the researcher substantially in acquiring permission and first hand information about the

communities participating in the research. Therefore, the researcher had to maintain a neutral role and not show any support for the host institution.

Ethics

This research was conducted in accordance with the standards of the University of Waterloo's Office of Human Research Guidelines for Research with Human Participants (following the Tri-Council Policy Statement (Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, & Social Sciences and Humanities Research Council of Canada, 1998). These standards include: honesty of conduct, protection of confidentiality and anonymity, the use of informed consent, and the principle of reciprocity.

3.7. Summary

The current chapter presented the data collection methods and approaches employed in the research. Both qualitative and quantitative methods were used as well as various primary and secondary data sources were interpreted to relate to the research questions. Methods such as surveys, interviews, informal discussions and observation were employed in the fieldwork to gather information about the current state of the reconstruction process. Statistical software (SPSS) was used to analyze the quantitative data. The qualitative information was categorized into individual sections to obtain indicators that suggest the success or failure of the reconstruction process. Results are discussed in Chapters 5, 6 and 7.

Chapter 4: Case Study background

4.1. Introduction to the Problem Area:

The purpose of this chapter is to provide the contextual information on the problem area affected by the 2004 Tsunami. On the morning of Sunday 26th December 2004 a severe earthquake in the Indian Ocean off the coast of northern Sumatra caused tsunamis that impacted at least nine counties in the region leaving, an estimated 150,000 persons dead and many more homeless (Rao, 2007). The main section of this chapter discusses the event "Tsunami" and the reasons behind its occurrence, history of Tsunami in the Indian peninsula, and the background of the case study areas selected by the researcher to conduct field surveys and data collection in India.

4.1.1 The Tsunami: Brief History:

The term tsunami comes from the Japanese language (*tsu*- harbour and *nami*-wave). The term was created by fishermen who returned to port to find the area surrounding the harbor devastated. Tsunami refers to a series of waves generated when a body of water, such as a lake or the ocean, is rapidly displaced on a massive scale (Rao, 2007). Earthquake, landslide, volcanic eruption and meteorite impacts all have the potential to generate tsunami. The effects of the tsunami can range from being unnoticeable to having a devastating impact. Tsunami is not a sub-surface event in the deep ocean; it simply has a much smaller amplitude (wave heights) offshore, and a very long wavelength (often hundreds of kilometers long), which is why it generally pass unnoticed at sea, forming only a passing "hump" in the ocean (Rao, 2007). Tsunami is a known phenomenon in the Pacific Ocean region stretching from Chile in Latin America to Japan (Lockridge, 1988 and IFRCRCS, 1997). Tsunamis have been historically referred to as tidal waves because as they approach the land they take on the characteristics of a violent tide rather than the sort of cresting waves that are formed by wind action upon the ocean. However, since they are not actually related to tides the term is considered misleading and its usage is discouraged by oceanographers (Rao, 2007). The tsunami generated by the Indian Ocean earthquake on 26th December 2004, ranks as the deadliest tsunami in the recorded history. The highest tsunami ever recorded was

estimated to be 85m (278 ft) high. The following table lists some of the most damaging Tsunamis in history.

Table 4.1 List of some of the deadliest Tsunami in History

Fatalities	Year	Magnitude	Principle areas
10,000	1410	-	Crete-Santomini Ancient Greece
30,000	1707	8.4	Tokaido-Nankaido, Japan
60,000	1755	8.5	Portugal, Morocco
13,486	1771	7.4	Ryukyu Trench, Japan
40,000	1782	7.0	South China Sea
15,030	1792	6.4	Kyushu Island, Japan
25,674	1868	8.5	Northern Chile
36,600	1883	-	Krakatau, Indonesia
26,360	1896	7.6	Sanriku, Japan
160,000	2004	9.0	Indian Ocean

Source: National Geophysics Data Centre, National Oceanic and Atmospheric Administration, 2005; Rao, 2007

4.1.2 Cause of Tsunami:

Tsunami is a very long wave of seismic origin i.e. caused by a sub marine or coastal earthquake, landslide or volcanic eruptions. It travels across the ocean at a tremendous speed, and may destroy the coastal areas- often thousands of kilometers from their place of origin (Rao, 2007; Nirupama, 2009). Basic difference between the tsunami waves and tidal waves is that while the former hits only the harbor and coastal areas even as the other parts of the sea remain calm, the later makes the sea rough. Tsunami caused by earthquake is more common than being caused by any other reasons. Massive earthquakes with sources near coasts (either inland or offshore) and particularly those occurring in the vicinity of great oceanic trenches, occasionally produce great oceanic waves. Often tremors displace ground surface, sending an entire column of water in motion outward from an earthquake region. Vast quantity of water is then piled up into a vertical wall, where they may rise up to 90ft. or more, especially in 'V' shaped bays and thus causing excessive damage and loss of life (Bernard et. al, 2001; Rao, 2007).

4.1.3 History of Tsunami in the Indian peninsula:

The Indian peninsula had been hit by a Tsunami on very few occasions (Sriramprasad, 2007; Nirupama, 2009). The first record tsunami occurred in the Bangladesh coast on 12th of April, 1762, and was caused by an earthquake with the magnitude of 7.5 on rickter scale. This resulted in the rise of the sea level to about 4m in Port Blair, Andaman and Nicobar Islands. On 19th August, 1868 another earthquake with the magnitude of 7.5 o the rickter scale occurred in Bangladesh Coast, and led to the run-up level of about 0.76m (Sriramprasad, 2007). During the same year, another earthquake at Carnicobar Island and Port Blair let to the rise of the sea level up to 0.3m and 1.22m respectively. On 27th August 1883 the tsunami, in Chennai and Nagapattinam caused the sea level to rise up to 1.5m (Sriramprasad, 2007). Subsequently, earthquake on 27th November 1945 raised the sea level up to about 12 - 15m in Gulf of Cambay, Gujarat (Sriramprasad, 2007). Although these incidences did have some casualties and losses of boats and fishing gear, they cannot be compared to the scale of destruction caused by the giant waves on 26th December, 2004.

Illustration 4.1 (a) & (b) Depicting the scale of destruction in 2004 Tsunami and the damaged boats and catamarans in the port area

(a)

(b)

Source: Govt. of Tamil Nadu, 2005

Source: Govt. of Tamil Nadu, 2005

4.1.4 Year 2004 Tsunami and the Tamil Nadu Coast of India:

Around 13 coastal districts were affected by the tsunami in the state of Tamil Nadu. Most, severely were affected Nagapattinam, Cuddalore, Chennai, Kancheepuram and Kanakumari districts (Govt. of Tamil Nadu, 2005). Many casualties were detected in

places where pilgrims and tourists flock, such as Velankanni and Kanyakumari, at the southern tip of India, and on Marina Beach in Chennai (Sriramprasad, 2007).

The damage to the fishing community who inhabit the land closest to the sea was overwhelmingly. In addition to suffering the greatest number of casualties, these fishing communities face the long-term consequences of lost homes, destroyed village infrastructure and total loss of livelihood when boats and fishing equipment were lost.

Illustration 4.2 (a) & (b) Countries affected by the Tsunami and areas affected in Tamil Nadu coast

(a)

(b)
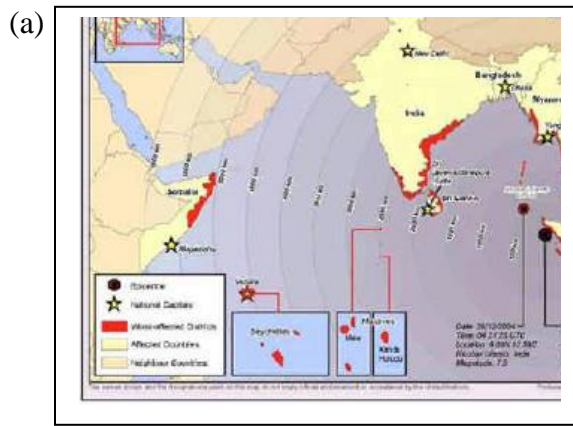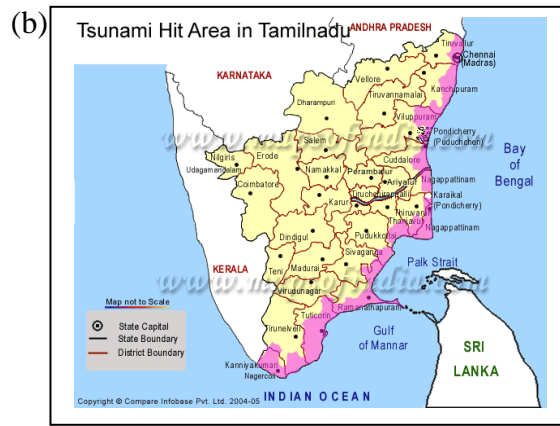
The places covered in the map of Tamil Nadu (see, Illustration, 4.2b) are Coimbatore, Udagamangalam, Nilgiris, Erode, Namakkal, Ariyalur, Nagappattinam, Cuddalore Pondicherry,Viluppuram, Tiruvannamalai, Dharampuri, Kanchipuram, Vellore, Chennai, Tiruvallur. The massive waves from the December 2004 tsunami crossed the Bay of Bengal at the speed of up to 500 miles per hour and wreaked havoc on India's southern coast. The state of Tamil Nadu was worst hit; Kerala also saw extensive damage. Other states such as Andhra Pradesh and West Bengal were affected to a lesser degree. The total number of affected people in Tamil Nadu (including those who died and were displaced by the disaster) was 52,190 (Govt. of Tamil Nadu, 2005). In Kerala, the tsunami killed or displaced 25,149 people. Women and children were the most vulnerable and suffered the brunt of the disaster. Also contributing to the gender discrepancy among the dead was the fact that women and girls in these areas generally are not taught to swim. The economic losses attributed to the tsunami in Kerala have been estimated at

$100 million and in Tamil Nadu at a whopping $815 million (Govt. of Tamil Nadu, 2005). These damages have increased these two states' fiscal deficits.

4.2. Study area background

Based on availability of resources and accessibility to the locations, the researcher selected two case study areas, 'Chennai' the capital city of Tamil Nadu District and 'Nagapattinam' district. Each of these locations is described in length in the following section with the help of the satellite maps and plans of the case study locations.

4.2.1 Study Area- 1:

Chennai: The city is the capital of the southern Indian state of Tamil Nadu, and is situated at approximately 13° North latitude and 80° East longitude. Chennai city currently encompasses an area of 172 sq km, and the metropolitan area adds almost 400 sq km of urban agglomeration (Nagaraj & Ramani, 1991, p. 38). The following figures presents the geographical location[27] of Chennai within India, and shows the city in its regional context.

Illustration 4.3 (a) Location of Chennai within India; (b) Satellite image of Chennai and Surrounding region.

(a)
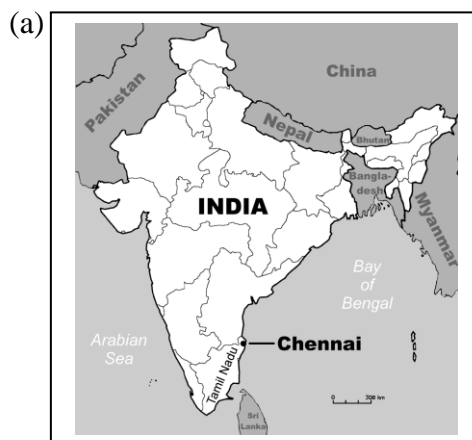
Source: (Nagaraj & Ramani1991, p.38)

(b)
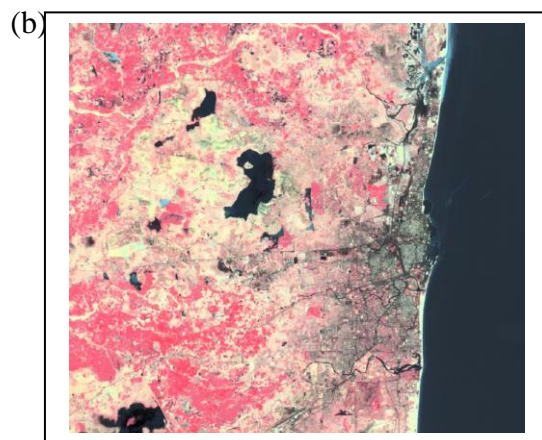
Source: Adapted from Bunch, 2000

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[27] IRS satellite image of Chennai and surrounding region. Grey areas in this satellite image are the built-up areas of Chennai and the Chennai urban agglomeration. Reddish colors indicate vegetation, and bright whitish colors are typical of highly reflective sandy areas. (Technical note: this image is a false color composite from bands 4, 3, and 2 of an IRS LISS-2 scene. The spatial resolution is 36.25 meters. The image is uncorrected geometrically and has been enhanced for visual interpretation using a histogram equalization stretch of the digital numbers).

The topography of the Chennai area is flat, with the terrain rising slightly inland from the coast. The mean elevation above the sea level for the city is 22 feet or 6.7 meters, but most of the city is at or only slightly above the sea level, making drainage a problem (Bunch, 2000). Formerly called *Madras*, Chennai is the fourth largest metropolitan area of India.

Chennai is located along the Coromandel Coast on the Bay of Bengal and had a population of 4.2 million in the 2001 census within its municipal corporation (Census India, 2001). The urban agglomeration of Chennai has an estimated population over 8 million, making it one of the largest urban agglomerations in India. The city was established in the 17th century by the British, who developed it into a major urban centre and the naval base (Sriramprasad, 2007). Chennai's economy has a broad industrial base in the automobile, technology, hardware manufacturing, and healthcare industries. The city is home to most of India's automobile industry and is the country's second-largest exporter of software, and information technology. Chennai Zone contributes 39 per cent of the State's GDP. Chennai accounts for 60 % of the country's automotive exports (Wikipedia, 2009a). The city faces problems of water shortages, traffic congestion and air pollution.

4.2.2. Boundries of Chennai:

The Marina Beach runs for 12 km along the shoreline of the city. The Cooum river (or *Koovam*) runs through the centre of the city and the *Adyar* river to the south. A third river, the *Kortalaiyar*, flows through the northern fringes of the city before draining into the sea at *Ennore*. Chennai is divided into four parts: North, Central, South and West. North Chennai is primarily an industrial area. Central Chennai is the commercial heart of the city and includes an important business district known as the *Parry's Corne*r. South Chennai and West Chennai, previously mostly residential districts, are fast becoming commercial areas, home to a growing number of financial companies and Information technology firms. The city is expanding quickly along the *Old Mahabalipuram* road and the Grand Southern Trunk Road (GST Road) in the south and towards *Ambattur*, *Koyambedu*, and *Sriperumbdur* in the west.

4.2.3. Climate and Administration of Chennai:

The hottest part of the year is late May and early June, with maximum temperatures around 38–42 °C (100–107 °F). The coolest part of the year is January, with minimum temperatures around 18–20 °C (64–68 °F). The lowest temperature recorded is 13.9 °C (57.02 °F) and highest 45 °C (113 °F). The average annual rainfall is about 1,300 mm (51 inches). The city gets most of its seasonal rainfall from the monsoon winds from the north-east during the period of mid-September to mid-December (Wikipedia, 2009a).

The Chennai metropolitan area is governed by the Corporation that consists of 155 councilors who are directly elected by the residents of the city and represents almost hundred and fifty five wards. The councilors elect a mayor and a deputy mayor who preside over about six standing committees (Wikipedia, 2009). Chennai, the capital of Tamil Nadu state, houses the state executive and legislative headquarters primarily in the Secretariat Buildings on the Fort St George campus but also in many other buildings scattered around the city. Chennai has three parliamentary constituencies—Chennai North, Chennai Central and Chennai South—and elects 18 Members of the Legislative Assembly (MLAs) to the state legislature (Wikipedia, 2009a).

4.2.4 Background of areas surveyed:

During the Tsunami, a number of villages and slums that were located near the coast in and around Chennai were washed away and the damage occurred to be beyond repair (based on the interviews carried out by the researcher). Local population, mostly fishermen, was relocated from *Pallavan Nagar* to *Kargil Vetri Nagar* in the aftermath of Indian Ocean tsunami and then to Tsunami Nagar (see, details of community meeting in Chapter 6). Due to the repeated floods and fire, residents from these temporary shelters were moved from one location to another a number of times. Traumatised community had to undergo very tough times during the relief phase after the tsunami. Tsunami rescue workers were hesitant to point fingers towards the government in rebuilding efforts. Residents from these communities were disappointed that the political leaders and the NGOs had wasted funds that were valuable to manage and look after the community (Kumaran, 2008).

According to the official figures, 13 communities were affected within the metropolitan area of Chennai (Govt. of Tamil Nadu, 2005). By September 2007, most of the population living in temporary shelters was living in the permanent housing provided by the Government of Tamil Nadu. The researcher made preliminary visits to the relocated communities in the North and South of Chennai and conducted community meetings with four communities. VOC Nagar, located towards the north of Chennai, was selected for the household surveys. The location selected for surveys had over 920 households living in the apartment blocks.

Illustration 4.4 (a) Location Map of VOC Nagar, Chennai (b) Site plan for VOC Nagar, Chennai

(a)

(b)

Source: http//www.google earth.com
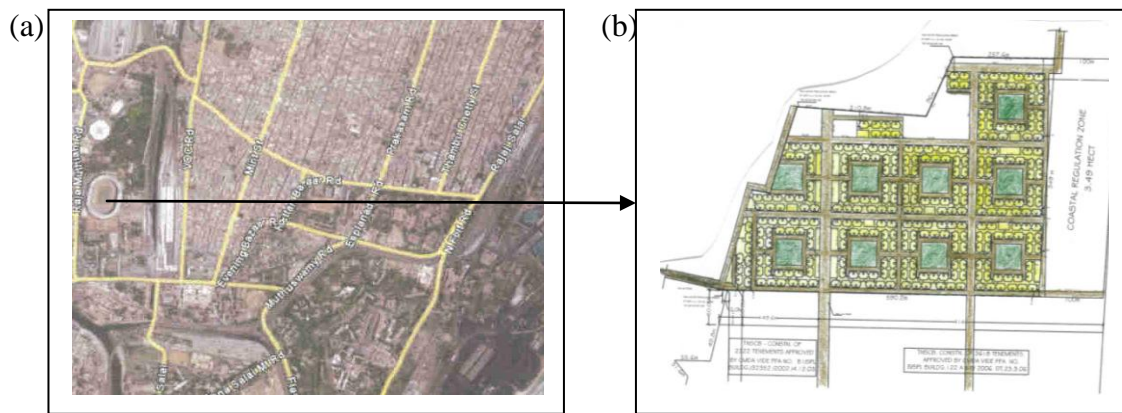
Source: Slum clearance board, Govt. of Tamil Nadu, 2008

The relocated site was around 2-3 km away from the sea. The neighborhood had small parks and open spaces for the children, an information center that was visited occasionally by the government representatives, and a small temple (based on surveys carried out by researcher). Other major amenities such as the health center, school and stores were located outside the premises of this neighborhood.

Illustration 4.5 (a) Apartment blocks around an open space in VOC Nagar, Chennai (b) Nature of development for parks in VOC Nagar, Chennai

(a)

Source: Author (Field work)

(b)
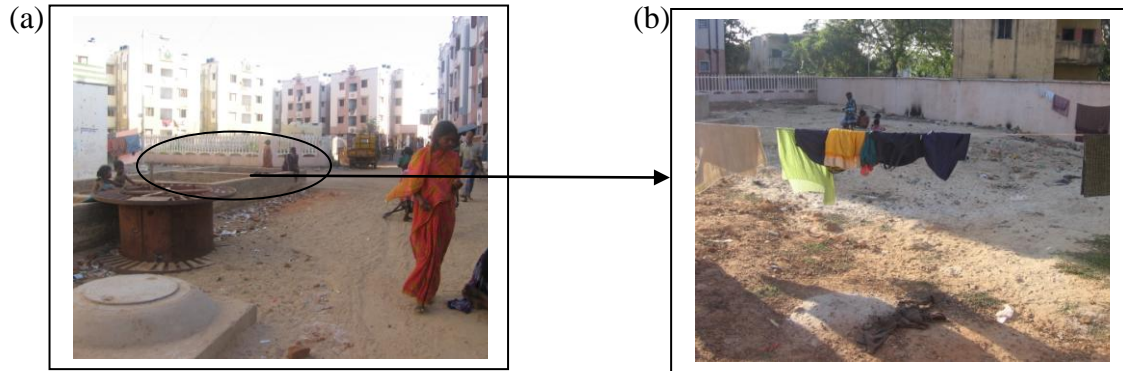
Source: Author (Field work)

4.2.5 Study Area- 2:

Nagapattinam: It is one of the coastal districts in Tamil Nadu. Located between 10° 15' to 11° 30' N and 79° 30' to 79° 55' E, Nagapattinam was carved out of the *Thanjavur* district in 1997. It is bounded by the Bay of Bengal on the east, the Palk Strait on the South, the *Tiruvarur* and *Thanjavur* District on the West, and Northwest and Cuddalore District on the North (Wikipedia, 2009b). This district forms a part of the Cauvery river basin and delta. The district has a coastline stretching up to 190 km. The total geographical area of the district is around 3536.38 Sq. km and it still continues to contribute its major share in the production of rice in Tamil Nadu (Wikkipedia, 2009b). However, this district has no less than eleven ports on the coast, of which eight are open to foreign trade (Sriramprasad, 2007).

Illustration 4.6 Map of Nagapattinam District

Source: District Office, Nagapattinam, 2008

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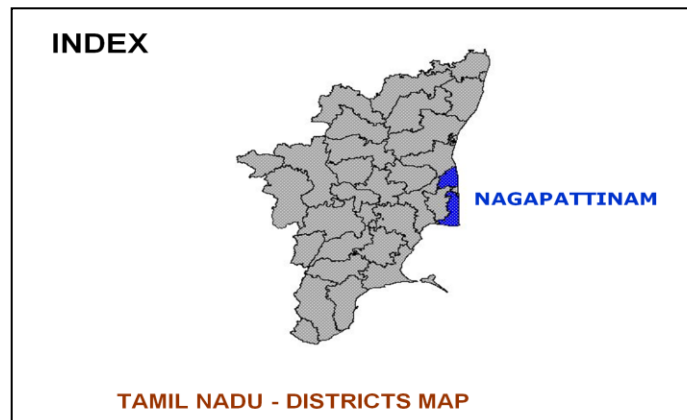
4.2.6. Historical Past of Nagapattinam District:

Nagapattinam was referred by early writers and the Portuguese as "the city of Coromandel". In 1657 the Dutch occupied the town, taking it from the Portuguese to become their chief possession in India. In 1781, Nagapattinam district was taken over by the British and was made the headquarters of the *Tanjore* District in the Southern Part of India (Wikkipedia, 2009b). Tamil and Telegu are two of the major languages spoken along with English, which was the official language. Buddhism flourished in the region from around the 8th century, and people have now adopted Christianity, Islam and Hinduism as few other major religions (Wikkipedia, 2009b).

4.2.7 Occupation and Population of Nagapattinam town:

As of the 2004, Nagapattinam town had a population of 92,525 (Census India, 2004). Males and females have an equal ratio of 50% each. The main occupation in this town is fishing. The Nagapattinam region was the second study area in this research. It is surrounded by a number of ice factories for preserving the fish caught in the sea. The marine catch mainly comprises of leognathics, sharks, flying fish, chank, catfish, prawns, silver bellies, crabs, rays and other varieties. Mechanized boats, catamarans and country canoes are used for fishing. This major fishing hub was severely destroyed during the Indian Ocean Tsunami of 2004. Agriculture is also practiced in some of the villages on the periphery of Nagapattinam town. Statistics show that the literacy rate for the entire district is above the national average of 59.5%, whereas the Nagapattinam town has a literacy rate ranging from 45-50% (Census India, 2004).

4.2.8 Background of areas surveyed in Nagapattinam:

During the Tsunami in 2004 the greatest number of deaths most of the 6,000 deaths in Nagapattinam District were among poor subsistence fishing communities (Govt. of Tamil Nadu, 2005). When their boats, nets and fishing equipment were swept away or badly damaged, these fishing communities had to face the long-term consequences of lost homes, destroyed village infrastructure and lost livelihoods. *Sneha* and *South Indian Federation of Fishermen Societies (SIFFS)* were two of the local NGOs

that were working at grassroots level specifically on the issues concerning fishing communities and fisheries workers in Tamil Nadu.

The scale of damage in Nagapattinam was unprecedented. The Tsunami left around 6065 people dead and the entire coastline devastated. Around 73 habitations in 38 revenue villages and 5 revenue village habitations (Taluks) were affected. Out of these villages, 1776 were children (887 male, 889 females) that comprises approximately one – third of the total dead numbers of casualties (Govt. of Tamil Nadu, 2005). Nagapattinam district alone accounted for 76 percent of the deaths of the entire state and was the worst affected district in India. The two locations selected for house hold surveys were within the town of Nagapattinam.

Illustration 4.7 (a) Map showing inundation in Nagapattinam, (b) Location map of Akkaraipettai village

(a)   (b)
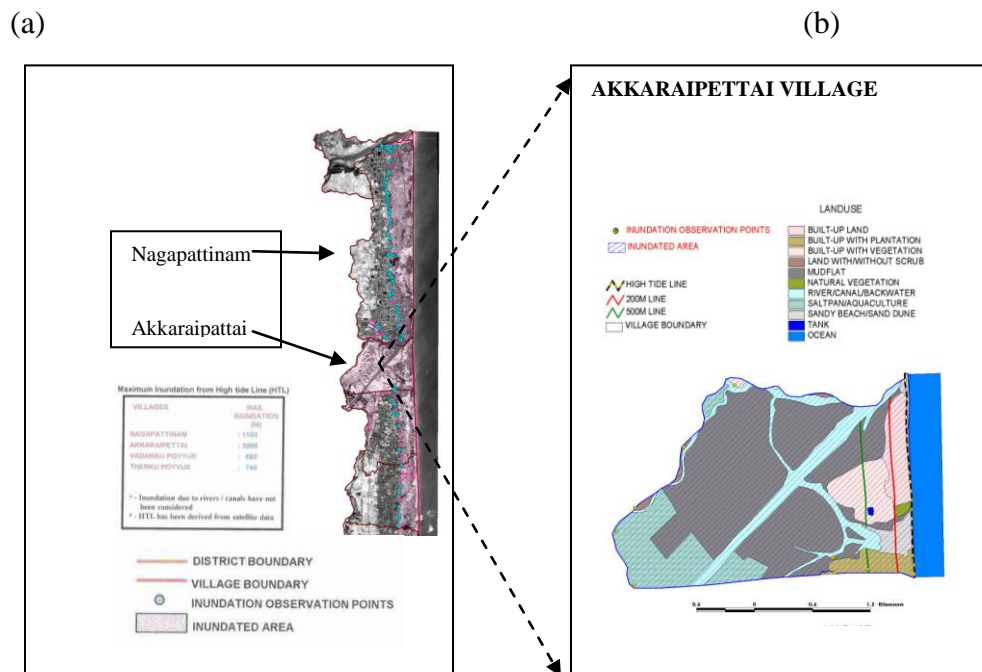
Source: District Office, Nagapattinam, 2008   *Source:* District Office, Nagapattinam, 2008

The population breakup for *Akkarapettai*, the first village selected for the surveys by the researcher was 1232 males, 1200 females, and 302 surviving children. They were accommodated in 770 temporary shelters a few days after the tsunami (Govt. of Tamil Nadu, 2005). The second village that was selected for survey purposes, *Keechankuppam*

had a population break down of 1015 male, 954 female and 646 children (Govt. of Tamil Nadu, 2005). During the period the surveys were carried out in the fall of 2008, a much smaller population from both the villages was provided with permanent housing. There was around 250 permanent housing provided to the community, out of which almost 20% of the households were interviewed in *Akkarapettai* for field work. The households that were interviewed in *Keechankuppam* were all staying in the repaired/damaged housing (based on surveys carried out by researcher).

4.2.9 Characteristics of a fishing village:

Fishermen huts are located one behind the other or in a scattered manner to form a small settlement called "Kuppam" (UNDP, 2005). They are very closely spaced in order to provide mutual shade to face the severe heat. Coconut mat walls facilitate airflow through the living areas to create a comfortable living space inside. A typical fishermen hut is a small unit consisting of 1-3 rooms. It has small openings with wide overhanging roof to face the severe climate, and consists of a living space and a semi-covered cooking space, the floor of which is finished with cow dung coating and mud to provide a cool and soothing environment inside. The thatched roof is often tied with coconut ropes.

Illustration 4.8 (a) Hut in fishing village made of thatch, (b) *Damaged housing in Akkarapettai*

(a)   (b)

Source: Author (Field work)   Source: UNDP, 2005 (Field work)

The houses have very shallow foundations that are not more than 900 mm deep, and 150 to 300 mm high plinth size. The houses belonging to rich families are made of

bricks, finished with mud or cement mortar, and are covered with a tiled roof. Pictures of both the types can be seen as above. Room sizes vary from 10 to 15 square meters. Pitched roofs are often covered with locally available mud tiles placed on wooden rafters and purlins (UNDP, 2005). Majority of tsunami-hit areas consisted of rural houses, which were totally ravaged. Many reinforced cement concrete framed buildings faced partial collapse and non-structural damage. Fishing is the only source of income for these downtrodden and powerless people who constantly live under the threat of big-boat owners, money lenders, and merchants. To enable fishing, most of the population lives in thatched huts, often very close to the shore (Govt. of Tamil Nadu, 2005).

Illustration 4.9(a) Arial view of Akkrapettai village, Nagapattinam, (b) Proximity of the relocated village of Akkaraipettai to the sea

(a)   (b)
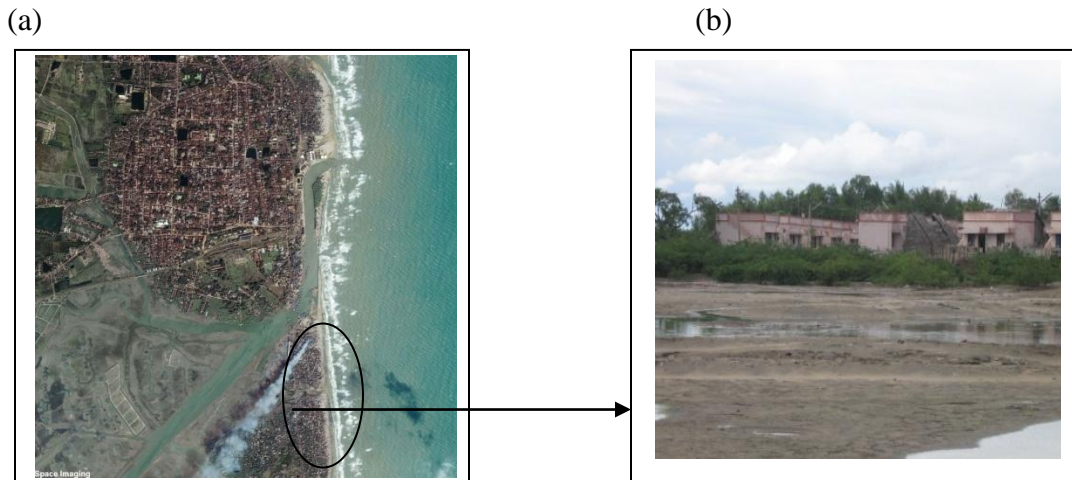
Source: Tsunami, 2004 [28]   *Source:* Author (Field work)

A few days after the tsunami, people started living in temporary shelters and new plans were developed for the fishing villages. The following figure shows the layout of a typical fishing village (see, Illustration 4.10). Around the fall of 2007, there was 60% occupancy of the permanent housing in Akkarapettai and close to 30% occupancy by the residents of Keechankupam (based on interviews with the government representatives of Nagapattinam District office). Detailed surveys were completed in both locations and the results are discussed in Chapters 5 and 6.

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[28] Space Imaging's IKONOS satellite took this high-resolution satellite image of Nagappattinam, India December 29, 2004.

Illustration 4.10 Typical layout of a new fishing village
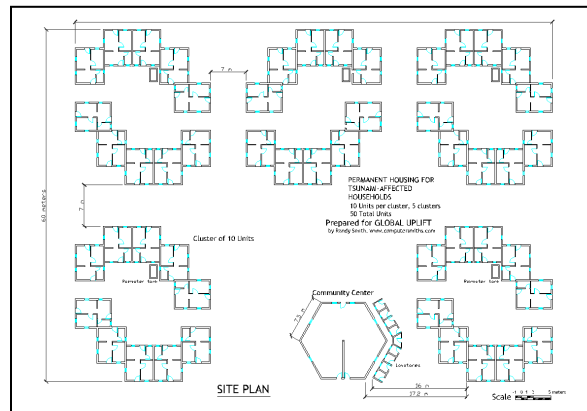
Source: UNDP, 2005

4.3. Summary:

Death, destruction and loss of livelihoods had shattered the confidence of the fishing communities in these areas. In the fall of 2008, the researcher went from one community to the other to explore and gather information and the perceptions from the communities on reconstruction. Four years after the reconstruction phase started, yet another 35 families in were waiting for the permanent shelters in Tsunami Nagar-Chennai (see, chapter 6). Further in early 2009, while reviewing a news paper article, it was noted that, "Tamil Nadu Slum Clearance Board" was preparing to construct 527 permanent houses at a cost of over $3 million (USD) for tsunami-hit people of Keechankuppam, a coastal hamlet in Nagapattinam, which was to complete by end of March 2009 (The Hindu, 2009). While entering the fifth year of reconstruction post-tsunami, the government appears to be still struggling to provide the basic facilities to the community. Detailed household interviews and community meetings clearly narrates the success and failure of the entire rebuilding process.

Chapter 5: Research Findings

5.1. Introduction

This chapter explores the research questions regarding the assessment of the reconstruction process for a disaster affected community and evaluation of indicators that suggest the success/failure of the disaster program. The chapter presents the, analysis of data collected through surveys in three disaster affected communities. Discussions proceed to build the relationship of the findings/outcomes with the planning methods that would be useful to improve post-disaster reconstruction processes.

5.2. Results and Discussion:

The results discussed in the following section are based on household level interviews that were conducted in three communities. Details of the methods used to conduct the survey and study area selected for the research are discussed in chapter 3 and 4 respectively. The household questionnaire had two types of responses (see, appendix A). Some responses had two variables such as "yes" and "no". These results are presented in the form of tables (for example see, table 5.1). The percentage value for each of the response was tabulated and results for the three communities were compared with each other. These tables were color coded, and for those responses to questions that reflected a positive impact on the community, they were shaded in blue. While responses to the questions that had a negative impact on the community were shaded in red. Since responses of the survey questions were 50 per cent and above, results of questions that ranged between 50%-70% as "yes" or "no" were responses was considered to be the lowest category for the both the positive and the negative responses. Those answers that had responses ranging between 71%-80% were grouped in the moderate category, and the responses ranging between 81%-100% were grouped at the highest category[229].

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[29] Positive category   Negative category

	Low	50-70%		Low	50-70%
	Moderate	71-80%		Moderate	71-80%
	High	81-100%		High	81-100%

This ranking was carried out in order to identify responses to which questions had a higher percentage of "yes" or "no" as an answer. Based on the color coding it was possible to identify that, sectors such as provision of potable drinking water, counseling centers, inability of the community members to pay back loan, and dissatisfaction of the members towards the government required immediate attention. On the other hand, responses to questions on legal transfer of the permanent housing, availability of markets, provision of road networks, schools and colleges, had a very positive response from communities.

On the other hand responses with multiple variables were represented in the form of comparative graphs. Results from the survey are discussed in alignment with the Table 3.2 from Chapter 3 (General Framework for developing indicators). At times during the surveys, respondent from a community chose not to respond to a particular question or in some cases; the question was not relevant or applicable for the particular community. In such case, the responses of the interviewees were listed under the category as 'no answer'. For example, interviewees were asked about the distance of health centers and whether or not they continue to exist after the relocation of the community members to permanent shelters from temporary accommodation (see Fig. 5.11a & b). It was observed that 30% of the respondents from VOC Nagar in Chennai did not respond to this question. There three possible interpretations to this, (a) they chose not to answer; (b) they were using different facilities that existed prior to the tsunami or (c) they were not aware of any health care facilities provided to them especially after the tsunami. As a result the interviewees did not respond to this question. Similarly there were other questions where the interviewees chose not to respond.

5.2.1 General information about the household:

Interviewees from each of the three communities were predominantly from fishing communities. In each community, the respondents were primarily men. This can be attributed to the nature of the community as being conservative, where women are not allowed to interact with outsiders/strangers.

Table 5.1 General information about the households interviewed

Study Area	Type of Community	Sex of HH[30] (person interviewed)	Sole bread earner of the HH
VOC Nagar, Chennai: n=85	82 % Fishing	67% Male	Yes 67%
Keechanukupam: n= 69 sample	100% Fishing	74 % Male	Yes 91%
Akkarapettai: n= 48	98% Fishing	83 % Male	Yes 71%

     A higher percentage of male respondents (73% to 83%) were in both rural communities. Despite government efforts to encourage women to work alongside men, it appeared from the results that men were the sole bread earner of the family, especially in the rural communities (see, table 5.1) In *Keechanukupam* 91% of the families had one earning member with an average family size of 4-5 members[31]. This indicated that a larger number of families in the rural areas depended on the income generated by one earning member in each household.

Figure 5.1 Family sizes for each of the community

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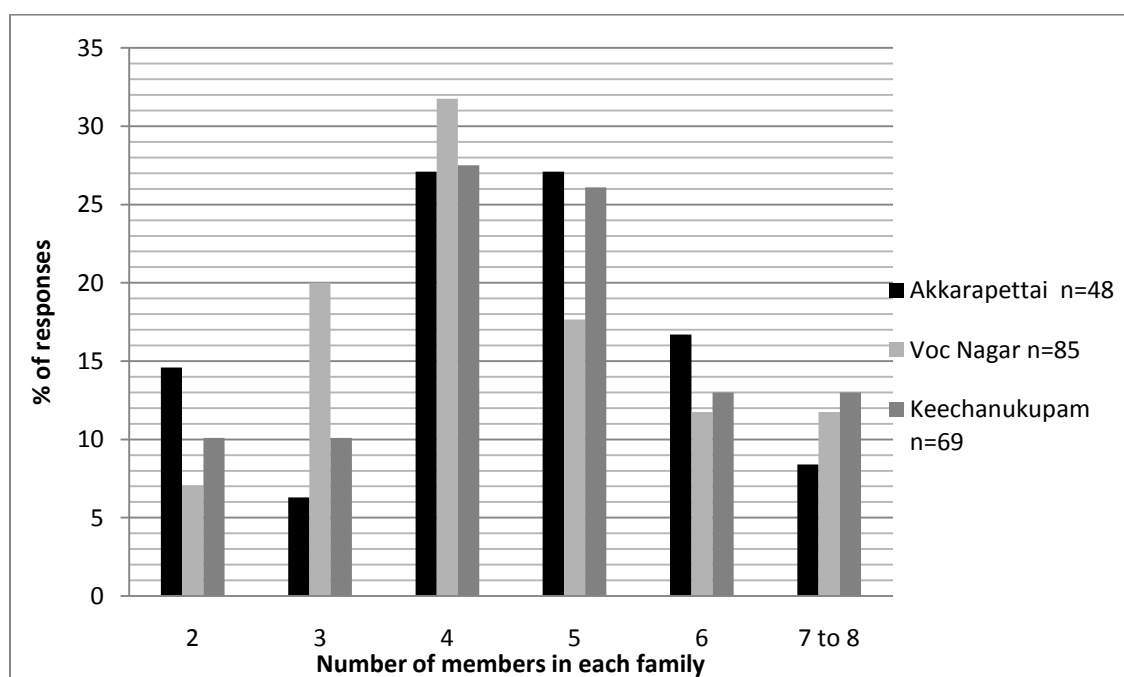
[30] Household
[31] Percentage responses are rounded to whole numbers

5.2.2 Physical and psychological restoration:

When asked if the families were satisfied with the initiatives undertaken by the government agency (Relief and Rehabilitation Center located in Chennai) both the rural communities (Akkarapettai & Keechanukupam in Nagapattinam district) as well as the urban community (VOC Nagar in Chennai) expressed their dissatisfaction despite being provided with financial assistance from the government (see table, 5.2). Each household received Rs.5, 000 /- INR ($104 USD) [32] monthly, for over two years.

Table 5.2 Government assistance after the Tsunami of 2004

Study area	Whether Asst. Received from Government	Satisfied with Govt. Agency work
VOC Nagar, Chennai: n=85	No 55 %	Yes 79%
Keechanukupam: n= 69 sample	Yes 80%	No 68%
Akkarapettai: n= 48	Yes 88%	No 67%

Figure 5.2 Amount of compensation received by each family
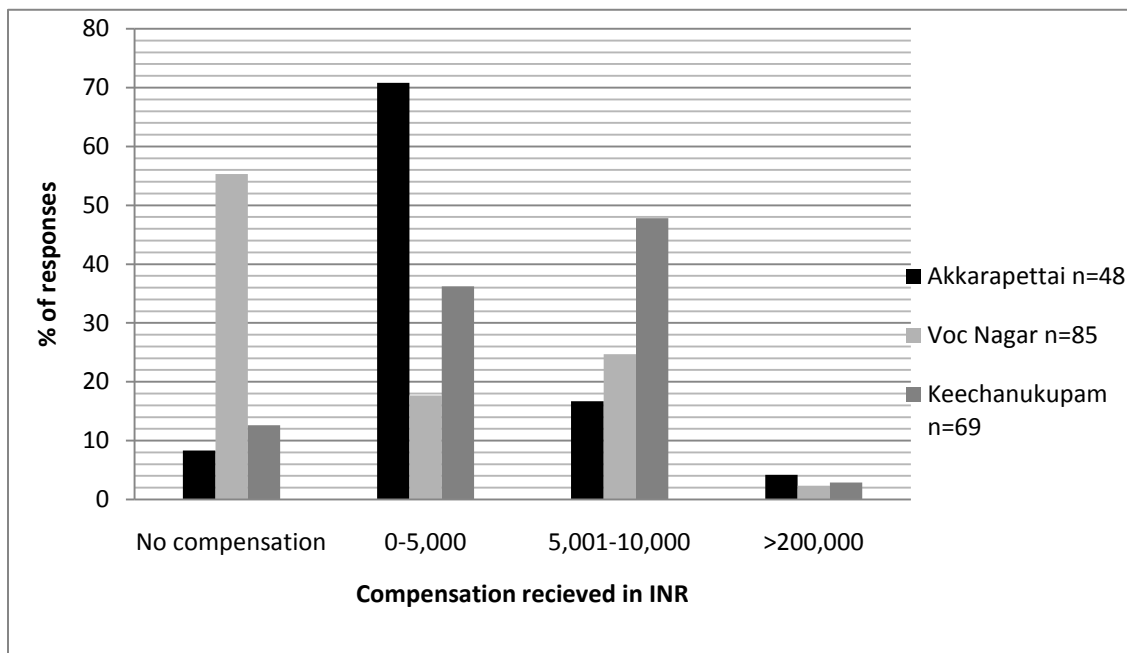
However, it was interesting to notice that almost 55% of interviewees from VOC Nagar in Chennai said that they had received no compensation (see, Fig. 5.2). This could be interpreted as, (a) they were hesitant to reveal the amount of compensation received by them from the government; (b) the interviewees were not Tsunami victims and were renting the place; (c) they did not receive compensation in the recent past.

Figure 5.3 Responses of interviewees when asked, (a)who were the providers of relief and; (b) what was the reason for their dissatisfaction with the government work.

(a)

(b)

95
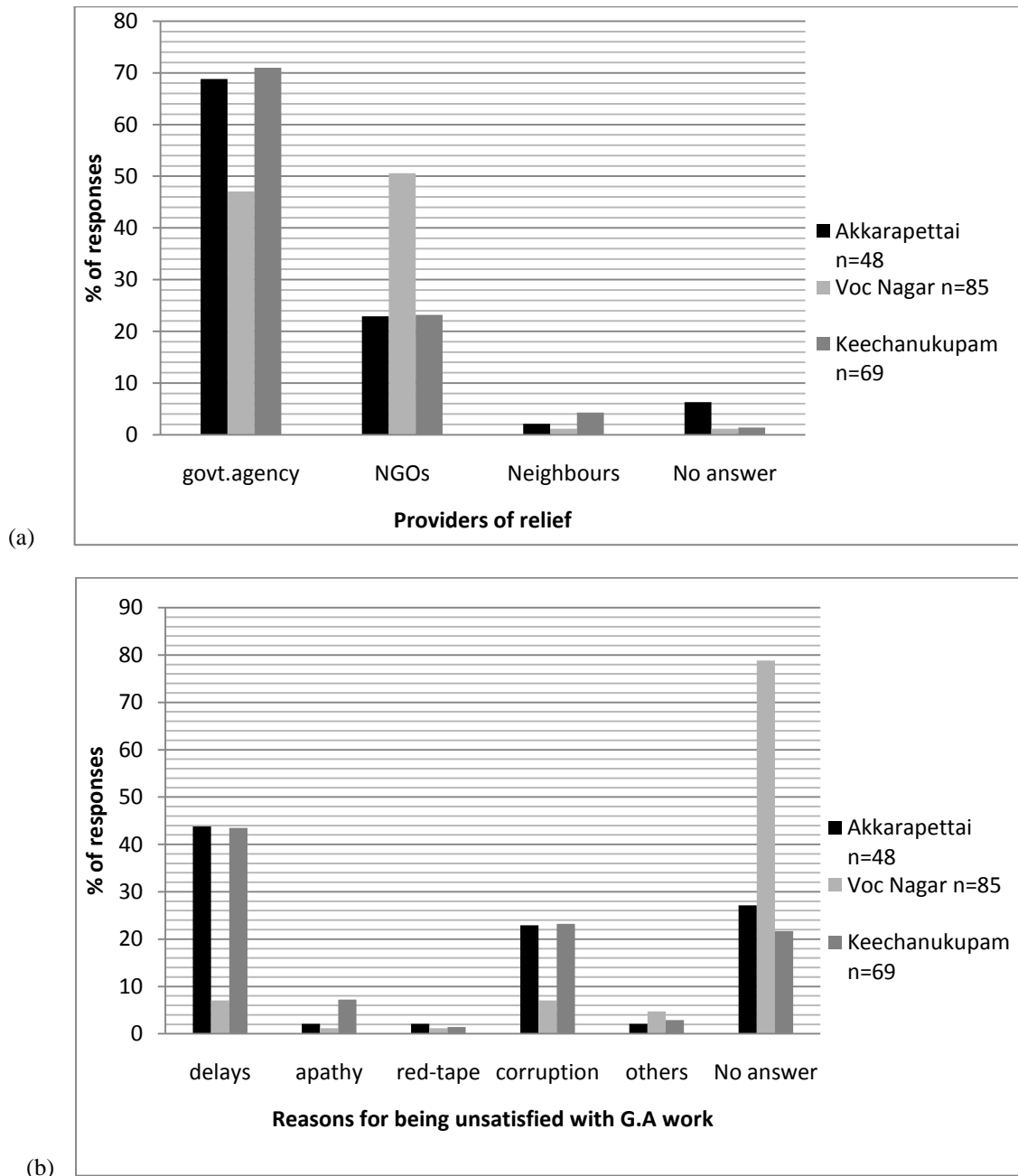
Both the government agencies as well as the NGOs played a major role in providing relief to the communities affected by the Indian Ocean Tsunami of 2004 (see, Fig. 5.3a). However, the community members showed dissatisfaction with the governments' work either due to the delays in delivering relief/aid in the rural communities or due to corruption (see, Fig.5.3b). Interviewees spoke about corruption by the government representatives and instances where names of some of the community members did not appear on the list for housing or financial aid. Almost 79% of the interviewees from the urban location chose not to respond to the question of their satisfaction with the government agency. This could be attributed to their fear or the fact that as they were living in apartments built by the government department and were grateful to them for providing the permanent housing.

5.2.3. Housing:

During the period the surveys were carried out, the population living in temporary shelters from 26th December 2006 to the last quarter of 2007 was relocated to permanent housing. Almost 60% of the permanent housing in both urban as well as rural communities of coastal Tamil Nadu was completed and the remaining infrastructure was still being added on site.

Table 5.3 Housing need based and legally transferred

Study Area	If housing was need based	If house legally transferred
VOC Nagar, Chennai: n=85	53% Not need based	93% yes
Keechanukupam: n=69 sample	86% yes need based	88% Yes
Akkarapettai: n=48	81% Yes need based	92% yes

Permanent housing in the urban location (VOC Nagar, Chennai) were in the form of apartment buildings where each household was provided with cubical approximately 350sq. ft in size, consisting of a kitchen, washroom, and living area. A narrow corridor connected each of the cubical and lead to a flight of stairs. The apartment blocks had multiple floors and were not provided with elevators. Household sizes varied and the families were generally large with more than five members sharing a very small living area for all their activities. Almost 53% of the interviewees from *VOC Nagar* (Chennai) said that the housing was not need based (see, Table 5.3).

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Illustration 5.1 (a) Apartment blocks in Chennai, (b) Housing in rural areas

(a)

(b)
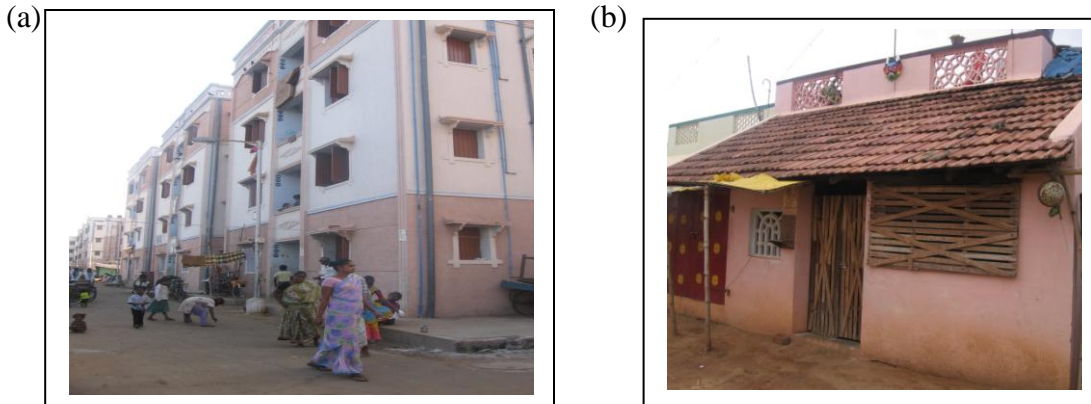
Source: Author (Field Work)

Source: Author (Filed work)

The housing provided in the rural locations (Akkarapettai & Keechanukupam), were individual row houses. Each of the units comprised of at least a living area, a bedroom, washroom and a kitchen. The housing units were relatively larger (550-600 sq.ft), with each house having a provision for extension up to the next floor level.

Figure 5.4 Housing material used for the newly constructed houses
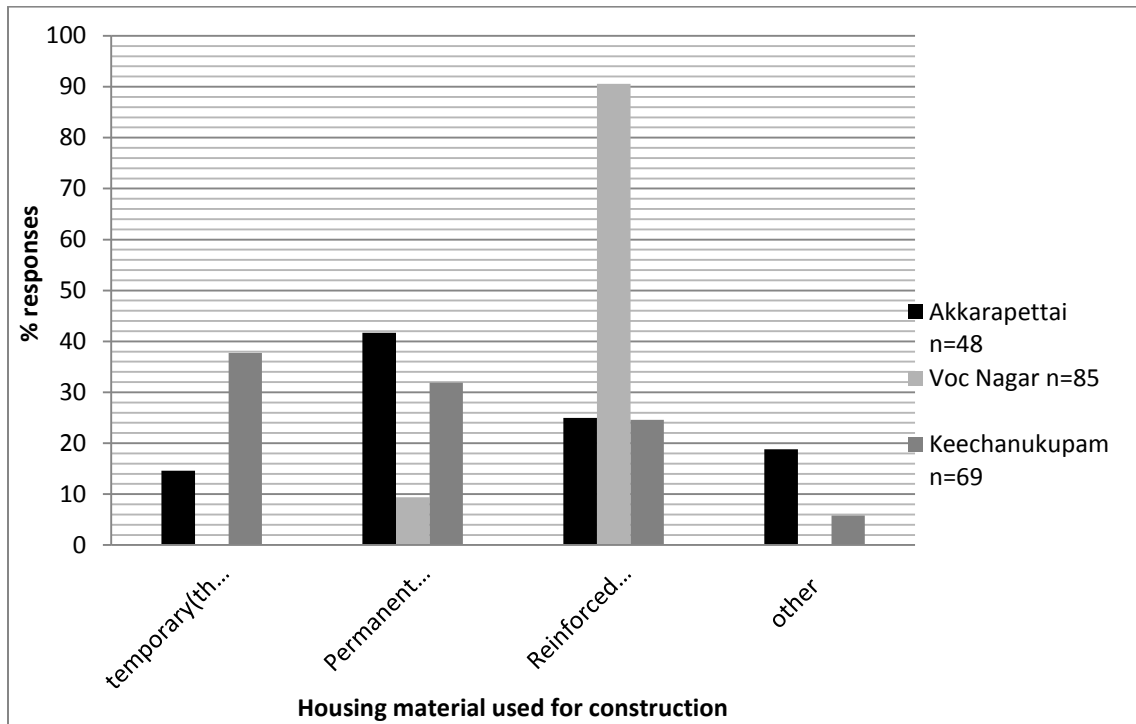
Housing in the urban location (VOC Nagar, Chennai) was built of mostly reinforced concrete. In the rural areas (Akkarapettai & Keechanukupam) the walls of the houses

were built of reinforced concrete or brick and based on local availability different, roofing materials were used, such as, thatch, tin, or asbestos (see, Fig. 5.4).

Figure 5.5(a) The providers of housing material and (b) if the new housing has been transferred to the owner legally

(a)

(b)
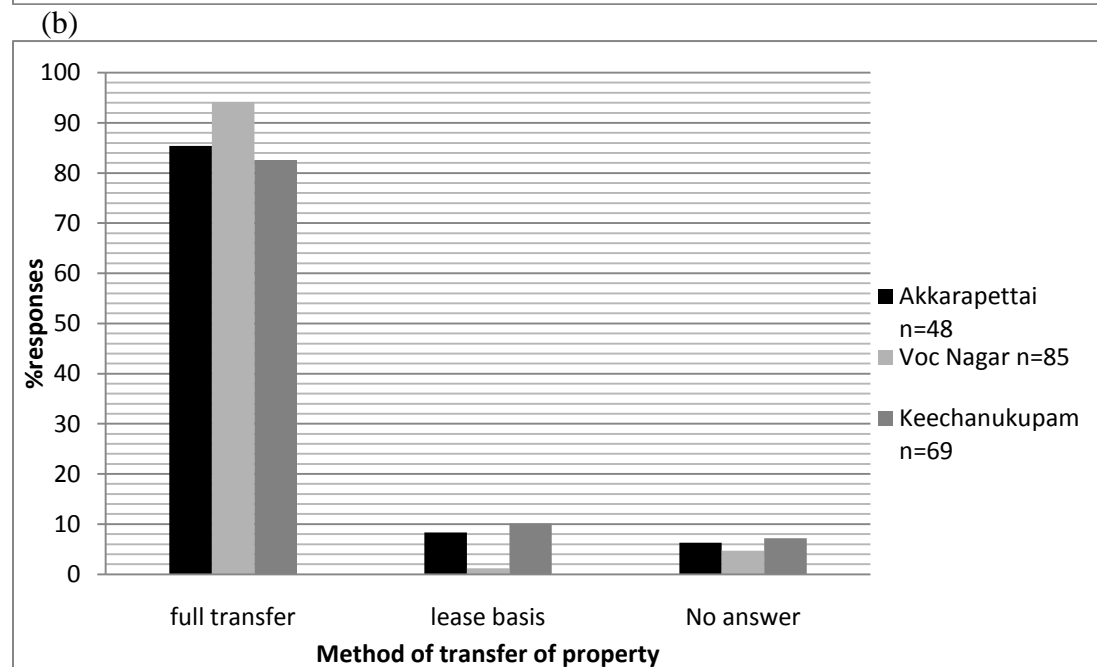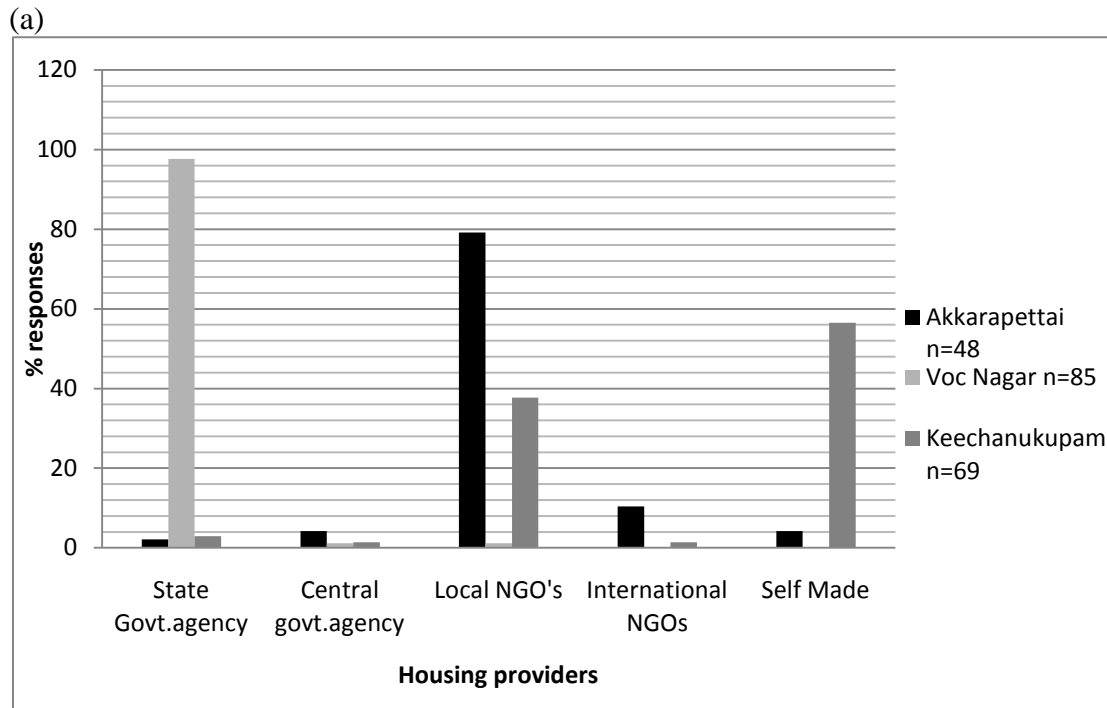
Based on the survey results, it appeared that the government agencies were fully involved in the urban areas (VOC Nagar, Chennai) in designing as well as providing the housing to the affected community (see, Fig. 5.5a). However, in both the rural communities (Akkarapettai and Keechanukupam), results from interviews and discussions showed that the NGOs (local as well as international) were more actively involved in rebuilding process. In Keechanukupam (rural community), families were still living in broken houses or partially repaired housing. Almost 57% of the interviewees from Keechanukupam said that they has rebuilt or repaired the houses by themselves and had received no support from either the Government or NGOs (see, Fig. 5.5a). This was one of the worst locations among the three communities (VOC Nagar, Akkarapettai and Keechanukupam) surveyed. There were numerous complaints being made by the interviewees about being neglected by the authorities and not being provided with new housing.

Illustration 5.2 (a) Housing at Keechnukupam (rural community), (b) Distance of the house from the sea

(a) (b)

Source: Author (Field work)   *Source:* Author (Field work)

The permanent housing provided to the community members was legally transferred to the families. Almost 83% to 94% of the interviewees confirmed that they legally owned the property. 8-10% of the rural population had leased the property, and yet another 4-7% from all the three communities had no answers to the question on transfer of properties (see, Fig.5.5b). The latter can be attributed to the fact that some of the respondents were women, who in such communities are usually unaware of legal matters of the household.

Figure 5.6 Responses of interviewees about distance of house from the sea
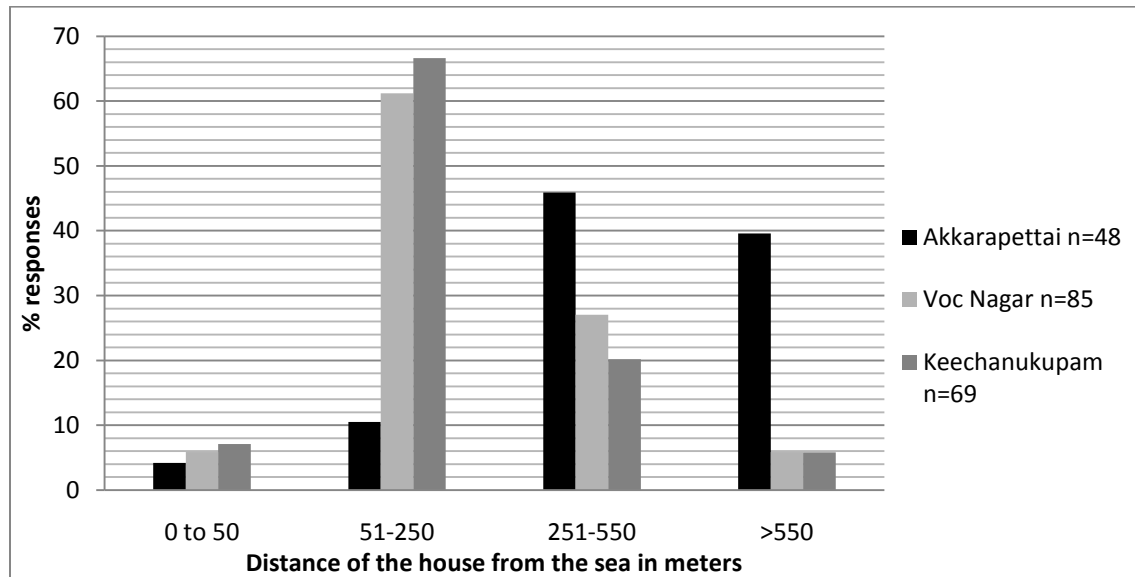
One of the most important reasons for the large scale impact of the Tsunami of 2004 was the proximity of the fishing villages to the sea. New policies laid down by the Government of Tamil Nadu, India, prohibits any construction up to 500 meters from the sea (see, Chapter 7 for details on coastal regulation policies).

Responses from the three communities (VOC Nagar, Akkarapettai and Keechanukupam) showed that distance of the houses were at least 250 meters away (see, Fig 5.6). However, in reality houses in Keechanukupam (rural community) were still very close to the sea (see, Illustration, 5.2b) at a distance of 10 meters or less. Households were waiting for the permanent housing and were living in repaired in-situ housing which was vulnerable to storms, floods or even another tsunami.

5.2.4 Infrastructure:

In each of the three communities surveyed (VOC Nagar, Akkarapettai and Keechanukupam), provision of potable drinking water was one of the major concerns expressed by the interviewees. The households expressed dissatisfaction as none of the new housing had potable drinking water supply or regular water supply. Households has access to municipal taps for water supply prior to the Tsunami and were now hoping to have better provisions made in the permanent location. Relocated population in VOC Nagar, Chennai had to carry water from the nearby municipal tap up to four floors in

apartment blocks. 99% of the respondents in this location said that there was neither potable water facility inside the housing units, nor regular or sufficient water supply from the municipal tap (see, Table 5.4). A lower (71%-80%) but a similar response was obtained from the rural communities (Akkarapettai and Keechanukupam).

Table 5.4 Provision of potable drinking water

Study Area	House provided with potable water facility inside	Regular or sufficient water	Provision of potable water nearby
VOC Nagar, Chennai: n=85	98.82% No	97.65 % No	98.82 % yes
Keechanukupam: n=69 sample	58% No	79.7 % No	69.6 % Yes
Akkarapettai: n=48	62.5% No	70.8% No	85.4 % Yes

Figure 5.7 (a) Distance of source of water and (b) type of source for water

(a)

(b)
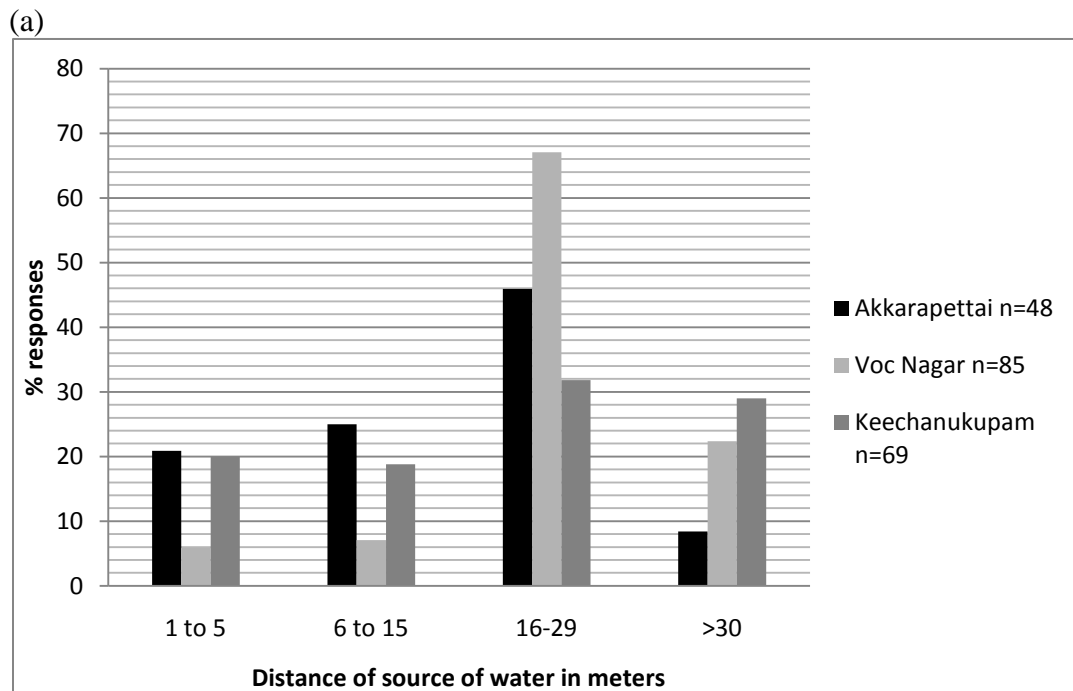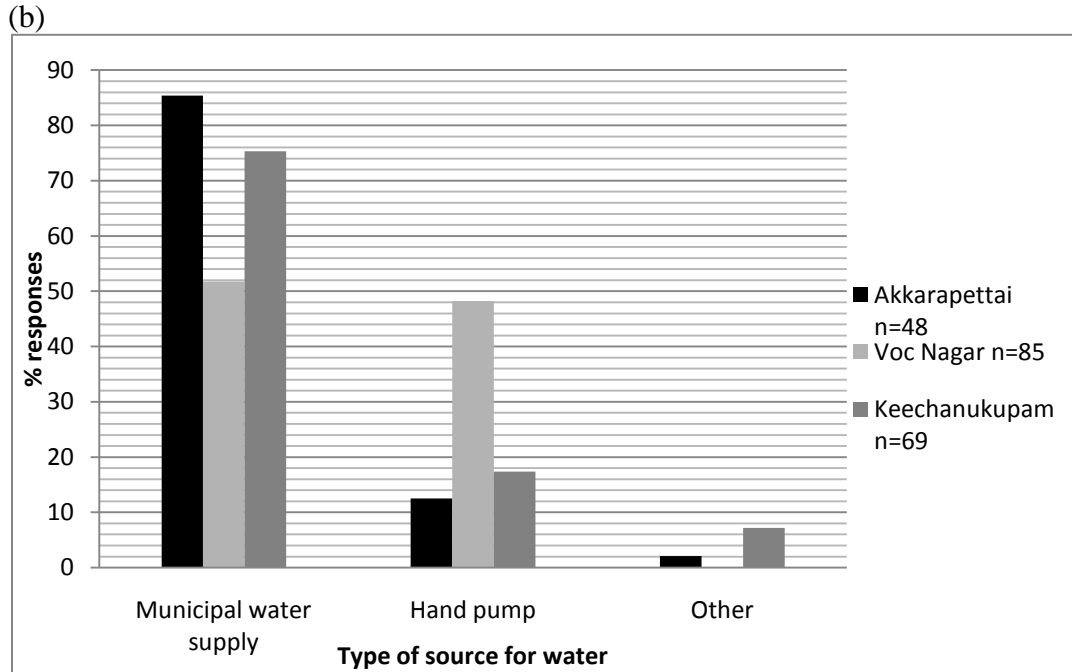
*other sources – ponds, purchase water etc.

There were water meters and taps installed in the apartment blocks in VOC Nagar, Chennai, but there was no supply of water for over eight months. The walking distance to the municipal taps was almost 15- 30 minutes in the three communities (see, Fig. 5.7a). People had to line up at the municipal taps to collect drinking water. In the rural areas, both municipal water supply as well as hand pumps were used to collect drinking water (see, Fig, 5.7b). Interviewees in the rural communities (Akkarapettai & Keechanukupam) expressed anger as the quality of water was poor (saline and muddy) and the public taps did not have regular supply of water.

Government agencies had provided electricity to each of housing units, both in the rural areas (Akkarapettai & Keechanukupam) and the urban location (VOC Nagar, Chennai). Meters were installed to monitor the consumption rate of electricity by each household. On an average, households were paying Rs.150- Rs.200/- (INR) per month ($3.06 USD- $4.08 USD) for consumption of electricity (see, Fig. 5.8a).

Figure 5.8 (a) Amount paid for electricity and (b) time taken to reach place of work

(a)
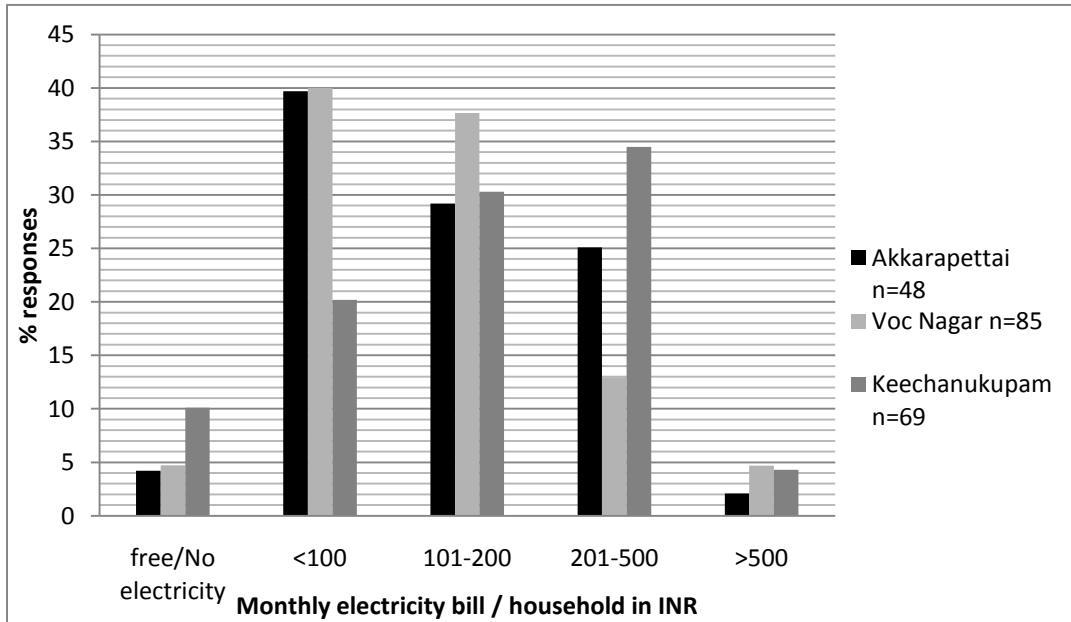
(b)
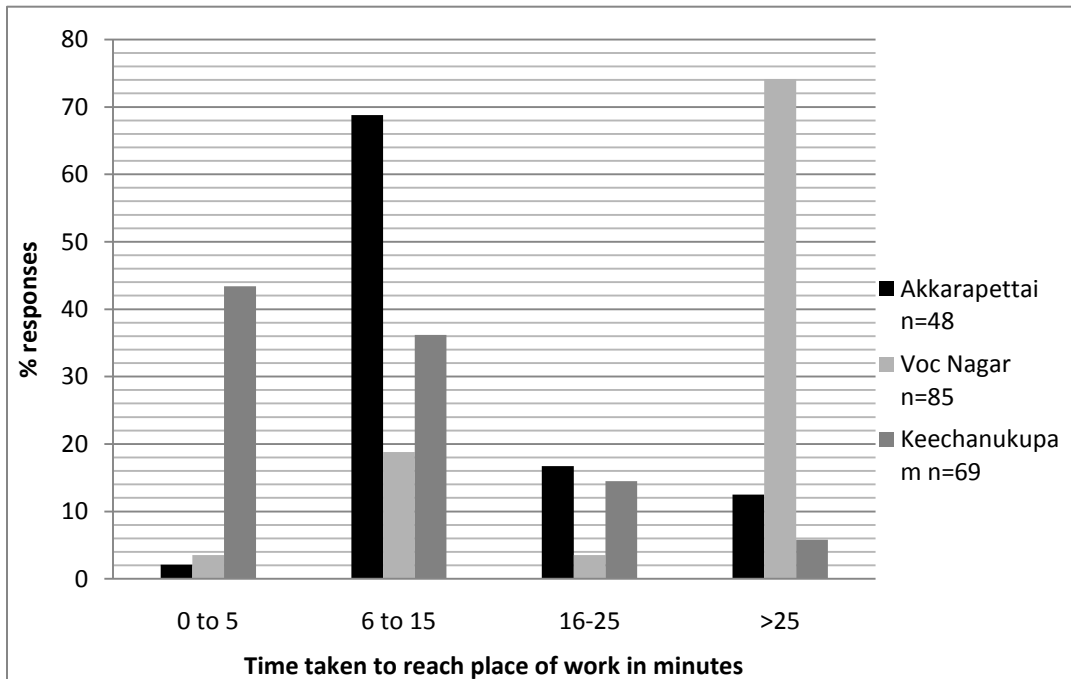
One of the major impacts of the relocation of the Tsunami victims to new areas was the distance they had to travel to work. This was a major concern, especially, in the urban areas (VOC Nagar), where household members had to walk over 25 minutes to reach

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their work place (74% of responses). The new permanent housing location in Chennai was farther away from the sea. Those households that continued fishing as their main occupation had to travel long distances and incur extra cost for utilizing public transport to reach their work place. However, the location of the permanent housing in the rural areas (Akkarapettai & Keechanukupam), was closer to the sea. Therefore, those households that practiced fishing could reach their work place, within 5-15 minutes. Distance to the work place from the permanent housing was the major factor for people changing their occupation (see, section 5.3 of this chapter).

Table 5.5 Provision of road networks and proximity of schools to the house

Study Area	Provision of road Network	Schools/colleges close to the house	If children study in school.
VOC Nagar, Chennai: n=85	89% Yes	87 % Yes	60% No
Keechanukupam: n= 69	97% Yes	88% Yes	75% No
Akkarapettai:n= 48	96% Yes	96 % Yes	69% Yes

5.2.5. Educational Facilities:

One of the more positive aspects of reconstruction post-tsunami of 2004 in the state of Tamil Nadu was the construction of new schools and renovation of old schools. From interviews and discussions with the community, it was concluded that almost 85%-96% of the children from Akkarapettai and Keechanukupam were attending school. Parents had become more aware of the fact that better education could make their children aware of hazards in future, as well as provide them with various career opportunities. On the contrary, in the urban location in Chennai (VOC Nagar), almost 60% of the responses (see, Table 5.5) showed that children did not go to schools, although schools existed in this area (see, Fig. 5.9b). The main reason for not attending school was related to the additional costs incurred to reach schools, since the schools were more than 20 minutes (walking) away from home (see, Fig. 5.9a). Some of the government schools charged an annual fee that the households could not afford and hence were reluctant to send children for education.

Figure 5.9 (a) Distance of the school from home, (b) whether the schools were newly built or old and repaired, (c) reason children do not study in school

(a)

(b)
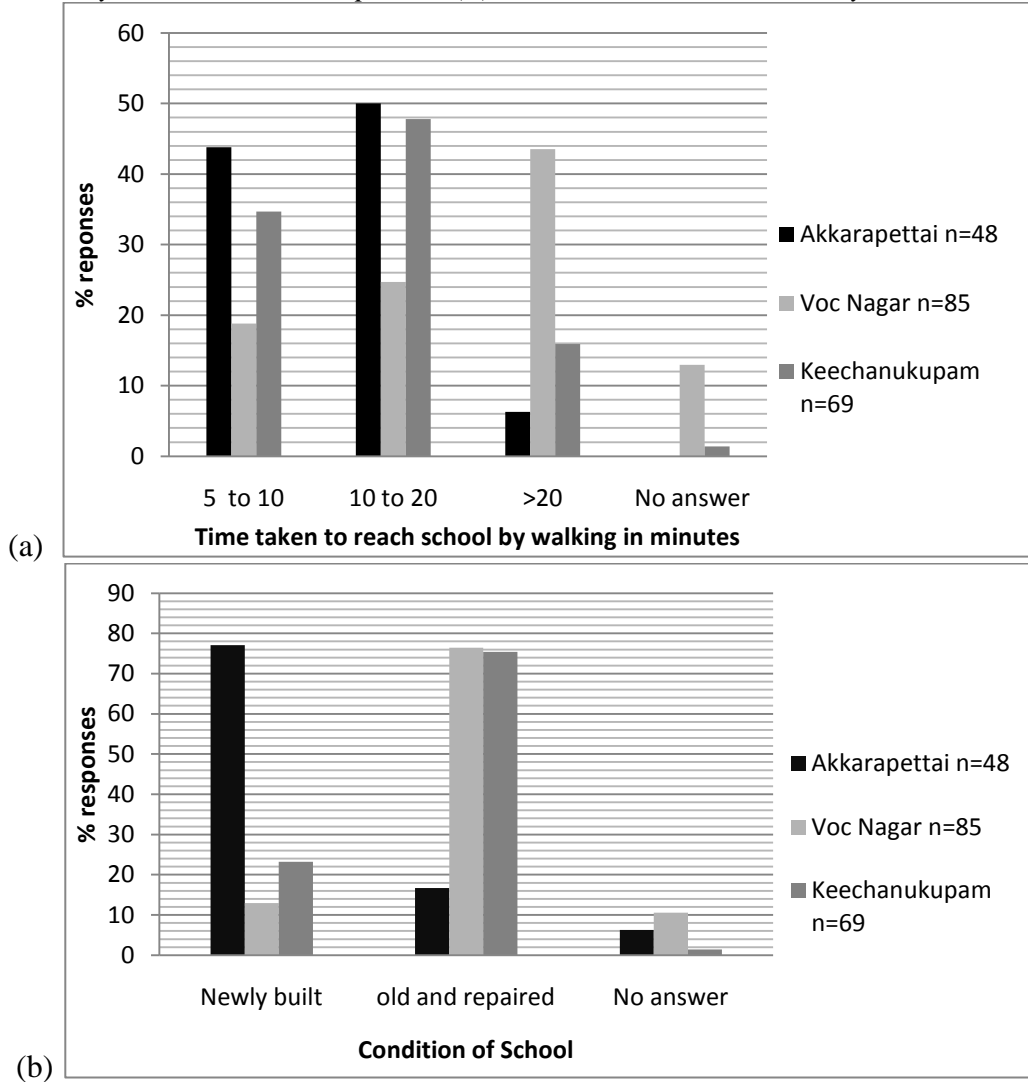
Almost 77 % of schools in Akkarapettai were newly built (see, Fig.5.9b). This rural community also showed a higher percentage of children attending school. The schools were either built by the government or through aid programs by various international agencies. By providing new schools in the rural areas, more students were enrolled during the recent years (2007-2008) of reconstruction after the 2004 Tsunami.

(c)

Reasons children do not study in school
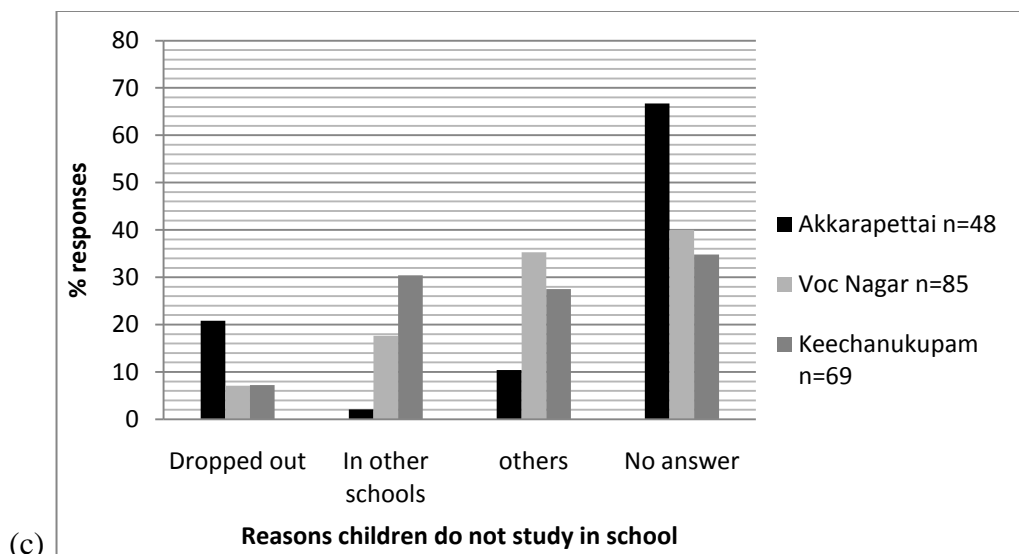
However, in the urban location (VOC Nagar, Chennai), children did not attend newly built schools because they preferred to go to the original schools (old schools) where they were enrolled before the Tsunami. During the community meetings, some of the respondents mentioned that the new schools in the urban areas did not have regular teachers. The old and repaired schools had to accommodate previously enrolled students, as well as the new students that moved into the relocated areas; hence some of the children did not get admission for the academic year and remained at home.

5.2.6. Markets:
Existence of markets is an indicator that general population has access to food and other essential utilities. Therefore, in a post-disaster scenario, it is important for the new neighborhoods to be planned either close to the local markets or to have provision for opening new markets.

Table 5.6 Existence of market facility

Study Area	Food market close to house	If the market facility existed before
VOC Nagar, Chennai: n=85	91 % Yes	51 % Yes
Keechanukupam: n= 69	65% Yes	55 % No
Akkarapettai:n= 48	94 % Yes	67% No

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In all the three communities where the surveys were being carried out, food markets were close to the residence (such as VOC Nagar in Chennai) and new stores and markets where people had been opened were people could go to purchase utility products and food (see, Table 5.6).

Figure 5.10 Distance of the local markets from relocated housing
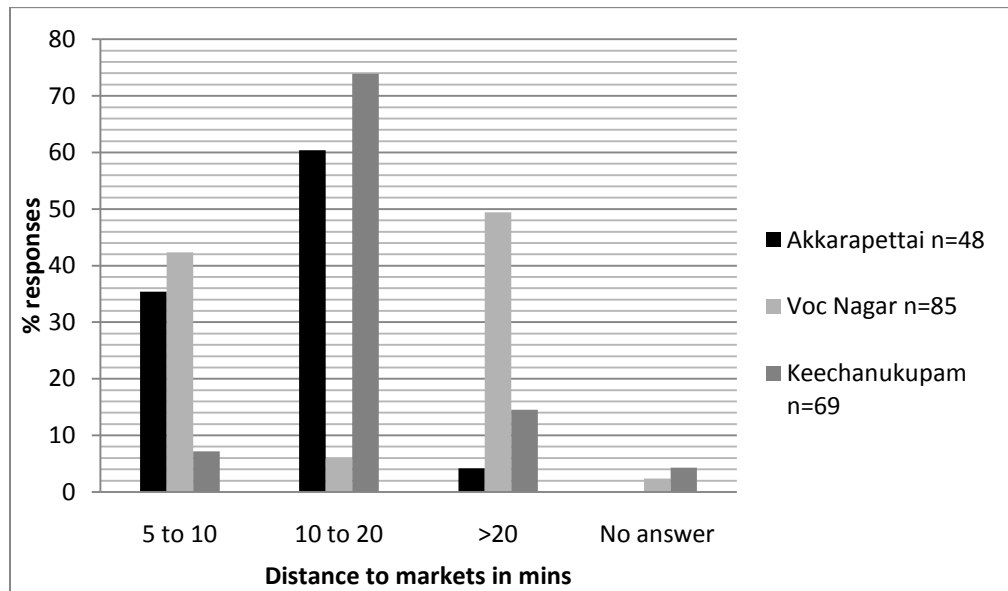
The respondents were satisfied with the new market facilities that were provided after the tsunami especially in the rural locations (Akkarapettai and Keechanukupam).

5.2.7. Health care facility:

Health care facility is one of the most critical services that should be provided to the community. During the Indian Ocean Tsunami of 2004, a large population in the coastal regions of Tamil Nadu, India, suffered from physical and psychological injuries. The Red Cross organization, local health care centers and hospitals provided immediate care for a few months. Soon after, the traumatized population was moved to temporary shelters, where health camps and mobile health centers provided the necessary treatment whenever it was needed. Such health care camps were set up either by the government agency or by the NGOs. Once the relief phase was over, the affected population was moved to permanent shelters toward the third quarter of 2007. Since a large population

was relocated to a new location, it was expected that health care facilities would also be provided in these new location.

Table 5.7 Health care facility

Study Area	Any hospital nearby after the Tsunami	Community benefited from the facility	Any counseling center nearby
VOC Nagar, Chennai: n=85	69% Yes	64 % Yes	100% No
Keechanukupam: n=69	75% No	52% No	60% No
Akkarapettai:n= 48	50% Yes	67% No	65% No

However, survey results show that, 45% to 68 % of respondents were concerned as the health centers were far away from the relocated areas (see, Fig. 5.11a). There was a mobile camp setup in the urban location (VOC Nagar, Chennai), but in the rural community of Keechanukupam, household members had to take public transport to reach a health care centre, which was at the distance of more than 20 minutes by public transport (see, Fig. 5.11a). The household members said that they had to spend extra money to reach and avail health care facilities. Many of the households could not afford health care and would suffer from diseases during the monsoon season, such as malaria and typhoid.

Figure 5.11 (a) The distance of the health centers from relocated housing, graph (b) The responses to whether the health center continues to exist.

(a)

108

(b)
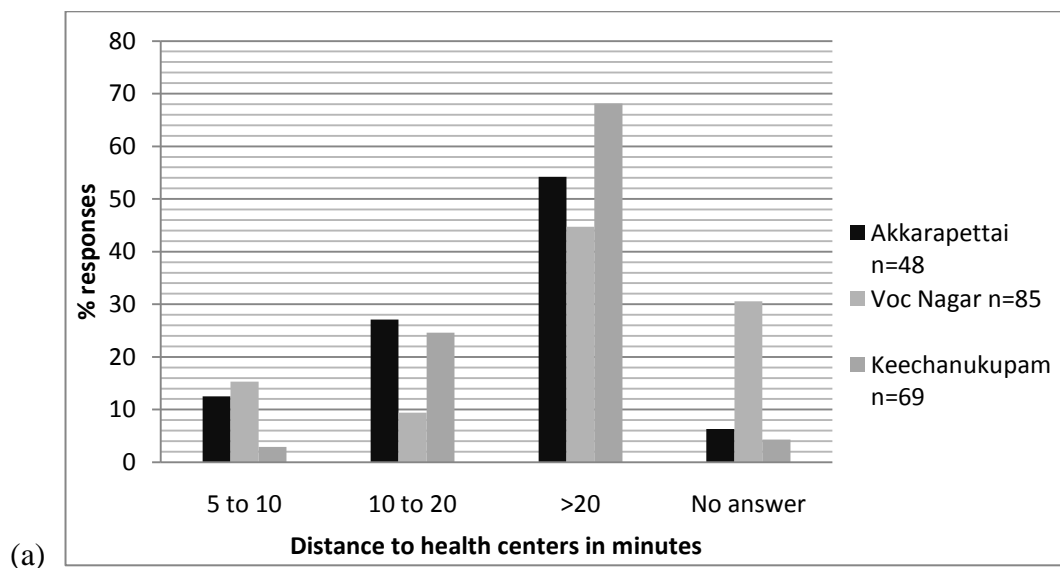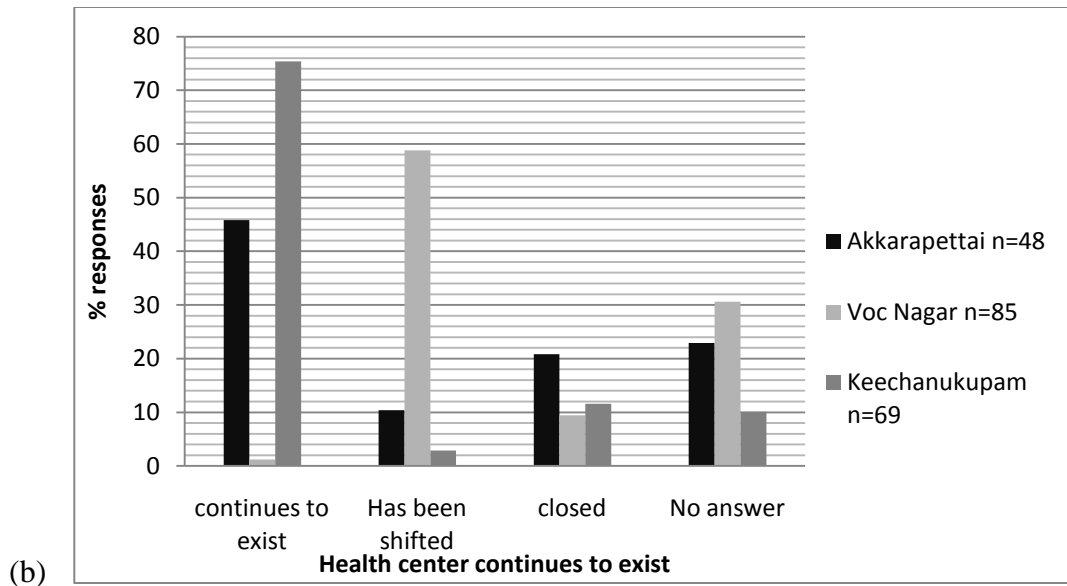
The community required counseling services to recover from the trauma of such a large scale disaster that had totally changed their lives. They had lost their homes, family members and their jobs. Relocation to new areas meant that people had to undergo numerous changes, physically as well as psychologically. Although some of the interviewees did express the desire to go for psychological treatment they could not avail the facility as counseling centers did not exist (see, Fig. 5.12a) in either of the communities (VOC Nagar, Akkarapettai & Keechanukupam).

Figure 5.12 (a) The responses if counseling services exists and graph (b) The percentage of responses that show who were the providers of the center

(a)

100
90
80
70
60
50
40
30
20
10
0

% responses

State govt   Central   NGO   Others   No answer
              govt

Providers of counseling center

■ Akkarapettai n=48
□ Voc Nagar n=85
■ Keechanukupam
   n=69

(b)
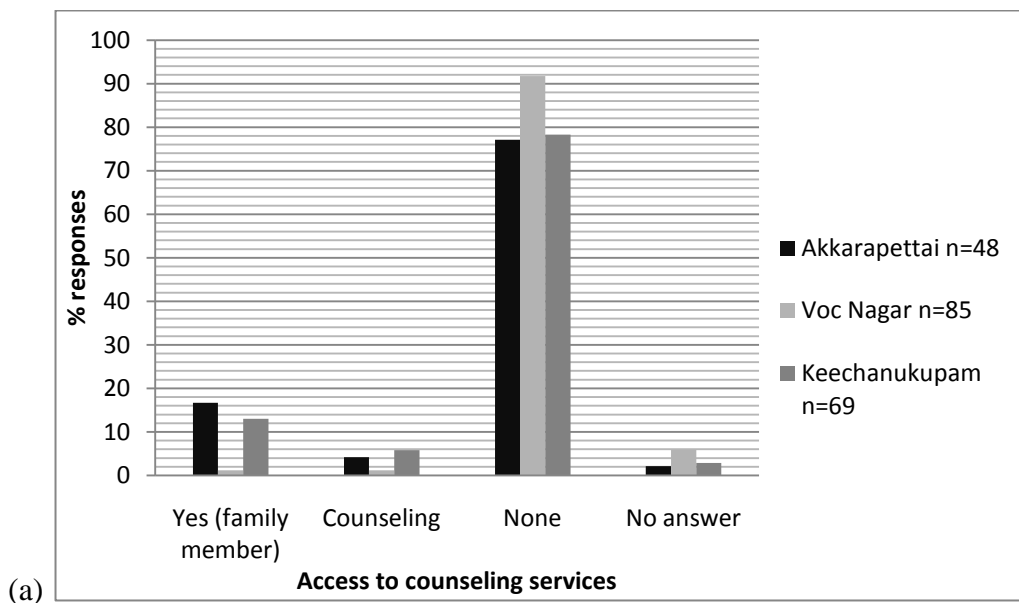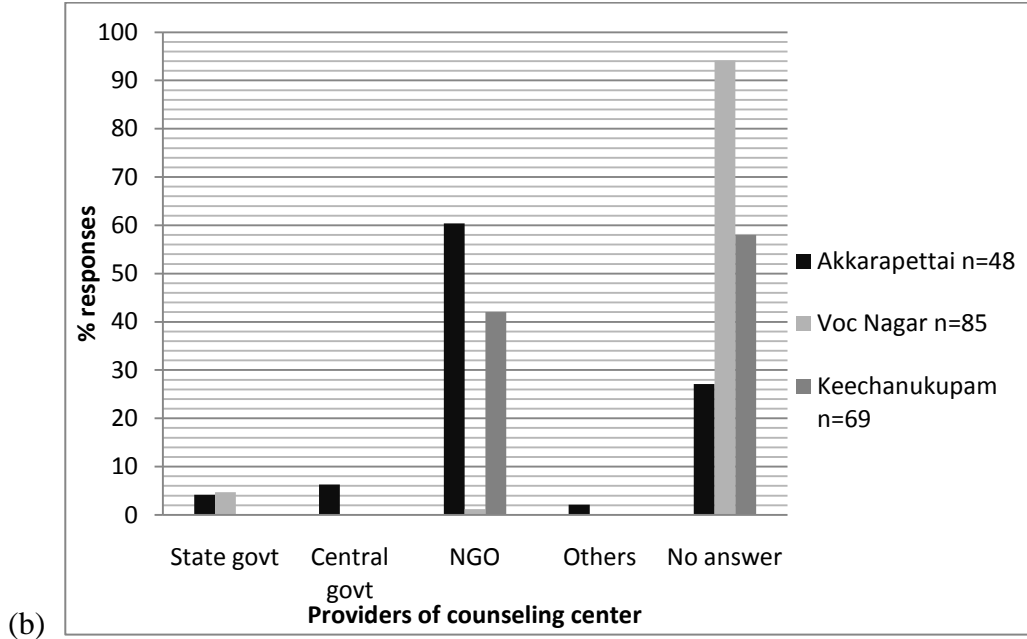
Since there were no existing counseling centers in the urban location (VOC Nagar), 94% of the interviewees chose not to respond to the question of providers of counseling centers. However, in the rural areas (Akkarapettai & Keechanukupam), there were few counseling centers set up during the initial period (first quarter of 2005), immediately after the Tsunami of 2004. These centers were coordinated by the local and international NGOs.

5. 3 Discussion on alternative livelihoods and results from surveys:

The scale of the 2004 tsunami and its impact on people, landscapes and livelihoods led to an unprecedented response from the global community to provide immediate emergency relief. The focus moved to rehabilitation and reconstruction of the livelihoods of the affected communities with an urgent need to ensure medium and long-term rehabilitation programs that would provide communities with a better and more sustainable future. Most of the affected rural coastal communities were poor and dependent on natural resources for their livelihoods. The tsunami had caused substantial damage to their shelters, boats and fishing gear. The search for alternative livelihoods had reached a crescendo in a years' time after the Tsunami. This type of disaster had brought risks involved in the coastal livelihood practices for the community. For a common

person livelihood means "everything or anything to make ends meet". Literature tells us more about livelihood and sustainable livelihood. Chambers and Conway's (1992) definition suggests that, "…a livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Ashley & Carney 1999, Carney 1998).

The Government of India had addressed the livelihood requirements for the communities through earnest and dedicated programs of alternative livelihood. The Government and the Aid agencies recognized the advantages of group based activities and thus, special attention was paid to the affected communities to ensure that such opportunities were delivered through the various Self Help Groups. Following such initiatives, it was expected that the coastal economy supply chain would be substantially altered after the implementation of these schemes (Govt. of Tamil Nadu, 2005). However, the household survey conducted by the researcher in three locations (VOC Nagar, Akkarapettai & Keechanukupam) did show that the community was yet to recover fully from their losses and required continuous support from the government to get back to normal lifestyles especially in the context of livelihoods.

5.3.1. Capacity Building and Livelihood Restoration:

Figure 5.13 (a) Dependence on relief (b) the type of occupation.

(a)

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(b)
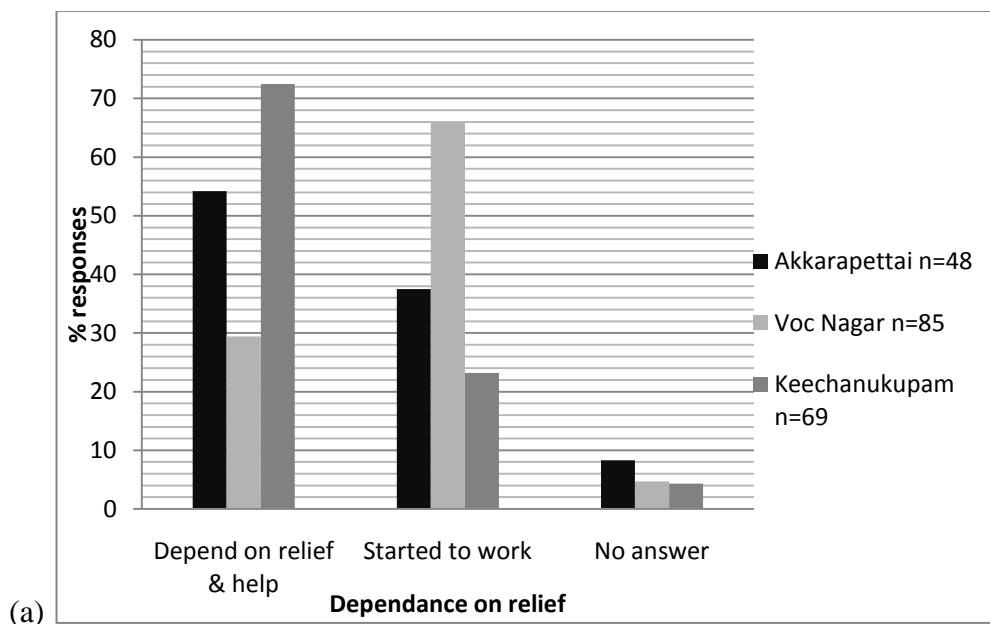
The results show that in both the rural communities (Akkarapettai and Keechanukupam), households were still dependant on relief from the government (see, Fig. 5.13a). Whereas, in VOC Nagar (Chennai), 66 % of the community had started some form of occupation (see, Fig. 5.13a). Although, as discussed earlier, only one member from each of the interviewed households was employed (see, Table 5.1), Keechanukupam shows a very high dependence on relief, almost73%. Interestingly the community (VOC Nagar) showed the lowest dependence on relief (29% -responses) was the community having highest percentage returning to work (65.8%-responses). A discussion based on the relation of dependence on relief and return to work is carried out in Chapter 7 of this thesis. Keechanukupam was one of the most underprivileged communities among the three surveyed communities. From the surveys it appeared that communities were trying to go back to their original occupation, which was mostly fishing related (see, Fig. 5.13b).

Figure 5.14 (a) Type of occupation practiced within the fishing industry and (b) how the community has been able to recover in businesses

(a)
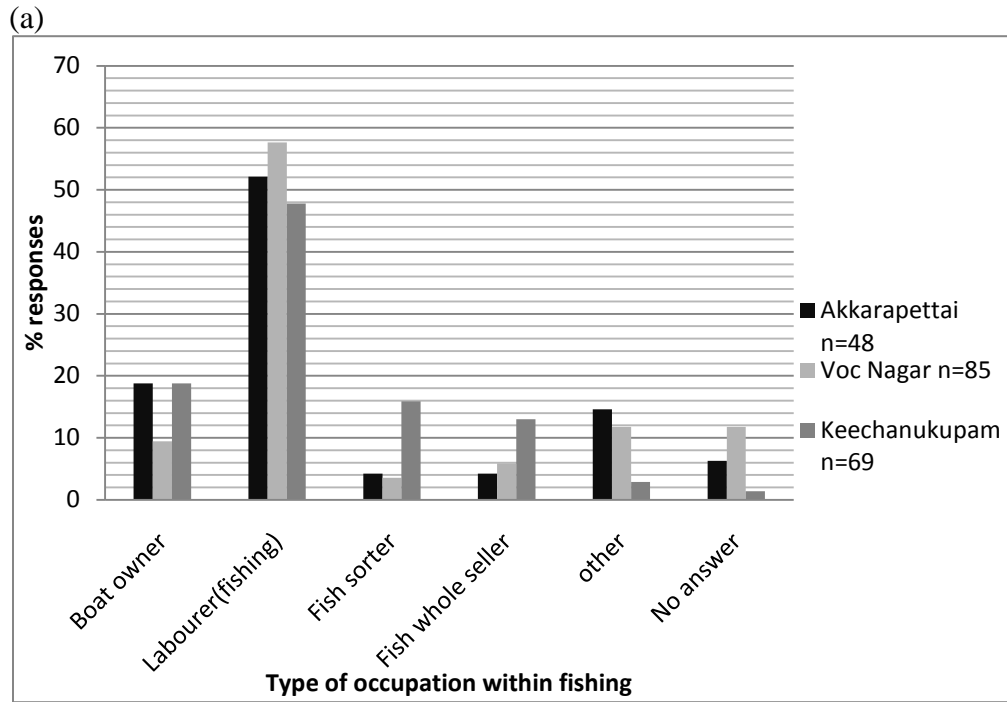
*other occupation: fish drying & trading, net making & fabrication of equipment, boat making & repairs, power boat maintenance, etc.

(b)
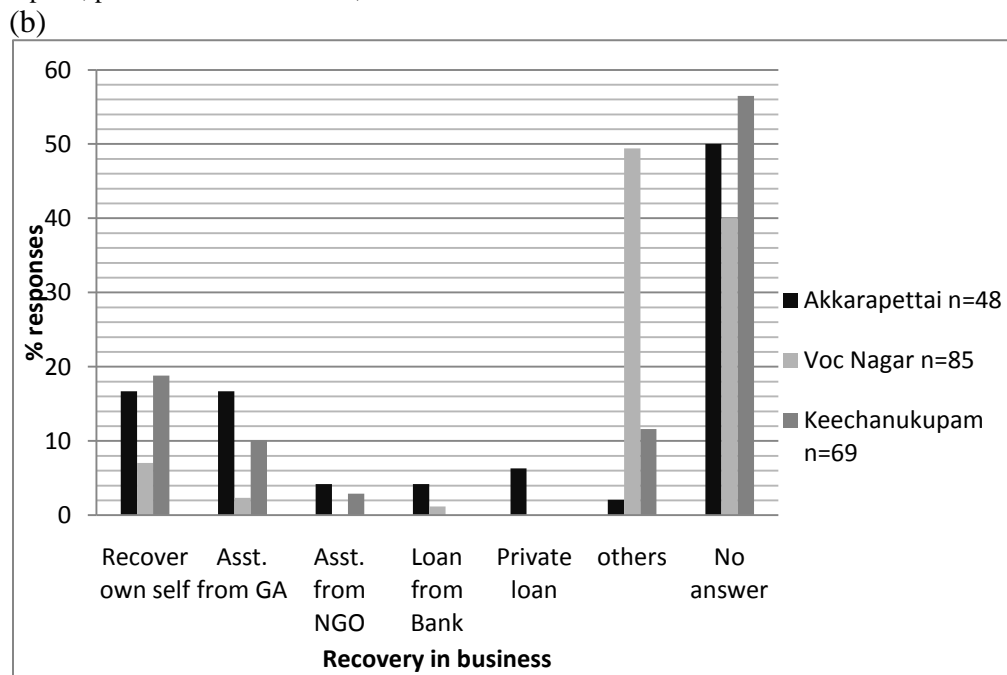
*other methods of recovery in business: Selling of household items, mortgage of property & assets, etc.

Comparing responses from the three communities (VOC Nagar, Akkarapettai & Keechanukupam), it appeared that just over half (48% to 57%) of the population is involved in the fishing industry as laborers who earn daily wages. This type of occupation is higher in the urban location in Chennai (see, Fig 5.14a) and represents the same occupation that was practiced prior to the Tsunami of 2004 by the households. Other households that had lost their businesses tried to revive them by their own selves, by taking private loans or selling off their remaining assets (see, Fig 5.14b).

Figure 5.15 (a) Type of changed occupation and (b) The period of return to former work.

(a)
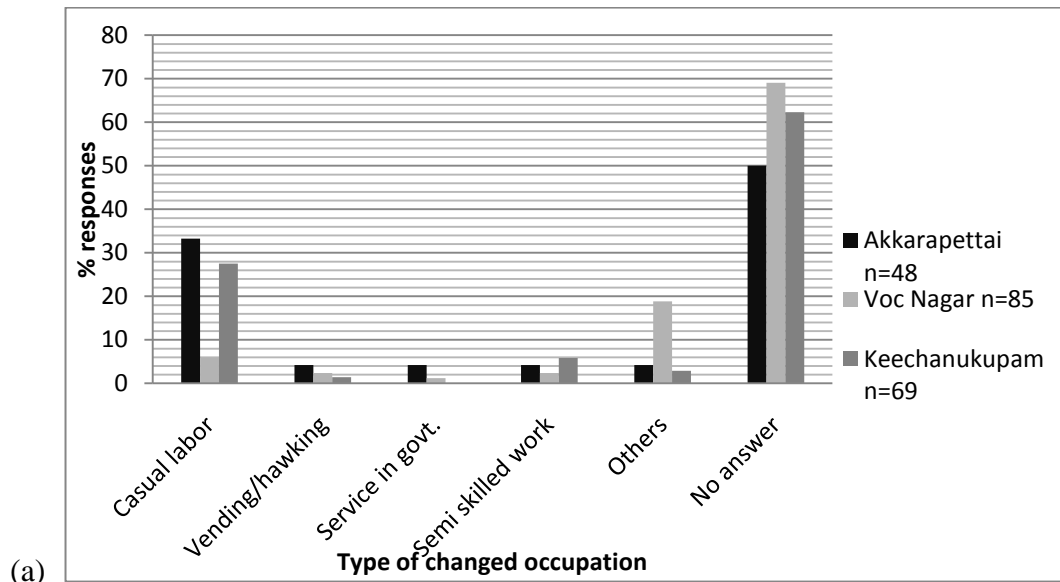
*others: Agricultural laborer, private services, NGOs, etc.

(b)
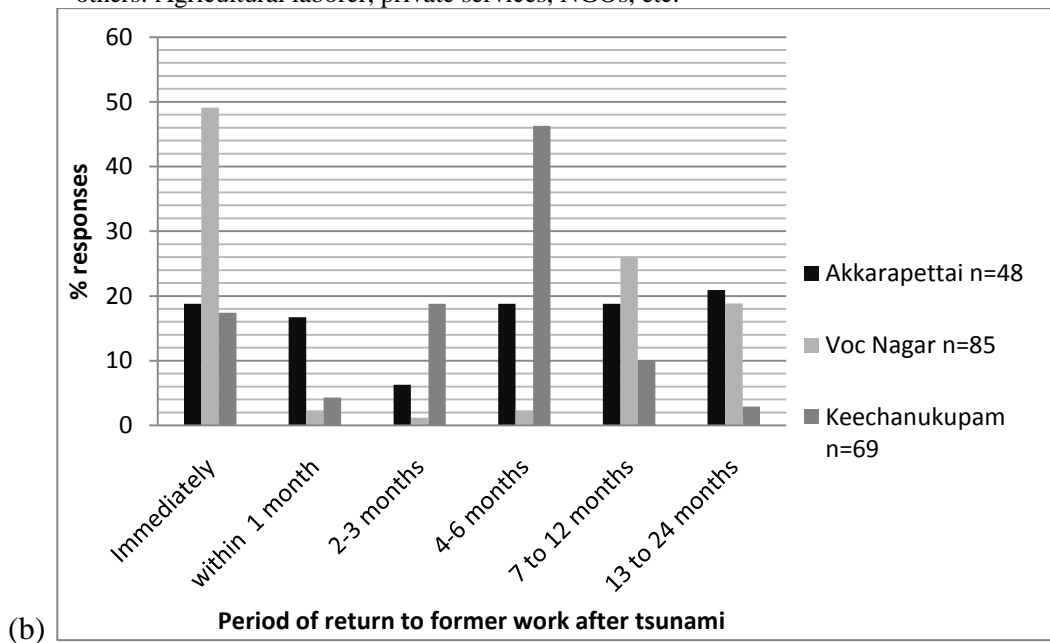
2% to4% of the community members took loans from banks or got assistance from NGOs (see, Fig. 5.14b). Even though the government agencies and local NGOs spent over two years in imparting vocational training and skill development programs, responses shows that a very small percentage of the population changed the type of occupation and got involved in other trades/job (see, Fig. 5.15a).Those households that did not go back to their fishing related occupation, worked as casual laborers in markets, as hawkers, as employees of the government or as agricultural laborers. Almost 49% of the households in the urban areas (VOC Nagar) returned to their occupation immediately, whereas in the rural areas households were still returning to their former jobs (see, Fig. 5.15b). Based on the interviews with the government representatives, it was revealed that both the government agencies and local NGOs provided funds to the relocated households to purchase auto rickshaws and small mobile stalls, as means of alternative livelihoods to the relocated households. Therefore, in the urban location (VOC Nagar, Chennai) around 18.82 % of the households recovered with the help of alternative livelihoods (see, Fig.5.15a). Some of the women interviewees said that they had open small mobile food (vending and hawking) stalls, which accounted for 1.4- 4.2% of the total responses.

Figure 5.16 (a) Monthly income of the household in INR and (b) comparison of household income before and after tsunami

(a)

(b)
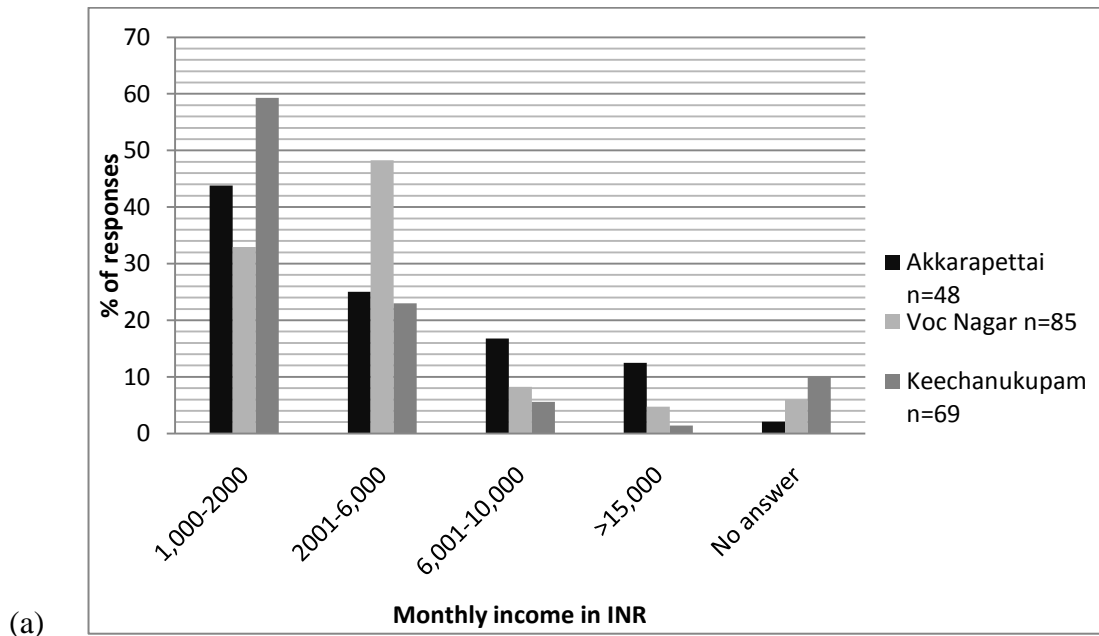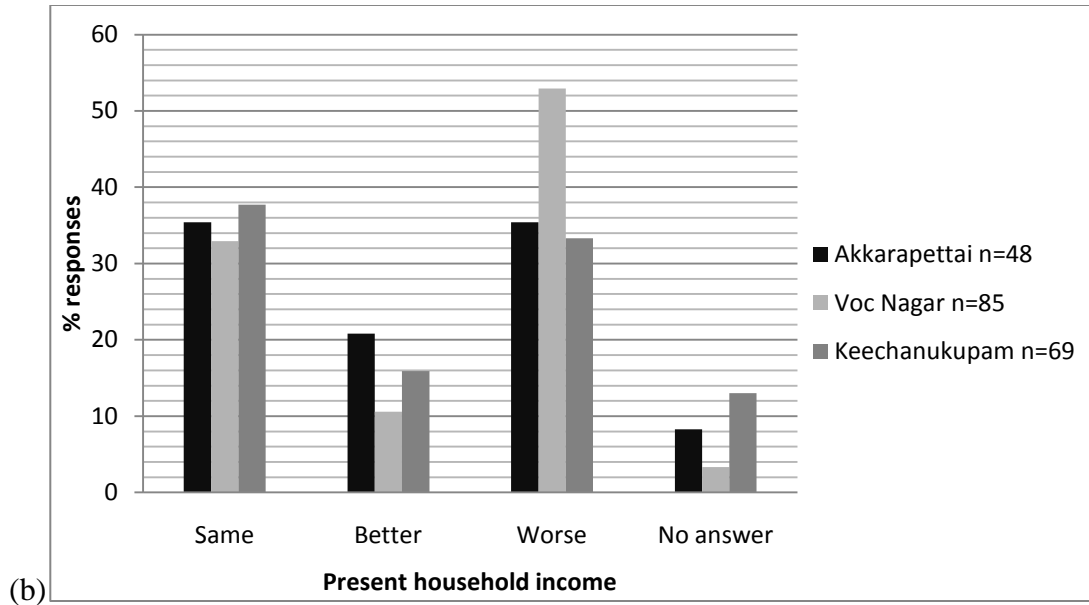
Results from surveys show that 60% of the rural population earns less than Rs.2000 (INR) per month, which is less than $40 USD (see, Fig.5.16a). In urban locations (VOC Nagar), the income of each households is almost twice that of the rural households (Akkarapettai and Keechanukupam), which is Rs.5000- Rs.6000/ month INR (close to $120 USD). However, the responses from the urban location (VOC Nagar) show that household income has worsened after the Tsunami of 2004 (see, Fig. 5.15b), whereas the, income of the 35-38% of the rural population, remained the same and 16-20% of the rural households experienced increase of their income. The results show that the livelihoods aspect needs urgent attention from the government and other agencies involved in the reconstruction process.

5.3.2. Livelihood Strategies:

Results compared for all the three communities reveal that the households from none of the communities had any other source of income (see, Table 5.3).

Table 5.8 Recovery of livelihoods

Study Area	Earnings from other assets, saving, investment	Able to pay back loan
VOC Nagar, Chennai: n=85	100% No	90.59% No
Keechanukupam: n=69	100% No	93% No
Akkarapettai: n= 48	98% No	89% No

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When asked if they were able to pay back loans, almost 100% of the interviewees denied that they could do so. Inability to pay back loans indicates that the community is still recovering its livelihood. The households in each of the three communities (Akkarapettai, Keechanukupam and VOC Nagar in Chennai), agreed that neighbors and friends supported them in times of need (see, Table 5.9).

Table 5.9 Livelihood strategies

Study Area	Formation of SHG	Neighbors help in need	Family member migrated to other town	Life returning to normal	Personal satisfaction despite losses
VOC Nagar, Chennai: n=85	76% Yes	74% Yes	99% No	82 % Yes	53 % Yes
Keechanukupam: n=69	83% Yes	74 % Yes	96% No	77 % No	55% Yes
Akkarapettai:n= 48	73% Yes	81% Yes	96% No	60% No	52 % Yes

Around 96% to 99% of the households interviewed disagreed with the assumption that some of the community members or families migrated to towns after the Tsunami of 2004. Despite the losses incurred due to the natural disaster, 52% of household members expressed their personal satisfaction in their present living conditions (see, Table 5.9).

Figure 5.17 Alternate livelihood strategies opted by the community in times of need.

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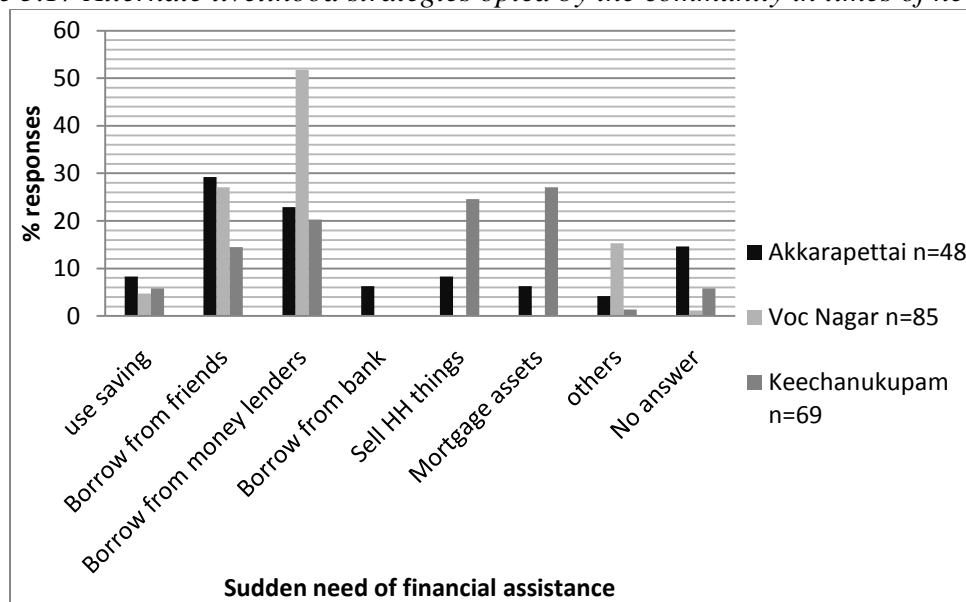
When there was a sudden need of financial assistance the only option was to borrow money from money lenders or friends on a high interest rate. Responses also show that in order to survive, the households would sell or mortgage their assets (see, Fig.5.17).

Figure 5.18 Period in the year when the households had to go without food
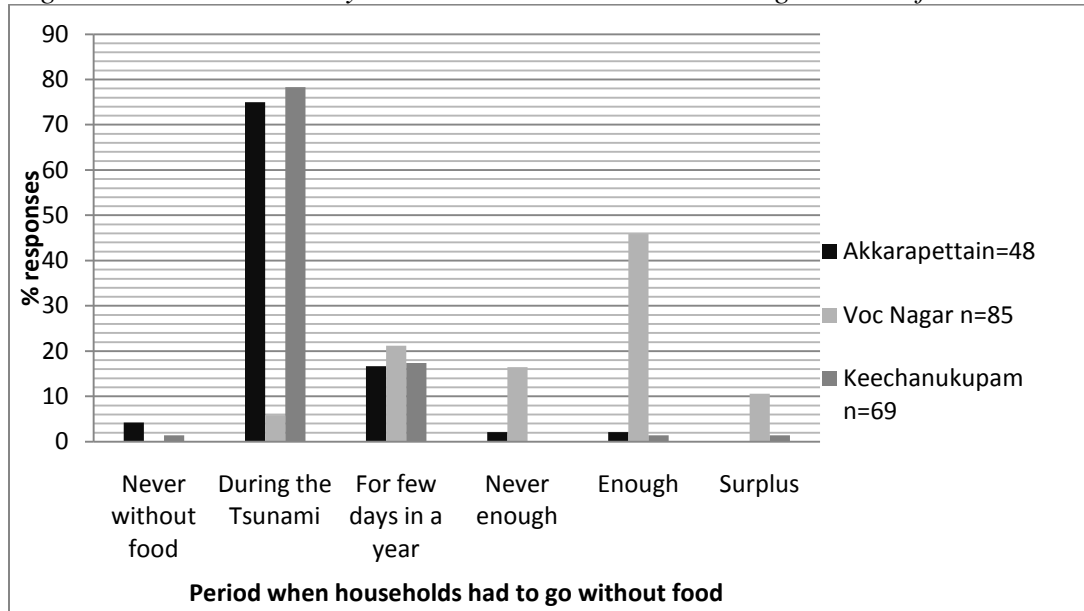
Fishing is a seasonal activity and for a few months in a year (summer months), the fishermen do not go into the sea as this is the spawning period. While conducting interviews with the urban and the rural community, some of the interviewees expressed the need for the assistance from the government in the form of cash or rice during these months. This need was especially difficult to overcome by the rural communities (Akkarapettai and Keechanukupam) who are highly dependent on the sea for their livelihoods and have fewer options of alternative livelihoods during the spawning period. On the contrary, the urban households (VOC Nagar, Chennai) did not feel that they had to go without food at any point in the year (see, Fig.5.18). They sometimes had surplus for their families.

5.3.3. Sustainability of the Planning and development intervention:

Over the past few years there has been a growing emphasis on the sustainability of development initiatives. Such an approach is particularly important in the case of reconstruction of a disaster affected community. Emphasis should be laid on community

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consultation and participation in the reconstruction and development programs. Such programs need to be planned with a vision to benefit the community's long term needs rather than just meeting short term goals. It is equally important for community members to be aware of future hazards and be prepared to face any unforeseen event.

Table 5.10 Sustainability of livelihoods

Study Area	Return to previous fishing related work	Can continue this work for 5-10 yrs?	Any existing fish market/cooperative in the community	Micro –finance organization in the community
VOC Nagar, Chennai: n=85	82% Yes	79% Yes	73 % No	91% No
Keechanukupam: n=69	100% Yes	58 % Yes	58% No	52% No
Akkarapettai: n= 48	85% Yes	73% Yes	73 % Yes	52% Yes

Due to the nature of occupation, the fishing community is one of the most vulnerable groups. The survey results reveal that 82% -100% of the household have chosen to go back to their earlier occupation (see, Table 5.10). 50% to 79% of the household members said that they would continue working in the fishing industry for the next 5-10 years. Some of them agreed that there was a need for co-operative markets close to the relocated areas. In the rural areas (Keechanukupam) some of the households were still living very close to the sea (see section on housing in this chapter). Although another Tsunami never occurred after the one in 2004, there were storms, tides, and flooding due to rains, both in the rural and the urban areas (years 2005-2009).

5.3.4 Knowledge about hazards and preparedness:
The Indian Ocean Tsunami of 2004 had occurred after fifty years since the last tsunami that occurred in the coastal areas of the Indian peninsula. This was possibly one of the reasons why communities in these coastal areas were unprepared for such a disaster. When the Tsunami waves appeared on the shore on the fateful day of 26th December, 2004, many people went closer to the ocean out of curiosity to see the waves rising and to witness such an unusual phenomenon. In movements the waves touched the shores and washed away people in hundreds. The warning systems in most of the affected countries were not in place that resulted in a catastrophic scale of the disaster. The

Tsunami of 2004 was an eye opener not only for the general public, but also for the scientific community worldwide, which immediately set to work on developing hazard maps, evacuation plans and preparedness programs.

Three years after the tsunami of 2004, the researcher visited three communities and interviewed households to understand whether these communities were better prepared for disasters in future. At the time when the surveys were carried out in the communities, it had rained for days (September 2008). Roads were in very poor condition and at times it was very difficult to access the households due to flooding (see, Table 5.11). The conditions were bad in both the urban and the rural locations (see, Illustration 5.3). Flooding is frequent during the monsoon season (July to November) every year in these locations.

Table 5.11 Preparedness to Hazards

Study Area	Any recent flood, hurricane or tsunami	Have any NGO/CBO or GA provided you with information about future hazards	Participated in disaster response program
VOC Nagar, Chennai: n=85	56% No	62% Yes	87% No
Keechanukupam: n=69	99% Yes	94% Yes	81% Yes
Akkarapettai: n= 48	100% Yes	96% Yes	83% Yes

When household members were asked if they participated in any response program, 87% of the interviewees from the urban location (VOC, Nagar in Chennai) disagreed.

Figure 5.19 Methods used to make people aware of natural hazards
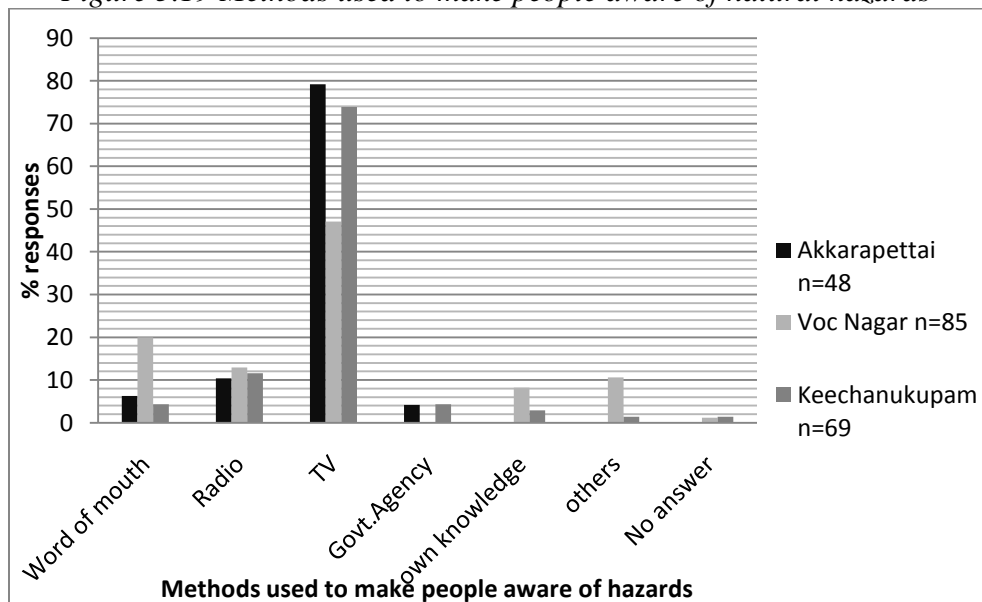
Responses from the interviews showed that people were made aware of natural hazards mostly by the television (see, Fig. 5.19). The Government of Tamil Nadu, India, had provided free television and cable connection to every household during the last few years. This technology was therefore widely used by the coastal population to learn about the natural hazard warning systems in their region.

Illustration 5.3 (a) Chennai streets flooded during rains, (b) Rural community submerged during rains

(a)

Source: Author   (Field work)

(b)

Source: Author (Field work)
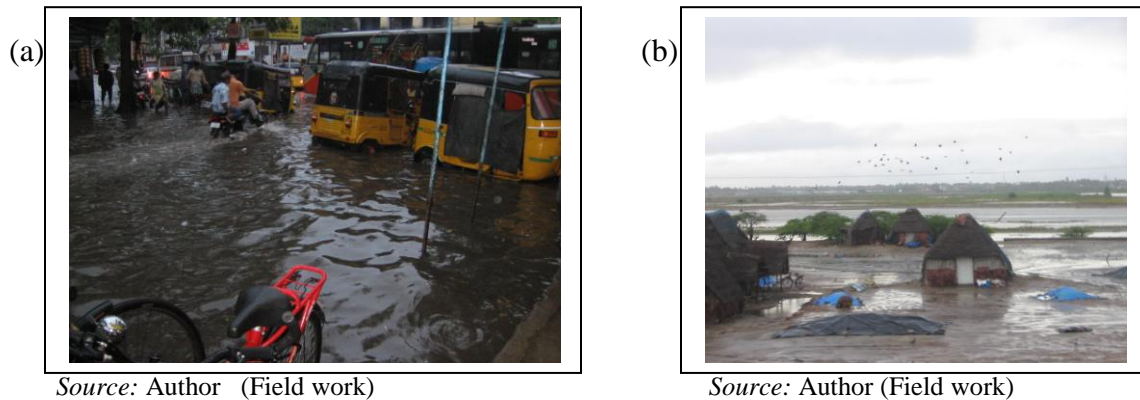
Figure 5.20 Agencies that organized the response programs
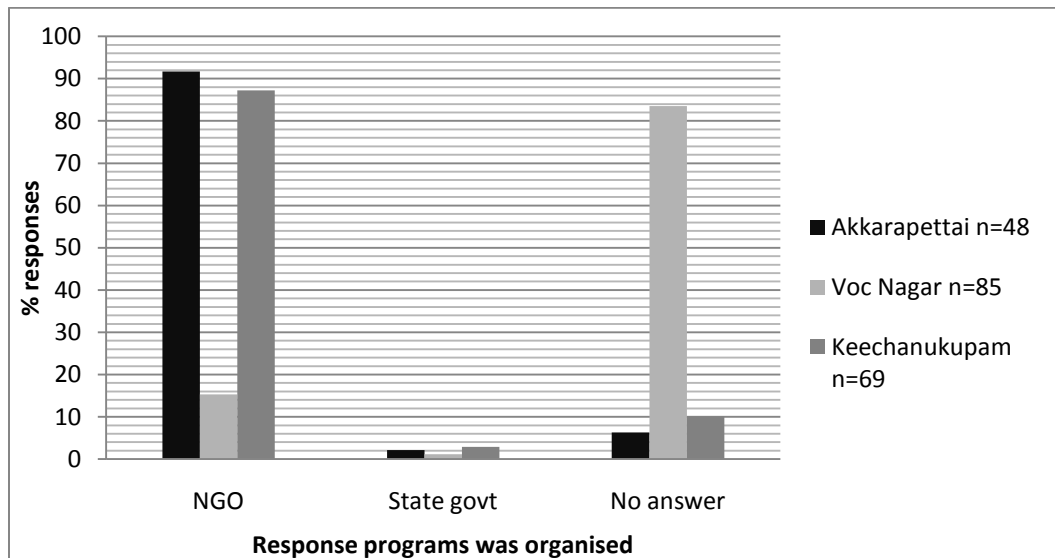
NGOs organized disaster preparedness and response programs in the rural locations (Akkarapettai and Keechanukupam). Out of the three communities surveyed, responses from Keechanukupam (rural community) showed that the community felt unsafe to go

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into the sea (see, Table 5.12). Women from Akkarapettai (rural community) requested life jackets and safety equipment for those men who went into the sea for fishing. The fact that the safety issues were still a matter of concern among the household members in the rural location, indicate that the preparedness programs need to be strengthened in these areas.

5.3.5 Sustainable design:

The reconstruction process requires not only meeting short term goals and objectives, but also to be carried out keeping in mind long term benefits of the programs and initiatives. There is tremendous potential for innovation in design, technology and in creating a much healthier environment for the relocated communities. The community members can be taught new methods to save energy and use clean technology. There is scope to utilize solar and wind energy to generate electricity for these neighborhoods. Similarly, rainwater harvesting could give opportunity to store enough water during the rainy season for domestic purposes. Government agencies and NGOs can deliver sanitation, health and hygiene programs to the distressed communities to improve their health and environment.

Table 5.12 Safety in the relocated areas

Study Area	Feel safe to go to sea	Material available locally	Safe in neighborhood
VOC Nagar, Chennai: n=85	88% yes	96% no	80% Yes
Keechanukupam: n=69	70% no	97% Yes	52% No
Akkarapettai: n= 48	54% yes	94% Yes	88% Yes

Figure 5.21 (a) Type of fuel used for cooking and (b) Methods used to dispose garbage

(a)
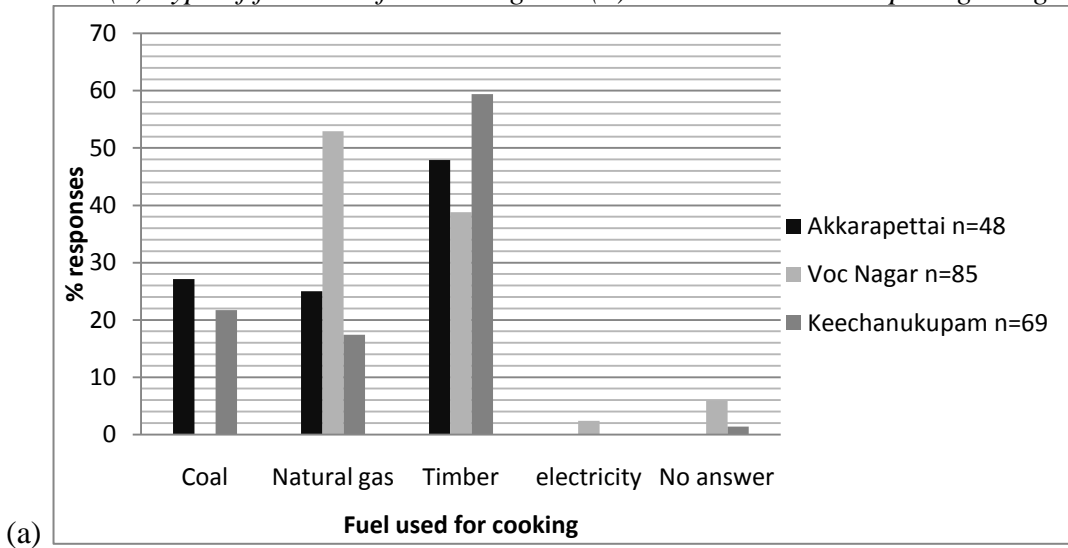
Locally available materials such as brick and thatch can be used for construction purposes (see survey results for housing in this chapter). Almost 48%-60% of the rural community (Akkarapettai and Keechanukupam,) use timber as fuel for cooking food (see, Fig.5.21a). This means that more number of trees is cut down to be used as fuel in these areas.

(b)
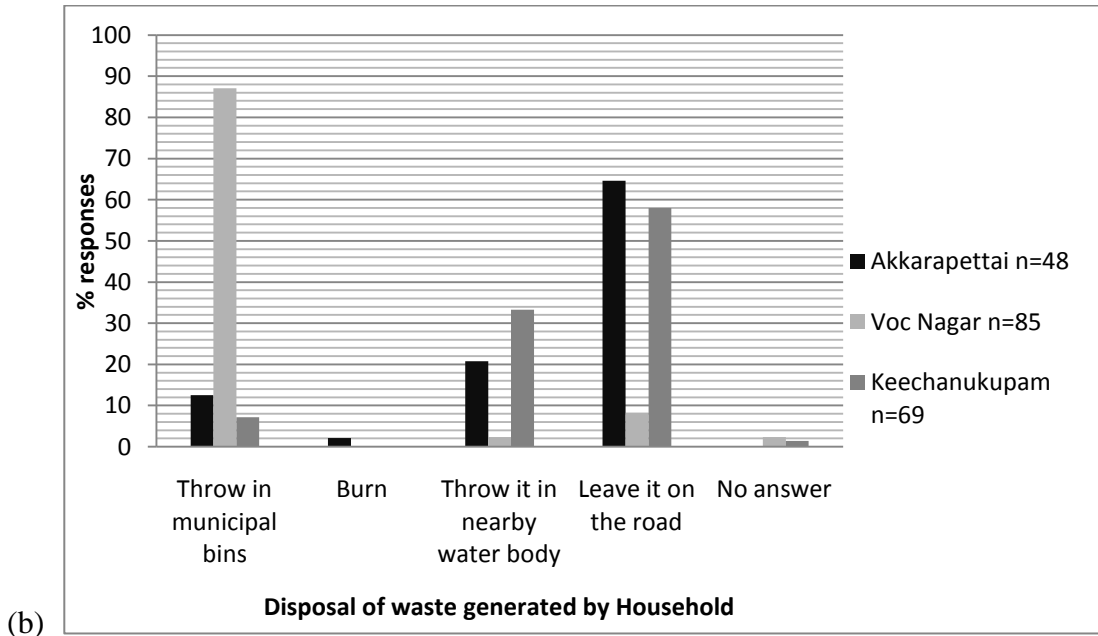
It appeared from the surveys that both the rural communities and the urban communities dispose generated household waste into the nearby water body, drains or on the road (see,

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Illustration 5.4). Some municipal bins were provided in the urban locations too, but were overflowing with the waste collected over the weeks.

Illustration 5.4 (a) Condition of waste in Nagapattinam , (b) Waste dumped close to relocate site in Chennai

(a)

Source: Author (Field work)

(b)

Source : Author (Field work)

People from the relocated communities used open grounds as dumping sites for the garbage that eventually decayed, attracted scavengers, and breed mosquitoes. The stench of decayed garbage spread all over these recently built neighborhoods.

5.3.6 Organization:

Comparison of the responses from the three communities (Keechanukupam, Akkarapettai and VOC Nagar), results revealed, that the urban communities in Chennai were neither involved in any community organization nor did they collaborate to form an organization that would oversee the activities of the community. In the relocated areas in Chennai such as VOC Nagar, people lacked collectiveness and cohesion. Different groups of people from various locations and different backgrounds were relocated to a single location. Most of the households were separated from their friends and families and tried to get to know their neighbors. Life style changed significantly for households who had spent decades leading a rural pattern of living in small fishing hamlets along the coast of Chennai. They were now in a new environment, trying to adjust to an urban life style in a formal setting comprised of apartment blocks.

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Table 5.13 Community participation

Study Area	Any other community organization	Member of any organization	Participation in community meetings	Meetings useful for the community	Representatives from the govt. act on your suggestions
VOC Nagar, Chennai: n=85	89% No	73% No	87% No	89% No	89% No
Keechanukupam: n=69	87% Yes	71% Yes	74% Yes	75% Yes	77% No
Akkarapettai: n= 48	65% yes	75% yes	71% Yes	79% yes	92% No

On the contrary, households in the rural areas (Akkarapettai and Keechanukupam) carried out their daily activities normally, such as community meetings and celebrations (see, Table 5.13). Each of the community had their own organization and over 80% of the households, were its members (see, Fig. 2.22). However, in all the locations surveyed, interviewees expressed their displeasure with the fact that government did not consult the community members and did not act upon their needs and suggestions.

Figure 5.22 Level of participation in community organization
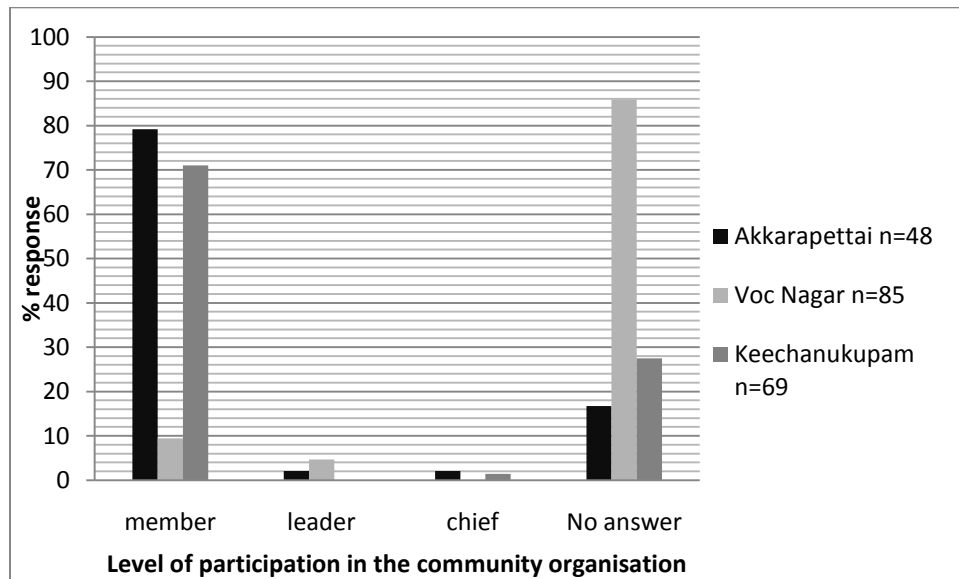
A large percentage (86%) of households did not respond to the question on the level of participation in community organization from VOC Nagar, as no such organization existed in this location.

5.7.1. Cultural sensitivity and social capacity:

Fishing communities are usually very close knit communities. Every fishing village has a leader with a committee which looks over the day to day issues of the households. After the Tsunami of 2004, eight fishing villages located along the coastline of Chennai were grouped together to form a new settlement called VOC Nagar. Similarly, a number of villages were relocated to new locations. Community members opposed the relocation due to their attachment to the earlier homes, as well as the cultural factors such as caste and religious groups and others, and the cost of travel from the new location to the work place. Culturally insensitive issues cropped up as International Aid Agencies participated in the early phase of relief and rehabilitation (Michel, 2005; Davidson et al., 2007). Based on surveys and interviews, it appeared that government agencies were also insensitive to the design of housing for the relocated urban community (VOC Nagar). Results show that 65% of the population in VOC Nagar is satisfied with the new housing. Although the individual units are small, households were pleased that they now had a roof over them.

Table 5.14 Relocation and its effects

Study Area	If relocated then do you like the place?	Has moving away affected livelihood?
VOC Nagar, Chennai: n=85	65% Yes	64% No
Keechanukupam: n= 69 sample	51% No	57% Yes
Akkarapettai: n= 48	65% Yes	52% Yes

Traditionally, women in fishing villages stay back home and complete fish sorting and drying from the previous day's collection. Such an activity requires some common space outside the house. In VOC Nagar in Chennai, women dried fish in the narrow corridors for a few months. Once the representatives from the government inspected the apartments and prohibited the households from drying fish or weaving nets in the passage area, women stopped performing any fishing related activity and spend their time idle or gambling with other women (see, Illustration 5.5b).

In the rural area, prior to the Tsunami of 2004, houses faced the sea and women would see the men working in the sea and plan their daily activities based on the return of

the fishermen. These communities are sea ward looking people, who were totally disoriented once relocated from the coast to the main land.

Illustration 5.5(a) Woman drying fish in a rural community, (b) Women, idle at a relocated area in Chennai

(a)

Source: Author (Field work)

(b)

Source: Author (Field work)

Figure 5.23 (a) Population still attached to their old homes and (b) whether relocation affected the livelihood of the household

(a)

(b)
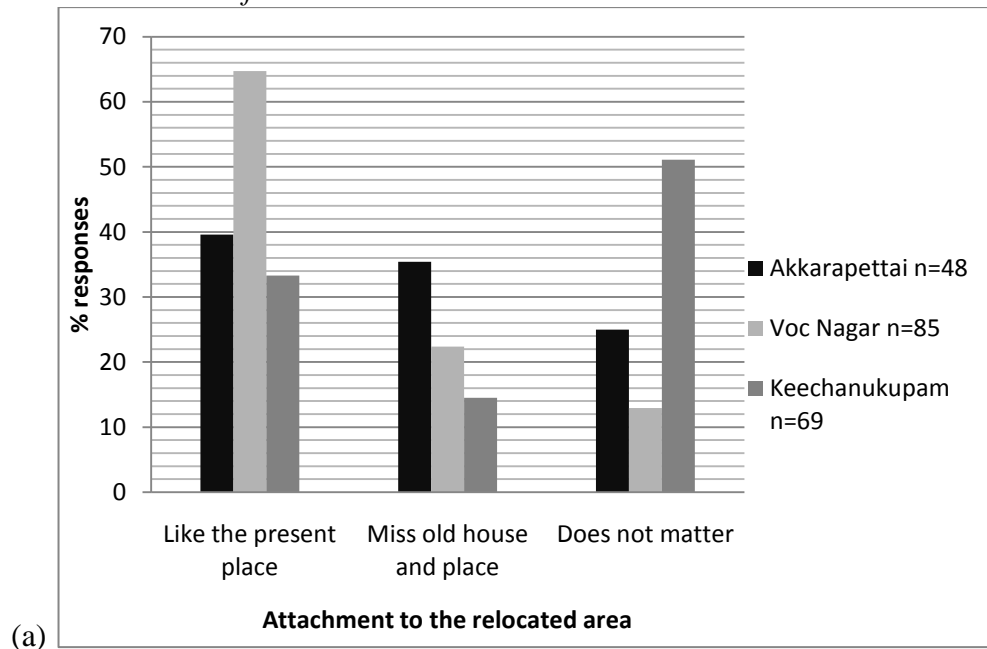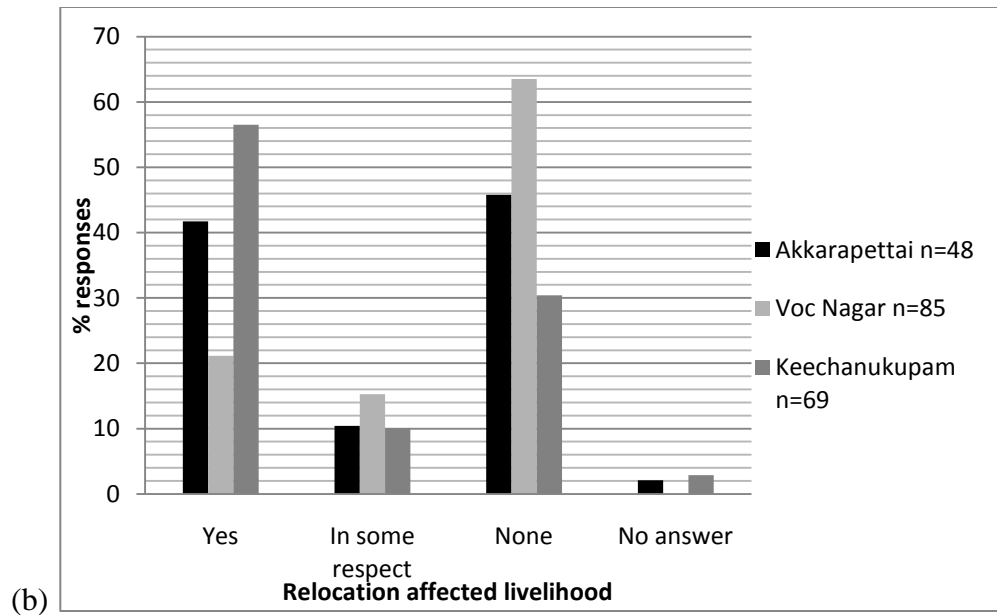
Results show that the population in the urban location did not miss their old homes (Fig5.22a). This result can be explained by the fact that now their living conditions are better compared to the squatter settlements along the coast of Chennai where they lived, prior to the Tsunami of 2004. Households in the relocated areas were legal owners of individual dwelling units. The rural communities however expressed some level of dissatisfaction to the relocation mostly due to the distance of the house from sea.

Table 5.15 Social cohesion and quality of life

Study Area	Celebrate festivals together?	Children from all communities in same school?	Do women work along with men?	Women give their income to men	Girls encouraged to go to school
VOC Nagar, Chennai: n=85	65% Yes	85% Yes	78% Yes	75% Yes	64% yes
Keechanukupam: n= 69 sample	96% Yes	94% Yes	54% No	62% No	78% Yes
Akkarapettai: n= 48	58% Yes	92% yes	65% No	69% No	83% Yes

Relocation had brought people from different background together. It was important for community members to participate together in community activities such as festivals to renew their bonds and social ties. Almost 85%-94% of the response from the households said that children were going together to community school and that religion or caste did not matter much in this case. In the urban areas 78% of the interviewees said that women were working alongside men unlike the rural areas where 50% and above disagreed (see,

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Fig. 5.15). Women empowerment and adult education was one of the key areas for changing societal perception and development. The scene was gradually changing as it appeared that girls were encouraged to go to school after the Tsunami of 2004. A small but a significant group of people belonging to the relocated community in Chennai had moved back closer to the sea (see, Illustration 5.6). It was difficult to determine the possible reasons behind moving back to the original homes as those communities were inaccessible.

Illustration 5.6 View of a community in Chennai moving back to locations near the sea

Source: Author (Field work)

Around 59% -65% of the households responded negatively to the question whether they drank alcohol after a hard day's work. Drinking alcohol is a traditional practice in the fishing community. However, based on meeting with representatives of NGOs (Exnora and C-Dot), it was revealed that after the Tsunami alcohol drinking levels had increased significantly among men (see, Appendix E for news paper article). In a press release in October 2006, it was said, "…almost 74.06 % of the coastal population is into drinking habit. There is a wide variation in the duration of drinking and the age at which drinking starts is as early as 10 years" (The New Indian Express, 2006). Most of the relief money given to each family was misused for drinking purposes immediately after the Tsunami (Deccan Chronicle, 2006).

Table 5.16 Quality of life

Study Area	Drinking after days hard work helps	Quarrels and fights between men and women	Special day care centers for young
VOC Nagar, Chennai: n=85	59% No	89% No	61% No
Keechanukupam: n= 69	65% No	87% No	74% yes
Akkarapettai: n= 48	60% No	92% No	67% yes

Life changed significantly for the older population after the tsunami. Traditionally, parents and grandparents stay with their children (in Asian communities). However, old age homes were built by various agencies to accommodate seniors who lost their entire family and had no place else to go.

Figure 5.24 Graph represents the life of seniors after the Tsunami
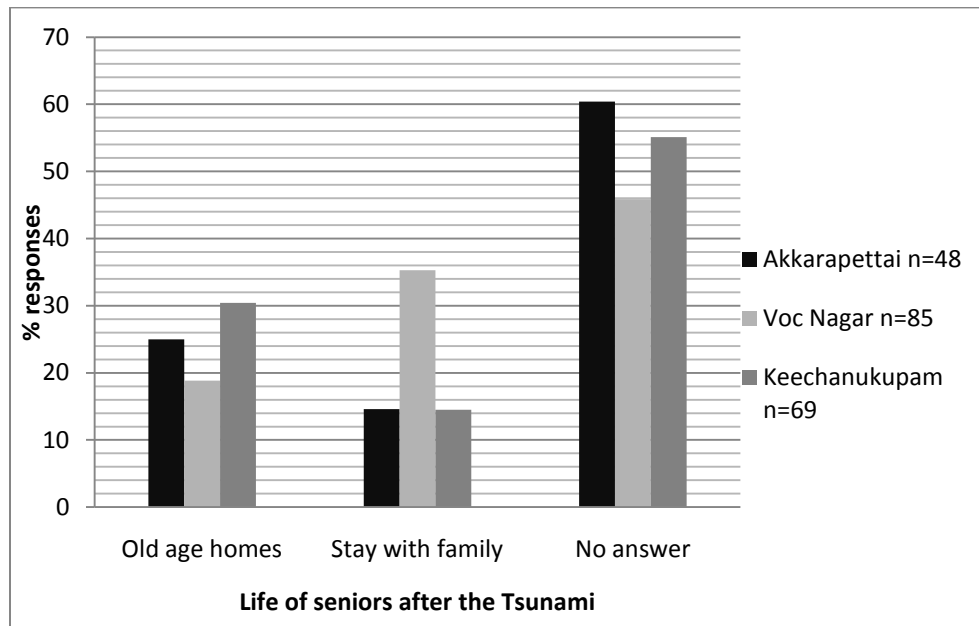
These old age homes got some aid money from the government as well as from the other agencies. However, such facilities were yet to be developed in the rural areas of Tamil Nadu.

5.4. Summary:

This chapter examined four major objectives of a reconstruction process in a disaster affected community. Several highlights can be drawn from this chapter to summarize the findings. Results from detailed household level interviews were presented for three fishing communities with comparative studies being carried out between the urban and the rural location. Community members expressed satisfaction in terms of receiving permanent housing, but were displeased with the fact of the housing not being 'need based' nor 'being consulted' during the planning process for the past two years or so by the government. Basic facilities like drinking water supply, health centers, counseling centers, sanitation and hygiene were major issues that evolved in the study. Although livelihoods were slowly being restored, results showed that people were still unable to pay their debt and unemployment rates were particularly high among women. Relocation was a major factor contributing to the change in livelihood patterns. Level of education had increased as children were attending schools. But the community lacked awareness of future hazards and was not prepared for any future eventualities. Over indulgence and involvement of various NGOs in the reconstruction process had brought a rift among the population and the government organizations. Has all these factors contributed to further vulnerability or reduced vulnerability? Details about various initiatives and programs undertaken by various organizations and discussions based on the findings are explored further in Chapter 6 and 7 subsequently.

Chapter 6: Perspectives of the community members and development agencies involved in the reconstruction program

6.1. Introduction:

The current chapter focuses on the perspectives of the community through meetings and interviews that were carried out in six communities affected by the Indian Ocean Tsunami (2004) in the Tamil Nadu coast of India, as well as with the NGOs and CBOs involved in the reconstruction programs. It is important to make an assessment of perspectives and effectiveness of programs by the NGOs and the CBOs to obtain a more balanced view on the situation. It may be noted that most NGOs and CBOs do carry out periodic self assessments of effectiveness of their interventions that enables continuous monitoring and updating of development plans.

During the course of the field work, the interviewees either had permanent or temporary housing. The meetings were organized once the household surveys were completed. The results of the house hold survey were discussed in Chapter 5 of this dissertation. Groups comprising of five to six community members as well as community leaders met at a pre-arranged location, such as a school class room, under a shaded tree in the open or in the living room of volunteers, and discussed in length issues and concerns of the community in relation to the travails of the Tsunami and the reconstruction interventions. Once the focus group meetings with the community were completed, the researcher organized a third level of interviews with representatives of NGOs/CBOs and from the government agencies who were directly involved in the rebuilding process. These meetings were carried out in order to understand the perspective of the agencies on reconstruction, various programs and initiatives undertaken for the development of the community as well as to examine whether any follow-up activities were undertaken as a response to the issues brought up by the community during the meetings. In all, eight NGOs and two government representatives were interviewed. The results of the interviews are discussed in section 6.2, 6.3 and 6.4.

6.2. Meetings with the community:

Once the household surveys were over in VOC Nagar (Chennai), Akkarapettai and Keechanukupam (Nagapattinam district), community meetings were carried out in these locations. Since the results from the discussions appeared to be similar to the results obtained from the household surveys, the summary of the results from the discussions in these communities are presented in Appendix C of this dissertation. However, there were three additional locations within Chennai Metropolitan area where community meetings were carried out. Two of these locations had permanent housing and one had temporary shelters. The summary of the results are presented in the following section.

6.2.1 Tsunami Nagar (Chennai)

Within Chennai metropolitan area, there were three more communities, where the Tsunami affected communities were residing in either temporary shelters or in permanent housing provided by the government. The researcher interviewed some of the communities informally and the interviewees narrated their stories. Notes and photographs were taken during the interviews. The community members narrated how they were moved from one place to another during the past three years and were finally left to fend by themselves in the *Tsunami Nagar*, a vast temporary shelter created for relief work. At the time of the survey, there were 40 families still residing in this neighborhood. After the Tsunami, the communities residing near the coastline, were moved to *Dideer Nagar* and then to *Pallavan Nagar*. Subsequently, after a period of two years and repeated incidences of fire and floods, around 750 families were moved to *Tsunami Nagar*. Interviewees said that there could be around 300 families who were not provided with permanent housing.

Illustration 6.1: Images from Tsunami Nagar, Chennai

(a)*Remaining shelters in Tsunami Nagar*   (b) *Inside the shelters*
 Source: Author (Fieldwork*)*   *Source:* Author (Fieldwork*)*

Housing and the Built Environment

The housing provided in *Tsunami Nagar* was row housings. The project was sub-contracted by the government to a few NGOs who created the facility for immediate housing of the victims. These were temporary units, comprising of brick walls and tin roof. Each household, irrespective of the number of members, was provided with a single cubicle of 10'x10' in size. Common washrooms were provided at one end of the facility. Many of the families had already moved to permanent housings which were given by a system of lottery. The remaining families felt that safety was a larger issue and were not sure how they would deal with another hazard such as a flood or hurricane, as their living condition was extremely poor. In addition, they were not aware of any evacuation plan or of any safe emergency shelter in the case of future hazards.

Livelihood Issues

Each of the households was given an amount of INR 2000[33] ($40 USD) initially after the Tsunami. This was followed by four-time payments of INR 4000 ($80 USD) along with 25 Kg. of rice bags and other groceries as relief measures. During floods and fire in *Dideer Nagar* and *Pallavan Nagar* families were compensated with small amounts of INR 2000 ($40 USD), each time the incidence occurred. There was no fishing

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[33] $ 1 (USD) = Rs. 49 (INR) as of May 2009

equipment provided to the community. The community members had no other sources of income other than the compensation provided by the government. Some of the families sold the bricks from the broken shelters, vacated by the other fortunate families that were allotted a permanent housing. During the discussion with the community almost hundred percent of the women agreed that they were willing to do some job provided they got some guidance and support. The families in this community were extremely poor and expressed the need for additional help either from the government agencies or from the NGOs. The community members believed that they would continue to pursue fishing as a livelihood activity, provided that they were given some kind of support.

Infrastructure Facility and Education

Initially, there were no other facilities added in the neighborhood of the 'relief camps' after the Tsunami. There was no adequate drinking water supply. Residents of the community would stop water supply tanks on the main road outside their neighborhood and force them to give away a few buckets of water which they would use for the next few days. A few trees that remained in the site after the shelters were built, were cut down by the residents and used as fuel-wood for cooking purposes. After the tsunami, people were immediately provided with the physical and medical care. A small health care facility was created and remained functional on site for a few months. The care givers were mostly NGOs. At the time this interview was conducted, there was no medical facility for families residing in this location. Therefore, residents had to seek medical assistance from existing hospitals which were far away from the shelters and would take 30-50 minutes by bus. An interviewee Nilima (name changed) said; *"My children suffer from malaria and diarrhea every month and I have no money to take them to hospitals, the only one where we can go is also far from here and I need to take a bus."* When asked if children from the community were going to schools, they said, *"previously they did go to schools, but cannot go now because of the additional travel cost and distance",* (approximately, INR 10 which equals a few cents in USD).

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Community perception on rehabilitation

When queried about the state of rehabilitation after three years, the community members expressed dissatisfaction over tasks like housing, water, electricity and schools, which they expected the government to provide. The community believed that due to discriminations on grounds of political allegiances of members of the community, i.e. those with allegiance to ruling State political parties got preferences over others. They expressed their view that allotment of a residence was a key to reconstructing their livelihoods and life in general. Some of the family members turned into alcoholics and consequently would borrow money or force family members to lend some to buy more alcohol. The level of education and awareness of the community was low and they failed to appreciate the legal provisions in restoration of their livelihoods, like the Coastal Zone regulations etc., which prevented relocation along the coastline.

6.2.2 Semencheri (Chennai):

This relocated area is situated to the south of the Chennai city. It was a low lying area, which was originally represented by a lush green marshy land. However, now it stood as a business center and a corporate hub, transformed into a concrete jungle. Around 7000 families were relocated from various slums, squatter settlements and Tsunami affected areas. 850 families were relocated from *Srinivasapuram* slum and 1000 families from *Besant Nagar* slum. Around 25 per cent of the housing was yet to be occupied.

Housing and the Built Environment

This location was developed not only to accommodate Tsunami affected population, but also people from the unauthorized slums. Hence, some were living in this area even before the tsunami. The entire site was newly built with proper road network, municipal water supply, and electricity. The houses were made of brick and concrete. When asked if the community felt safe about the place, the interviews expressed some doubt as there were repeated floods during the past few years, as the site was a low lying marshy area. The community members were not aware of any evacuation routes or any safe structures built for emergencies and said that they would escape and wait in the main

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roads when the houses would get flooded again. One of the interviewees said; *"I will just climb the roof of my house if there is a flood otherwise run to the highway, if I can make it and not drown".*

Illustration 6.2 View of the community located in Semencheri, South Chennai

(a) *Semencheri before the relocation project*
Source: Author (Fieldwork, 2008*)*

(b) *Road and infrastructure in the neighbourhood*
Source: Author (Fieldwork, 2008)

Livelihood Issues

During the relocation process families residing in damaged houses were not given any compensation. It was only the home owners who received compensation from the Government. Those families who did not have any ownership documentation for the houses that were destroyed were provided with a onetime compensation amount of INR 45,000 ($918 USD). Those who owned well-built, undamaged houses stayed in their own homes, without any compensation.

The community in this location practiced various occupations, and only 25 households practiced fishing as the main occupation. This was primarily due to the apparent distance of the relocated site from the sea. Prior to the tsunami, around 700 women now staying in this location were working as domestic helpers, which was their chief means of income. Due to relocation, and the distance from their place of work, most of them were jobless. A search for livelihood, led many of these women into flesh trade. The latter became a growing concern for some of the NGOs working in the area. There was thus, an urgent need to introduce more livelihood support programs for the community. Unemployment persisted as some of the community members were seasonal

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wage workers. When assistance was provided to the community through self-help groups (SHGs), it was mostly the women who cooperated and were willing to work.

Infrastructure Facility and Education

Compared to several locations visited by the researcher, Semencheri relocation site seemed to have better infrastructure facilities. A primary health care center was set up by a local NGO called C-Dot (see, section 6.3). An information center for the community was also set up by the government. Representatives from the various local NGOs and the Government agencies visited the community from time to time. However, community members were particularly unhappy with the water supply system. The Chennai Municipal Corporation (CMC) provided the community water with the help of water supply tanks. Usually, 30 supply tankers would visit the area twice daily. This was reduced to once a day due to which the community members often have to purchase water from other commercial sources.

Three new temples were added to the location, based on the fact that the majority of the residents were Hindus. Training programs helped the community to develop a system for cleaning the neighborhood. Each household was to pay a fixed amount for the maintenance of the location. Women from within the community were engaged in the cleaning programs and were paid through this fund. However, the wetlands surrounding the neighborhoods were filled with garbage and the place gets infested with mosquitoes after sunset. Children from this location had to travel far for their education. Local schools provided education up to the eighth standard. The neighborhood school was established by the government. However, the interviewees were unhappy as most of the teachers were on contract and were often irregular in their work.

Community perception on rehabilitation

In this community people expressed overall satisfaction on the rehabilitation program, despite the challenges that the community members faced for almost four years post-Tsunami, and rated the Government's efforts to be good. They hoped that in future the government representatives would meet them more often for consultation. The community appeared relatively pleased though there were differences among the

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members, and appeared to cooperate in organizing neighborhood cleaning programs. There was unity among the community members during festivals and celebrations, thereby indicating the 'community rebuilding' process was taking a positive turn. The community felt that with education, their children will have better career opportunities and may also seek other vocations other than fishing.

6.2.3 Tillagar Nagar (Chennai):

The Tillagar Nagar neighborhood is a permanently relocated site that was located closer to VOC Nagar towards the north of Chennai. Around 1200 household were relocated from various temporary shelters to the multi-storied apartment blocks.

Illustration 6.3: Housing provided to the community in Tillagar Nagar. Chennai
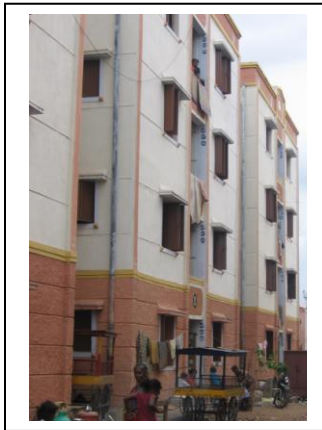
(a) Apartment Blocks
Source: Author (Field work)

(b) Indian Oil Refinery close to the residences
Source: Author (Field work)

Housing and the Built Environment

The housing type in Tillagar Nagar was similar to that of the VOC Nagar. Apartment blocks were built with small units (approximately 450 sq ft) provided to each of the households. The materials used for housing was mostly burnt brick and concrete. Community members expressed that they felt safe in the new location. However, due to the unsanitary conditions the location was infested with mosquitoes, especially during the rainy seasons (November to February). The apartment blocks were not provided with elevators nor were the units provided with piped water supply. Hence, women had to carry water to the fourth floor level from nearby public taps. The community was unaware of any evacuation route for future disasters or of any emergency shelter.

Livelihood Issues

NGOs like *Karunalaya* (see, section 6.4) provided residents with food, such as rice and bread during the first few days of relief. Fiber boats were provided by the government to families who lost their fishing gear and equipments. Compensation provided by the government was similar to that of other locations within Chennai. Unlike communities living in other relocated areas, the interviewees from *Tillagar Nagar* told that the livelihoods had not been seriously affected and the community members had returned to their traditional occupation that is fishing. However, unlike in their original habitations in the new location only men went to the sea, and the women were excluded from traditional errands like fish sorting, drying or vending in markets. Therefore, a number of new skills for women were introduced by NGOs, such as, soap making and candle making. Ambika, an interviewee (name changed), said; *"I was provided with a vehicle, which was used as a mobile store and I earn enough to manage my own family"*. She contributed around INR 10,000 ($204 USD) and the remaining amount was paid by the government. Most of the adult members had started with some new businesses or new jobs. Unemployment was not a serious issue in this location. Women were active and were hired to work in factories and in 'marriage halls' as caterers. Some of the small grants projects from the government provided the households with loans of INR 50,000 ($1040 USD) to start a small-scale business. Initially, the government provided training and supported the projects, but often the participants failed to capitalize on the support due to lack of business acumen and the high cost of raw material and marketing issues. The community viewed reduced fishing related occupations in next ten years.

Infrastructure facilities and Education

There were no new facilities were created in the area, such as schools or hospitals. An oil refinery (see, Illustration 6.3b) existed near the housing area. Fire hazard in the future is a major risk in this location, particularly since the community members were less educated and unaware of emergency procedures. A nearby water body was used as a garbage dump by the community thus, making it a breeding ground for mosquitoes and other scavengers. Most of the children went to schools. The community members felt that

they wanted the children to learn new trades and encourage them to look for other non-traditional occupations than continuing with traditional fishing activities.

Community perception on rehabilitation

There was a considerable sense of solidarity among the members of the community, and they felt confident to face similar disasters and wanted to move ahead with their lives. The particular benefit appreciated by the community members was the permanent housing along with full titles of the property given to the households. This was valuable to each household with the current market valuation of the apartments in excess of 1 million INR. A nominal sum of INR 10 (equivalent to a few cents in USD) in a month was collected from each family for the garbage collection system, which was yet to be functional. Women in this community had leadership qualities and volunteered in community mobilization programs. However, they expected the government representatives to visit the location and consult the community on various issues. The community members were better educated and were aware of the new rules and policies introduced by the government.

6.3. Summary of the meetings with the community:

A total number of six community meetings were carried out in Chennai and Nagapattinam, in the province of Tamil Nadu, India. Since household survey results were presented in Chapter 5 for three of the communities (VOC Nagar in Chennai and Akrapettai and Keechanukupam of Nagapattinam), the results for the community meetings of those communities have been presented in Appendix C. A summary table presents (see, Table 6.1) the results of meetings with the three communities and the indicators of positive or negative outcomes for the reconstruction process in these communities. This, however is a qualitative assessment based on the focus group interviews.

Table 6.1 Summary of the major indicators of the reconstruction process based on the community meetings

Community	Positive Indicators/Benefits	Negative Indicators/Concerns
Tsunami Nagar[34] (Chennai)	-community provided with some compensation during the first two years after the tsunami.	-no water supply -no electricity -no health center -no school -unemployment -no community consultation by the government -people unaware of escape routes -frequent flooding -sanitation and garbage a major problem -no counseling services -people are left to fend for themselves
Semencheri (Chennai)	-unity in the community -children getting educated which opens avenues for new trades and occupation -new temples constructed -a health care center provided -a school up to 8th grade reopened -a community group manages the garbage and cleans up the roads and drains -people feel they have got back to normal lives and have been rehabilitated	-no adequate water supply - unemployment a major issue - women started with illegal activities (prostitution) -people unaware of any byelaws by the government. - people unaware of escape routes -no community consultation by the government representatives in recent past -infestation by mosquitoes -frequent flooding during rains
Tillagar Nagar (Chennai)	-unity in the community -confidence and prepared to face disasters -women developed leadership quality -better place to stay -developed awareness of byelaws laid by govt. -Unemployment not a major issue (livelihoods restored) -children go to school	-no water supply to individual units -no management plans in place for removal of garbage -closeness of the oil refinery, hence chances of fire hazard. -no health care facility in the neighborhood. -place infested with mosquitoes -failure of some of the small grants projects -No community consultation by government representatives in recent past -Unaware of escape routes for disasters in future.

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[34] Tsunamni Nagar, Chennai was a temporary relief camp established in the immediate aftermath of the Tsunami and was not intended to be a permanent rehabilitation site.

6.4. Meetings with NGOs and Government:

This section details out the activities undertaken by the government and some of the NGOs that were interviewed after the community meetings were completed. It was almost four years since the Tsunami occured, at the time of these interviews. Most of the international NGOs had completed their projects during the first two years of the reconstruction and had moved out from the affected areas. The second phase of the projects was largely undertaken by the (provincial) government. However, there were many local NGOs/CBOs who were still active in supporting the community, although their rate of success was getting lower by the day as compared with contributions made by them during the relief phase. Chennai NGOs Coordination Council (CNCC) was the nodal agency which coordinated all Non-Governmental Organizations to provide relief and rehabilitation to the Tsunami affected people in Chennai Metropolitan Area. Around seven NGOs (representatives) were interviewed and two government organizations, that were actively undertaking the development programs for reconstruction, were interviewed.

6.4.1 EXNORA (NGO):

This was one of the NGOs based in Chennai that played a major role in the relief process. One of its main contributions was the design of a *Family Startup Kit*. This was part of the immediate relief provided to the Tsunami victims of December 2004. Soon after the tragic occurrence, relief material flooded the affected areas. This kit was designed and every family was provided with it. The standard *family start up kit* consisted of essential kitchen utensils, essential provisions, basic bedding and other household items worth around INR 1,350 ($27.5 USD). This was especially useful in the remote fishing hamlets where the governmental relief measures did not reach in time or in adequate quantity.

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Illustration 6.4: Family start up kit

Source: EXNORA, 2008

The primary objectives of Exnora were making provision for absolute essentials needs that a household required to function as an independent unit. Eight hundred fifty kits were handed over to families in various villages. The area of operation of this NGO was at various levels, like the local, the provincial, the national and the international levels. It has no religious affiliations and worked with other international agencies like the UNICEF, WHO and CARE.

Exnora was also in regular contact with the principal and authorized NGO network in Nagapattinam, Tamil Nadu (NCRC), to share experiences and have better coordination. Some of Exnora's other areas of intervention includes counseling, construction of temporary shelters and temporary toilets and waste management. With the support from the Swiss Red Cross, Exnora had taken up the task of putting up 200 temporary shelters and 40 pit toilets in *Karaikal* (Union Territory of Pudducherry), India. Exnora had also been involved in the promotion and expansion of the Self Help Groups (SHGs) in Tamil Nadu. Volunteers from within the fishing community, known as *Samaj Shilpi* worked with the NGO in the rehabilitation process. They organized micro-enterprise activities and thrift and credit activities among the distressed communities. The district administration of Nagapattinam had requested Exnora to establish a system of 'participatory waste management' system both in the urban and rural areas in the entire district. Some of achievements of the Exnora during the early phase of Tsunami relief and reconstruction process are:

Table 6.2 Summary of the achievements during Tsunami rehabilitation by Exnora

Activities under Sanitation	Psychosocial activities
-Working closely with Municipality / *Panchayat* staff on sanitation related issues. -Continuous education of communities on using toilets, avoid open defecation, flushing / to take water while entering the toilet, local community /groups involvement in toilet maintenance. -Conducted training on toilet usage through networking with other NGOs working on sanitation, example with *Sevalaya*/ *Gramalaya*.	-Identifying possible short term skills for imparting training. -Easy to learn & Eco-friendly skills examples paper bag making.
Activities under Solid waste management	
-Construction of compost sheds -Educating families living in temporary shelters / township areas / affected villages on clean and green concepts. -Distribution of waste bins to facilitate door step collection and source segregation of waste. -Close working and monitoring with sanitation workers of local bodies to ensure proper waste disposal, daily cleaning etc. -Integrating training inputs on Solid waste management, source segregation and problems of plastics etc., with skill training modules.	

6.4.2 Community Development Organization Trust (C-DOT):

Community Development Organization Trust (C-DOT) is a registered organization established in 2002. Its main functions are to organize Self Help Groups and grass root level health care systems. It visualizes and carries out community health programs and capacity building measures. C-DOT had organized specific health rehabilitation and social awareness programs for the Tsunami affected communities in northern and southern Chennai with a focus on women, children and adolescents. This NGO also worked with youth belonging to fishing community in order to generate better livelihood options. The organization has no religious affiliations.

Some of the major objectives of this organization were to create awareness among the people and to promote community health through community participation. The activities were such as, mobilization of the community to address issues of alcohol abuse and to treat the addiction case. By skill training activities the marginalized communities were taught new income generation skills with the focus on the women and the youth. Certain programs like manufacturing of fish products, alternative livelihoods strategies, and micro-credit programs achieved significant successes.

Illustration 6.5 (a) Paper cutting;   (b)Pickle production

Source: C-Dot, 2008

Source: C-Dot, 2008

Women empowerment, equal education and economic independence were also some of the key objectives of C-DOT. A summary of the various achievements are listed in the following table.

Table 6.3 Summary of the achievements during Tsunami reconstruction by C-dot

Health and Education	**Programs designed for Women Empowerment**
-health education was imparted for the rehabilitated communities - provided primary health care and counseling based on the needs of the community -due to increase in the use of alcohol after Tsunami, with a growth from 71per cent to 92per cent project emphasized the awareness on alcoholism, special attention on children and launched various rewarded measures such as family therapy and psychological counseling - counseling reduced social problems such as domestic violence, mental trauma, multiple ailments, burden of debt, suicidal tendency, mal nutrition and various other behavioral problems.	- Women from *Semencheri* were identified to promote livelihood activities. -With active involvement of women, it was possible to increase their awareness, self confidence and economic independence - The programs included creative painting, weaving, embroidery, candle making, crochet, pot decoration and fabric painting. - The utilization of the local resources generated a sense of ownership and it is essential for the sustainability of the intervention. -Even though many skill training programs were offered the Jute bag training and beautician course, influenced large member of participants to attend the training program. -The federation of women entrepreneurs promised to extend all help and support to 20 SHG members
Economic Activities	
- **Paper processing Unit**: was an eco-friendly and non –pollution type. -The paper boards are produced from waste papers, fabric waste and cellulose waste. -In this unity visiting cards, paper boards, office files, envelopes and carry bags are produced. -The projects responded to community needs to improve basic social and economic conditions of the local community since it was based on the participation of the local residents. -During the training the participants were also taught about the micro credit, loan programs and trained them various marketing strategies.	

-The hand-made paper products are now popularly sold in all the Departmental Stores and Super markets.
-The export values of these products are constantly increasing improving the conditions of the local markets.

-100per cent Export Oriented Value-addition Sea food plant: fishing units were found to have lot of scope to improve the standard of living.
-women from various communities who are vulnerable and need help to run their day to day livelihood were identified.
- training was offered by Fisheries College and Resource Institute of *Tuticorin* and Tamil Nadu State Resource Centre
 - The Sea food processing unit could employ 25 technically skilled women and indirect employment through cold storage unit for preservation, transportation, production and marketing.
- On an average 40 women were employed in the production centers and another 40 women found jobs in allied activities
-Hands on training for the preparation of value added fish products such as fish pickle, dried fish, prawn pickle and flavored fish were provided to the Tsunami affected women of *Thiruvanmiyur (Chennai)* fishing village.

Cell phone servicing Diploma Course: to meet the needs of the middle and low class communities for cell phone servicing, C-DOT negotiated with the cell phone companies and got placements for trainees
- There were 250 who were trained to become entrepreneurs
-After the successful completion of the course, the youths were employed in the service centers

Auto Rickshaw Bank: many rickshaw laborers wanted to rent an auto rickshaw to make their ends meet.
-50 Rickshaws were given to them in return of a daily payment of INR 20 as loan
-they were provided with uniform and insurance facilities.

Table 6.3cont'd: Summary of the achievements during Tsunami reconstruction by C-dot

Based on a number of meetings and awareness programs carried out by C-DOT, the federation of the fishing community, that was trusted with the responsibility of supporting the coastal community, was established. Rallies and discussions helped to bring people together and discuss issues on a common platform. The community members were also made aware of the various initiatives by this organization for livelihood generation.

6.4.3 TRINET (NGO):
This NGO was a resource center and networking platform for people from various backgrounds to get together and discuss issues related to the rebuilding process post-Tsunami. Trinet was based in Chennai and its area of operation spans from the local to the international level. This NGO uses the means of newsletter and other publications to spread its message around. The organization completed two years of operation by the

time the interview was carried out. It was specialized in relief and rehabilitation and had no religious affiliations. Some of its major programs were providing weekly news through the internet, a networking platform, and discussion sessions on coastal zone protection project, sanitation, governance and the role of traditional *Panchayats* (village councils). According to the CEO of Trinet, some of the programs in Tsunami rehabilitation failed due to the government's apathy and political interferences. Community members actively participated (through representatives) in the programs organized by Trinet. The community co-operated actively during the discussion on the abuse of coastal protection programs. During the interview session, the CEO of Trinet also listed some of the important tasks to be completed in the future by the Government in order of priority. They are:

Table 6.4 Suggested tasks by Trinet to be undertaken by the government

Suggested tasks to be undertaken by the government in future
-registration of the boats provided to the fishermen as compensation after the tsunami
-improvement of government and district websites so that the community is able to access up to date information regarding the measures undertaken by the government during the reconstruction
- significant intervention to speed up the process in Nicobar Islands, that has been presumably neglected due to additional rehabilitation cost
- organization of forum based on the traditional system of governance in the Nicobar Islands

6.4.4 Karunalaya and Adept (NGOs):

Karunalaya is an NGO that collaborated with the fishing community even before the Indian Ocean Tsunami took place. When the Tsunami struck, within a few days this NGO was contacted by the Government of Netherlands to support the victims for relief activities. Subsequent meetings were coordinated to mobilize support and commitment from local people.

Karunalaya was a small NGO and had no expertise in managing large amounts of funds that poured in during the first few months of the Tsunami. The support staff increased up to 80 employees. Adept, on the other hand, was a smaller center for research, resource mapping and counseling. Both Adept and Karunalaya worked closely to respond to the increased demand for support to the affected community. The main area

of specialization of both the NGOs during the Tsunami was in health care, relief and rehabilitation, and family rehabilitation sectors. Some of the critical issues which emerged during the rehabilitation were related to gender issues in the temporary shelters. During the interview the representative of this NGO said; *"... the walls of the temporary shelters were very thin and caught fire in no time. The living conditions of the traumatized community were particularly dismal. There were nine rounds of floods in the temporary shelters during the rains. There was no infrastructure, no local schools or books for children."*

Karunalaya started to provide buses to schools and the postal services in the temporary shelters in Chennai, since initially there was inadequate infrastructure for children. Soon there was need for proper enumeration to determine the actual beneficiaries to relocate the community to permanent housing. Most of the slums that were affected during the Tsunami were unauthorized. People were moved from 13 different locations and were put up in one location (Tsunami Nagar). There were reported cases of organ trade by evacuees to support their families. The NGO tried to open day-care centers for infants of evacuees, which finally closed in 2-3 months time. Karunalaya and Adept worked for over three years in the relocated community. Around 8000 families benefited from the various programs undertaken by Adept and Karunalaya. The NGO also used its own resources (including private donations). Some of the programs in which the NGO was actively involved were monitoring the community problems and construction of temporary shelters according to minimum standards. In addition, the NGO sustained various ongoing programs and kept track of staffs working in the community. According to the NGO some of the issues that are critical and demands attention from the government agencies are:

Table 6.5 Critical issues that demand attention from the government

Critical issues demanding attention from the government
-maintenance of the infrastructure provided by the government -provision of public transport facility -improvement of low-lying areas which get water logged and become a breeding place for mosquitoes resulting in malaria -women in the relocated areas are victims to crimes like abuse and molestation -there were no shops for everyday purchases - unemployed of men increased the burden on women, thus local economies need to be revived -culturally insensitive donor agencies made blunders in times of relief provision -some of the programs were failures as the government had no fore sight -low income and *Dalit* (low caste) communities among the evacuees are still unattended, and finally -there are no preparedness programs in place to be tested on the community

6.4.5 NGO Co-ordination and Resource Center, Nagapattinam (NCRC):

The NCRC was run by a team of competent professionals. The effort of this NGO was to ensure that the needs of the tsunami affected communities was fulfilled through the rehabilitation process, which was to be effective and sustainable (NCRC, 2005). NCRC was originally formed by a group from Trivandrum, Kerela, India. The main task of this NGO was to provide information to the community in the way that the community understood, and to engage the community in a productive dialogue. The objectives of this organization were based on discussions and participatory evolution of ideas. The NCRC coordinated transparent interaction between various government departments, NGOs and the communities affected by the Tsunami in the Nagapattinam District of Tamil Nadu, India. NCRC was in place since January, 2005 as the NGO co-ordination center and was focused on coordination of relief efforts by various agencies and NGOs. During the relief phase the centre was run by numerous volunteers from within the country and abroad. Some of the main objectives of NCRC were:

Table 6.6 Objectives of NCRC

Objectives of NCRC
-Researching and building up a knowledge base around issues and sectors relating to rehabilitation
-Providing technical expertise to facilitate the development of sectoral and regional perspectives.
-Collecting reliable relevant data and making this easily available to all stakeholders
-Contributing to appropriate and relevant policy formulations.
-Facilitating community participation in the decision making process so that the community perspective is clearly articulated

There were around 500 NGO's between 2005 and 2006 who worked in the region. The main objective of NCRC was not in just implementing relief and rehabilitation, but in advocacy, policy formulation and coordination among other NGOs and the government. Guidelines were prepared and the chief district officer was able to make changes based on the consultation process.

"The fishing community is a well delineated community. Their living close to the coastline and apparent isolation is by choice and they have their own way of dealing with their own day to day issues"—told by the CEO of NCRC. Around 12 information centers were set up across the coastline in Nagapattinam area and studies were carried out by this NGO. The NCRC deliberately worked with the government with a clear view that neither the NGOs will be effective without the government nor the government programs will be successful without NGOs. A synergy was built between the government and NCRC, which became a very effective program model. Some of the main observations made by NCRC during the reconstruction phase were:

Table 6.7 Observations made by NCRC

Observations by the NCRC during the past four years after the Tsunami
-the fishing women were mostly affected
-their vision for life had completely changed due to relocation
-time has been compromised as earlier they could sit in the home and see the ocean
-community space and socialization had considerably changed as the houses were in rows
-there were no livelihoods to secure their lives and to develop a coping mechanism
-agriculture sector was also neglected in the past few years
-lot more effort is required to put in place the traditional livelihood system
- the local markets are poorly connected to the cities and therefore collection centers and co-operatives cannot be set up for other livelihood activities such as sale of mangoes and dairy products
-need for an education system for women and establishment of tuition centers for children.

6.4.6 UNITED NATIONS DEVELOPMENT PROGRAM (UNDP):

The UNDP operated indirectly in the local areas affected by the Tsunami, but were more direct at the Provincial level through coordination of programs at National and

International levels. The operation period of UNDP in Tamil Nadu was over three years post-Tsunami. By the time this interview was carried by the researcher, some of the project offices of UNDP had already closed their operations. Its main interventions were related to housing, disaster management and environment. Around 35 million USD of the total available funds were spent on the community services. The programs undertaken by UNDP were carried out with an objective of achieving sustainability of rehabilitation and development programs. However, based on the comments of the representative, some of the programs did not succeed due to lack of adequate staff training. The community actively participated in some of the programs. The interviewee highlighted aspects related to the shelter project. For example, there was at least one member from each family working as a mason in the shelter project. The interviewee further said, *"...one of the major challenges faced in the shelter project was that, the component of project management was incomplete. Therefore, the shelter project took longer time period for completion."* The community was the most co-operative in decision making and defining their needs. Some of the important tasks to be completed in future as listed by the representative of UNDP were:

Table 6.8 Tasks for the future

Tasks to be undertaken in the future by UNDP
-mainstreaming the study of the rural habitat policy
-more emphasis on capacity building programs
-the community needs to be in the forefront of developmental decision
-community participation needs to be balanced for optimum results
-the role of the facilitator is very crucial during execution and hence more needs to be accomplished toward skill training and delivery.

6.4.7 HOPE (International NGO):

HOPE Foundation is an independent affiliate of HOPE Worldwide. Its aim is to bring changes in the lives of everyone who have lost hope in life. It provides non-sectarian assistance to more than 1 million needy people per year in 80 nations. It is a recognized NGO in special consultative status with the Economic and Social Council of the United Nations (ESCAP) and is a registered private voluntary organization with the

United Sates Agency for International Development (USAID). Its mission is to provide capacity-building, health and education programs, through staff and volunteers.

One of the largest initiatives in response to the Tsunami disaster was launched by HOPE Foundation, in collaboration with Manpower Inc., USA at Nagapattinam, a district which witnessed three-quarters of the deaths that occurred during the tsunami in Tamil Nadu (HOPE, 2006). It established two vocational training centers at Tharangambadi, Karaikal, Union Territory of Pudducherry and Nagapattinam district of Tamil Nadu that focused on the local requirements and on the development of the local economy. The project focused on long term commitments in order to make a sustainable impact. According to the plan, 10,000 students would be assisted to graduate in the first 10 years. The plan also included the creation of SHGs (Self Help Groups) and providing them with money to create at least 70 small businesses for women in Tharangambadi. The other achievement was the establishment of a school up to the 10th standard in Tharangambadi. Most of the children came from nearby fishing hamlets and had no educational background. Many of the children were now taught to speak in English. Among other objectives of the HOPE Foundation were those of establishing primary and nursery schools, community halls, health clinics and training centers for men and women.

6.4.8 South Indian Federation of Fishermen's Societies (SIFFS, CBO):

SIFFS is the apex body of 150 village level fish marketing societies in Kerela, Tamil Nadu, Andhra Pradesh and Pudducherry states of India. The NGO provides a wide range of services to the fishing communities. SIFFS has a primary society in Tarangambadi which markets almost the entire fish catch of the village at best possible price and provides credit, savings and insurance services. The organization had been involved from the day one of the disaster in relief and subsequently, in rehabilitation activities in Tarangambadi. The efforts of SIFFS spanned from supply of relief kits, payment of compensations, restoration of livelihoods, education support, construction of temporary shelters and permanent homes and many more such programs. A dedicated team of engineers, architects and community development officers attended to the technical and social needs associated with the construction of shelters. By May of 2007, out of the 1100 houses to be constructed in Tarangambadi, 451 were handed over to the

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house owners. Another 55 houses were built *in situ* in the old location. Electricity and water supply was also ensured.

Illustration 6.6: (a) Changes made by individual households to the façade of permanent housing; (b) use of locally available thatch and bamboo

(a)   *(b)*

Source: Author (Field work, 2008)   Source: Author (Field work, 2008)

Involvement of SIFFS in Tarangambadi is part of its larger involvement in Tsunami relief and rehabilitation across the state of Tamil Nadu with special focus on Nagapattinam and Kanyakumari districts of Tamil Nadu. It also played a key role in ensuring coordination across the NGOs and with the local government. Some of its main initiatives were:

Table 6.9 Major initiatives undertaken by SIFFS

Habitat reconstruction	Hazard and Habitat mapping
-Involvement of house owners at every stage from planning to construction of houses -Extensive scientific studies undertaken as part of the planning process. -Plots allotted to each household in advance, enabling them to monitor the construction of their house. -Dividing the project into clusters to ensure better meeting of needs of house owners -Creation of seven model houses in real dimensions for house owners to choose from. -Freedom for house owners to customize their house according to their needs. -Training house owners in monitoring the construction of their houses.	-A habitat mapping exercise was carried out in the old village settlement to understand the use of space and other requirements, based on cultural values and design preferences associated with them. -Apart from this another mapping exercise was carried out to mark the level of inundation at the time of tsunami and based on it areas were either marked safe or risky and the local community were made aware of it.

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Use of cluster approach and model houses	Provision of sanitation facility and awareness
-clusters of 25 to 50 houses were formed in Tarangambadi -A committee of 5-6 owners was selected for every cluster as volunteers to oversee the construction process. -A construction team also accompanied them. -Seven model houses were designed based on the habitat mapping exercise. -The house owners could make their own choice of the design. -The area of the houses ranged from 400-450 sq.ft and gave an option of changing the kitchen, prayer room and toilets.	-total sanitation provision through a comprehensive intervention by environment sanitation, water management and hygiene behaviors -An awareness and mobilization campaign was underway. -Women responded better to the campaigns. -Individual household sanitation plans were prepared for all the households in the new habitat in Tarangambadi. -every household was encouraged to separate plastic and bio‑degradable waste at the household level - Pits were made for dumping the waste - Soak pit were made for waste water absorption - Rain water harvesting was introduced
Some of the positive outcomes of the sanitation program organized by SIFFS	
-Community involvement increased as the program developed hygiene behaviors -A good percentage of people started using foot wears while going out. -The number of children taking bath before going to schools and cutting their nails regularly had increased. -Littering of the streets decreased.	

Table 6.9cont'd: Major initiatives undertaken by SIFFS

6.4.9 Slum Clearance Board (Government Agency):

The Community Development office within the Tamil Nadu Slum Clearance Board (TNSCB) was the central department for implementing the livelihoods project. This organization had professionals from the field of Social Sciences with a committed approach and attitude in extending services to the Tsunami affected communities. The project was assisted by the services of the grass root level volunteers from within the project areas. Apart from 25 Tsunami affected coastal slum areas, the main areas of intervention within the Chennai Municipal Corporation area were 3 resettlement areas of, *VOC Nagar*, *Thilagar Nagar* and *Semencheri*. The beneficiaries in this project were mostly the Tsunami victims, physically challenged individuals and women who headed households. The main components of the project and the costs involved in each of the areas were:

Table 6.10 Components and costs for Community development projects

Components and costs involved for each of the projects in INR		
Formation of Self Help Groups	---	INR2,000 per SHG ($40.81(USD)
Revolving Fund	Grant	INR30,000 – as group ($612 USD)
Skill Training	---	INR5,000 per trainee cost ($102 USD)
Smaller Economic Activity	Grant	INR10,000 as individual ($204 USD)
Livelihood Support Activities	Grant 75per cent Loan 15per cent Group/Individual Contribution 10per cent	INR10000- INR2,00,000 ($204- $4081USD)

Source: Slum Clearance Board, 2008

SHGs are defined as small groups (either women or men) comprising 12- 20 members from the same habitat/neighborhood. Their main objective was to cultivate a habit of saving with a monthly/weekly subscriptions and utilizing the amount for internal lending for social and economic purposes. The stages involved in this project were, first the formation of the groups, then the training of the SHGs and finally, the effective use of funds. Almost 618 SHGs were issued the revolving fund facility which had benefited as many as 9742 SHG women and men at a total cost of INR 1.54 million.

Short term skill development training were conducted to upgrade or impart new skills to the adolescent boys, girls and women with duration from one week to six months through government institutions, NGOs and other supporting, credible institutions. The cost involved for each of the trainee for the entire skill training program was approximately of INR 5,000 ($120 USD). According to records, 362 women from 200 SHGs were trained by mid-2008. Major livelihood activities had also been encouraged with the financial support of 75 per cent grant and 25 per cent credit from banks or through contributions made by the SHG's. Two-hundred and ten persons from 44 SHGs were supported with bigger livelihood activities. Some of the livelihood activities that were undertaken in this category were:

Table 6.11 Livelihood programs introduced by the government for Tsunami Victims

Auto rickshaw (three-wheeled motor vehicle) for livelihood creation	Livelihood through Solid Waste Management
- a group of 15 persons was helped in this venture and provided them with the three wheeler auto network to restore their lost livelihood -beneficiaries earn a regular income ranging from INR6000 to 8000/- INR per month - rendered ownership of the vehicle -facilitates mobility of people living in the relocated area, for the school children, hospitals and MNCs on the IT corridor. - local community also benefited -program was a success -another 38 autos was sanctioned by the Govt. agency	- solid waste management by a federation of 20 SHG women -4,000 waste baskets been provided with 2 to each household -the garbage collected at the household point was being collected by the 18 garbage collectors at the door step -the project had made provision of cleaning equipments and hand gloves, boots, caps & uniforms to the garbage collectors -members earned a regular income of INR2,500 besides creating a clean environment through regular garbage collection
Production of Women and Baby utility products	**Establishment of Community Departmental Stores**
-16 Women from 8 SHGs were trained in the production of sanitary napkin and baby products -a group was formed which was named as "Valarpirai Women Federation" at Semencheri -the total cost of project was INR1,36,390/- INR out of which 75per cent i.e., INR88,792/- INR was met as grant and the balance by bank loan	-18 women SHG members were trained in Management of Community Departmental Store at Semencheri -the shop sells day to day requirements of the families including groceries, vegetables, wet flours etc. -the shop also provided coin phone facility as additional service to the community

Based on the meeting with the representative of the Slum Clearance Board, it was understood that the Livelihood Project had been a boon to the Tsunami affected population in Chennai. Apart from being rehabilitated in good settlements equipped with all basic amenities, the project assisted effectively in their own micro enterprises. Adequate training has been provided to the youth who were then referred for jobs/placements, especially in the IT Corridor in Chennai. Networking with corporate sectors like TCS, Satyam Computers (Foundation) had opened new vistas through proposals in the form of assistance to schools, commencement of IT schools for the youth, job referrals and help to the SHGs in terms of marketing products from the area and capacity building of the community. Special supportive programs from the government were also provided to the Tsunami affected communities. Some of them are:

Table 6.12 Special supportive programs for the victims from the government

Information, Education and Communication Activities	Education
-it addressed the environmental sanitation issues with focus to improve the behavioral changes with regard to use and maintenance of the facilities - achieved by proper disposal of household garbage - training the members of the neighborhood groups and committees in solid waste management -ventures like vermin compost and manure production was introduced to SHGs -awareness camps had been organized on all themes including women empowerment, health and environmental sanitation	-a school building was constructed at Semencheri -about 494 children had been enrolled in the middle school -The Integrated Child Development Scheme (ICDS) had been running two pre schools with 100 children in their centers - UNICEF had donated teaching and learning materials for the middle school children.
Communication Activities	**Health camps**
-networking sessions were organized between the NGO's and other Government Departments - as a result the TATA Consultancy Services had donated computers and water coolers for the school children -The Satyam Computers had expressed its willingness to co-ordinate an extend services in terms of assisting IT Schools and helping the Tsunami affected children -welfare programs were planned under their venture such as SWISS (Satyam Welfare Initiative for Semencheri Scheme).	-Monfort Community Development Society had organized mobile clinics and clinic bus visits at the Semencheri Project area thrice a week - The Community Development Organization Trust had been running a clinic cum dispensary thrice a week -Medical camps were arranged periodically -Dental Camps were conducted at the schools to drive home the message on oral hygiene.
Referral Services	**Retail outlet at the Trade Fair Exhibition**
-individuals were referred for jobs -four women were placed as primary teachers under EGS (Education Guarantee Scheme) -their salaries are sponsored by *Panchayat Union*. -there were tie ups made with corporations for employment opportunities for about 200 persons from Semencheri in various trades like construction, plumbing, carpentry, housekeeping etc.	-the SHG members were encouraged to display and sell their products in the specially allotted spaces in various pavilions. -a Trade Fair Exhibition had provided ample scope to women to demonstrate entrepreneurial power

A number of field *animators*[35]/volunteers were assigned with a fixed number of families to make regular home visits and maintain records of the families and details of the received assistance. Project co-coordinators at the rehabilitation sites monitored these *animators.* Representatives from the Community Development Organization monitored

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[35] The term was used to denote field level workers by the government agency.

the field level operation of the project and provided a feedback to officials in the government offices. The livelihood assistance provided through the project helped to create assets that boosted the community's confidence and helped them to face challenges in their newly rehabilitated settlements both at Semencheri and *HLL Colony* in Chennai, Tamil Nadu.

6.4.10 District Collectorate, Nagapattinam (Government organization):

The researcher visited the government organization known as the District Collectorate, located in the Nagapattinam city. This was done in order to understand the land acquisition process and to acquire feedback from the government agency. This organization was the chief district field agency dealing with land related policies and reconstruction process in the Nagapattinam district, with legal powers of field implementation of all government programs. It was the government that provided land to the accredited NGOs through MOUs (legal contract) for construction of the permanent shelters during the reconstruction process. The primary task of the government at the initial phase of reconstruction after a disaster took place, is that of land acquisition. Some of the details for this process are as follows:

Table 6.13 Land acquisition process, housing, infrastructure and policy by the Government agency

Land Acquisition	Policy
-first objective was to get consent for land Government land was avoided and surplus land was provided to the farmers and fishermen -Tsunami Land acquisition was deviated from the usual land acquisition process - Victims were given 200per cent compensation on irrigated land -217 hectares of land was acquired in the Nagapattinam district alone - 53.62 hectares of temple land and 9.35 hectares of free land (from donations) was acquired - Government provided 26 hectares of land - during 2005 December that 60per cent of the land acquisition for relocation was completed -remaining 40per cent was expected to be completed in 2007	-second objective of the government was the formation of the coastal zone regulation -there would be no development between, 0- 2 meters of the sea -tides would reach 200 meters no construction was permitted within this zone -The affected community was relocated beyond 200 meters -people living at less than 300 meters distance was also relocated -where the beneficiary was residing in highly objectionable government land (unauthorized) then were evicted -the permanent houses are insured for 10 years for comprehensive disasters - the title ownership of the house is in the names of both the husband as well as the wife for 10 years - after that the eldest daughter is the beneficiary

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Housing	Infrastructure
-Out of the 19000 permanent houses, 4423 were in situ category, 14183 were relocated - Houses that were within 0-200 meters and were totally damaged were provided with a new house -houses that were partially damaged and within 0-200 meters, were also provided with a new house - Repair grants were also provided for damaged houses -18000 temporary shelters were provided during the rehabilitation to those who were renting -Based on the CRZ11 the height of the building could not exceed more than 9 meters or 33per cent of built-up -NGO's were not able to complete the target permanent housing; therefore the government undertook the housing projects too.	-People from the villages were provided with INR1600 for electric connection - Internal roads leading up to the houses were constructed with concrete - Every house was provided with an individual water tank for municipal water supply -escape routes are still in plan

Table 6.13cont'd: Land acquisition process, housing, infrastructure and policy by the Government agency

6.5. Summary:

This chapter presents the findings related to the community experiences revealed during the focus group meetings as well as discussions with various NGOs/ CBOs and government agencies implementing or facilitating rehabilitation programs. Based on interviews and analysis of available documents, narratives illustrated the ways in which various programs for relief and rehabilitation of affected communities were undertaken. The general impression gathered through these interactions indicate a relative success of a wide range of physical, social and economic interventions undertaken during three years of reconstruction and development programs. The government agencies and the NGOs/CBOs took efforts to network and to reduce costs in project implementation. It also appears that the tsunami affected communities were proactive to some of these interventions. There have been substantial changes in the lives and occupations of women in the community. Being now located away from the sea and for safety reasons, women can no longer participate with men in traditional pursuits and have switched over to new occupations.

However, at the end of three years, most of the training programs and livelihood projects had ceased to operate. If the communities are to recover from losses and traumas brought about by the disaster they need to develop better coping capacities to sustain in

future. Finally, sustainability of any intervention requires capacity of the community to be independent of aid programs. Many of the incomplete projects and tasks of the NGOs have now been taken over by the government agencies. Networking platforms such as the NCRC and the Trinet have now changed their focus to other community issues, such as those related to the farming community. With no effective monitoring system in place, except for those by the government agencies and with limited community consultations, can development programs be sustained? Only periodic monitoring of the communities can help in ascertaining the degree of sustained progress in these communities.

Chapter 7: Findings and Discussions

7.1. Introduction:

This chapter discusses several themes explored throughout the previous chapters and the findings of the current study. Empirical data provides new light on the field of study and insights that could be used by various agencies to improve the reconstruction process for a disaster affected community. Indicators for post-disaster reconstruction have been directly examined and inferences are drawn from programs that were a success in the communities. This chapter also discusses the factors that lay behind the success or failure of reconstruction programs, with specific reference to fishing communities from the coastal State of Tamil Nadu, India. Building on the literature and incorporating the viewpoints from various representatives of the community, international NGOs, local NGOs and the government, recommendations are designed to integrate disaster research and community planning by using an interdisciplinary framework.

7.2. What was learned:

This section discusses the study findings, while reflecting on the conceptual model that was developed in Chapter 2 (see, Fig. 2.2). There were primarily four objectives that were developed for the purpose of evaluating the Tsunami reconstruction process in Tamil Nadu coast of India. Discussion of the findings would be carried out in the same order as: (i) Physical and Psychological Restoration of the community; (ii) Capacity Building and Livelihood Restoration; (iii) Sustainability of the Planning and development intervention; and finally (iv)Cultural sensitivity of the initiatives, and social capacities of the community.

7.2.1.Physical and psychological restoration of the community:

The growing number of disasters and scarcity of usable land leave millions of people homeless every year, with the scene chaotic mostly in the developing countries. Homelessness and poverty are two major contributors of vulnerability in the developing countries. There are often intense debates about what technologies should be used to

rebuild homes, in order for the community to be 'safe' and less vulnerable to a disaster. The Indian Ocean Tsunami drew large amounts of international aid to rebuild communities and provide housing. Yet after four years there are families who still wait for a roof that would protect them from the rain, storm or possibly, another Tsunami. One of the greatest failures of the post- tsunami reconstruction process was that development lessons, which should have been targeted towards safety oriented development plans, were otherwise overlooked by government agencies and NGOs. Permanent housings in the urban areas (Chennai) were apartment blocks that were designed for the fishing villages, keeping in mind factors such as cost and minimization of land-use. Fishermen were relocated away from the sea, whereas businesses (such as tourism and hotel industry) were given permission to build waterfront parks for entertainment and resorts along the coast. Government officials need to be committed to unbiased implementation of building laws and coastal zoning policies to prevent unchecked development in these areas. Some of the relocated fishing families continued living in temporary shelters four years after the Tsunami occurred in 2004.

These temporary shelters were designed without considering the severe heat and space requirement. A box-like temporary house made of 'ferrocrete' walls (walls constructed with steel mesh and cement concrete) and very thin roof resulted in inside temperatures rising from 30 to 50 degree centigrade in the summers. There were no adequate openings for light and ventilation. Large families comprising of five to six members continued living in pitiable conditions for over three years (see, Illustration 6.1). Therefore, over 50 percent of the interviewees expressed their dissatisfaction with the housing provided to them by the government. Communities that once lived a rural life in an informal environment started to live in multistoried apartments by the third quarter of 2007. Unhygienic living conditions and negligible management of waste made the place appear close to 'vertical slums'.

Row housing provided to the 2004 Tsunami victims in the rural areas (Nagapattinam) did not provide the much needed community space for social activities, play area or the place interaction for women and children. During construction, the quality of housing material used in rural locations (Akkarapettai & Keechanukupam) was not tested. Seepage of rain water left cracks on the roofs of many houses. In one of the

community meetings carried out in Akkarapettai village of Nagapattinam district, Vimala (name changed) said; *"I am happy with the new house, but just last month a part of the roof broke and fell on my back, this is my X-ray report. We had to repair our roof and spend our own money for it"* (shows the doctors report as evidence). Despite the zoning regulations people were still residing at the distance of less than 10 meters away from the sea, especially in the rural areas (Keechnukupam). Four years after the disaster had occurred; the local government was still scrambling to complete other permanent shelters for the affected population.

7.2.2. Need for Community consultation and Sustainable Design:
Community consultation

Historically, community participation in planning originated from the 'ladder of citizen's participation' proposed by Arnstein (1969) and was modified later in the context of developing countries by Choguill (1996). The meaning of the term community participation is embedded in the philosophy of empowering beneficiaries or community members to take part in making decisions and in shaping a community. It is also termed as the 'peoples-based approach development' or alternative development' (Nederveen Pieterse, 2001).The United Nations' publication on "Shelter after Disaster" (UNDRO, 1982) suggests that "the key to success ultimately lies in the participation of the local community—the survivors—in reconstruction''. The concept of community participation and consultation is widely encouraged within disaster management, especially in the post-disaster reconstruction context by NGOs, policy makers and scholars. Traditionally, in the context of developing countries there are three forms in which community consultation and planning exists. A) The first being based on community development, where the small local NGOs, although other expert based international organizations exists working parallel on various government and international projects. B) The second form of community participation exists in the form of capacity building and training. International NGOs funded by international governments at times sub-contract projects to smaller local NGOs (Kenny, 2007). C) The last form exists through the involvement of external experts who apply their skills, resources in accordance to the local political, social and economic systems. It is this form of community consultation that exists in the

areas where the current research was carried out. From the current research it was evident that very few communities participated directly in the process of rebuilding neighborhoods. A summary table (see, Table 7.1) was prepared to illustrate the degree of user (beneficiary) participation in the reconstruction project, specific to housing.

Table 7.1: Summary of the shared responsibilities between the participant and development agencies in the four case studies

Activity	Case study 1	Case study 2	Case study 3
	VOC Nagar Chennai	Akkarapettai, Nagapattinam	Keechanukupam, Nagapattinam
Program initiation (leading role in procuring the plan of reconstruction	GOV	GOV + NGO	GOV
Project initiation (starting the project)	GOV	NGO	GOV+NGO
Project financing	GOV	GOV+NGO	GOV
Design	GOV	NGO	NGO
Construction	GOV	NGO	GOV+NGO
Post-project modification	N/A	GOV	N/A
Level of community participation	inform	inform	inform

Beneficiaries (Community members)	BEN
Non-Government Organization	NGO
Government	GOV
Community-based Organization	CBO

During the entire field work there was just one location, the Tarangambadi village in Nagapattinam district of Tamil Nadu (north of Karaikal district from the Union Territory of Pudducherry) that demonstrated people's participation in the design and selection of housing. Participatory approach in housing requires longer time frames and consultation necessarily slows down the process of plan implementation. Therefore, it was observed that in Tarangambadi there were still a number of housing units yet to be completed. However, the community members appeared to adjust well to the new environment. One of the philosophies for providing housing is that, the beneficiaries establish strong community ties (Davidson et.al, 2007) and social cohesion (Choguill, 1996). Survey results illustrated that community members in VOC Nagar (Chennai) were still struggling to establish community ties as most of the population were brought to live together from different groups and locations. As a management strategy, Tarangambadi, seemed to be the only location where with the support of CBOs and local actors the

influence of the state government was reduced and local de-centralized organizations were stimulated to take over the task and responsibility of reconstruction. The Tsunami of 2004 not only led to the loss of life in Tamil Nadu, but changed the living environment everywhere along the coast. Survey results clearly indicated that a lot more could have been done in terms of community participation and consultation in the three locations (VOC Nagar, Akkarapettai & Keechanukupam). This could have helped in developing a sense of security and comfort without jeopardizing the livelihoods of community members. In the Tsunami affected areas of Tamil Nadu it was evident that the example of capacity building or community development was only based on the work of NGOs involved in the first few years of reconstruction, where their aim was to provide for 'unmediated' assistance to survivors. During the focus group meetings, the NGOs expresses their commitment to community planning and development, whereas interviewees from the current study were still struggling to re-establish themselves. Community development and consultation has been widely discussed in the form of reports in various websites by larger international NGOs (such as UNDP, Oxfam and USAID), as well as by the government, however the current research underlines how far the rhetoric is put to practice.

An important aspect of natural calamities such as an earthquake, a storm or for instance the Tsunami is that the existing institutions and the policies are unable to cope with the sudden and the urgent needs effectively (Housing by People in Asia, 2005). The existing system could be compartmentalized to deal with the onrush of the needs of the community after a disaster. A single agency cannot organize by itself the relief, rehabilitation or the reconstruction of a disaster affected community. Various aid agencies, professionals, government department and community groups need a common platform to understand and deal with the problems post disaster in a more coordinated and collective manner (Kenny, 2007). Such a common platform that links the NGOs, aid agencies, community members and the government department could help in dealing with issues in a more collaborated manner.

Sustainable design

There is a need to design shelters adequately conforming to the architectural forms that respect the climate, site, culture and the region. Geis (2000) advocated building disaster resistant communities as opposed to 'resilient communities'. Stress was laid on the built environment and quality of life of a community. The theory of having *disaster resistant communities* has been critiqued in recent literature of disaster management (see, McEntire, 2004). However, building resistant communities still remains as one of the purposes of community-based designs during the reconstruction process. It is important for local government officials to look beyond individual buildings and to consider the entire built as well as natural environment (Geis, 2000).

A technical solution to the problem could be the use of self-help groups and utilization of local knowledge from the people who have developed methods of adapting to the environmental conditions in their own way, rather than utilize imported solutions that jeopardizes local economy and dissatisfies the community at large (Pug, 1997). The built environment includes, places where people live, work, learn and play; the lifelines (roads, pipelines and electricity) that connects and provides services to the people; and the neighborhood, a block, or the region where the population resides (Geis, 2000). The natural environment includes small parks and water bodies to larger natural systems such as forests and wildlife, rivers and the sea (Geis, 2000).

Reconstruction projects are often executed in a rush without paying much attention to innovation in design and technology. As a results, the new 'built environment' created for the disaster affected population (for example, VOC Nagar), leaves beneficiaries dissatisfied and the project unsustainable in the context of long term benefits. It is true that indigenous problems vary from one disaster to another and mitigation approaches need to be developed accordingly. However, one cannot dither from the fact that the most advanced technologies may not be the solution to a problem. It is important to identify practices that are successful in one location/ country, that could have applicability in another area and in this manner there is the sharing of experiences that benefit all. Public participation in designing interventions within their immediate environment would make a significant difference in the overall capacity of the community to minimize physical, social and economic vulnerability (Geis, 2000; Burby,

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1999; Pearce, 2003). Some of the products of sustainable community design could be in the form of:

- Policies that guide future development- Communities can participate in making decisions regarding demarcation of 'safe zones'.
- Layouts of physical plans using mitigation measures- Community consultation is very important in preparing layouts of houses, neighborhoods, evacuation routes and buffer zones. Use of new technology along with traditional knowledge could be ideal in such cases. 'Community mapping' can also be used as a tool to prepare layouts (Pearce, 2000).
- Warning systems – Utilizing not only technological devices such as radios, televisions and sirens but also by other traditional means of communication (Housing by People in Asia, 2005).
- Livelihoods – Members from the community could use multiple sources of livelihood generation by improving their skills and formation of self–help groups (SHG) particularly for women.
- Environmental restoration- By involving community in tree plantation, neighborhood cleanliness programs, conservation and many such activities (Geis, 2000).
- Public Education- by involving communities to participate[36] in making new schools and colleges for education (Paton & Johnston, 2001).

Another aspect of sustainable design is to *design with nature* (IanMcHarg, 1992). There was one such example after the Tsunami of 2004 in Indonesia that successfully applied this concept (Tsunami update, 2006). These villages were known as Eco-villages (see, Fig. 7.1). The following table summarizes how the communities designed escape routes, evacuation centers and designed housing using indigenous technologies.

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[36] In forms of labor, local material, financial contribution, monitoring the construction, and teaching.

Table 7.2 Summary of sustainable design initiatives by Eco-Village, Indonesia

Natural and built buffers :	Natural barriers such as mangrove forests, coconut and pine plantations and rice fields were planted to absorb the force of waves, winds and storms. Numerous and varied protective layers were added between the sea and the settlements. Built barriers such as dikes, ditches, roads (lined with still more trees), canals and fisheries ponds were also incorporated to add more protective layers.
Escape routes and escape hills :	Each village has planned special escape pathways and evacuation centers in the nearest hills or high-ground, so everyone knows which way to run in the event of another tsunami.
Sustainable village development	Villagers also explored new ways of making their communities ecologically healthy, self-sufficient and more in harmony with the environment by using local building materials, recycling, use of organic waste-water treatment, kitchen gardening, biogas digesting and non-polluting alternative energy.

Source: based on Housing by People in Asia, 2005

Communities such as these may not have the means to use warning systems developed by new technologies such as the computers, television or detailed maps and hazard atlases, but have developed their own ways of communication at the onset of a disaster. "Design with Nature" (McHarg, 1992) emphasizes zoning of hazardous locations in relation to natural systems such as slopes and water bodies (streams, rivers, lakes, etc.). Therefore, this concept could have policy implication for development of safety zones. Planning and designing 'safe communities' can also have implication on livelihoods of the community (Geis, 2000; Burby, 1999). Houses are to be planned away from the shore and not located close to any hazard-prone areas. However, in fishing communities houses are close to the shore so that fishermen have easy access and conveyance to fishing implements.

Housing for such communities needs to be cost-effective, efficient and designed to cater to the spatial requirements of the traditional lifestyles of the local inhabitants, in this case the fishermen. Consequently, not designing neighborhoods to the specific needs of communities might push these communities to further vulnerabilities. Locally available material like bark of coconut tree, palm leaves, thatch and coconut mats could be encouraged to be used with the combination of modern materials like cement, concrete or tiles. The layout of a fishing village should be planned in a way that it retains the

character of a typical fishing hamlet where there is ample space to perform day-to day activities.

Figure 7.1: An Eco-Village plan
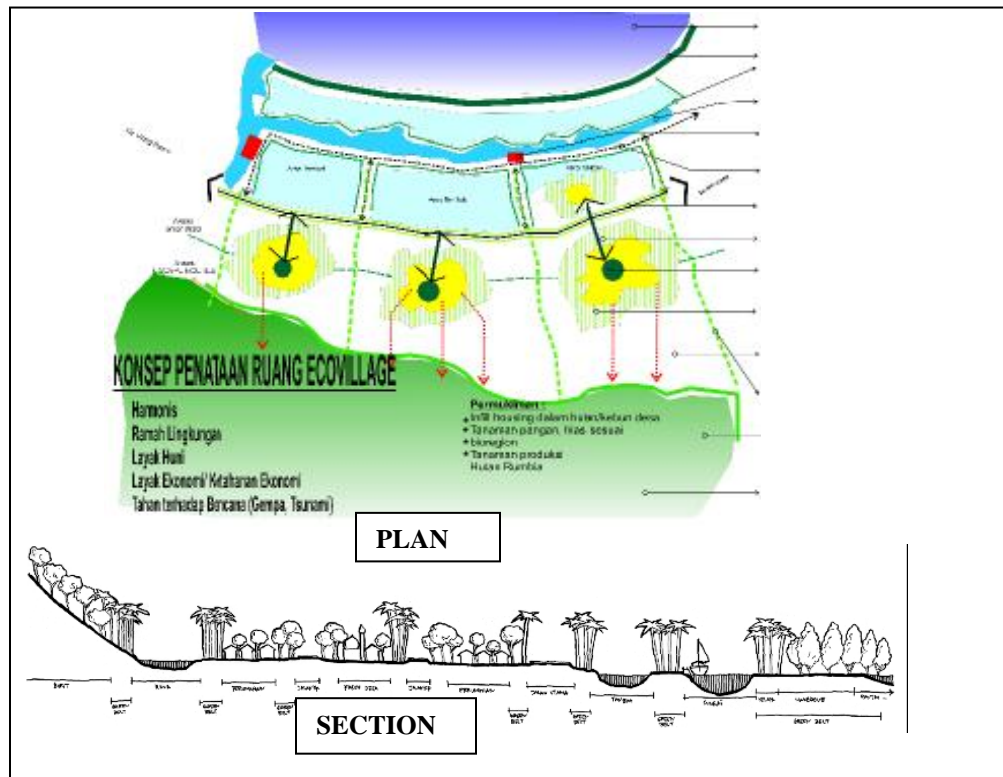
Neighborhood designs for disaster affected communities need to develop such symbolic and functional values of a place, that would reduce future vulnerabilities. Insensitive designs and uprooting communities from the original locations have forced communities return to their original homes making them more vulnerable to disasters (Michel, 2005; Flint & Goyder, 2006). This approach of designing with nature may pose some limitations for techniques that are currently being used for rural and indigenous communities. However, its applicability in urban and semi-urban context needs to be further explored by architects and planners. Community participation and consultation could be ensured as following:

1. Ensuring that the community members are consulted at the time of selection of designs for their housing unit or neighbourhood.
2. Providing a choice to the community in selection of a contractor or builder.

3. Ensuring that selected members take responsibility for managing some accounts and financial matters related to construction and housing.

4. Encouraging individuals or small groups to take charge of management of the construction phase.

5. Ensuring participation of members in developing the terms of contract or legal ownership of the completed location.

These steps could help in developing ties between the community and the new neighbourhood and rekindle a sense of ownership among each household. Current practices have forced household members in Tamil Nadu Coast to live in a rigid environment, confined to small spaces and narrow corridors. Constructional practices need to be upgraded, so that the designs of the houses are more efficient and successful in the future.

7.2.3 Provision of Facilities:

Provision of infrastructure facilities is another major indicator that measures the success or failure of reconstruction programs. It reveals the level of community participation as well as the extent to which the government contributed to the disaster affected areas. Road networks, transportation systems, schools, health centers, market places and community centers are comparable to the nerves, heart, lungs and brain of the community. No community can function successfully without these amenities. Apart from providing housing, the government is required to provide for good road networks and transportation facilities connecting community members from the relocated areas to the shores, especially for the fishing community. Distance to the sea was not a major issue for the rural communities (Akkarapettai and Keechanukupam), but many families in the urban locations (VOC Nagar in Chennai) had to change their occupations due to the additional costs incurred for travelling long distances everyday to the sea shore for their traditional occupation that was fishing related.

New schools that were built by the government and NGOs provided educational facility to children, both for boys and the girls. However, surveys indicated that there was not much done in terms of *adult education*. Results from the survey illustrate that almost 60-90 percent of the households (see, Table 5.1), had only one earning member. Every

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household had to undergo tremendous financial pressures to manage expenses incurred in the relocated areas after the 2004 Tsunami. It was observed that women in the urban location (VOC Nagar) remained mostly at home and wasted their time during the day gambling or playing cards. Traditionally, apart from household duties, women contributed in the fishing trade by cleaning, grading and drying fish. The women in the relocated areas stopped carrying out these activities in the new location due to the distances from fishing jetties/ sorting areas which was along the coast. Post-tsunami studies also revealed that 'alcohol abuse' was high among the affected community. A study carried out by Tamil Nadu Tsunami Resource Centre (TNTRC) and the NGO called C-DOT, released facts stating that almost 74 percent of the coastal population had taken into alcoholism. Approximately 20 percent of women, adolescents and children reported that the problem worsened after the Tsunami of 2004 (The New India Express, 2006).

Although, there were a number of programs developed by various NGOs and the government agencies for livelihood generation particularly for women, very few programs sustained as far as the third quarter of 2008 (the period during which the field work was carried out). It was evident from the community meeting carried out during the study and meeting with NGOs (such as C-Dot) that these programs phased out either due to the lack of funds, motivation or the weak market demand for the finished products prepared by the women from the relocated areas. Instead of initiating short term livelihood programs that did not last two years into the reconstruction process, there should have been more emphasis laid on programs that delivered education to the adults and women from the affected community. Such programs could have helped individuals peruse a variety of occupations based on their skills and training achieved during the process. The story of M. Shantha Kumari, who came from a fishing village and had spent months in temporary shelters, was inspirational. She completed her Doctoral studies in the field of Fisheries and stated that she *"....wanted to be a link between the developed communities and the fishing community so that they would know the issues that we face"* (Nagapattinam District, 2005, p.75).   The level of involvement of women in the development process needs to be more proactive. It is primarily a cultural issue, where women from fishing communities mostly work at home or helped men in sorting fish or

selling fish in the market. Slowly, but eventually it is only education that could open more avenues for women to work alongside men and help in the development of such small fishing communities. Therefore, there is an urgent need for more efforts towards women empowerment through education programs that would build their confidence and capability, for undertaking independent or joint actions and making them a part of mainstream development process (Osti, 2004).

A number of health camps were opened for the victims post-tsunami, in both the temporary shelters and relief camps. People were provided with psychological and physical support by doctors and counselors. In two years period (third quarter of 2007), communities were relocated to the permanent housing and these health camps ceased to exist. Based on interviews, community members expressed that now they had to travel long distances by using public transport to avail basic health care facilities or services from government hospitals and nursing homes. Therefore, the households had to incur additional costs in transportation to avail health care facilities.

Public health care, psychological counseling and sanitation are by far the most important indicator for the *social wellbeing* of a disaster affected community. There were few (possibly one or two in each camp that had hundreds of trauma patients) counseling centers that helped people during the initial months of after the Tsunami (end of December 2005 to last quarter of 2006). However, at the time the household surveys were being carried out for this study, there were no counseling centers in any of the surveyed locations. The first few months after the Tsunami (26th December 2004 to mid of 2006) victims were moved from one temporary location/camp to another before they finally were moved to the permanent housing in 2007. Quoting what a tsunami victim had to say about the trauma faced by the community: "…*it is no more the community that existed in Pallavan Nagar. It is shattered, broken, torn asunder by the black waves. Everyone has his or her grief that cannot be wiped completely away, that individuals find it difficult to connect, even after all these months, to the other grieving persons because their grief is perceived more deeply than others. Some people have insulated in themselves such that they would not open to others easily. The rupture is deep and irreversible. The grief is deep and not containable. The fear is omnipresent, in everyone's eyes and hearts…*" (Kumaran, 2008, p. 18).

Every community visited during the research, expressed the need for adequate supply of potable water. Deprivation from clean and safe drinking water has been taking lives of millions of people across the world particularly in the developing countries. The World Bank estimates that 21% of communicable diseases in India are related to unsafe water (see, www.water.org). Some of the hard facts about the global water crisis are:

1. 884 million people lack access to safe water supply, which accounts for one in eight people;

2. 3.575 million people die from water-related disease every year;

3. Every 15 second a child in some part of the world dies from a water-related disease;

4. Millions of women and children spend several hours in a day collecting water from a distant source (www.water.org/waterpartners); and yet after relocation to new neighbourhoods after the Tsunami of 2004, residents of surveyed locations expressed their need for potable drinking water.

In the rural areas (Akkarapettai and Keechanukupam), hand pumps were provided to the relocated communities. The water table in the coastal areas is at the same level of the sea. Due to the tsunami saline water from the sea seeped into the aquifers and water obtained from the hand pumps and dug wells were contaminated. In an interview, the district rehabilitation officer in Nagapattinam district, spoke of a water purification system which was based on reverse osmosis process and removes salinity from water. This water was to be provided to the relocated community for a certain fee. Clean and safe drinking water is a basic necessity and should be available free of cost, especially to the poor. Pipes and water meters, installed in the urban location (VOC Nagar in Chennai), proved to be futile as the community had to carry water from public taps, spending hours waiting in a queue. The community members were displeased by the government's negligence to provide basic amenities in the new areas (see, Table 5.2). Lack of sanitation (disposal of waste) and proper water supply pushes these communities into further vulnerabilities.

7.2.4. Capacity Building and Livelihood Restoration:

The next major objective evaluated for indicators during the research was, whether the capacity of the community had been successfully rebuilt and the livelihoods restored. Speedy recovery from a disaster is highly correlated with the return of the lost livelihoods, livelihood activities and self-protection (Cannon, 2003). Livelihoods are primarily a combination of a range of resource management strategies of production, consumption and exchange of living conditions (Twigg, 2004; Alexander et.al, 2006). To evaluate the livelihood and coping capacity of the community, elements from the sustainable livelihoods approach (framework) were incorporated in the household survey questionnaires. Indicators (see, Table 3.2) for both the categories (livelihoods and coping capacity) were assessed in terms of:

Livelihoods-
- Jobs- Return to former jobs/businesses or industry, or employed in new jobs
- Incomes/Earnings- Consumption basket
- Banks- Local micro finance, return of loans and credits, savings

Coping Capacity-
- Social networks- Community based organization (CBO's), Formation of SHG, training centers, information centers
- Food- Access to food and nutrition
- Education- Enrolments in schools, training for new skills, increase in knowledge about hazards and future risks, Access to information, such as radio/ televisions etc.

Livelihoods

The coastal communities in Tamil Nadu had to cope with the tsunami and had to deal with its secondary effects such as, lack of drinking water (salination of ponds and wells) or loss of assets. At the end of four years since the disaster occurred, one would assume that the relocated community would have recovered in terms of livelihoods. The research reveals otherwise. Families received compensation for their losses as well as an additional amount of Rs.5000/- INR[37] ($ 102 USD) for over two years. Survey results show that there were communities that were still surviving on the relief from the government (see, Fig. 5.13a). This was mostly the case for communities in the rural areas

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[37] $ 1 (USD) = Rs. 49 (INR) as of May 2009

(Akkarapettai and Keechanukupam). In the urban locations (VOC Nagar in Chennai), despite efforts taken by the government agencies, household incomes had worsened over the past few years (see, Fig.5.16b). Most of the families had gone back to previous fishing related occupations but hope that their children would not have to practice the same occupations in future. Survey results further indicated that over 90 percent of the families are unable to pay back their loans (see, Table 5.8). Indicators of livelihood recovery reveal that the community is still vulnerable and requires '*new interventions*' to boost the community's livelihoods by the government and other agencies.

Livelihood indicator can be interpreted in another manner. While carrying out focus group meetings with some of the NGO's (TRINET and EXNORA), the changing attitude /behavior of the community towards any external funding was the central theme. Some said that people were unwilling to work as they were still getting compensation from aid agencies or the government. However, it was interesting to observe that, on one hand, the growth of a community was as a result of the support from the government aid agencies. However, on the other hand, excessive financial support by the agencies to the community at times could complicate processes of recovery, making financial aid counterproductive (Birkman & Fernando, 2007). Poverty cannot be eradicated by just providing money to community members, but by increasing the adaptive capacities of a community to survive and lead an improved quality of life. During the past decade or so there have been numerous debates about the relationship between community development and the sustainable livelihood approach (Hinshelwood, 2003 Sen, 1981; Swift, 1989). Although a number of donor agencies and NGOs work using the sustainable livelihoods approach, and emphasize participation and empowerment of the community (common to community development); conflict arises at the time of technocratic decisions and a desired outcome for community development can be at times politically sidelined (Brocklesky and Fisher, 2003). Major issues surface around power and politics and who gets to decide what is best for everyone else; what values are considered paramount.

A coherent factor between community development and sustainable livelihoods approach is a focus on 'planning for peoples' livelihoods in a 'participatory manner'. However, very seldom any recognition is given to peoples' experiences and livelihood

realities. This argument can be well supported with the example from the first year of relief after the Tsunami, where aid-agencies donated large number of mechanized catamarans, which the local community could not operate. The fishermen in the coastal areas of Tamil Nadu were used to operating traditional wooden boats and fishing nets. Based on community meeting and household surveys, many of the fishing families complained that they lost jobs since the boat owners had learnt to use the mechanized boats and did not require as many fishing laborers in the sea. Community development should be based on local knowledge-base, which in turn should be the building block for the various forms of 'capital' mentioned in sustainable livelihoods approach (Brocklesky and Fisher, 2003).

For those people who lost almost everything during the Tsunami of 2004, shelter, food and medicines is a much smaller step in comparison to the challenges faced to put their livelihood systems back in place. Disasters of this scale are large poverty creators. Details of a number of initiatives that were undertaken by various NGOs and government agencies have been discussed in the previous chapters. However, at the time of the surveys, it appeared that many livelihood programs had ceased to exist, possibly due to funding issues. Livelihood restoration is a slow and a challenging process. There needs to be continuous monitoring and evaluation of the programs, and those that are successful needs to be carried forward and replicated. One such example was that of *Swayam Shikshan Pra*yog - SSP (a Mumbai-based NGO) and the *Covenant Center for Development* (a Tamil Nadu-based NGO working with affected communities). This team had members that were past survivors of the disasters that occurred in 1993 and 2001 earthquakes in Latur (Maharashtra, India) and Kutch (Gujarat, India). The team visited the worst affected districts of Nagapattinam and Cuddalore, and drawing on their own experiences set out to help victims to use the reconstruction process as an opportunity to rebuild local capacities (Housing by People in Asia, 2005). Some of the concepts used by the SSP group were community driven. They were:

1. Forming village development committees of women's groups and other community institutions to manage the rehabilitation and to monitor disaster-safe reconstruction.

2. Making financial and technical assistance within easy reach of affected communities.

3. Defining clear roles for local government in the areas of planning, monitoring, problem solving, infrastructure development and disaster safety.

4. Using local skills and labour and including women in all aspects of reconstruction.

Housing is one such sector that can create jobs. Use of indigenous materials and building technology requires local skills and thus, hiring local builders/ labor. There was just one relocated community visited during the fieldwork which had a Community Based Organization (CBO) leading the housing program. This was a small fishing hamlet located in Taramgambadi, a port town in (Nagapattinam district) Tamil Nadu coast. The CBO was successful in using local knowledge and technology as well as the support of the community in rebuilding the area. The projects that were undertaken in this community came under the areas of; (i) habitat reconstruction, (ii) hazard and habitat mapping, (iii) use of cluster approach and model houses, (iv)provision of sanitation facility and awareness. The success story from this relocated village does demonstrate the fact that the reconstruction process can create jobs. However, it is still unclear as to how sustainable these livelihood opportunities are in reality, since with the end of funding from aid agencies, employment also starts diminishing. Moreover, there is no common platform in any of the relocated areas where community organizers could meet and discuss issues related to the community. Often reconstruction efforts are plagued by the lack of coordination between various groups for funds or recognition, mistrust or conflicting agenda, which was the case for most of the areas surveyed for this research. For long term programs, such as those related to livelihoods, there needs to be some form of coordination and linkages between NGOs, aid agencies and government department, which apparently did not exist in any of the three communities (VOC Nagar, Akkarapettai and Keechanukupam). It is easier to teach community members alternative trades like carpentry for safe buildings. But eventually would the low income groups be able to hire builders for the development or sustain themselves based on new skills that the groups acquire? Thus, in most of the cases long term employment opportunities cease to exist few years into the reconstruction process and many are left unemployed (Twigg,

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2006). Therefore, establishing a linkage mechanism between different groups could be effective in transferring promising ideas from one area to another. During crisis, ideas must flow fast and coordination between the working committees must be strengthened.

Coping capacity of disaster affected communities

Coping strategies were analyzed by focusing on formal and informal social networks, as well as the awareness and knowledge of potential hazards after the occurrence of the tsunami. Accessibility to food was assessed in a manner similar to other disasters due to drought/famine i.e., availability of food markets. During the past few years after the Tsunami of 2004, the communities had extended its networks with the help of various Community Based Organizations, local NGOs and numerous other international agencies. There were groups formed to assist women to support families, numerous training centers and information centers opened for the community to gather valuable information about various hazards. Results from the survey showed that almost hundred percent of the children now went to schools that were either newly built or repaired. Wholesale and retail markets were slowly gathering impetus and food was in surplus in some of the areas. However there were other indicators that suggested gaps in the process of reconstruction, such as, 'trust between the agencies and community members' and 'local knowledge about hazards'. Coping capacities of a community in a disaster situation can be determined based on the social assets which comprise of: (a) social networks established; (b) participation of the community members in various community based organizations; and (c) by development of trust and reciprocity (Camey, 1998).

During the entire period of relief and reconstruction, that is from the day of the disaster (26th of December, 2004) up to almost four years into reconstruction (fall of 2008), the community members received packets of aid money not only from the aid agencies like UN, UNDP or the United Nations Human Settlements Program (UN-Habitat), but also the government that supported the community in every possible way. However, the sudden onset of the disaster left tremendous pressures on the local government to deliver immediate services to the community. Lack of manpower made the local government deliver resources to the community with the support of local

Community Based Organizations and NGOs. These organizations efficiently worked alongside the displaced community members and completed tasks sub-let to them by the government agencies. When funds for projects diminished, the CBOs and NGOs moved out of the relief area. The community members had developed 'bonding' and 'trust' with these organizations in the span of three years. During the three years (2006 -2008), government representatives infrequently visited these areas for consultation.

The CBOs and NGOs acted as the main liaison between the community members and the government agencies. As a result, at the end of three years, community members lost faith and trust in the government agencies (evident from survey results and community meetings). Therefore, when the government agencies seeks co-operation from the community in completing the remaining projects (march 2008 onwards), they faced resistance and anger from the residents. Community members from Keechanukupam (Nagapattinam district) refused to move to the new relocated areas and continued to stay in their makeshift homes despite the local government giving a deadline for relocation. For any organizational sustainability, 'trust' and 'leadership' are the key factors (Heap, 2000) that enable organizations to deal with and influence the local environment. Various socio-political issues need to be examined and in order to sustain operations, only a catalytic approach to capacity building can help in developing agreed mission and values (Uphoff, 2001). People living in fishing hamlets for hundreds of years were forcibly uprooted, sometimes purely for the benefit of private parties or politician who planned to develop hotels and water parks along the cleared up beach front (especially around Marina Beech in Chennai). At the end of three years, the community demanded accountability and transparency of programs initiated by the government agencies, which could have otherwise been achieved through participation of the community in the decision making process (Birkman and Fernando, 2007).

Queries were made through the surveys about informal networks established within family and friends of the affected community, which helped to determine the coping strategies used during the tsunami and in the aftermath. It was interesting to note that 60 to 80 percent of the respondents from the rural areas (Akkarapettai and Keechanukupam) were part of some community organization, whereas 90 percent of the interviewees in VOC Nagar (Chennai) refused to be a part of any organization (see, Table

5.13). Community members in the rural areas (Nagapattinam) were still living in familiar neighborhoods with friends and relatives. However, in the relocated areas in Chennai, many people were brought together from different regions, not necessarily from among the fishing families, but from other backgrounds as well. Some of the interviewees complained of being in an unfamiliar environment where they were not sure if the women and children were safe at home when the men left for work. During the times of financial need or crisis, 15-30 percent of the respondents agreed that they took help from family and friends instead of taking loans from the banks. Although, being part of an informal organization is not adequate to assess the coping capacity, such networks do play a key part in the wellbeing of a community.

The second indicator in the category of coping capacities was the 'awareness and knowledge' of the community about future risks and hazards. Coping capacity is also determined by knowledge of the hazard and recognition of danger (Birkman and Fernando, 2007). Fishing communities are sea-ward looking people. Their attachment to land or a house is far less than that of a farmer (agriculture). The fishermen brave storms and winds, but still feel comfortable with the sea. This gives them the sense of freedom, something which the land-bound communities do not enjoy. During the fieldwork, numerous families expressed fear of disasters in the future, especially to a disaster similar to that of the 2004 tsunami. When asked if they were aware of new hazard plans or of escape routes, none of the interviewees could provide an appropriate answer. Women expressed fear for the men who go into the sea every day, and requested life-jackets and other equipments for protection. During the field work, flash floods occurred two times in a month, and in some of the locations (Keechanukupam) houses were submerged up to a plinth height. Hazard researchers have estimated the probability of another Tsunami following the Tsunami of 2004 to be after another 200-500 years (Carpenter, 2005). However, dangers of other natural hazards are recurrent and should incidences such as the annual floods, cyclones or even droughts be overlooked?

<u>**Risk communication**</u>

One of the major goals of disaster management is public preparedness and education campaign, which is to make the community aware about their level of exposure to hazard risk and how it would personally effect them (Coppola and Maloney, 2009). While the occurrence of a disaster is taken as the time when people would become aware of a particular hazard risk, it is most appropriate to educate and enlighten people long before the actual disaster occurs (Citizen Corps, 2006). Making public aware is at times difficult since different groups or individuals have a varied experience in terms of hazards risks. Granger Morgan (2002) reports that, "the time that most people can devote to unusual risks is usually very limited" (Coppola and Maloney, 2009, p. 18). There are a number of ways by which warnings for future risks are made.

1. Warning: The hazardous event is underway or is likely to occur soon. If an immediate threat to life and property exists, the public needs to take immediate protective action.

2. Advisory: These apply to events that are less severe than warnings in terms of consequences to life and property. However, actions are taken to protect the community from any exposure to harm.

3. Watch: This is issued when the likelihood of a hazardous event increases significantly and is taken as a precautionary measure, although the chance of the event materializing is slim.

4. Outlook: It is the prediction of a hazardous event in the future, which includes information or recommendations to prepare for the possible event.

5. Statements: These are not warnings, but information used as follow-up, advisories or watches.

On one hand, scientists try to map the tsunami and determine future eventualities, and on the other hand, local knowledge saved lives during such eventualities such as the Tsunami of 2004. Interestingly, the presence of *Medu* (in local language, a raised land/mound or platform), breakwaters and mangroves (Narayan et. al, 2005) helped to avoid the loss of human life and property (The Hindu, 2004 & 2005). In a small fishing hamlet (Kilinjal) in Nagapattinam, with the population of around 2000 residents, incidentally the loss of life was just 23 compared to hundreds of lives lost in other

villages, such as Akkarapettai. The height of the village on the *Medu*, was 8-10 meters (see Illustration 7.1), whereas the height of the tsunami near the shore was 8-9 meters. The width of *Medu,* parallel to the shoreline was around 200m and the slope towards the sea was steep and then flat up to 50-60 m, thereafter again a gentle slope. The residents of the hamlet reported, that the waves caused by the tsunami were unable to reach the top of the *Medu* (Narayan et. al, 2005).

Illustration 7.1: Raised village, Medu
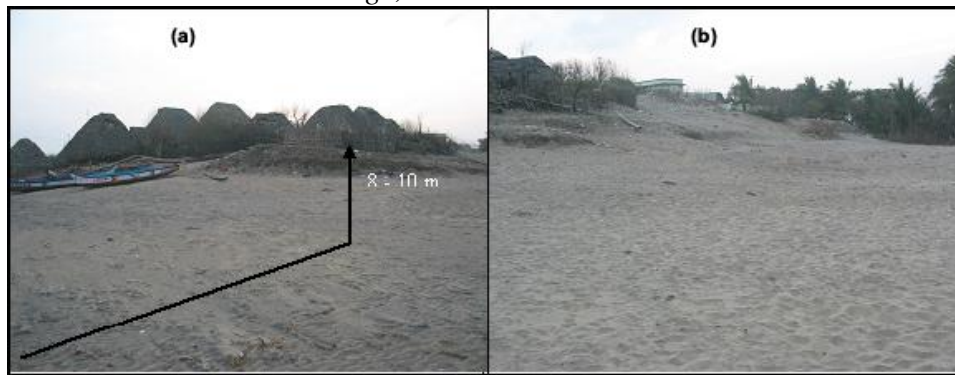
Source: Narayan et. al, 2005

Traditional knowledge of the community to raise land and then build houses saved hundreds of lives. Thus, familiarization with tsunami as a hazard and other coastal hazards is very crucial for the community in order to minimize possible loss of life and property in future. Fishing families, particularly in the rural areas (Akkarapettai and Keechanukupam) were still living close to the shore despite their fear of the waves washing away their houses. Many community members have opted for alternative occupations, out of fear from venturing into the sea. Yet others do not want their children to work in the fishing industry in the future. A deliberate decision taken by the community members eventually effects the growth and economy of the coastal communities.

Public policy in risk communication

The aim of risk communication or warnings is not just to include vulnerable population, but public in general, the educators, media, emergency services and NGOs and the policy makers, who can make changes or facilitate one (Coppola and Maloney,

2009). Policies that include laws and standards or operating procedures are ways to bring about changes in attitudes towards risks. More often it is the lack of understanding of following some safety standard (for example, the need to have postings for evacuation signs in hotels or mandatory first aid education in public school) that could lead an individual or a group to further risks. Having the right technology and warning systems is one part to emergency management, but making people aware of it is of great significance (Mileti, 1999; Coppola and Maloney, 2009). Public consultation and awareness programs could be the first step that can help break down the existing barriers and improve the effectiveness of various programs. Public preparedness programs empower the community members, to help themselves, their family and their neighbors. Public disaster preparedness education can decrease individual vulnerability in two primary ways; a) by teaching individuals how to mitigate hazards risks and; b) by training them to respond effectively when a disaster occurs (Coppola and Maloney, 2009). The government's role is critical in designing effective mechanisms to prepare the community for future hazards. A good example of preparedness program used by the U.S. Department of Homeland Security (DHS) is:

1. A kit- that prepares the individual or a family to survive emergencies (at a stage when essential resources such as water, food, and clothing are in short supply or not available).

2. A plan: that makes family members locate each other, make contact or join together and make informed decision.

3. Knowledge: learning about the possible consequences of hazards and to make responses to different scenarios (example, evacuation, sheltering in a place or moving to a safer location).

The UN continues various efforts for public preparedness through International Strategy for Disaster Reduction, for establishing resiliency among the globally affected disaster population (Coppola and Maloney, 2009).

7.2.5. Sustainability of the planning and development intervention: Policies

The tsunami affected communities faced numerous challenges throughout the various phases of relief, recovery and reconstruction. Most of the issues have been discussed in the previous sections. Relocation was one of the major steps taken by the Government of Tamil Nadu in consultation with various aid agencies and research organizations. The Coastal Regulation Zone (CRZ) policy had major implications in shaping the lives of fishermen and other industries related to it (Govt. of India, 1971)[38]. The coastal zone implies the coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action. In the context of this research provisions from CRZ II and CRZIII by the Government of Tamil Nadu is of significance.

> CRZ – II- consists of areas that have already been developed up to or close to the shoreline. For this purpose, "developed area" is referred to as that area within the municipal limits or in other legally designated urban areas which are already substantially built up and which have been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains.

> CRZ-III- This category is further divided into two sub categories one, the area that falls within the 200 meters of the High tide line (HTL) and the other falling between 200mts and 500mts of the HTL. The first sub category is designated as "No Development Zone" (NDZ) where no construction is permitted. But repairs of existing authorized structures not exceeding existing Floor Space Index, existing plinth area and existing density, and for permissible activities under the notification including facilities essential for such activities are permitted under this zone.

The above policies implied that there would be no new developments within the Coastal Regulation Zone. Dwelling units between 200 and 500 meters of the High Tide Line are permitted to be constructed or reconstructed[39] as long as they are within the ambit of traditional rights and customary uses such as the existing fishing villages. In the city of Chennai, the fishing hamlets were relocated and community members were prohibited to

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[38] GoI notification completely bars any fresh construction activities 500 m from the high-tide
[39] The total number of dwelling units shall not be more than twice the number of existing Units; Total covered area on all floors shall not exceed 33 percent of the plot size; The overall height of construction shall not exceed 9 meters and construction shall not be more than 2 floors (ground floor plus one floor); Further construction is allowed for permissible activities under the notification including facilities essential for such activities

build shelters near the sea. The communities were moved to permanent location almost 2-3 km away from the sea. The government took hold of every opportunity to protect and redevelop the coastal zone due to its commercial value, and in order to protect people from future tsunamis.

Even before the tsunami of 2004 occurred, natural vegetation that protects the coast was removed due to human activities related to tourism and fishing. A large number of unauthorized squatter settlements dotted the coast of Chennai. Vulnerability of communities to disasters was high, and was further contributed by poor and unchecked building regulations and environmental laws. The Tsunami of 2004 was an eye opener to the government and the citizens alike. Many of the communities were forcefully relocated. The government prioritized new development along the coast, such as waterfront development, parks and hotels due to its commercial value. There was a high degree of resistance from the local residents as their livelihoods were dependant on these protected lands (Newell, 2002). The needs of the fishermen were invisible. A fisherman from one of the villages said; *Three days after the tsunami, we went back to our own homes. Initially, we were scared, but we are fishermen, we can't stay too long in the refugee camps. We need to continue our livelihood, because the tsunami aid is not going to continue to sustain us for the coming years. So we took the initiative to return home together"* (Housing by People in Asia, 2005, p.9). Could disasters as the Tsunami serve as a trigger for poverty reduction and social change? This seems an unlikely outcome as strengths and capacities of the communities have changed due to relocation.

<u>Supporting policies</u>

Guidelines for planning and design are of no use by itself. It needs to be fitted into other regional plans and policies. When certain planning policies are supported by higher level policies (for example the CRZ policies fitted with the housing guideline), the policy becomes more relevant and powerful for implementation. Community consultation can be carried out by holding charettes and public engagement. It is the residents of a particular community that are usually emotionally attached to a location. Therefore, while designing new communities, the general public should be more actively involved through various mapping exercises and brain storming sessions with planners as facilitators.

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<u>Energy Efficiency</u>

Homes are usually the biggest users of energy, and generate large amounts of waste. Utilization of appropriate and higher standards of construction could help in reducing the energy usage in homes, especially in newly developed locations. Construction of buildings using appropriate technology and good quality building materials could make houses more durable to withstand severe weather conditions. If neighborhoods are designed more sustainably, it could help to mitigate various effects of climate related hazards, as well as other unforeseen events on vulnerable populations.

<u>Managing ecosystems</u>

The major impact by the tsunami was on the local environment. Trees were extensively damaged and uprooted. The sea water increased salinity of soil and, as result the crops could not be cultivated for few seasons' years (information gathered from meetings with the NGOs). The shape of the beach changed with large amounts of waste and sand on the beach pushed ashore by the tidal waves. There was damage to the coral reefs as well as to a wide variety of marine ecosystem which was the main source of income for the fishing communities. During the discussions with the community, some local researchers argued that, 'over-fishing' was the main cause of the degrading marine ecosystem. Therefore, the community was discouraged to invest further in the expansion of fishing industry. Usually the small scale fishing communities often bolster the local economy (as in Nagapattinam, e.g). This decision had an implication on the local economy and livelihoods of the fishing population. The mangrove forest was disturbed by the floods and the tsunami. Fishing communities took interest in regeneration of the degraded ecosystem, mostly in the rural areas (Nagapattinam).

Illustration 7.2: Methods used to renew on coastal ecosystem

(a)Embankment created to prevent sea water from entering communities   (Source: Field work)   *(b) Cashew trees planted along the coastline to protect communities from tidal waves (Source: field work)*

Once the community was relocated, members from the new neighborhoods took the initiative to plant mangroves and cashew nut trees along the coast. Fishing catches from the small-scale industries provided essential nutrients for the communities in the coastal and in-land areas. Efforts taken by various CBOs such as the SIFFs (South Indian Federation of Fishermen's Societies) helped the natural ecosystem to revive by extending support towards the local communities. However, observations from the field work showed that people from the relocated communities still dump their garbage into drains, roads and open areas, which eventually gets washed away into the sea. Pollution resulting from the continuous flow of waste material into the sea affects the marine ecosystem; especially, the coral reef which provides food to the wide variety of fish that breed and get nutrients from them.

Knowledge of the hazard

Interviews with NGOs and government representatives suggest that during the first few days after the Tsunami, a number of awareness programs were launched to make people aware of future hazards. Schools were training and educating children about tsunami and other natural hazards, and how to deal with such emergencies. Members of the community in the urban locations were now feeling safe to go into the sea, but expressed that they did not want their children to take up fishing as a profession. At the time of the field work, none of the communities were enrolled in any preparedness programs. Some of the respondents from the interviews (VOV Nagar, Chennai) said that

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they were not aware of any hazard plan or evacuation routes. The community members would instead point toward the main road as a place of safety or toward the community center. Respondents were aware of past incidences of Tsunami and would tell tales of the horrific ordeals they had been through when the waves had struck them.

Organization

Community organizations faced major challenges post-tsunami. A number of programs were initiated by local NGOs with the help of SHGs (Self-help groups). Focus was on reviving local livelihood opportunities and helping women to develop skills to establish themselves (based on results from meetings with NGOs). However, such programs did not sustain due to funding shortages and 'corrupt practices' of local leadership as well as the implementing agencies (based on community meetings). Although, efforts were taken by the government representatives and by NGOs to build local capacities (see, details in Chapter 6), different groups and federations alienated from each other over differences in objectives in each of the programs. As a result it gave rise to communication gaps between agencies. Members of the community organization needed to balance their time between household demands and those of community service. As a result the community members gave up working in these organizations. There was a certain degree of political manipulation added to this condition, as suggested by interviewees during the surveys. Interviews with representatives from NGOs also revealed that successful programs were stopped from being replicated, and the federations/NGOs had to move on with new ventures at the end of two years after reconstruction.

Organizational sustainability can be achieved only by addressing both external and internal factors which instead affect the capacity building efforts (Giffen, 2002).Time allocation for participation by community members in various programs should be carefully planned; especially for women members who have day activities and family commitments to fulfill as well. It is necessary to ensure the participation of women in the decision making process or it could lead to further marginalization (Datta, 2007). Successful programs need to be replicated by careful documentation and knowledge dissemination from one project planning team to the other team. Learning is an ongoing

process and sustainability of programs can be achieved only if 'experience and knowledge' is shared. Lessons learned from the post-tsunami reconstruction can provide for opportunities to recognize that groups do not have competing interests but those that are complementary, such as the lives of farmers in the same region are also connected to those of the fishing community. Elements such as shared leadership, local knowledge and innovation and a decentralized approach to work can improve reconstruction efforts.

7.2.6. Cultural sensitivities and social capacities:

The coping capacity of a community can be determined also by day to day patterns of social interaction and organization (Morrow, 1999). Indicators such as social cohesion, religious sensitivity and factors such as age, gender, different caste groups and cultural practices all define the social health and well being of a society. A close-knit community such as the fishing community was torn apart by the Tsunami. Efforts were taken by the Government and the NGOs in reviving the integrity of the community and developing bonds between devastated households. Various social programs, skits and sports were introduced during the first two years of rehabilitation to keep community members occupied (based on meetings with NGOs). Activities supported by the community were impressive and some of the programs sustained beyond the initial few years. Representatives from the youth and women groups contributed towards the community by volunteering and working in the community organizations. Responses from the household survey revealed that people celebrated festivals together and had new places of worship built close to their homes.

Social Issues

Over the years the community had to undergo numerous social changes. Meetings with representatives from NGOs and with community members revealed that gambling and drinking had increased substantially within the community. During the first two years of relief (2005-2006), much of the money received by the families as compensation had been frittered away. Unemployment in other cases forced women and young adolescent girls into the 'prostitution' (based on information gathered from representatives of NGOs working in the urban locations). Caste issues prevailed within the community even

though it is denied by most of the members interviewed. Incidentally, centuries-old systems of caste reopened after the tsunami (Kumaran and Negi, 2006). In some of the rural areas of Nagapattinam, people from almost ten villages protested against discrimination during supply of relief materials. The provisions of the Indian constitution bars any discrimination based on group, rank or hierarchy[40]. Women from a meeting in Semmencheri (southern relocated area in Chennai) spoke about inter-communal disputes, since community members belonged to different regions and lacked unity. The delicate social fabric of the coastal communities was weakened due to relocation. Different groups did not communicate with each other as they were yet to build attachment with the new neighborhood. It may take a few years to know whether the relocated families from diverse community backgrounds have been able to build bridges across those traditional barriers.

Community-Place Attachments

New communities should be designed with a distinctive character. The significance of place and its deep rooted symbolic and functional value had no meaning to those who then planned insensitive designs for the disaster affected communities. The newly developed neighborhood should stir people's emotions and attachments to place and therefore enhancing the overall sense of identity. The sense of place theory "…traps the broad realm of environmental meaning. Sense of place, can be thought of as a collection of place meanings, which express attachment to a place in a very broad sense" (Kaltenborn, 1998, p.173). *Place* is the most encompassing term, referring to the entire group of cognitions and affective sentiments held regarding a particular geographic locale (Altman and Low, 1992; Jorgensen and Stedman, 2001) and the meanings one attributes to such areas (Fishwick & Vining, 1992; Kaltenborn, 1998). *Attachments* to *place* encompass a whole spectrum of place-related phenomena, including place dependence, place identity, rootedness, and satisfaction (Kaltenborn 1998). Over the period of four years, many from the fishing communities returned to their ravaged villages. Uprooting

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[40] Article 19 of the Constitution of India specifically bars caste based discrimination which is a cognizable offence under criminal law, apart from Articles 14 & 15 on non-discrimination as Fundamental Rights of citizens.

communities from the original locations made them to go back to their ancestral homes, making them more vulnerable to disasters (Michel, 2005; Flint and Goyder, 2006).

It was interesting to observe how the social structure of these communities was affected as a result of the relocation. Many of the families lived in squatters and unauthorized slum (especially in Chennai) that were owned by the government and of no value to them. After relocation, they were owners of well-developed and relatively safer housing units. Above 50 percent of the interviewees expressed their satisfaction with the new housings, at least in terms of having a permanent roof. Distance from the sea, however, changed livelihood patterns. Lives of women changed dramatically as they would now just wait the entire days for the men to return from work without being productive. It is important to understand the local context of a community, and the activities performed in the location to enhance community attachments to the place.

Emotional *bonds* or *rootedness* developed by a community with the neighborhoods are products of not only external inputs but of internal and social processes (Manzo and Perkins, 2006). Research reveals that residents who are attached to their neighborhoods have higher levels of cohesion, and less fear of crime, show better signs of revitalization (Perkins, and Brown 2003). It is equally important to understand the role of common spaces being shared by diverse groups. Various spaces, designs and vernacular (locally based) architecture define a particular culture. For example, during field work, the Tharangamvadi village in Nagapattinam district of Tamil Nadu (north of Kariyakal district from the Union Territory of Pudducherry), turned out to be the most successful in terms of design and social connectedness. Community participation was in the form of empowering the community to make changes and design their new homes. The new layout of the neighborhoods and the common spaces made relocated families closer to each other and helped them to build their own identities.

Illustration 7.3: Housing in Tharangamvadi village relocated after Tsunami

(a)Use of Thatch as a traditional element in design fenced houses (Source: Author*)*

(b) Street developing a character bordered with (Source: Author*)*

Community consultation can bring the community together and create new attachments to the place. It is important to understand the community's psyche and its historical background. Fishermen living close to the sea have lesser bond or attachment to land. Therefore, a well designed or developed neighborhood can build the bond between the community and the physical assets, like housing and the neighborhood. Emotional connection is the core of sense of community. Can poor designs and lack of place attachment motivate members of the community to move back to the old hamlets deepening the vulnerability issue? Is 'lack of space' just an excuse for not putting enough efforts to prepare creative designs of relocated neighborhoods? It is important for researchers and scientists to understand the implications of considering 'good designs translating to luxury' (Manzo and Perkins, 2006) and not considering the underlying motivational factors for a community who needs it the most.

Gender and Age

A large number of casualties during the Indian Ocean Tsunami were women, children, disabled and the old (Govt. of Tamil Nadu, 2005). Families were broken due to these deaths and children became orphans. The Government of Tamil Nadu took special care of the orphans and efforts were made to find them new homes (foster families). Studies reveal that woman, children and the old are generally, marginalized in developing

countries and that they are at higher risks for any such eventualities (Sharma, 2005). Studies illustrated that, most of the women in the affected locations were staying at home with children when the waves washed them away.

Based on interviews, women were not physically strong and could not escape the waves. They tried to protect the children and in the process lost their lives. Due to the nature of occupation, men were far out in the ocean, where as women took care of children and performed domestic work in these communities. Therefore, vulnerabilities of women and children were greater, since women had to evacuate themselves as well as their children. The Tsunami of 2004 occurred on a Sunday when most of children were out playing in the beech (based on community meetings in Keechanukupam and Akkarapettai). Therefore, the scale of damage was much higher in the rural areas.

Culturally, in Asian countries old parents stay with children and are dependent on their children for survival and care. The tsunami left the senior population homeless (based on surveys). Results from the survey indicate that old-age homes were mostly located in major cities and urban centers in Tamil Nadu. In the rural areas, old people worked as laborers for a living and were depended on relief from diverse agencies. There were no centers for psychological restoration providing help and counseling to the most vulnerable fraction of the society, that is, women, children and the elderly population. A number of health camps were initially organized after the tsunami, where free health checks and medicines were distributed among the victims. Over the years, families had to pay and make visits to the nearby hospitals. Rehabilitated community members expressed their concern over health issues that occurred during the rainy season, such as, water-borne diseases like diarrhea, dengue and cholera. Although, there is a lot of change in people's perception on educating women, issues such as marriage of under-age girls continue to persist. Should reconstruction and development just focus on providing physical amenities and divert from social issues which are presumed not to have any direct consequences on vulnerability of communities? The following table summarizes some of the finding from the study that could help in determining indicators of success/failure.

Table 7.3 Summary of findings

Post- disaster Reconstruction Objectives	Reconstruction process-inputs	Findings -indicators
Physical &Psychological Restoration of communities	Housing	-Not need based -Improved quality, but not in terms of space and design -Further away from the sea, safer location -30-40% of permanent housing yet to be completed.
	Infrastructure	-No water supply in the units in the urban locations -No potable drinking water in both the rural and urban communities -Electricity provided -Poor road networks in the rural locations -No sanitation or waste management in the rural locations,
	Education	-100% of the children go to both new and old schools.
	Food and Health	-Food surplus in most of the areas -No health care centers or counseling centers in any of the locations -Orphanages located mostly in urban areas
Livelihood restoration and capacity building	Jobs	-80% of the families return to former jobs -60% of households have only one bread earner
	Incomes/Earnings	-Incomes reduced after the tsunami
	Social Networks	-Rural communities are more active in participation than the location in the urban areas. -Number of self-help groups and training programs were organized which have now ceased to exist or are very few in numbers
	Banks	-Community is unable to pay back loans
	Food	-Community had inadequate supply of food only during certain months of the year
	Education	-Children educated about hazards and future risks
Sustainability of Planning and development intervention	Technology	-Preparedness programs existed only during the period when communities lived in temporary shelters. - Members totally unaware of hazard plans or evacuation routes

	Policies	-Its still a myth as to who benefited from the change and in CRZ policies, is it the community or the authorities
	Organization	-No community consultation, top-down approach in planning, except for Tarangamvadi in Kariyakal district
Cultural sensitivities and social capacities	Religion	-People are yet to bond well in the new neighborhoods -Do celebrate festivals and other religious practices -Women feel unsafe in a diverse neighborhood
	Gender and age	-Younger children including girls are attending schools. -Women and adult need special care
	Social institution	-Social issues such as alcoholism, gambling and flesh trade are on a rise since the tsunami -Families still rely on their friend and relatives in time of need -Lack of trust between the community members and the government agencies

Table 7.3 cont'd: Summary of findings

7.3. Implications of the study and future trends in post-disaster reconstruction:

The integration of planning theory and disaster management had not been attempted seriously, before the current study. Global environmental situation has worsened over the years, especially in the developing nations. This study was an attempt to understand both planning and environmental issues within a common framework and the experiences drawn from the study can be applied to different disaster management issues. The study implication is discussed in the context of planning theory, community based planning and reduction of risks and future vulnerability to disasters.

7.3.1 Planning theory and practice:

Scientists, academicians and planners world over could 'agree' or 'disagree' to the fact that there is no 'discrete' planning theory.

Malcolm Grant (1999) says:

Planning has not developed as an intellectual discipline in its own right. It
Has no original disciplinary foundation. It has no first principles of its own,
but rather draws upon certain foundation disciplines including law,
architecture design, geography, sociology and economics…
This is an important part of the richness of planning, but it means that
there is less certainty than with other professions about what planning
`owns' and what, therefore, it should be developing (Thompson, 2007, p.30)

Planning theory is a means of understanding and infusing various new ideas by practice. The current research contributes by building connections of planning theory with the discipline of disaster management. An example of connecting planning theory and disaster management would be, developing an early warning system that could prepare planners for future or new influences (Thompson, 2007). Again such new influences can be addressed in the current planning practice and alternative responses can be developed.

Disaster research is a developing field which has gained impetus in the last two decades. With the increase in the number of disasters in the last few years, the scientific world needs more skilled and expert based disaster managers as well as community based planners who could help communities cope and prepare for disasters. Through the findings of the research it was evident that there is an urgent need for skilled professionals who have adequate training and expertise to manage complex environmental conditions (such as the catastrophic, Tsunami of 2004) in collaboration with the local community. Time and again, the disjointedness of theory and lack of interaction between various practitioners (such as planners and disaster managers) has been highlighted by various academic researchers (for example, Myers, 1997; Pearce, 2003 and Thompson, 2007). Pearce further says that: "…both community planning and disaster management planning can make important contributions to community safety, thus it is quite surprising that the two disciplines are not more highly integrated" (Pearce, 2003, p.214). Having said that, the current research has made an attempt to test the applicability of various stages of disaster management and the findings from this research in relation to various planning models in chapter 2 of this dissertation (see, Table 2.7). Various interdisciplinary community based planning frameworks can also have a wide range of applicability in disaster management (see, Table 2.8). Interestingly, most of the planning models fit in very well with disaster management; with rational comprehensive model (RCM) as the most conventional and widely practiced model in disaster

management (top-down and expert led). Whereas adaptive, advocacy, participatory and collaborative models being identified as theoretically the most ideal to be applied in disaster management, but seldom or rarely practiced especially in the context of developing countries (based on research findings). Thompson, 2007, very aptly said that: "Unfortunately, we work in a climate that is not at all conducive to the free and regular interaction of theory and practice or to the recognition that these are the responsibility of all planners. Practitioners must carry some of the blame for this. They hit academics with the double-whammy of asserting that theory is for academics to do and then with the opinion that academics are out of touch" (p.131). To support this, during many instances, at the time of sharing feedback and responses from the Tsunami affected community with the government representatives or other professionals working in NGOs, the researcher's perspective (on community's condition) was given the least value. So, could we say that there is no room for advocacy planning or collaborative planning? Collaborative planning is valuable in understanding ways by which practice needs to understand change (Thompson, 2007). Healey (1997) rightly argues that: "… theory is not simply the province of academics. Ways of knowing cannot be divorced from ways of being. What planning needs is the constant interaction of theory and practice" (Thompson, 2007, p.132). This is applicable to both community planners and disaster managers.

7.3.2 Public participation and consultation:

One of the troubling findings of this study is that despite efforts taken by the government agencies, local and international NGOs, there was distrust among the community for the government. Numerous empirical studies from the past concur to the fact that community planners and disaster managers at times ignore the local community, and therefore decrease the chance for alternative solutions to disaster related issues (Pearce, 2003). One such example was stated by Britton (1989, p.17): "…there was a rift between the public and the planners, and the destruction of the public confidence contributed significantly to the failure of the planners to bring about changes in the land use that were desirable…By 1977, as reconstruction neared completion, land use change in Darwin had, if anything, reinforced the pre-cyclone trends which the planners had tried to halt". The current research findings shed light on the fact that when the affected

population or the public in general is not involved in any form in the disaster management process; it is not surprising that the public would challenge the decisions and action of those that carry out the management task or are in command.

The Tsunami affected fishing communities in Tamil Nadu opposed the relocation to neighborhoods that were further away from the sea and continued living in the original homes (for example, Keechanukupam in Nagapattinam) close to the sea in vulnerable conditions. Community members from the study area were unaware of the significance of relocation and the policies that were laid out by the local government. One of the ways by which the community members could have appealed or influenced the politicians or the decision makers is through the access to information (Pearce, 2003). The International Federation of Red Cross and Red Crescent Societies stated that: "… once people have the access to information as a right –not just from their country's government, local authorities, companies and interests groups, but also from international organizations and aid agencies, they can then plan for themselves, make informed choices, and act to reduce their vulnerability" (1995, p.37). It is evident from most examples that the question of 'whom to plan for' is often neglected. In post-disaster conditions the poor and the smaller communities are the worst affected with a majority requiring adequate shelter, health care, education, infrastructure and range of social services. This is true for both the developed and the developing countries (Pearce, 2003). During the early stages of relief and reconstruction, public consultation and participation is rather a difficult task to accomplish, as the affected communities would be in a state of trauma. However, it is imperative to have public consultation during the reconstruction phase (when permanent shelters and new neighborhoods are built) and to continue the consultation as an on-going process. Disaster managers and government representatives could argue that information is provided to the community at every stage (in the form of brochures and pamphlets). But, having information does not ensure that the affected community is a part of the planning process. Educating communities (Dorcey and McDaniels, 1999) and making them aware of the 'need for participation' (for capacity building) is significant for public consultation (Thomas, 1995; Pearce, 2003).

One of the ways by which the public could be involved in the decision making process could be through public meetings, surveys or participation in advisory

committees (Thomas, 1995). The advisory committee could comprise of volunteers from amongst the affected community, representatives from various businesses, labor unions and agencies. Policy makers could be at one end of the meetings and the advisory committee at the other (Pearce, 2003; Keeney et al., 1990). Some of the benefits of having such committees are; a) through multi-stakeholder engagement consensus could be reached efficiently; b) the affected community is represented and c) policies could have wider public acceptance. Since, disasters are more recurrent and affect a larger population in the developing countries, such a form of public consultation process could have a larger appeal; both within the disaster affect population and among the stakeholders for effective and sustainable hazard mitigation and reduction of vulnerability.

7.3.3 Progression to safety:

Vulnerability to disaster is a much debated, yet the most accepted theory by the scientific world (McEntire, 2001 & 2005). Vulnerability to a disaster is projected to be the root cause of disasters by its advocates, which is caused by various social, political and economic factors, influenced by human behavior and due to various 'dynamic pressures' (Wisner et al, 2004). This approach has been discussed in previous chapters of this dissertation (see, chapter 2 and 3). The vulnerability approach challenges disaster management to expand beyond disaster relief and include the broader framework of various competing socio-political factors that pushes a community towards further risks (Steckle, 2006). The findings of the study suggests that the Tsunami affected community of Tamil Nadu, India were still trying to recover from their livelihood losses and expressed regrets of being unable to pay back loans taken after the disaster. Although, lifestyles of these communities had changed dramatically in the urban areas (like, Chennai), but not much changed in terms of quality of life. Rural communities were still living very close to the sea and some, in very vulnerable conditions. The study also indicated that there was a lack of proper evaluation of post-reconstruction programs. Strategies for vulnerability reduction and disaster mitigation have gained attention in past few years. However, there is a need for addressing risk reduction for the poor (Yodmani, 2001).

Traditionally, in the context of the developing countries (such as, Srilanka, India or Bangladesh), agencies, companies or the state have control to various rights of the coastal fisheries or coastal plantation. These rights could be formal or informal, legal or illegal, for workers that are seasonally controlled by the boat owners who employ large percentages of laborers (Wisner et al, 2004). The understanding of the various livelihood patterns in both the urban and the rural context is significant for disaster related problems, such as the Tsunami affected communities of Tamil Nadu, India. It emerged from the study findings that multiple options for livelihoods both in the urban and the rural context were not exploited by the government or the commercial agencies, to the full potential. Planning theories such as adaptive resource management, that has been applied to rural livelihood issues in different situations, could have a wide applicability especially for managing common resources in the coastal area, that were damaged by the Tsunami. It appeared from the discussion with the community in the case study areas that, there is a gradual change in demand for labor intensive fishing due to the extensive use of mechanized boats and trawlers (coastal areas of Tamil Nadu). At the same time examples from other countries such as Thailand and the Philippines suggest a decline in small-scale fishing due to over-fishing and competition among fishing companies (Kent, 1987). The local community in the rural location of Nagapattinam (Akkarapettai and Keechanukupam), have lower incomes during lean season and, another storm, hurricane or a flood could add to the complex conditions and risks for the community.

Based on the findings from the current research the progression of safety model (Blakie et al, 1994 and Wisner et al, 2004) fits into the rhetoric of post disaster reconstruction for the vulnerable coastal communities (see, figure 7.2).

Figure 7.2 The Progression of safety

THE PROGRESSION OF SAFETY *(The release of pressure to reduce disasters: the progression of safety)*

ADDRESS ROOT CAUSE	REDUCE PRESSURE	ACHIEVE SAFE CONDITIONS	REDUCE DISASTER RISK	REDUCE HAZARDS
Increase the access of vulnerable groups to Power Structures Resources **Challenge any Ideologies** Political systems or Economic Systems Where it causes or increases vulnerability	**Development of** Local Institutions Education Training Appropriate silks Local investments Local Markets Press freedom Ethical standards in public life **Macro- Forces** Population programs Urbanization Adapt arms industry for development purposes Reschedule debt	**Protect environment** Safe locations Hazards resistant buildings and infrastructure Diversification of rural income oppurtunities **Resilient local economy** Strengthen Livelihoods Increase Low-incomes **Public actions** Disaster preparedness	**Aim for a controlled situation** No loss of Life No casualties Restricted damage Food Security	**A range of measures to reduce certain hazards** Flood controls Shelter breaks to reduce wind forces Evacuation routes for future floods or Tsunami Effective warning system

Source: Blakie et al, 1994 and Wisner et al, 2004

Further, loss of labor for poorer households makes it difficult for communities such as those studied though this research. Disease and death due to a disaster (such as another flood or a storm), makes conditions difficult for an already marginalized community (Wisner et al, 2004). It is often observed that poorer household have to make additional expenses on health, which was the case for the Tsunami affected population in Tamil Nadu, India. Loss of assets such as buildings, agricultural implements, fishing equipment and salination of soil complicates the recovery process (Campbell, 1984; Wisner et al, 2004). Factors such as the structure of denomination (discussed in chapter 3), dependency and inability to pay debt tend to reinforce the allocation of power (Wisner et al, 2004). Added to it, in the context of the lesser developed countries, the deeply embedded systems of caste and birth groups (discussed in sustainable livelihood's framework, chapter 2) exposes the community to further risks.

More often, unsafe practices are pursued by public or private organizations (Wisner et al, 2004). Adjustments are made in policies without understanding its true implications on vulnerability, which was the case for the study area. There has been

critique from various activists and researchers that, politicians and decision makers have their own vested interests in having a continuing cycle of disaster and reconstruction so that they could benefit financially and politically (Wisner et al, 2004; Susman et al, 1983). Groups of tsunami affected population moved back to unprotected location closer to the sea at the time of elections (based on community meetings). It is yet to be determined if it was the own will of the community or were they used as mere vote banks by politicians. Disasters are recurrent, but at the same time there is a great deal of progress made in preventing and improving disaster management practices. Some of the methods for reduction of future risks and actions for disasters are discussed in the following section.

7.3.4 Recommendations- actions for the future:

A) <u>Inference from the study:</u> *Identification of an all-hazards approach to prepare for and manage hazards*

<u>Recommendation:</u>

The decade long arguments of differentiating natural and technological disasters have been discussed earlier in Chapter 2 of this dissertation. Literature on various concepts and approaches to manage disasters has been also reviewed. Discussion on the research findings brings out the social connections of disasters. McEntire (2001 & 2005) and Blakie et. al (1994) had also elaborated on the 'social dimensions' of vulnerability to disasters. Therefore, whatever agent triggers a disaster, during an emergency, evacuation, sheltering, search and rescue, feeding, disposing of dead, mobilization of resources and flow of information, need to be adequately prioritized. Be it a disaster due to a tsunami or a flood due to storms, the same warning system could be in place. Hence, certain aspects in disaster planning are not dependant on the hazard agent but the nature of post-disaster tasks. Similarly, at the organizational levels, mobilization techniques could be the same to plan for an earth quake, tsunami or a hurricane.

Government bureaucracies often lead to the proliferation of disaster agencies and many times the same tasks are repeated by different organizations without much inter-agency coordination (as was observed during field work). Multiple plans are created for mitigation after the disaster happens without any of them effectively in place. During the

course of the study, it appeared that, on one hand some locations in Tamil Nadu were paid more attention by the government agencies and community members from those areas were made aware of preparedness programs. Such communities were frequently visited by various agencies, whereas other communities were relatively neglected. Such problems are more generic in nature and can occur for any aspect of mitigation planning, irrespective of the disaster agent. Thus, the "all-hazards approach" that has been discussed earlier in the literature review, in a way consolidates plans and is in a way of avoiding duplication, conflicts and overlaps in planning and managing disasters. Such an approach can strategically mobilize a wider range of interests groups together for strengthening disaster planning. It is cost effective and increases efficiency of the operation to cope with emergency situations. Government agencies need to seriously consider such an approach to guide policies and programs.

B) Inference from the study- *The extent of damage is influenced by multiple factors in the given community, though the cause of the disaster is natural.*
   Recommendation:

Based on literature and studies in the past, it is understood that the scale of a disaster is dependent on various human factors and social actions. Therefore, the first major step could be to understand the source of problems, which could guide us towards effective solutions. The women, aged population and children have greater vulnerability as well as people living in hazardous zones are at greater risks to disasters. Mileti (1997, p. 35) discusses disasters as a 'social occasion' and not a 'physical happening'. He further goes on to say that "…it is a misnomer to talk about natural disasters as if they could exist outside of the actions and decisions of human beings and their societies" (p. 36).

It is a fact that the high concentration of population along the coasts in most of the Asian countries led to catastrophic consequences after the Tsunami of 2004, but never the less unavoidable. Similarly, millions of lives are lost each year due to poor building construction codes, no proper evacuation plans or warning systems. Lack of proper health care system creates unusual pressures on existing services during such emergencies. The results of the study clearly indicate that systems do fail even in best of situations and

literature that espouses providing better lives remains often in theory. Often the cultures are blamed. Therefore, perhaps a better approach would be to work within the cultural diversities and the given social institutions. It must be appreciated that all humanity, irrespective of cultural nuances desires a better life and safety and security of their families—motivation enough to operate willingly with the government or other intervention agencies during a crisis.

Results from studies have shown that there is a need for flow of information for the decision making process at the time of a crisis. However, the social institutions may still not be in place resulting in a chaos at the time of relief and rehabilitation. This was the case immediately after the Indian Ocean Tsunami of 2004 hit the coastal areas of India and other Asian countries. There needs to be more pre-impact coordination on a sustained basis between various official agencies and NGOs to be more effective. Stringent building codes, land use plans and educational (awareness) programs for all age groups should be in place at the earliest. One needs to take into account the more contextual factors and the values attached to places and economic initiative while designing mitigation measures. Research results show that relocation post-Tsunami of 2004, had major implications on the livelihoods of the coastal community, particularly the fisher folks in Tamil Nadu State of India. Those days are gone when technical or institutional lapses were blamed as chief reasons of failure of disaster programs:

> …that fallibility problems . . . [will] become more prominent as
> [vulnerable systems] . . . proliferate …..and less skilled technicians take
> over especially in countries with little technical infrastructure or tradition
> (Lovins & Price, 1975, p. 17-18).

Developing countries have gone far ahead in engineering and technology and now efficient programming systems such as the Geographical Information System (GIS) are taught as a part of curriculum in most of the planning schools in these countries. The problem arises during the application of these systems by local planning officials especially in the rural areas. Traditional land use systems and bye laws, often is in conflict with sophisticated software used to mark out as hazard zones, especially population pressure forces poor communities to live in vulnerable areas and effective relocation programs could not be carried out due to sheer scale of relocation or otherwise land may not be available for such purposes. There needs to be more awareness and

education programs in the rural areas for people to start cooperating and coordinating with specialist agencies[41]. Surprisingly during fieldwork, the researcher was shown excellent vulnerability maps and base-line information pertaining to the affected areas. However, full advantage of such maps and information was neither shared with any other organization for development nor did the agency use it for its own benefit. Rather kept it in locked filing cabinets. Technology should be correctly used by those who can for disaster planning purposes.

C) Inference from the study: *A need to integrate disaster planning and development planning along with social planning*

Recommendations:

In the literature review of this study, the researcher discusses the fact that there is a total disconnect between disaster management literature and planning literature. At the same time, it is seen that disaster managers are more active in a disaster event and otherwise work independent of development planners. It is not to suggest a point of attack, but to bring both the domains to work in recognition of each other. Since disasters are not independent of social changes and environmental changes, both community level planning (developmental planning) and disaster planning need to linked to be each other. A conceptual model was developed by the researcher for this purpose to link post-disaster reconstruction to development (see, Fig. 2.2), and to determine what factors are common in both the domains and what needs to be achieved in order to mainstream reconstruction into long term sustainable development. Mitigation can be supported by a wide range of measures in order to establish linkages with planning (Mileti, 1997). Many activities can be embedded within routine development works undertaken in a community. Numerous differences in approaches had evolved due to the complicated decision making processes especially in the developing nations.

Over the past few years experiences due to disasters has brought about some changes in the construction industry (example, after the Gujarat earthquake in 2003 in India), and now certain measures are taken to mitigate impacts from earthquakes, such as the construction of earthquake resistant building. Mileti (1997) says that, "…the most

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[41] There are many states in India that have already prepared detailed digital cadastral maps along with ownership documentations on GIS platforms (Maharashtra and Madhya Pradesh, e.g.).

effective way to reduce the impact of disaster is to incorporate or integrate hazard assessment and disaster planning into the process of community project formulations and development planning, and implementation" (p. 40). The reconstruction process post-disaster can provide great opportunity to readapt to a new system and environment. Such adaptation to an environment can bring about satisfaction to human needs and somewhat lowers vulnerability. The developing nations require adequate training and resources for integration of both domains. The costs could be enormous, but the benefits would result in establishing greater linkages for long term development and reduction of disasters. Another way of establishing linkages of disaster management and development planning as suggested through this study is to use an inter-disciplinary framework (see, Table 2.8). Various planning frameworks that have been applied in different scenarios, for example, the adaptive co-management used in understanding relationship between natural resource users and institutions, distribution of rights and benefits (power) and studies relating to socio-political and economic effects and changing livelihoods systems (scale). Such approaches can be revisited by disaster planners and certain aspects of this approach can be integrated and applied to disaster planning. Linking the processes may require political will, citizen's awareness, policy changes and programs that align with risk reduction measures and sustainable development.

D) Inference from the study: *Disaster mitigation needs to be part of ongoing planning and development activities.*
   Recommendation:

Disaster mitigation is in many ways equated with structural measures such as coastal zone regulation, building bye-laws and codes. However, disasters are also caused by social structures and processes--prevention of disasters should be in those directions too. During the past few decades, structural mitigation, design standards and building codes are followed more stringently even in developing countries[42]. After the Indian Ocean Tsunami, Government policies were changed and construction up to 500 meters

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[42] After the 2000 Gujarat (Bhuj) Earth Quake in India that killed 38000 people, stringent structure codes are in force through a Central (Federal) legislation (information based on discussions with other researchers).

from the high-tide line was prohibited for all new residential or commercial structures[43]. On the other hand, economic measures such as insurance and protection from other types of hazards are yet to be fully in place. It is difficult to say whether more priority was given to mitigation and preparedness was downplayed[44]. Communities surveyed during the research expressed their unawareness of evacuation plans or hazard routes. When asked, "*what they would do if the area is flooded*?"--most responded by saying that they would "*climb on to the roofs or run to the nearest roads*". This clearly indicates that community members are not prepared for future eventualities. Mileti (1997), insists that "mitigation should never aim at replacing such measures as more effective warning systems, better management of evacuations, or quicker and more effective integration of relief and recovery activities" (p. 39). Mitigation can never eliminate the occurrence of a disaster, but would definitely reduce the damage and deaths and weaken psychological stresses.

E) <u>Inference from the study:</u> *The need to recognize local knowledge and practices*

<u>Recommendations:</u>
From a more realistic point of view, it is almost impossible to have a risk free community. Time and again societal needs and demands change and make everyone one step closer to a technological risk. However, at times it might be wiser to look into age old indigenous knowledge, practices and institutions for risk mitigation too. The international community has gradually begun to recognize this aspect of risk reduction based on the experiences from recent disasters including the Indian Ocean Tsunami of 2004 (Baumwoll, 2008). Fishing communities in the Asian subcontinent have their unique characteristics, such that many programs during reconstruction were perhaps, culturally inappropriate. Through this research indicators of knowledge, environmental ethics, cultural beliefs and connection to place show that the community is still vulnerable in many respects. Certain communities are yet to start off with a normal life (see, Chapter 6) and are at risk to future disasters. Utilization of cost-effective strategies

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[43] The first Coastal Zone Regulation in India was introduced in 1971, but the enforcement was weak.
[44] In the neighbouring State Andhra Pradesh, which is prone to periodic hurricane disasters, the disaster preparedness program is much more institutionalized, both by way of coastal warning systems as well as quick-response teams to deal with disasters. Many of the quick-response teams participated in rescue and rehabilitation work in the State of Orissa on the aftermath of the devastating hurricane in October, 1999.

that are built upon knowledge (see, Fig 7.1 & 7.2) of the community can reduce risks to some extent.

F) <u>Inference from the study:</u> *Lack of effective monitoring, evaluation and supervision*
   <u>Recommendations:</u>

Lack of effective monitoring and evaluation mechanism is a major obstacle for sustained development in the developing countries. The lack of continuity in the development processes leads to poor quality plans/programs designed during the reconstruction process. Plans were neither assessed nor the community consulted after two years of implementation of the programs. Supervision of site and quality assurance remains much desired.

7.4. Study limitation and future research:

The study was conducted keeping certain limitations in mind. Findings of the study contribute to broader theory formulation and may not be replicated entirely in other cases. The results of the case study were informally discussed with some of the stakeholders but were not presented to the respondents at this stage, due to logistic problems. Other shortcomings of the study are:

1. *Lack of community participation*: Although bottom-up approaches such as participatory planning is promoted by the international community, during the study there were very few examples that could be analyzed adequately by the researcher in the field. Since, the focus of the government agencies after the 2004 disaster was to provide amenities like shelter for the community at the earliest, there were isolated cases where communities participated in general development issues and programs. Therefore, comparative studies could not be carried out between top-down and bottom-up approaches. Traditionally implementation of participatory planning approach in developing countries has been challenged due to the decentralized nature of power and limitation of resources[45]. Certain

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[45] In India, e.g. there is a three tier governance, the Central (Federal), the State (Provincial) and the Local (Village and Town level governance) and disasters are primarily a State subject by constitutional division of powers—the Central authorities support by assistance and enabling supports, whereas implementation of programs are either by the State agencies or the local authorities.

community based organizations (such as SIFFS), are trying to change approaches, but processes are slow and may not be effective overnight.

2. *Shortage of human resources*: During the interviews with the Government representatives and the NGOs, it was brought to light that none of the existing development agencies were actually prepared for disaster situation. They were trained while working in the field in the past 3-4 years of the reconstruction process. Therefore, many programs were mere experiments and tests conducted to see what works best in specific situations. For example, there were very few trained psychologists providing counselling to the traumatized population. They were either health professionals or nurses providing some kind of support to the patients or in some cases the NGOs. There were more people to carry out administrative services and less of those who were experts on disaster planning and community based rehabilitation programs. Some of the programs were over long before their dead-lines as those offices lacked experts and resources. Such programs could not be evaluated.

3. *Political barriers*: The Government played a fundamental role in the planning and the reconstruction process of the communities studied. It therefore, had an upper hand in providing information that makes excessively optimistic claims of the progress as opposed to the results reflected by the surveys[46]. Certain respondents have possibly spoken favourably on the role of the Government or other agencies out of fear and/or political pressures.

4. *Lack of collaboration and information sharing*: There was lack of collaboration among the different official line agencies, such as, between the public and private organizations, the planners and the developers and the administrators. This impeded effective formulation of plans that could have been beneficial to the community. Every organization visited by the researcher hesitated in providing relevant information with an excuse of it being confidential information or yet

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[46] At the time of the fieldwork, the Chief Disaster Functionary (Relief Commissioner) at Chennai did state that the Government is likely to engage an independent expert group to evaluate the success and failures of the rehabilitation program.

incomplete and not properly verified. It was ironic to see vulnerability maps that could be helpful for zoning hazardous locations were kept locked in files. Sound planning calls for joint inputs from various disciplines and collaborative action among various actors and planners.

5. *Non-victims as interviewees:* During the surveys in the urban location, VOC Nagar, Chennai, there were few cases where the people residing in the permanent locations were not the beneficiaries. The exact number of such cases is difficult to assess as the interviewees were hesitant to give out information of their status as tenants in the apartment or owners.

6. *No responses to certain questions:* The interviews all the locations were on voluntary participation of the community member or interviewee. However, certain responses to questions had a high percentage of the category, no answer. This could be attributed to the fact that the respondents were unwilling to either answer to the question, or the enumerators were unable to ask the question properly.

7. *Funding limitations:* Due to limitation of funds and time, the study was limited to primarily three communities, with group interviews carried out in other communities. Pre-disaster conditions could not be adequately studied and the study was limited to the response of the survivors, possibly 'the most vulnerable to the tsunami' had already lost their lives during the disaster.

Despite the above limitations the study has productive in recommending future actions to be taken in disaster planning. Findings of this research would help local policy makers and planners to plan for mitigation and long-term development. Due to the time frame and funding constraints, a longitudinal study to track further social changes over a longer period of time could not be carried out.

7.4.1 Future research directions:

First, some of the limitations of this study could provide lead to future research. Different countries have their own issues and problems, and therefore, within the available time, suitable practices can be identified and applied to areas with similar conditions. It is evident from various studies that mitigating disasters by design and construction are not enough. It is very important that experiences are shared and knowledge exchanged between the developed and the developing nations.

Second, the current study was based on interviews with practitioners, community members and representatives of various organizations. In future, a long-term study could be carried out to track further social changes for the same communities. It would be helpful to have more individuals from the government department to support such efforts.

Third, there needs to be more comparative studies to be undertaken between the developed and developing countries, which would be beneficial to practitioners both in the disaster management and the planning field.

Fourth, future studies could incorporate more intensive cultural dimension to future vulnerabilities to disaster. The current research presented a holistic picture that indicated future vulnerabilities of a particular community, the fishers. But could culture be a major factor for some of the communities that determine the scale and extent of a disaster?

Fifth, natural disasters cannot be prevented, but by identifying the vulnerable areas and factors that lead to community vulnerability, the extent of the damage can be greatly reduced. Such programs could be carried out alongside other development programs by the local government with the support of local or international NGOs to identify possible locations where there could be maximum damage and to respond promptly in the aftermath of a disaster. It is extremely important not only to maintain a continuous flow of information but also making useful information easily accessible to interested agencies and the community.

Finally, local (traditional) knowledge could be utilized, and evaluation of development programs could be institutionalized. Sometime the most advanced technologies may not be applicable, but preparedness, education and training can help solve long term issues. Frank Mc Neil (2000) states that "…even the most well-

intentioned reconstruction programs are likely to amount to little more that triage in the absence of a more systematic address to environmental degradation, particularly in tropical and subtropical areas"(p.11). Based on this study, at-risk communities can be identified and their vulnerability to disaster mitigated to some extent. This study points towards the need for more extensive studies within the domain of planning and disaster management and integration of practices for attaining sustainability. Research related to community based planning in disaster management should be situated within the broad spectrum of social structures and processes and focus on the practical issues associated with local communities in potentially vulnerable locations.

7.5. Final Conclusion

The main objectives of this study were to critically analyze current disaster management concepts and the reconstruction process; to build connections between disaster management and planning theory, in order to improve disaster management practices in future. The literature review critiques concepts and approaches used in disaster management and identifies community based disaster management as the most appropriate approach. The review also briefly discusses the historical context of disaster planning and the gaps that have led to the current practices and theories. After reviewing literature from both disaster planning perspective and community planning, it concludes that the approaches need to be integrated using a common multidisciplinary framework.

The study utilizes a mix of methods and approaches to assess success of an on-going reconstruction process in Tamil Nadu coast of India. The findings of this research are consistent with disaster literature and clearly bring out critical issues following a disaster event, and how decisions can have long-term implications for a community's economy, vulnerability and the environment. The researcher collected data using qualitative as well quantitative approaches, through interviews and document analysis and on field observations. This chapter summarizes the entire research and its contributions.

The research questions were answered through several methods such as review of documents and semi-structured interviews. Yin's (2002) four conditions of: (a) construct validity, (b) internal validity (c) external validity and (d) reliability were incorporated in

the current case study. The research was also based on the central argument that within the disaster paradigm, turning relief resources into developmental objectives in developing countries could have significant successes. Fedrick Cuny (1983) was one of the first to bring out the idea, "…disaster relief aid was usually wasted and instead should be tied to development, especially through implementing mitigation and preparedness during recovery" (Dynes, 2002, p. 2). During the past few years there has been criticism of the lack of understanding of donor agencies in providing assistance towards development and the results of the current study also reveals similar conflicting policies. It is important for humanitarian aid organizations to provide for those who are the most vulnerable, and be transparent and accountable to both the government and the public. It was observed during the research that various NGOs and charitable organizations tend to act as scapegoats due to mismanagement by the Government. Furthermore, there is a growing emphasis on more cross-cultural and comparative studies that could have important implications for post-disaster reconstruction and development theory. Until much recently, literature reviews are silent in terms of evaluations of reconstruction processes and the use of effective indicators.

As stated in the earlier chapters, a more holistic approach to redevelopment post-disaster requires inclusion of disaster victims in redevelopment initiatives (Vatsa & Krimgold, 2000; Wisner, 2005a) and empowering them in a way to bring about positive changes to their own conditions (Guijt & Shah, 1998). The research reveals emergent vulnerability of communities and an in-depth understanding of various communities at risk. These finding can be utilized to develop effective early-warning systems and evacuation plans as a part of regular emergency management strategies. Livelihood indicators have an important bearing on the outcome of recovery of the community. Certain indicators were meaningful in theory such as the overdependence on aid, being counterproductive at times. However, results based on indicators cannot change willingness of the planners, politicians or the disaster managers to take actions to prevent future disasters.

Finally, the study emphasizes on innovative community based disaster planning (CBDP) approaches, which could not only reduce local vulnerabilities but strengthen adaptive capacities. Community based approaches encourages local-knowledge base and

understanding of issues from the perspective of the community. CBDP approaches are a part of a wider system (Allen, 2006) that supports adaptation, sustainable development at all levels (local, regional, national, and the international levels). Although this approach faces hurdles in implementation (see Chapter 6, for example), it empowers vulnerable people and places a greater responsibility on the shoulders of the community. Such approaches can eventually avoid public criticism of policies and activities that are seen as having long-term environmental ramifications (Allen, 2006). Capacity building can not only be viewed as just a step towards the process of empowerment but also provide people with ability to cope, adapt, shape institutions and contribute towards policy.

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Appendix A: Recruitment letter and household survey questionnaire

Recruitment letter for household level survey and focus group interview

The recruitment script is given below (when contacted by phone):
P = Potential Participant; R = Researcher
R - May I please speak to [*Participant Name*]?
P - Hello, [*Participant Name*] speaking. How may I help you?

R - My name is Romasa Mohapatra. I am a PhD student in the School of Planning at the University of Waterloo, Canada. My research is on assessment of post- disaster reconstruction in the 2004, Tsunami affected areas in the Tamil Nadu Coast of India.
I am conducting this research under the supervision of Professor Murray Haight. As part of the research, I am conducting a door-to-door survey, between the hours of 10am- 5pm. Following that I would be carrying out community meetings which would comprise of a group of 5-6 members of you community. This is in order to understand the condition of the community after the start of the post- tsunami reconstruction.

Since you are the leader of the village/rural community, it was necessary to take permission from you to interview members from your community. Is this a convenient time to give you further information about the case study and what your involvement would entail if you decide to take part?

P - No, could you call back later (agree on a more convenient time to call person back).
                                OR
P - Yes, could you provide me with some more information regarding the household survey you will be conducting?

R - Background Information:
- I will be undertaking the household surveys and community meetings during the months of August and September 2008.
- A sample size of 5%-10% of the community would be interviewed. Each of the household interviews would take around 30-40 minutes.
- These surveys comprise very important component of my research as it would provide me with information and feedback from the community about their experience with reconstruction process from recent past.
- Also with various programs being undertaken by the government agencies and numerous aid-agencies, it is important to understand the effectiveness of the programs and the community's opinions is very important for this study.
- Participation of the community members is entirely voluntary.
- There is a certain amount of risk associated with the interview. Certain questions posed to the participant could act as a stressor as it could be personal or remind them of the past trauma. However we would ensure that such questions is avoided at the time of interview based on the state of mind of the participant.
- It is with your permission that some photographs of the villages would be taken.
- You may decline to permit me to conduct the household survey.
- If you agree to grant me permission to conduct my study, then each of the members of the community would be provided with a sum of Rs.300/- (approx-$10) as remuneration for full participation.

- Following the household interviews I would be carrying out community meeting where a small group of 5-6 members would meet and discuss issues related to the reconstruction, post-Tsunami of 2004.
- The focus group could collectively respond or individually at the time of the interview.
- For this the group would require to meet at a public place, such as an empty class room (school), or a community center, which would be convenient for everyone and also at a suitable time.
- This meeting would take around 30-40 minutes.
- Each participant member would be given an amount of Rs.300/-(approx-$10) as remuneration for full participation.

(The minimum wage is per day in the country which is around Rs.150/- in a day, which is eight hours of work. The participant would be given double the amount for a day's labor. However, the remuneration is not provided as payment for the time provided by the participants, but considered as a gift of appreciation for cooperation).

- All information you provide will be considered confidential.
- This research is not supported by any industrial or marketing organization.
- The data collected will be kept in a secure location and disposed of in five years time.
- If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please feel free to contact me at ………….. (local phone number) or email Prof. Murray Haight at mehaight@uwaterloo.ca.
- I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo, Canada. However, the final decision about participation is yours. Should you have any comments or concerns resulting from the participation of your community in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at (1 519) 888-4567, Ext. 36005 or by email at ssykes@uwaterloo.ca.
- After all of the data has been analyzed, you will receive an executive summary of the research results.
- With your permission, I would like to mail/fax you an information letter which has all of these details along with contact names and numbers on it to help assist you in making a decision about participation in this study.

P - No thank you.

     OR

P - Sure mail me the information letter with the details.

R - Thank you very much for your time. May I call you in 2 - 3 days to see if you are able to grant me permission to interview the community members? Once again, if you have any questions or concerns please do not hesitate to contact me. My phone number is +91-9436311437 (local phone number).

P - Good-bye.

R - Good-bye.

(Information letter and consent to participate for the household level survey)

Title of Project: Community Based Planning in Post-Disaster Reconstruction: A Case Study of Tsunami Affected Fishing Communities in Tamil Nadu Coast of India

Organizer*: Romasa Mohapatra*
School of Planning, University of Waterloo,
   Canada ………………

Dear (Participant Name):

I am a PhD student from the University of Waterloo, Canada and wish to conduct a study in your neighbourhood. This study focuses on the assessment of post-disaster reconstruction process in the areas affected by the Indian Ocean Tsunami of 2004, and is being conducted as a PhD research project through the Department of Planning under the supervision of Professor Murray E. Haight . With various programs being undertaken by the government agencies and numerous aid-agencies, it is important to understand the effectiveness of the programs and your opinions is very important for this study. I would appreciate the opportunity to speak with you about this.

Participation in this study is voluntary and would involve a 30-40 minute interview in your home or alternate location at a convenient location and time.

The questions here are to gather knowledge about the experience as on various aspects, like losses you suffered, the relief and rehabilitation, compensations to community, rehabilitation/ reconstruction process, livelihood restoration, overall planning process and reconstruction work.

There is a minimum anticipated risk to your participation in this study. Some of the questions are quite general (for example, was your family affected by the Tsunami, 2004?) where most of the others are specific to you and the disaster. You may decline answering any questions you feel you do not wish to answer. All information you provide will be considered confidential and grouped with responses from other participants. Further, you will not be identified by name in my thesis or in any report or publication resulting from this study. The information collected from this session will be kept for a period of 2-5yrs in my supervisor's lab at the University of Waterloo in a secure filing cabinet and with the researcher in a password protected laptop.

If you have any questions about participation in this session, please feel free to discuss these with the facilitator, or later, by contacting Professor Murray E. Haight at 519-888-4567, Ext. 33027 or by email mehaight@uwaterloo.ca. Alternately you could contact on the local cell phone number, …………………(India). If the community group (represented by the village head) is interested in receiving a copy of the executive summary of the session outcomes or a copy of my thesis, please contact me at rmohapat@fes.uwaterloo.ca

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo, Canada. However, the final decision about participation is yours. Should you have comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 36005 or by email at ssykes@uwaterloo.ca

Thank you for your assistance with this project. In appreciation of your time given to this session we will provide you with a remuneration of Rs.300/- (INR).

 Yours sincerely,

Romasa Mohapatra

D	T	V	HH

Sch.No_____

(D: District Code, T:Tehsil/Taluka/CD Block, V: Village/Ward, HH: Household Code)

School of Planning, University of Waterloo, 200 University Avenue West Waterloo, **Ontario**, Canada **N2L 3G1**
Assessment of Post-disaster reconstruction process

<u>**Household Schedule**</u>

Script: Before we begin, I would like to thank you for taking time out of your schedule for this interview. The format of the interview will be focused and somewhat structured. I will start by asking a question and you can take your time to collect your thoughts and respond. I may ask follow-up or clarifying questions based on your response. The overall interview will consist of 14 main topics and related sub-questions. The interview would take an approximate time of 30-40minutes.You will also have the opportunity to provide general comments, thoughts and feedback both throughout the interview and at the end. Let us begin with some general questions related to you and the household.

Part-I: IDENTIFICATION (GENERAL INFORMATION)

Preamble: The purpose of this section of the household survey component is to gather demographic details about the household and the relationship of the participant to the head of the household, the sex of the participant, the age, marital status, education and the main occupation practiced. This information is collected in order to understand the structure (including information of other members) of your household, also of those who are not participating in the interview. This information would also help me getting a total population figure, the sex ratio, livelihood pattern and the level of education of the population which is very important for my research. The information would be kept confidential and you could also decline to answer if you don't want to share such detailed level information about your household.
(Rationale: Demographic study would give general information about the household and the structure of the household. It would be also used to analyze the male/female ratio and such other figures which would help in understanding the community better)

1. Name of the Head Of the Household/Participant:

2. Name of the (a)village/location: (b)P.O.   (c) C.D.Block
         (d) Police Station   (e) District

3. Community: ☐ 1: Fishing, 2: Other communities

4. Personal Information of the HHH:
a. Sex   ☐   (Male 1, Female 2)

b. Religion   ☐ (Hindu 1, Muslim 2, Christian 3, Others 33)

c. Age: ☐ (Completed Years)

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d. Total Members of the Household [   ] (Numbers only)

5. Whether the household was affected by 2004 Tsunami (Yes:1, No:0) [   ]

6. Are you the sole bread-earner of the household? (Yes:1, No:0) [   ]

Part-II: Household Demography

Sl.No	Relationship with the Head of the HH	sex	Age	Marital status	Educatio nal status	Main Occup ation
1.	(1)	(2)	(3)	(4)	(5)	
2.						
3.						
4.						
5.						
6.						
7.						
8.						

(01) Relationship: 01- Self, 02-Wife, 03-Husband, 04-Father, 05-Mother, 06-Daughter, 07-Son, 08-Daughter in Law, 09-Son in Law, 10-Granddaugher, 11-Grandson, 12-Uncle, 13-Aunt, 14-Brother, 15-Sister, 16-Others.
(02) Sex: 01-Male, 02-Female.
(03) Completed age in yrs
(04) Marital Status: 01-Single, 02-Married, 03-Widowed, 04-Divorced, 33-Any other
(05) Education Status: 01- Illiterate, 02- Up to Primary (Standard 4), 03-Upto Middle (Standard 5-7), 04-Upto Secondary (Standard 8-10), 05-up to Higher Secondary(10+2), 06- Graduation, 07- Professional (ITI), 08- Traditional fishing training (boat making/ net making and other skills, 33-Any other (Pl. specify if important). **Note**: If the child is below age 14 & is school going, put 1(one)-say 021 and if, dropped-out, put 0 (zero), say 020 for a child dropped out after primary (standard 4).
(06 & 07) Occupations: 01- Non-Worker (Children <14 or adults 65+), 02-Owner-Fisherman, 03-Labourer-fisherman 04—Fish sorter/cleaner (Labourer), 05-Fish seller(vending/hawking), 06-Fish whole-seller, 07-Non-fishing Labourer, 08-Govt. Service, 09-Private Service, 10-OtherSelf Employed(small businesses other than fish related, 11-Cell craft related, 12-principally fish drying and trading, 13-Net-making and fabrication of catching equipments, 14-boat making/repairs, 15-power boats repair/maintenance, 16-fish business financing/usury related activities, 33-Others (specify if activity is marine related other than fishing).

Part-III: OBJECTIVE 1 (Physical and psychological restoration)

(Rationale: This section is a very important component of the research. This information would be used to make an assessment of the kind of assistance received by the community from the government or other sources after the Tsunami, as well as the extent of the restoration works and the level of satisfaction of the community.)

3.1 Did you receive any monetary compensation from the State or the Central

Government? (Yes:1, No:0) [   ]

3.2 If Yes, state the amount source-wise:

(a) Source _____   INR_____

(b) Source _____   INR _____

(c) Source _____   INR_____

Total   INR _____

3.3 If No, state the reason: (1: Red-tape, 2: Corruption by officials, 3: Delays, 4: political differences, 33: Any other) ☐

3.4 If Asset Loss (3.2-2), state the type & value of assets (approximately):

3.4.1   House   Damaged/Destroyed   Value in INR _____

3.4.2   Boat   Damaged/lost   Value in INR _____

3.4.3   Other Equip   Damaged/lost   Value in INR _____

3.4.4   Domestic Animal   Lost/dead   Value in INR _____

3.4.5   Agricultural-land   Crop damage/saline   Value in INR _____

3.5   Livelihood-loss   Value in INR _____

3.6   Did you live at your own home (1) or at camps (2)? ☐

3.6.1   If at home, did you receive relief materials (Yes 1, No 0)? ☐

3.6.2   If Yes, for how long (in days)? ☐

3.7   If stayed at a camp, for how long (in days)? ☐

3.7.1 Did Government agencies (1), NGOs (2), Neighbors (3), or all of them (4) provide relief to you and your family? ☐

3.7.2 If yes (1), are you satisfied with the work of G.A. (Yes 1, No 0)? ☐

3.7.3   If No (1), what reasons?   ☐   (1: delays, 2: apathy, 3: red-tape, 4: Corruption, 33: others)

3.8 Do you still stay in the camps (1) or moved to permanent houses (2) ☐

Notes:…………………………………………………………………………………………
……………………………………………………………………………………………………
…………………………………………………………………………………………………
………………………………………………………………………………

4. Housing /Shelter:

(Rationale: Details about the housing type and quality would be used to assess the types of housing units provided to the community as well as their quality.)

4.1 Type: (1) Detached, (2) Semi-detached, (3) Row housing, ☐

(4) Multiple floors, (5) Single floor, (6) Others

4.2 Material used: (1) Temporary (thatch), (2) Permanent (tin roof)

(3) Reinforced Concrete, (4) Others

4.3 Need based (Yes-1, No-0)

4.4 Who provided the house? (SGA: 1, CGA:2, LNGO:3, INGO:4, Self-made:5)[3]

4.5 Size of the house (plinth area)?

4.6 Is the house legally transferred to you & your family? (Yes 1, No 0)

4.7 If Yes (1), whether full transfer (including rights of inheritance (1)or lease basis (2)?

4.8 If Yes, (4.1.6-1) house transferred to you (1), your wife/spouse (2) and/or jointly (3)?

Notes:…………………………………………………………………………………………
……………………………………………………………………………………………………
………………………………………………………

5. Infrastructure:

(Rationale: Infrastructure is an component of the reconstruction process. This information would help in identifying whether or not adequate infrastructure facility has been provided in the relocated areas and if there are any issues that have arisen in the past related to it?)

5.1 Is the house provided with potable water facility inside? (Yes 1, No 0)

5.2 If yes, is the water supply regular & sufficient? (Yes 1, No 0)

5.3 If No, is potable water available near by? (Yes 1, No 0)

5.4 What is the distance from the house (in meters)?

5.5 Source of Water supply: (1) Municipal water supply, (2) Hand pump

(3) Dug wells, (4) Others

5.6. Is the House connected with electricity (Yes-1, No-0)

5.8 If yes, how much monthly power bill do you pay (in INR)?

5.9 Is there any road connection/transport point near the house? (Yes 1, No 0)

5.10 How much time it takes to reach your place of work (in minutes)?

5.11 How far is the house from the sea (in 100 m)?

5.12 Is the house provided with sanitation system in side? (Yes 1, No 0)

5.13 If No, what has been provided? (None: 1, Out-side the house: 2, Community facility:3, Others: 33)

---

[3] SGA: State Govt Agency, CGA: Central Govt Agency, LNGO: Local NGO, INGO: International NGO

6. Education facility:

(Rationale: Education is very important factor for the development of a society. A number of schools and colleges were damaged during the Tsunami. This section would give vital information regarding what initiatives have been undertaken by the government during reconstruction to uplift the level of education in these communities.)

6.1 Are there any schools/colleges close to your house? (Yes-1, No-0)

6.2 Distance in minutes   (1) 5-10mins, (2) 10-20mins,(3) More

6.3 Is the school newly built (1), old & repaired (2)?

6.4 Up to what classes can the children study? (Crèche/KG: 1, P: 2, M: 3, S: 4, HS:5, Non-fomal:6)

6.5 If a newly built school, then who provided it? (SGA:1, CGA:2, NGO:3, Religious Org:4, Others:33)[4]

6.6 Do your children study in the school? (Yes 1, No 0)

6.7 If No, why? (Dropped out: 1, In other schools: 2, Others: 33)

7. Markets:

(Rationale: Proximity to a market decreases the cost of transportation of goods as well as expense of day to day purchases. Location of markets is a very important factor for a community such as a fishing community, which would require to sell its daily catch to a nearby wholesale shop. Also not all households in fishing community would have access to a mode of transport. Thus this information would give an idea of how far or near is a market to the community.)

7.1 Is there any food market close to your house? (Yes-1, No-0)

7.2 Distance in (walking) minutes: (1) 5-10mins, (2) 10-20mins,(3) More

7.3 Was the facility existed before the tsunami of 2004? (Yes-1, No-0)

8. Health care facilities:

(Rationale: Good health is primary to the well being of every community. A lot of people were injured during the Tsunami. Post- Tsunami there were cases in which disease affected the already traumatized community. India is a country where every year due to floods a number of waterborne diseases affect poor communities. These spread to other areas too. Therefore it is very important to have a small health center stationed at every old or new relocated community. This section would give information if this has been provided to the affected community.)

---

[4] P: primary, M: Middle School, S: Secondary & HS: Higher Secondary. In the Indian education system schooling ends at HS level, i.e., 12 years of formal schooling. (Primary: first 4 years after KG, Middle: 5-7 years, Secondary 8-10 yrs and HS: 11-12 years.

<u>Health centers</u>

8.1 Was any hospital/dispensary created nearby after the Tsunami? (Yes 1, No 0)

8.2 Distance in minutes   (1) 5-10mins, (2) 10-20mins, (3) More

8.3 Does it continue (1) or has been shifted (2), or closed (3)?

8.4 Have you benefited from the health facility? (Yes 1, No 0)

<u>Counseling centers</u>

8.5 Was any member of the family undergo psychological treatment (1), Counseling (2), none (3)?

8.6 If (1 or 2), is there any facility near your community? (Yes 1, No 0)

8.7 Distance in minutes   (1) 5-10mins, (2) 10-20mins, (3) More

8.9 If Yes (1), was it set-up after the Tsunami disaster? (Yes 1, No 0)

8.10 If Yes (1), was it set-up by the SGA(1), CGA(2), NGO(3), or others (33)?
Note:
……………………………………………………………………………………………………
……………………………………………………………………………………………………
…………………………………………………………

Part-IV: OBJECTIVE 2 (Livelihood restoration and capacity building)

(Rationale: This section would give the researcher an understanding of how well the livelihood of the community has been restored. It would also help in understanding if the community has adopted other sources of income and taken financial help from banks and government agencies.)

9.1 Do you still depend on relief and help (1) or started some work of your own (2)?

9.1.1 If (2), Is it your earlier vocation (fishing related) (1) or some new work (2) or you are unemployed (3)?

9.1.2 If (1), provide the exact nature of work from given options:
(01-Boat Owner-Fisherman, 02-Labourer-fisherman 03—Fish sorter/cleaner (Labourer), 04-Fish seller(vending/hawking), 05-Fish whole-seller, 06-Cell craft related, 07-principally fish drying and trading, 08-Net-making and fabrication of catching equipments, 09-boat making/repairs, 10-power boats repair/maintenance, 11-fish business financing/usury related activities, 33-Others (specify if activity is marine related other than fishing)

9.1.3 State if you could recover your business of your own (1) or with assistance from

GA (2), NGOs (3), Banks (4), Private Loans (5), Others (33)

9.1.4 State the amount of assistance obtained to start a business:

Grants (Sources)_____   Amount in INR _____

Credit (Source) _____   Amount in INR _____

9. 2.1 If you have changed your work (5.1.1-2), state the type of work:

(01- Casual laborer, 02- Agri-labourer, 03- Small businesses, 04-vending/hawking (without permanent establishment), 05-service in Govt/local bodies, 06- private personal services, 07- company, 08- Vas/NGO, 09-semiskilled work (driving, mason, carpenter etc), 10-skilled work (fitter, welding, motor-repairs etc), 33-others)

9. 2. 2 How far is your present workplace from your earlier house?

    (1) 5-10mins, (2) 10-20mins, (3) More

9.3 For how long you have returned to your former work (in months)?

9.4 If you are in your traditional (fishing related) work, do your family members assist you (1), work independently (2), do not work (3), work in other types of vocations (4), Does Not Apply (5)?

9.5 What is your monthly earnings in INR?

9.5.1 Earnings of other family members/ month in INR?

9.5.2 Earnings from house property/savings/investment related incomes/m.

9.5.3 Earnings from other sources in INR/m

9.5.4   Is your present household income, (01-the same, 02-better, 03-worse) than pre-Tsunami days?

9.6 Livelihood Strategies:
(Rationale: This section would help in understanding how well the community has adopted to the new/previous occupation and what are the different ways/strategies that were used to help the community get back to its normal life.)

9.6.1 Have community-based organizations (CBO's), Non-governmental organization and other agencies helped in formation of self-help groups, information centers and skills training centers? (Y-1, No-0)

9.6.2 Are there any such centers located nearby? (Y-1, No-0)

Coping Strategies
9.6.3 After the Tsunami of 2004, in what ways do you think that such organizations have helped you in improving your skills/knowledge and in getting important information?

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9.6.4 Do your neighbours help in times of need? (Y-1, No-0) ☐

9.6.5 What do you do if you suddenly need some financial assistance? ☐

 (1-use savings, 2-borrow from friends, 3-borrow from money-lender

  4- borrow from bank, 5- sell household things, 6- mortgage assets, ☐

33: Others)

9.6.51In what ways have the Government agencies helped you in past year following the

Tsunami?

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Adaptive Strategies

9.6.6 Has there been any situation after the tsunami where your family had to go without

adequate food supply? ☐

(01-during the tsunami, 02- for few days in a year, 03-never enough, 04-enough, 05-surplus)

9.6.7 Do you think you have sufficient for family needs? (Y-1, No-0) ☐

9.6.8 Any member of family migrated to towns for work? (Y-1, No-0) ☐

9.6.9   Do you feel your life is returning to normal (after the disaster & losses)? (Yes 1, No 0) ☐

9.6.10 Are you personally satisfied with your situation despite losses suffered (physically, mentally and financially)? (Yes 1, No 0) ☐

Notes:

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Part-V: OBJECTIVE 3(Sustainability of planning and development intervention)
(Rationale: Sustainability of any initiative undertaken by the government is a very important factor. It is important to understand whether or not the community is able to practice its fishing activities in manner that would secure the future of next generation.)

Livelihood Sustainability:

10.1 If you have returned to your earlier work (fishing related)? (Yes 1, No 0) ☐

10.1.1 Do you think you can continue this work for next 5-10 years and provide for your family? (Yes 1, No 0) ☐

10.1.2 If No (0), what do you consider reasons among the following: (Yes 1, No 0)

(a) Increased competitions (more boats/ less fish) ☐

(b) Lack of community cooperation ☐

(c) Lack of finance from institutions ☐

(d) High interest rates ☐

(e) Lack of marketing system ☐

(f) No support from Government ☐

(g) Any Other (pl. state): _____

10.2 Your total business credits in INR ☐

10.2.1 What are your installments for a month/ quarter/year in INR ☐

10.2.2 Are you being able to pay back the loan ? (Yes 1, No 0) ☐

10.2.3 If No (0), state the reason:

(a) Inadequate income ☐

(b) High interest rates ☐

(c)Fall in catch size ☐

(d) Fall in price of fish ☐

(e) Increase in household expenses ☐

(f) Increase in other liabilities (education of children/ marriage etc) ☐

10.3 Is there any fish marketing cooperative in the community? (Yes1,No 0) ☐

10.4 Is there in cooperative finance (micro-fin) org in the community? (Yes 1, No 0) ☐

10.4.1 If Yes, what is the rate of interest charged per month? ☐

10.4.2 Do you need to be a member (shareholder)? (Yes 1, No 0) ☐

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10.4.3 How many days it takes to get a finance request?

10.5 Is there any other community organization in your village? ☐

(a) Women's society ☐

(b) Traditional community *panchayat* (community adjudicating body) ☐

(c) Gram Panchayat (village LSG under Indian Constitution) ☐

(d) Community health/ education society ☐

(e) Any other (pl. state): _____

Note:
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11. Technology: (Warning system/information)
(Rationale: This section would provide information regarding the new and innovative technology that has been used to prepare the community better for the future hazards.)
11.1 Has there been a recent flood/hurricane or a Tsunami? ☐

(Yes-1, No-0)

11.2 How were you made aware of it?(01-By word of mouth, 02- Radio, ☐

03- T.V, 04- GA, 05-own knowledge, 33-others)

11.3 Have any Ngo's/CBO's or government agencies helped you by providing useful

information about a future natural hazard? (Yes-1, No-0) ☐

11.4 Have you participated in any kind of disaster response program in the recent past?

(Yes-1, No-0) ☐

11.5 If yes, then what was it about and who organized it? (01-NGO, 02-SGA, 03-CGA,

04-IA) ☐

Note:
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12. Sustainable Design: (Use of scientific and local knowledge for physical reconstruction)
(Rationale: Post-tsunami, a number of engineers and architects tried to merge technology, innovation as well as local materials while undertaking housing projects. Some used bamboo stilts, some used escape tunnels. This section will give information if any new methods have been used to make these neighbourhoods safe and sustainable.)

12.1 Have you built the house yourself (1)or assisted the agency involved in anyway?(2)

☐

12.2 Is the material used in building the house locally available? (Yes-1, No-0) ☐

12.3 What kind of fuel do you use for cooking?
(01-coal, 02-natural gas, 03- timber, 04- electricity, 33-other)

☐

12.4 How do you dispose the waste generated from your household? ☐
(01- Throw in municipal bins, 02-Burn it, 03- Throw it in the nearby water body,
04- Leave it on the road, 05- recycle it)

Safety

12.6 Do you feel safe in your house from any storm/wind/hurricane or Tsunami? ☐
(Yes-1, No-0)

12.7 Do you feel safe in your neighborhood?(Yes-1, No-0) ☐

12.8 Do you feel safe to go again to sea? (Yes 1, No 0)

☐

13. Organization: (Level of multi-stakeholder participation)

(Rationale: Peoples participation has been continuously encouraged in rebuilding post disaster communities. This section would give information which would be used to understand the level of involvement of the community members in various development programs in the past 2-3 years after Tsunami.)

13.1 Are you a member of any organization or community group? ☐
(Yes-1, No-0)

13.2 Do you participate in any kind of community meetings where issues/problems of the community are discussed? (Yes-1, No-0) ☐

13.3 What is your level of participation? ☐
(01-member, 02- representative, 03-leader, 04-Chief)

13.4 How often do these meeting take place? ☐
(01- in 15 days, 02- once a month, 03- in 3 to 6months, 04- at anytime on a short notice)

13.5 Do you think that the meetings are useful to your community? (Yes-1, No-0) ☐

13.6 Do the representatives from the government or other agencies act on your suggestions? (Yes-1, No-0) ☐

Notes:………………………………………………………………………………………
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Part-VI: OBJECTIVE 4 (Cultural sensitivity and social capacity)

14. Social Connectedness: (Place attachment & Place identity)

(Rationale: A community that has been affected by a disaster is usually traumatized due to the damage and destruction. In cases where people are relocated to new locations, they have to adjust to a totally different environment. This section is very important in understanding whether or not the relocated communities are able to identify themselves well with the new location and new setting.)

14.1 If you have been rehabilitated in a new place (& residence) do you like the present place(1), you miss your old house & place (2), does not matter (3)?

14.2 How far is the present house from your earlier home (in 100m)?

14.3 Are some relations still living near your earlier home? (Yes 1, No 0)

14.4 Has moving away affected your livelihood (1),your life in some respect

(2), none (3)

15. Overall quality of life: Religious cohesion

(Rationale: The communities that were affected by the Tsunami were poor fishing communities who were practicing traditional means of earning their livelihood. They had little or no education and mostly lived a life facing the sea. Therefore it is very important for the researcher to understand in what way development (relocation) has changed the lives of these communities. Has it improved the quality of life? Is the community more united and has there been a change in the traditional beliefs and practices.)

15.1 In your community do you celebrate festivities together (of other religions/ communities)? (Yes 1, No 0)

Gender sensitivity and age

15.2 Are their children from all communities in your village/ locality school?　(Yes 1, No 0)

15.3 Do women work along with men in your community? (Yes 1, No 0)

15.4 If Yes, do working women pass-on their earnings to their husbands/ guardians? (Yes 1, No 0)

15.5 Are girls encouraged to go to school in your house? (Yes 1, No 0)

15.6 What do you consider right age of marriage of a girl (in yrs)?

15.7 Do you consider drinking after a day's hard work, helps? (Yes 1, No 0)

15.8 Are there quarrels in the community between men & their wives after the men are drunk?

Special care for old and young

15.9 Are there any special day care centers for young children in your locality?(Yes 1, No 0)

15.10 Are there any old age homes (1),or do your old parents/grandparents stay with you (2)?

Date & Place   Signature of Enumerator

Appendix B: Consent letter for the village headman and representatives of NGOs and the Government organization and questionnaires for community meetings and interviews with representatives of various organizations

(*Information letter and consent to act as a liaison between the researcher and villagers*)

Title of Project: Community Based Planning in Post-Disaster Reconstruction: A Case Study of Tsunami Affected Fishing Communities in Tamil Nadu Coast of India

Organizer*: Romasa Mohapatra*
School of Planning, University of Waterloo,
  Canada ……………………

Dear (Village Head):

I am a PhD student from the University of Waterloo, Canada and wish to conduct a study in your village/community. This study focuses on the assessment of post-disaster reconstruction process in the areas affected by the Indian Ocean Tsunami of 2004, and is being conducted as a PhD research project through the Department of Planning under the supervision of Professor Murray E. Haight . Since there are various development programs introduced into the affected communities during the reconstruction process by the government agencies and numerous aid-agencies, we would like to understand if the programs are effective and your opinion and that of the community is very important for this study. I would like to provide you with more information about this study and what your involvement would entail if you decide to take part in the study.

Background Information:

1. The study would be conducted in two phases in the village. During the first phase a household level survey would be carried out and in the second phase a community level meeting would be organised. The household surveys and community meetings would be held during the months of August and September 2008.

2. For the household level survey, a sample size of 5%-10% of the community would be interviewed. Each of the household interviews would take around 20-30 minutes. The survey comprises a very important component of my research as it would provide me with information and feedback from the community member about their experience with reconstruction process.

3. The second phase of the study involves carrying out a community meeting where a small group of 5-6 members would meet and discuss issues related to the reconstruction, post-Tsunami of 2004. The focus group could collectively respond or an individually at the time of the interview. For this the group would require to meet at a public place, such as an empty class room (school), or a community center, which would be convenient for everyone, at a suitable time. This meeting would take around 20-30 minutes.

4. Participation of the community members is entirely voluntary. In both the phases of the study, your role as the village head is very crucial for my study.

(a) In granting me permission to conduct my study in your village.

(b) In acting as a liaison between me as a researcher and the villagers, to inform and disperse information to the villagers.

5. Your role to participate in the study as a liaison is entirely voluntary.

6. If you agree to grant me permission to conduct my study, then each of the households in the sample would be provided with a sum of Rs.150/- (approx-$4/-) as remuneration for participation. (The minimum wage is per day in the country which is around Rs.150/- in a day, which is eight hours of work. The participant would be given the amount for a day's labour. However, the remuneration is not provided as payment for the time provided by the participants, but considered as a gift of appreciation for cooperation).

7. All information you or the community members provide is considered confidential and will be grouped with responses from other participants. Further, you will not be identified by name in the report that the facilitator produces any session. However, there could be few instances where anonymous quotations from the interviews would be used during documentation and publication of the study. The information collected from the sessions will be kept for a period of 5years in the researcher's supervisor's lab at the University of Waterloo in a secure filing cabinet and with the researcher in a password protected laptop. In the end of the retention period the data would be confidentially destroyed. The researcher also plans on storing the information in 2 separate computers which would be password protected to ensure the safety and security of the data collected.

8. The data collected during the field visit would be securely brought back to Canada by the researcher in password protected laptops & storage disks (CD).

9. If you have any further questions about your role in this study, please feel free to discuss these with the facilitator, or later, by contacting Professor Murray E. Haight at (1-519)-888-4567, Ext. 33027 or by email mehaight@uwaterloo.ca. Alternately you could contact on my local cell phone number, …………….. (India). You (village head) will receive a copy of the executive summary of the research results on behalf of the participants of the study. If the community group, represented by you (village head) is interested in receiving a copy of my thesis, please contact me at rmohapat@fes.uwaterloo.ca

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. Should you have comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 36005 or by email at ssykes@uwaterloo.ca

 Yours sincerely,

Romasa Mohapatra

(Information letter and consent to participate for the focus group interview at the community level)

Title of Project: Community Based Planning in Post-Disaster Reconstruction: A Case Study of Tsunami Affected Fishing Communities in Tamil Nadu Coast of India

Organizer*: Romasa Mohapatra*
School of Planning, University of Waterloo,
  Canada ………………….

Dear (Participant Name):

I am a PhD student from the University of Waterloo, Canada and wish to conduct a study in your neighbourhood. This study focuses on the assessment of post-disaster reconstruction process in the areas affected by the Indian Ocean Tsunami of 2004, and is being conducted as a PhD research project through the Department of Planning under the supervision of Professor Murray E. Haight . With various programs being undertaken by the government agencies and numerous aid-agencies, it is important to understand the effectiveness of the programs and your opinions is very important for this study. I would appreciate the opportunity to speak with you about this.

- Some of the main objectives of the session focuses on discussion with the community leaders and other members of the community on various aspects, such as losses they suffered during the Tsunami of 2004.

- The questions here are to initiate discussion with the community leaders on various aspects, like losses they suffered, the relief and rehabilitation, compensations to community, rehabilitation/ reconstruction process, livelihood restoration, overall planning process and reconstruction work and views of community leaders about the tasks Government Agencies need to do and possible role of the community in this direction.

- The information collected from this session would be useful in analyzing the current state of the reconstruction process and developing recommendations for the future.

- This session will be facilitated by Romasa Mohapatra.
- Participation in this session is voluntary and involves a 30-40 minutes of time input. There are no known or anticipated risks to your participation in this session. You may decline answering any questions you feel you do not wish to answer and may decline contributing to the session in other ways if you so wish. Should you decline from participation in the session you will not lose the remuneration that was promised to you.

All information you provide will be considered confidential and grouped with responses from other participants. Further, you will not be identified by name in the report that the facilitator produces for this session. The information collected from this session will be kept for a period of 2-5yrs in my supervisor's lab at the University of Waterloo in a secure filing cabinet and with the researcher in a password protected laptop.

 Given the group format of this session we will ask you to keep in confidence information that identifies or could potentially identify a participant and/or his/her comments. If you have any questions about participation in this session, please feel free to discuss these with the facilitator, or later, by contacting Professor Murray E. Haight at (1-519)-888-4567, Ext. 33027 or by email mehaight@uwaterloo.ca. Alternately you could contact on the local cell phone number, ………………. (India). If the community group (represented by the village head) is interested in receiving a copy of the executive summary of the session outcomes or a copy of my thesis, please contact me at rmohapat@fes.uwaterloo.ca

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision about participation is yours. Should you have comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 36005 or by email at ssykes@uwaterloo.ca

Thank you for your assistance with this project. In appreciation of your time given to this session we will provide you with a remuneration of Rs.300/- (INR).

 Yours sincerely,

Romasa Mohapatra

Consent Form

I have read the information presented in the information letter about the session being facilitated by Romasa Mohapatra from the School of Planning at the University of Waterloo, Canada. I have had the opportunity to ask the facilitator any questions related to this session, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that this study is for Romasa's PhD and is being conducted under the supervision of Prof. Murray Haight from the School of Planning at the University of Waterloo, Canada.

I am aware that I may withdraw from the session without penalty at any time by advising the facilitator of this decision. In appreciation of my time given to this session I am aware that I will receive an amount of Rs.300/ (INR). However, if I withdraw from participation the notes associated with my responses will be destroyed and no quotations will appear in the report.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous. I was informed that I may withdraw my consent at any time without penalty by advising the researcher. I was informed that the collected information will not be shared with any third party.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at (1-519)-888-4567 ext. 36005 or by email at ssykes@uwaterloo.ca.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this session and to keep in confidence information that could identify specific participants and/or the information they provided.

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.
_____ YES _____ NO
Participant Name: _____ (Please print)

Participant Signature: _____

Student Investigator: ___ Romasa Mohapatra _____

Student Signature: _____

Date: _____

School of Planning, University of Waterloo, 200 University Avenue West Waterloo, Ontario, Canada N2L 3G1

Assessment of Post-disaster reconstruction process

<u>**Focus Group Interview- Community Members**</u>

*(**Participants:** Community elders, leaders, local school teachers, community workers, SHGs particularly women leaders, CBOs, Religious leaders & any other relevant community participants)*

*(**Script**: Before we begin, I would like to thank you for taking time out of your schedule for this interactive session. I will start by asking a question and you can take your time to collect your thoughts and respond. I may ask follow-up or clarifying questions based on your response. The overall discussion based interview will consist of 7 main topics areas and related sub-questions. The session would take an approximate time of 30-40minutes.You will also have the opportunity to provide general comments, thoughts and feedback both throughout the session and at the end.*
Let us begin with some of the more general questions related to the community)

*(**Objective and rationale:** The questions here are to initiate discussion with the community leaders on various aspects, like losses they suffered, the relief and rehabilitation, compensations to community, rehabilitation/ reconstruction process, livelihood restoration, overall planning process and reconstruction work and views of community leaders about the tasks GA to do and possible role of the community in this direction.)*

Community Relocation:

(Rationale: This section would provide general information about the relocated communities and if there were known families that were yet to be relocated.)

1. Name of village/ municipal ward:

   P.O._____ Taluka/Tehsil (Rev Office)_____

   P.S._____Dt._____

2. Name(s) of Community(ies) in the village/Ward (3 most important):

(a)

(b)

(c)

3. Is this an old (01)or new (02)(re-) settlement colony after 2004 Tsunami? ☐

4. Size of the village/ M. ward (No. households) ☐

5. No. of house owners: ☐   Tenants ☐   Others ☐

6. No. of buildings at present: ☐

7. By type classification: (1) Temporary, (2) Semi Permanent, (3) Brick &Concrete ☐

8. No. of buildings: (1)damaged, (2) destroyed during the 2004 Tsunami: ☐

9. No of buildings: (1) repaired, (2) newly built ☐

10. How many House Holds have been relocated to other places? ☐

11. How much compensation was paid by the : (1) State Govt ☐ (2) Central Govt, ☐   (3) Any other (insurance claims) ☐

12. Was compensations paid for houses/ family : (Yes: 1, No: 0) ☐

13. Was compensation paid for loss of boats, fishing equipments other productive assets? (Yes: 1, No: 0) ☐

14. If yes: (1) How much per boat & equipment ? ☐

15. How many persons from the village were shifted to the camps if any? ☐

16. How long were they kept in camps (in months)? ☐

17. Are there some families still in camps? (Yes: 1, No: 0) ☐

18. If yes, how many? ☐

19. How many families have been provided with new houses? ☐

20. Is it in the (1) original village or (2) relocated to new sites? ☐

21. Who built these houses? (1) SGA, (2) CGA, (3) NGOs ☐

22. Have some more families been promised, but have not been provided with new houses? (Yes: 1, No: 0) ☐

23. If yes, how many such families ☐ and why the delay, if any?

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……………………………

Built environment:

(Rationale: This section would help the researcher in understanding to what extent the new communities feel safe in the relocated area and how well prepared they are for future hazards if any.)

24. How do you feel about the new site in case of a tidal wave in the future?
    (01-Safe, 02-Unsafe, 03- not sure) ☐

25. Where would you go for shelter in case there is a severe flood/hurricane or a Tsunami? (01- nearest main road, 02- school, 03-community hall, 04-neighbors/relative's house, 05-climb on a high ground or tree, 06-don't know) ☐

26. Are you aware of any new evacuation routes planned in case of a flood or a Tsunami? (Yes-1, No-0) ☐

27. Are there any special tall structures, specially built for such future emergencies? (Yes: 1, No: 0) ☐

28. What facilities have been added in your neighbourhood after the Tsunami, 2004? (01- Temple/Church/Mosque, 02-Community hall, 03- playground, 04-information centre, 05-post office, 33-others) ☐

Ecological restoration of natural environment:

(Rationale: This section provides information about the natural environment and how well it has been restored.)

29. Have new trees been planted in your neighbourhood in the recent past? (Yes: 1, No: 0) ☐

30. What do you think of the nearby pond/lakes or any other water bodies? ☐ Are they dirty, 02- cleaned regularly, 03- cleaned and maintained sometimes, 04-don't know)

31. How would you consider the quality of drinking water in your neighbourhood?(Good:1, poor:0, Don't know:2) ☐

32. Do you think that the quality of your land has changed in the last two years? (Yes-1, No-0) ☐

33. If yes then has it (01-improved, 02- remained the same, 03-worse)? ☐

34. If it has improved then state the reason for it?
    …………………………………………………………………………………………
    …………………………………………………………………………………………
    ……………………………………………………………

Policy & Organisation:

(Rationale: This section is important in understanding the social bonds developed between the community members. India is a country where religion and culture play a very important role. It is necessary to understand that have the new areas been developed keeping in mind the cultural sentiments of the people or what level of trust has been developed between the people and the government.)

35. What do you think about the community? Is it still (1) United as before, (2) broken-up in the housing relocations?

36. Are you aware of the new rules laid out by the government for not having any development near the coast? (Yes:1, No: 0)

37. Has the new location in anyway affected your livelihood?
    ………………………………………………………………………………………
    ………………………………………………………………………………………
    …………………………………………………………

38. What happened to the community assets during the tidal waves (like temples/ churches etc, community centres, village schools etc)? (01- damaged,02- destroyed,03- nothing happened, 04-don't know)

39. If 01/02, were they (1) repaired, (2) newly built?

40. If 01/02, then who took the initiative? (1) SGA,(2)CGA,(3) NGOs,(4) Community itself, (5)Others

41. After the Tsunami, how many people of the village required medical attention for: (1) Physical medical care/recuperation,   (2) Mental help/Counselling services

42. Were any medical care unit set up in the community? (Yes:1, No: 0)

43. If yes, was it (1) temporary (state, how many months), (2) some permanent dispensary, (3) Primary Health Centre.

44. Who were the care givers, (1) GA,(2)NGO,(3)Community volunteers (4)Others

45. If No, then where do you go for your health care?
    (01- Existing hospitals, 02-nearby medical centres, 33-other)

46. If yes, how far is it from the locality/village (in Km or minutes)?

47. Do you think the community has been more or less rehabilitated after 3 years of the disaster? (Yes:1, No: 0)

48. If no, then what are the tasks that remain to be completed?

…………………………………………………………………………………………………
………………………

49. State in order of priority (main 5 tasks) and who do you expect this to do?
…………………………………………………………………………………………………
………………………

(1) GA ☐   (2) NGO ☐   (3) Your own Community ☐   (4) Others (state)

50. What do you think about the governments actions during the relied and rehabilitation work?

…………………………………………………………………………………………………
………………………

51. How would you rate Govt. Agency work? (1) Very Good,(2)Fair, (3)Not very good, (4) Unsatisfactory ☐

Education:

(Rationale: Education is very important factor for the development of a society. A number of schools and colleges were damaged during the Tsunami. This section would give vital information regarding what initiatives have been undertaken by the government during reconstruction to uplift the level of education in these communities.)

52. Are the children going to schools now?   (Yes: 1, No: 0) ☐

53. If yes, what percentage?   (1) Boys ☐   (2) Girls ☐

54. Do you ask the children to continue your (traditional) work or encourage them to adopt new vocations, like doing service, becoming educated etc?

…………………………………………………………………………………………………
……………………………

55. Is the school (1) new, (2) old? ☐

56. If new, who constructed it?
……………………………………………………………………………………………

57. Is it close to the village (distance in Km)? ☐

58. Who manages the school? (1) Govt. Agency,(2) Private,(3)Community ☐

59. Were you consulted, in rehabilitation and reconstruction programme of the (1)Govt. Agency, (2) Others? ☐

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60. If yes, in what respects (state)?

....

Occupation:

(Rationale: It is important to know if the community is satisfied with their means of occupation. When asked collectively, there could be members who could voice out and raise the issue of unemployment or other income related issues.)

61. Have most of the adult earning members of the community (both men & women) have found some job? (Yes:1, No:2) ☐

62. Is it in (1) your traditional occupation (2) Any new work/self employment/ business (3) Services (4) wage-work (state percentages) ☐

63. Is unemployment a problem? (Yes:1, No:2) ☐

64. If yes, how many adults are willing to work? (In percentage)? ☐

65. What percentage of households are very poor, who need extra-help from Govt. Agency or NGO? ☐

66. What could be done for them? (Suggestions)

……………………………………………………………………………………………
………………………

67. Do you think your traditional fishing related work has a future, in the next 10 years?   (Yes:1, No:2) ☐

68. If no, state the reasons and difficulties you are faced with and suggest how the situation can be improved.

……………………………………………………………………………………………
……………………………………………………………………………………………
…………………………………………………

Community cohesion:

(Rationale: This section would provide information regarding the unity of the community. It is important that the newly developed communities bond well with each other and take part in each others beliefs/faiths and celebrations. Also this section would also give a collective response to whether or not the community feels safe and is prepared for uncertainties.)

69. Does the community have any *traditional panchayat* (community body)? (Yes:1, No:2) ☐

70. If yes, briefly state its functions and role:

……………………………………………………………………………………………… …………………………

71. Do the community members/ neighbours help each other in times of difficulty?

72. If yes, state the nature of cooperation

……………………………………………………………………………………………… ……………….

73. If you are a multi-religious community, do you participate in each others celebrations? (Yes:1, No:2) ☐

74. If yes, state in what way?

……………………………………………………………………………………………… …………………………

75. Do you feel confident now, as a community to face a similar disaster in future? (Yes:1, No:2) ☐

76. If yes, state why? If no, state the weaknesses of the community.

Enumerator: Date:

(Information letter and consent to participate for the focus group interview at the NGO level, Government agency or community based organisation)

Title of Project: Community Based Planning in Post-Disaster Reconstruction: A Case Study of Tsunami Affected Fishing Communities in Tamil Nadu Coast of India

Organizer*: Romasa Mohapatra*
School of Planning, University of Waterloo,
  Canada …………………..

Dear (Participant Name):

This letter is an invitation to consider participating in a study I am conducting as part of my Doctoral degree in the Department of Planning at the University of Waterloo, Ontario, Canada under the supervision of Professor Murray E. Haight. I would like to provide you with more information about this project and what your involvement would entail if you decide to take part. With various programs being undertaken by the government agencies and numerous aid-agencies, it is important to understand the effectiveness of the programs and your opinions is very important for this study. I would appreciate the opportunity to speak with you about this.

Over the past few years there has been an alarming increase in the occurrence of natural disasters with about 650 natural hazard events occurring in the year 2004. The Indian Ocean Tsunami of December 26, 2004, put an end to about 320,000 lives and left millions of others displaced, mostly in the South-east Asian countries. With the initial phase of relief and rehabilitation being over in these countries, the reconstruction process is on its way. Hence, the purpose of this study is to assess the reconstruction process and develop recommendations for the future.

Since traditionally planning and development initiatives were mostly top-down in nature, this study tries to identify the level of participation of the community in the post-disaster reconstruction and how community participation could lead to reduction of vulnerability and sustainability of various programs. Therefore, I would like to include your organization as one of several organizations to be involved in my study. I believe that because you are actively involved in the management and operation of your organization, you are best suited to speak to the various issues, such as (level of participation of the community, success of the program).

Participation in this study is voluntary. It will involve an interview of approximately 20-30 minutes in length to take place in a mutually agreed upon location. You may decline to answer any of the interview questions if you so wish. Further, you may decide to withdraw from this study at any time without any negative consequences by advising the researcher. Shortly after the interview has been completed, I will send you a copy of the notes to give you an opportunity to confirm the accuracy of our conversation and to add or clarify any points that you wish.

All information you provide will be considered confidential and grouped with responses from other participants. Further, you will not be identified by name in the report that the facilitator produces for this session. The information collected from this session will be kept for a period of 2-5yrs in my supervisor's lab at the University of Waterloo, Canada in a secure filing cabinet and with the researcher in a password protected laptop.

Given the group format of this session we will ask you to keep in confidence information that identifies or could potentially identify a participant and/or his/her comments. If you have any questions about participation in this session, please feel free to discuss these with the facilitator, or later, by contacting Professor Murray E. Haight at (1-519)-888-4567, Ext. 33027 or by email mehaight@uwaterloo.ca. Alternately you could contact on the local cell phone number, …………………(India). If your organisation is interested in receiving a copy of the executive summary of the session outcomes or a copy of my thesis, please contact me at rmohapat@fes.uwaterloo.ca

I would like to assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo,Canada. However, the final decision about participation is yours. Should you have comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at (1-519)-888-4567, Ext. 36005 or by email at ssykes@uwaterloo.ca

Thank you for your assistance with this project. I hope that the results of my study will be of benefit to those organizations directly involved in the study, other voluntary recreation organizations not directly involved in the study, as well as to the broader research community.

Yours Sincerely,

Romasa Mohapatra

Consent Form

I have read the information presented in the information letter about the session being facilitated by Romasa Mohapatra from the School of Planning at the University of Waterloo, Canada. I have had the opportunity to ask the facilitator any questions related to this session, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that this study is for Romasa's PhD and is being conducted under the supervision of Prof. Murray Haight from the School of Planning at the University of Waterloo, Canada.

I am aware that I may withdraw from the session without penalty at any time by advising the facilitator of this decision. However, if I withdraw from participation the notes associated with my responses will be destroyed and no quotations will appear in the report.

I am also aware that excerpts from the interview may be included in the thesis and/or publications to come from this research, with the understanding that the quotations will be anonymous. I was informed that I may withdraw my consent at any time without penalty by advising the researcher. I was informed that the collected information will not be shared with any third party.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo,Canada. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at (1-519)-888-4567 ext. 36005 or by email at ssykes@uwaterloo.ca.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this session and to keep in confidence information that could identify specific participants and/or the information they provided.

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.
_____ YES _____ NO
Participant Name: _____ (Please print)

Participant Signature: _____

Student Investigator: ___ Romasa Mohapatra _____

Student Signature: _____

Date: _____

School of Planning, University of Waterloo, 200 University Avenue West Waterloo, **Ontario**, Canada **N2L 3G1**
Assessment of Post-disaster reconstruction process
<u>**Focus Group Interview-Govt Agencies**</u>

Romasa Mohapatra, Ph.D. (Candidate)

*(**Participants:** District officials, Tehsil/ Taluka/Revenue Division Officials, Community Development Block officials or any other specialized Govt. Agency involved in relief/rehabilitation/reconstruction programs.)*

*(**Script:** Before we begin, I would like to thank you for taking time out of your schedule for this interview. The format of the interview will be focused and somewhat structured. I will start by asking a question and you can take your time to collect your thoughts and respond. I may ask follow-up or clarifying questions based on your response. The overall interview will consist of 38 main questions and related sub-questions. The interview would take an approximate time of 30-40minutes.You will also have the opportunity to provide general comments, thoughts and feedback both throughout the interview and at the end.*
Let us begin with some general questions related to communities/villages where you have been involved for development.
*(**Objective/Rationale:** Assessment of govt. program on Tsunami 2004 relief, rehabilitation, reconstruction, their assessment of success/failures, community participation in program, tasks to be completed, funds spent on each of the communities under study, govt. evaluation of reconstruction programs, sustainability aspects, livelihood & employment questions.)*

1. Place of FGP (District HQ/Block HQ/Tehsil/Taluka/Revenue Office): ………………………

2. List of participating officials to be retained separately:

   (a)……………………………………………………………..

   (b)…………………………………………………………

   (c)……………………………………………………………..

3. List of community(s)/villages/ wards responsible for rehabilitation/reconstruction program:

   (a)……………………………………………………………..

   (b)…………………………………………………………

   (c)……………………………………………………………..

4. Please provide a tentative time schedule of:
    (a) Rescue……………………………………………………..

    (b) Relief …………………………………………………….

    (c) Rehabilitation ………………………………………….

     (d) Reconstruction ………………………………………

(Rationale: The following section is vital for the study as this data would help in understanding the level of involvement of the government immediately after the Tsunami.)

5. How many communities/villages were affected under your area of operation? ☐

6. Total population affected: ☐

7. Total number of: (a) Death ☐   (b) Injuries ☐ (c) missing ☐
(d) mentally affected ☐

8. Total homes (a) Damaged ☐ (b) Destroyed ☐ (c) House Hold affected ☐

9. No. of persons rendered job-less: ☐

10. Estimated loss of fishing equipments (In INR '000000): ☐

11. Schools/colleges damaged/destroyed: (a) Number ☐ (b) Value ☐

12. Number of Hospital/public institutions damaged/destroyed? ☐

13. Infrastructure damaged: (a) Roads ☐ (b) bridges ☐ (c)Power ☐

(d) Water-supply ☐ (e)Any other ☐

14. Extent of involvement of state infrastructure (a) Rescue/rehab(%) ☐
(b)Reconstr.

15. Give total relief & yearly village-wise (only fishing) allocation of GA from 2004-05 onwards:

(a) On relief (in INR) ☐ (b) Ex-gratuity (on deaths) ☐ (c)Medical-care
  (d)Reconstr. allocation (05-06) ☐ (e) (06-07) ☐ (07-08) ☐
  (provide separate sheet)

16. Have you carried-out any evaluation of the tasks carried out by the GA?

……………………………………………………………………………………………
…………………

17. If yes, state the degree of success (%) by the GA in respect of the following areas:

266

(a) Rescue & relief [ ]   (b)Shelter [ ]   (c) healthcare [ ]   (d)Counseling-services [ ]

(e)Infra-reconstruction [ ]   (f) livelihood restoration [ ]   (g) Housing [ ]

(Rationale: Details about the various initiatives undertaken by the government and its plans for education, infrastructure etc., and how this is undertaken is discussed in the following section.)

18. Give a brief description of reconstruction plan for the fishing communities: (If a blueprint is available please could you provide a copy)

……………………………………………………………………………………………………

19. Is there a separate cell overseeing the RP (Reconstruction Program)?

…………………………………………………………………………………………………

20. If Yes, specify its key roles?

……………………………………………………………………………………………………

……………………………………………………………………………………………………

21. How does the Reconstruction Program co-ordinate with the line departments (Public Works, Water-supply, education, heath etc)?

……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………

22. Are the RP run separately or is integrated with long-term line department plan? (state in a few lines)

……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………

(Rationale: Peoples participation has been continuously encouraged in rebuilding post disaster communities. This section would give information which would be used to understand how well the government programs encourage the involvement of the community members in various development programs in the past 2-3 years after Tsunami.)

23. Do communities and common people cooperate with Reconstruction Program & Govt. Agency programs in their local area?

……
………………

24. If yes, what is the nature of cooperation? (Please state in a few sentences)

25. Is there any consultative program (CP) of the Govt. Agency to involve the community, citizens in :

(a) Building their capacity ☐ (b) Sensitization for future disasters ☐
(c)In proposed Reconstruction Plan

26. Are the *Gram Panchayats* involved in the Reconstruction Plan? ☐

………

27. If Yes, state the nature of the role? ☐

(a) In planning ☐ (b) In implementation stage ☐ (c) In monitoring ☐
        (d) Owning & managing community assets created ☐ (e) Any other (pl. state)

(Rationale: The following section tries to understand whether the government was able to take a follow up evaluation of the relocated communities and cater to the more recent issues if any.)

28. What in your assessment is the success of livelihood restoration in the community/village?

……
………………

29. Is unemployment a big question still? (Yes:1, No:0) ☐

30. If yes, pl. state the GA programs in this direction if any?

....

31. To what extent people have returned to their traditional works (%)? ☐

32. Do they feel safe to go to the sea? ☐

33. Is there any poverty survey in the given villages? (Yes:1, No:0) ☐

34. If yes, what is the percentage of families below the government criteria of poverty (BPL)? ☐

(Give, village-wise figures if available)

35. (State) What are the strengths of the community?
………………………………………………………

36. Have they emerged stronger after the disaster?

37. Do you consider, the programs initiated by the Govt (RP) will be sustained and not affected by political changes in state/ national politics?

38. Does the Govt. Agency give attention to inter-community relations during the process of program implementation?

Authorised Govt. Agency signatory   Enumerators/ Moderator

Place: Date

Appendix C: Check list for the house hold enumerators

<u>Before leaving for the household survey go though the following checklist and put a tick mark against each of the points.</u>

1. Copies of the household questionnaire ☐

2. Copies of the information letter ☐

3. A bag containing all necessary stationary, pens, note pad, pencils, erasers ☐

4. Make sure you carry some lunch and water ☐

5. The envelopes containing the remuneration amount ☐

6. Money for your own travel to the site and return ☐

7. Keep a photo ID (Student ID), in case someone would ask for identification ☐

8. Carry the phone numbers of the researcher and the village head in case of an emergency. ☐

<u>On reaching the survey location and during the interview session take note of the following points.</u>

1. Politely introduce yourself and the purpose of the study and hand in the information letter.

2. In most cases accept an oral consent to participate in the interview.

3. Ask if the person answering the door belongs to the same household

4. Courteously ask if the person is ready to proceed with the session.

5. If yes then, proceed by filling in the details of the house number.

6. Remember to use the separate code sheet to enter the person's name and only use the code number for question no.1 of the household questionnaire.

7. On the top left of the questionnaire, remember to fill in the village code as (01, 02..), the district information and the house hold code (house number if available).

8. While going through each and every question, make sure that you pause and listen carefully to the response of the participant.

9. If the participant is unable to understand the question, take your time to explain it.

10. Do not insist to answer on any occasion.

11. Most of the questions involves filling in numbers in the boxes.

12. Make sure you fill in the right number for each answer.

13. Some of the questions may be common to every household in that location (village), for example those related to housing type.

14. Try not to spend too much time on such questions, and fill it by yourself in between the sessions.

15. The session should ideally be completed within 30-40 minutes.

16. Take down any additional information in the note book provided to you or in the dotted lines provided in the household questionnaire.

17. If the participant feels uncomfortable to answer any particular question or a section of the house hold questionnaire, then proceed to the next section or the next question.

18. Should there be any instance where the participant recalls past experience during the Tsunami and develops feelings of distress, with a comforting nature ask what would make the participant feel better or whether he/she would like to continue with the session.*

19. If the participant wishes to withdraw from the study, thank the participant and hand in the remuneration.

20. Also do refer about the counseling centre (list provided), where the participant could take some psychological help.

21. In case the participant feels fine to continue with the study and does not require psychological help, then take a small break and proceed to the next question.

22. In case the participant develops feeling of anger or objection towards the government or the local NGO, remain calm and patient.

23. The study needs to be unbiased and hence, do not provide any support and avoid any confrontation with the participants.**

24. Make notes of what the participant expresses and in no occasion should you encourage the participant to indulge more beyond the scope of the study.

25. In case the participant persists and becomes aggressive, be polite and try to put an end to the session, saying the interview would be completed on a later date.

26. In case there is an emergency and the enumerator requires any help, feel free to contact the researcher on the local contact (researcher would be present in the neighborhood on all the day while the surveys are being conducted) number or the village head.

27. In each of the cases once you end a session, make sure the participant are not intimidated in any way.

28. Complete the questionnaire by signing and putting the date of the interview (enumerator).

29. Also remember to hand in the remuneration and any additional information, such as that of the psychological counseling center.

30. Should the participant want to have a copy of the study; mention that a copy would be given to each of the village heads once it is completed.

31. Thank the participant before proceeding to the next interview.

* **Listen** to the participant's thoughts and feelings. This needs to be done in a sensitive and a non-threatening way. Redirecting participants in this case means that one can communicate understanding by reflecting on the participant's message/thoughts. For instance by saying " It sounds like you had a very difficult time in the past few years." Then allowing the participant to respond and in case the participant continues to show distress then ask "Would it make you feel better if we take a break from this session and continue after some time, or do you want to withdraw from the study?" It is important to include both content and feeling in the reflection. **Instill a Sense of Hope**. Provide assurance to the participant that things can get better. When it is appropriate, you might choose to assure the participant of the availability of resources and of individuals who are available to help (e.g., counseling centers).

** **a) AVOID JUDGING**, evaluating, and criticizing the participant Do so even if the participant asks your opinion. Respect the participant's value system, even if you do not agree with it.

b) EMPATHIZE with the participant without agreeing or disagreeing with what they are saying. Try to place yourself in his/her shoes and understand things from the participant's point of view. It is important to maintain professional boundaries and role relationships.

c) ACKNOWLEDGE your observations of the participant's situation and openly acknowledge to the participant that you are aware of his/her distress.

d) IDENTIFY your own concerns and uneasiness as well as the participants. This may help you to determine the best course of action.

e) MAINTAIN clear and consistent boundaries and expectations. The professional nature of the interviewer and interviewee should be communicated and maintained. It is important to involve one self only as far as you want to go. There can be situations, where in the interviewer tries to give opinions (for eg., from the governments side) and the participant (in this case the villager) reacts and argues; a situation which would risk the study and involve more time or skills than permitted. If one needs to be more effective in intervening in such situations, it is important to know your own risks.

f) REMEMBER YOUR ROLE and avoid dual roles. Your job is to provide support and to make referrals when support is not enough. Don't get involved beyond what feels comfortable or appropriate for you. See that the participant is not made uncomfortable beyond a certain point.

List of Psychological Counseling centers in Study Area

Name of the center	Address	Contact person
International Association for Human Values (IAHV)	IAHV Camp Office Old No.3, New No.6, Neela Mela Vadampokki Street, Opp. Professional Courier Office, **Nagapattinam.** Ph. No: +91-9865402619/618 Email:iahv.tn@gmail.com	Venugopal (Director of center) Ph no: +91-9840026268 Subramaniyam Ph no: +91-9865402619
Institute for Social Education and Development (ISED)	No.5, R.K.Nagar, 4th Cross Street, Raja Annamalaipuram, **Chennai**-600028 Ph.No: +91-44-24938192 Email:ised@md3.vsnl.net.in	K.Kannadasan District Coordinator Ph.no: +91-04364-256014 +91-9443853636
Help Age India	Main Office: No.3-C Thiyagaraja Complex, 853,Poonamallee High Road, Kilpauk,**Chennai-**600010 Ph.no:+91-44-25322149 Email: helpageind@touchtelindia.net Local Office: No. 21 1st cross street, Seetharam Nagar, Pudupalayam, **Cuddalore.** Ph.no:+91-41-42295071	Mr. Rajeshwar.D, Project Head Ph. No: +91-41-42295515 Mr. S.Dass, Project Director, +91-41-42295081
Lutheran World Services-India	15, Seetharam Nagar, **Cuddalore**-607001 Ph No: +91-4142-293062 Email: lwsits@sanchar.in	K.G.Mathaikutty Program Director +91-9830186811 mathewlwsi@vsnl.net
M. S. Swaminathan Research Foundation	3rd Cross Street, Institutional Area, Taramani **Chennai** - 600113, India Ph: +91-44-22542698, 22541229 Email: msswami@mssrf.res.in	A.Gopalakrishnan Scientist +91-04144-239006 ag_krishnan@yahoo.com
National Mother and Child Welfare Organisation (NAMCO)	79/1.Ejama Nagar, Thiruthuraipundi. **Tiruvarur**-614713 Tamil Nadu,India Ph. No: +91-4369-220409 Email:namcoindia@yahoo.co.in	Mr.C.Jeevanandham Secretary/Director, Ph.no:+91-4366-251297
National Institute of Mental health and Neuro Sciences (NIMHANS)	E.Sinu, NIMHANS CITRA C/0 No.44,Mookulathu Street, Kottuchery, **Karaikal**-6060609 Ph.No: +91-9843067229 Email:esinu2003@yahoo.com	E.Sinu Program Manager Ph.no-+91-9843067229
Organisation for Eelam Refugees Rehabilitation (OfERR)	OfERR,2nd floor, 31 Sait colony, Egmore, **Chennai** Ph.no: +91-44-28193063/28190400	Mr.S.C.Chandrahasan +91-44-28193063 Email:

	Email: oferr@offerr.org	scchandrahasan@eth.net
Peoples Development Initiative (PDI)	No.14,St.Francis Xavier Street, Near G.H, Karaikal-609602	M.Rajalingam Project Co-ordinator Ph.no: +91-9842824952 Lingam_raju2005@yahoo.com
Phoenix Federation	1,Ground Floor, Pavunammal Colony, Elencheran Nagar, **Nagapattinam**-611001 Phone: +91-4365-248732 Email:phoenixnagai@sify.com	Mrs.Seethalakshmi Managing Trustee, Ph.no:+91-9842657963 Email: seethalakshmika@siffy.com
Rural Education and Action for Liberation (Real)	29, Andavar Nagar, South Palpannaicherry, Opp.Colectorate, Nagore PO., **Nagapattinam**-611001. Phone.No: +91-4365-251423 Email:real_trust@vsnl.com	Mr. Roche Project Co-ordinator, Ph.no: +91-4365-251423 Email:rochepro@hotmail.com
Rural Organization for Social Action (ROSA)	16, Main Road, **Tharangambadi,** Nagai Ph.No: +91-4364-289690 Email:rosa_udhayam@yahoo.com	Ms. R.Veronica, Managing Trustee, Ph.No: +91-4364-289706 Email: veronica_rapphael@rediffmail.com
Society for Education Village Action and Improvement (SEVAI)	No-1,RVG Nagar, Near Collector's Office, Nagore Main Road, **Nagapattinam.**	Dr.K.Govindaraju, Executive Secretary, Ph.No: +91-9443156731
Society for People Education & Economic Change (SPEECH)	6/121,Chola Gardens, Manjakollai, Thiruvarur Main Road, **Nagapattinam.** Ph.No: +91-4365-245823	Mr.Arunodayam Erskine, Project Director, Ph.No: +91-4365-245823 Email:mdu_speech@sancharnet.in
South Asian People Initiatives (SAPI)	91,6th Street, Maraimalai Nagar, Kadambadi, **Nagapattinam-**611001 Ph.No:+91-4365-247200	Mr.Paul Mike, Coordinator, Ph.no: +91-4365-247200 Email:paulmike@jesuits.net
St.Joseph's Development Trust (SJDT)	13 E, Queen Street, Tranquebar, **Nagapattinam.** Ph.No: +91-4364-288155	I.Soosainathan Project Coordinator Ph.No: +91-04364-288155 +91-9842286260
TERT	No.23,Batch Palace, New street, **Nagapattinam**	M. David Mansingh, Director, Ph.No: +91-9443162855
Thanjavur Multi Purpose Social Service	14,Annai Illam, Perumal Sannathi st,	Fr.Sengloe Director

Society (TMSSS)	**Nagapattinam** Ph. No: +91-4365-221720 Email:tmssstanjore_tsunami@rediffmail.com	Ph.No: +91-9443330009 Mr.M.Prabhu, Asst. Project Coordinator, Ph.No: +91-93451-55507
Trust for Hope	3/117,Siva Sakthi Nagar, South Palpannaicherry, **Nagapattinam**-01 Ph.No: +91-04365-250930 Email: drgopinath97@gmail.com	D. Gopinath, Programme Officer, Ph.No: +91-9841067918 Email:drgopinath97@gmail.com
Trust for Rural Women's Emancipation and education (TREE)	32, Main Road, Thalaichangadu, **Tharangambadi** (Tk) Email: ttree_2002@yahoo.in	R.Samuel Santhosham Ph.No: +91-9443488603 Email: samtreesan@yahoo.co.in
UNICEF	United Nation's Children's Fund, 2, Chittaranjan Road, Teynampet, **Chennai** 600018 Ph.No: +91-044-24344051 (Local office): UNICEF Cell, 322, Third Floor, District Collectorate, **Nagapattinam** Ph.No: +91-04365-252814	Anuradha Mundra Consultant, Health and Nutrition Ph.No: +91-9841031483 Email:anuradhamundra@gmail.com
Welfare Organization for Rural Development (WORD)	No.2,Selvam Building, Hotel MURA Upstairs, Velippalayam, Near New Bus Stand, **Nagapattinam.** Ph.No: +91-04365-243108 Email:wordtrust@yahoo.co.in	Mr. M. Govindasa, Program Advisor, Ph.No: +91-04365-243108 Email:wordtrust@yahoo.co.in
World Vision	18, Elencheran Nagar, **Nagapattinam**-611001 Ph.No.91-04365-249479 Eamil:suratha_samuel@wvi.org	V.S. Suratha Samuel Program Manager 91-04365-249065 Email: suratha_samuel@wvi.org

Appendix D: Community meetings

The following section is collection of field notes for three community meetings. Since detail surveys of these areas were presented in chapter 5 of the main report, these notes are presented as additional information.

1. VOC Nagar (Chennai)

The community members were relocated from *Indu Nagar* and *Teesarathnam Nagar*. They stayed in St. Theresa School for a year, and at that time there were 437 families living together. During the surveys community members were staying in permanent settlements for over six months and the previous location, *Teesarathnam Nagar* had been demolished. Some people were promised permanent housing but were not provided with any housing.

Compensation

Compensation was same as that being provided to people living in *Tsunami Nagar* (see, Chapter 6). Boat owners were given 200,000 -300,000/- INR, as compensation for boat loss or damage.

Housing & Built Environment

The permanent housing provided to the affected community, was located at least 4 kilometers away from the sea. Hence, the community felt safe from tidal waves and storms in the new location. However, the residents were not aware where they would go in case of a severe flood or a tsunami, nor were they aware of any new evacuation plans or of any special tall structures to escape floods. The permanent housing was created as apartment blocks that was provided by the government. The materials used were mostly concrete and steel. The community members were apprehensive of the quality of housing, so they were worried that in a disaster such as an earthquake, the roof of the apartment could break and fall on them.

Livelihood

Due to the new location and the distance from the sea members of the community had changed their traditional occupation and were working as wage workers in other occupation. Hence, there were now resident practicing varied occupations living in a common relocated area. When asked if all the community members were employed, and both men and women were going for jobs, the respondents said that around 50% of the men were not going to jobs. Also that when women would work, men would stay back at home and drink alcohol during the day and become abusive. Only 20% of the community members were involved in traditional occupation. Unemployment was a major issue in the neighborhood. Women were mentally prepared to go out and work, but preferred not to work as domestic helpers. Residents were unable to pay back their loans.

Education

New schools were located less than 2 km away from the neighborhood. Almost all the children from the community were going to school. When asked if the residents wanted their children to continue in traditional fishing related activity, they said that they would rather want them to get educated and explore other opportunities than the ones that are fishing related.

Infrastructure facilities

There was a park provided in the neighborhood for children to play, and an information center where the Slum clearance board would organize community meetings. There was a small temple also provided to the residents for religious purposes. Individual housing units were connected to municipal supply lines and water meters were installed as well, but were non-functional. The neighborhood did not have proper garbage collection site and hence, there was garbage all over the place. There were very few trees planted by the people residing in the neighborhood. The drinking water quality was relatively good.

Health care

After the Tsunami, community members were provided with physical health care as well as psychological counseling. There was a medical care unit set up in the community, which was operated by private practitioners. But for major health issues residents would go to a government hospital for which they had to use a public transport.

Policy and Organization

The community members felt that they were not united as before since a lot had changed after relocation, and people from different fishing villages were now grouped together in the same location. The residents did not have any community leader. During festivals, people would share food with their neighbors. The community members felt that they were at least now protected from tides and storms. The residents were aware of the government policies and coastal regulation, since a representative from an NGO had delivered the ruled to the community during a community meeting.

General Comments

The community felt that they were more or less rehabilitated, except for those who were not lucky enough and were still living in temporary shelters. People were unsatisfied with the progress in the reconstruction process by the government, and said that making drinking water facility for the community should be given the first priority among other tasks to be accomplished by the government organization.

2. Keechankupam (Nagapattinam)

This was an old settlement located in the suburbs or Nagapattinam town. Very few repairs completed on the damaged housing, after the Tsunami of 2004. Around 240 families were relocated from this location to other permanent shelters.

Compensation

Every family was given compensation of 4000 INR by the state government after the Tsunami. People were also given compensation for lost boats and equipment. The

community members lived in shelters for 10 days initially and returned to their own homes.

Housing

The community members said that they felt unsafe of the in-situ housing, as it was located very close to the sea. The residents were unaware of any evacuation routes and said that, they would probably run to the nearest community center or the school for shelter in case of an emergency.

Livelihood

Most of the adult earning members of the community had some means of employment. The employed population was mostly practicing their traditional occupation. Around 80% of the households residing in this location were poverty stricken and expressed the need for more monetary support from the government. The residents expected the government to provide them with proper housing facility, road network, toilets, and health centers. Some of the community members said that since they were not receiving any additional compensation from the government, during the lean fishing season (the spawning period), the households would sell utility items from their home to sustain their families.

Facilities

When asked if any facility was added to this neighborhood after the Tsunami of 2004, the community expressed anger and resentment towards the government for leaving them at such miserable conditions and not taking care of them. However, the residents of this location mentioned that there was some medical care provided to them in the first few weeks after the disaster, by a local NGO's. At present, they avail facilities from local hospitals, for a fee to be incurred by themselves. The local hospital is located at a distance of almost an hour distance from the neighborhood by a public transport. The residents felt that there were a number of tasks to be accomplished by the government, such as provision of drinking water, construction of roads, and provision of more hospitals.

Education

Children continued going to schools. The residents said that it was only based on whether they could afford to send their children for higher education, that they may encourage them to pursue other occupation, other than those related to fishing. The existing school in the neighborhood existed before the tsunami of 2004.

Policy and Organization

The community members felt that the residents were united as before the tsunami of 2004. The community members followed the traditional *Panchayat System* (governing body at the village level). The community members would help each other in times of need. Most of the residents of the neighborhood were Hindu families and would take part in religious festivals and celebrations.

General Comment

The community did not feel safe or prepared from disasters in future.

3. Akkarapettai (Nagapattinam)

This village had some newly built houses and few in-situ constructions. This was one of the worst hit locations in the Tamil Nadu coast, during the Tsunami of December 2004. At the time of the surveys, there were around 450 households residing in this location. Almost, 164 new houses were built by the organization, *Mata Amritanadamayi Math* (social service organization). Women actively took part in community meetings where as men were away for fishing into the sea.

Compensation

The households were compensated by the government for their losses after the Tsunami of 2004. The new houses were constructed by local NGO's. The material used was brick and concrete and the neighborhood was planned in the form of row housing.

Built Environment

When the residents were asked if they felt safe from tides or storms in the future, they were mostly unsure and said that, their houses were still very close to the sea. Hence, they were still vulnerable, despite the relocation. The residents were not aware of any evacuation routes, and said they would either climb the roof of their houses or escape to the nearest community hall in case of an emergency.

Facilities

There were a number of facilities added in the neighborhood. There was a children's education center, community hall, a temple, a village knowledge center and a digital library (information center) added to the new relocated neighborhood. There were new trees planted in the neighborhood and the community members themselves took the initiative to keep their neighborhoods clean.

Policy and organization

The community members felt that there was no unity among the residents of the neighborhood, as families from the original village were relocated to a different location. The residents were aware of new rules and regulations laid down by the government. When asked whether the community members felt that they were more or less rehabilitated, only 50% of them agreed to it. The residents were also not satisfied by the efforts taken by the government during reconstruction.

Health care facility

A number of community member's required mental help and counseling after the tsunami. There was a medical care center set up for one year after the tsunami in the neighborhood. The care givers were mostly from local NGO's. At present they go to the hospital located at a distance of about an hour by a public transport.

Education

Almost 100% of the children from the community were going to schools. A new school was constructed in the neighborhood by a local NGO. This school was managed

by the government. The local residents of this neighborhood said that, since the annual fee for the school was too high (300 INR/month), the residents had to send their children to other schools where their children receive free education.

Livelihood

Most of the men were practicing their earlier jobs. Almost 25% of the women from this neighborhood helped the men in selling fish. Unemployment was not an issue in this neighborhood. Around 30-40% of the population in this neighborhood required some additional help from the government.

General comments

The tasks to be completed by the government, as expressed by the community, were provision of drinking water, construction of a bridge connecting their neighborhood to the nearby town, and a hospital in the neighborhood. During the surveys, it was observed that the roofs and walls of some of the newly constructed houses were leaking after the rains. Particularly, the very same house where this community meeting took place, the resident informed that roof had collapsed and was repaired. The community members felt that they were now psychological stronger and confident to face any disaster in the future due to their horrific experience in the aftermath of the Tsunami of 2004.

Appendix E: Press Clippings

Press Clippings

DECCAN CHRONICLE   CHENNAI MONDAY 23 OCTOBER 2006

Alcohol abuse high in tsunami-hit areas

By OUR CORRESPONDENT

Chennai, Oct. 22: Alcohol abuse among the coastal regions has increased, especially after the tsunami hit the shores of Tamil Nadu, according to a report released by Tamil Nadu Tsunami Resource Centre and Community Development Organisation Trust.

The study, which was started to find out alcohol consumption pre and post tsunami and the effect of alcohol consumption on the family, was conducted among 320 in two coastal hamlets in Chennai district at Ennore and Srinivasapuram conducted through personal interviews and focus group discussions.

According to the study, 52.8 percent of the men were dependent on alcohol and many of them are in the extreme stages of alcohol abuse. Various reasons including post tsunami trauma, excessive relief money and easy availability of alcohol are being attributed to the alcohol abuse.

According to the study, 52.8 percent of the men were dependent on alcohol and many of them are in the extreme stages of alcohol abuse.

"The alcohol dependent persons were abusing 329.64 ml before tsunami, 229.18 ml immediately after tsunami, 407.14 ml when the relief money was disbursed and 350.92ml at present. The average income of the total sample was Rs. 1970. 47 and on an average they were spending about 43.65% of their monthly income of Rs. 848.40," the report said. From interviews con-

ducted with the spouses of the population it was found that nearly 69.64% of the adolescents and children reported psychological abuse and 50% of them reported physical abuse also.

In contrast, only 9.52 % of the men had reported physical abuse of their children.

A worrisome trend showed that children thought their fathers consumed liquor because of body pain or physical and mental stress.

"The children believe

that alcohol could relieve stress which could lead to getting on to the habit themselves sooner," the report said. The report recommends motivational programmes and information about alcohol abuse and view alcohol as a disease than just an addiction.

"Establishing de-addiction centres so that treatment is accessible and psychological care for those facing trauma after tsunami may help reducing alcohol dependence of the men," the report added.

(a)

4 With The New Indian Express

Chennai, Saturday, October 21, 2006

Post tsunami, drinking habits on the rise

Express News Service

Chennai, October 20

AFTER almost two years since the tsunami destroyed lives, properties and livelihood, the drinking habit among the affected survivors in Chennai is on the rise, according to a study.

The study on 'Impact of Tsunami on Alcohol Abuse in Chennai' conducted by the Tamil Nadu Tsunami Resource Centre (TNTRC) and the Community Development Organisation Trust (C-DOT) in Ennore and Srinivasapuram was released here on Thursday. The study covered 320 affected persons from April 2006 to September 2006.

It revealed that the affected persons were using 329.64 ml of liquor before tsunami which dropped to 229.18 ml immediately after tsunami and had gone up to 407.14 ml after getting the relief money.

However, currently it was 350.92 ml. "The consumption had a direct effect on the family of those who were taking liquor. Almost 74.06 percent of the coastal population are into drinking habit. There is a wide variation in the duration of

drinking and the age of first drink is 10 years which has shocked the researchers," said the study.

As much as 19.39 percent of women, adolescents and children reported that the problems worsened after tsunami.

The alcohol had a direct effect on adolescents and children with 69.64 percent reported psychological abuse and 50 percent physical.

However, among the sample, 61.8 percent of women, adolescents and children reported no change in behaviour after tsunami among those who consumed alcohol.

The researchers observed that among considerable number of persons, traumatic responses were not resolved which led to continuous consumption of alcohol. With a lot of them wanting treatment for alcoholism, the social workers who gathered on Thursday came out with a set of recommendation that included creating awareness campaigns in form of rallies, street plays and other medias. They also wanted establishment of de-addiction centres in these areas which would help them to seek help.

Releasing the study vice-

chancellor of University of Madras, S Ramachandran, said, "After tsunami, restoring ecology is a big task which would affect the livelihood of persons." He pointed out that efforts were on to come out with an integrated coastal management plan that could help in improving the social and economic status of the society. "With all these approaches probably we could bring them out of alcoholism," he hoped.

Joint Commissioner, Revenue Administration, Relief and Rehabilitation, R Venkatesan, said more discussions were necessary to come out with a plan to relieve tsunami affected persons from alcohol problems.

Dr Vivek Benegal of National Institute of Mental Health and Neuro Sciences said, "Disasters increased the pre-existing problem of alcoholism. The amount that the governments spend on helping persons to come out of alcoholism is less that the revenue they get by selling the liquor."

Manager of TNTRC, Nalini Keshavaraj, S D Rajendran of C-DOT and Father Manu Alphonse of Social Watch also participated.

(b)