LIFE AFTER THE TSUNAMI: SRI LANKA

THE ARCHITECTURE OF DISASTER RELIEF

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U30099 DISSERTATION
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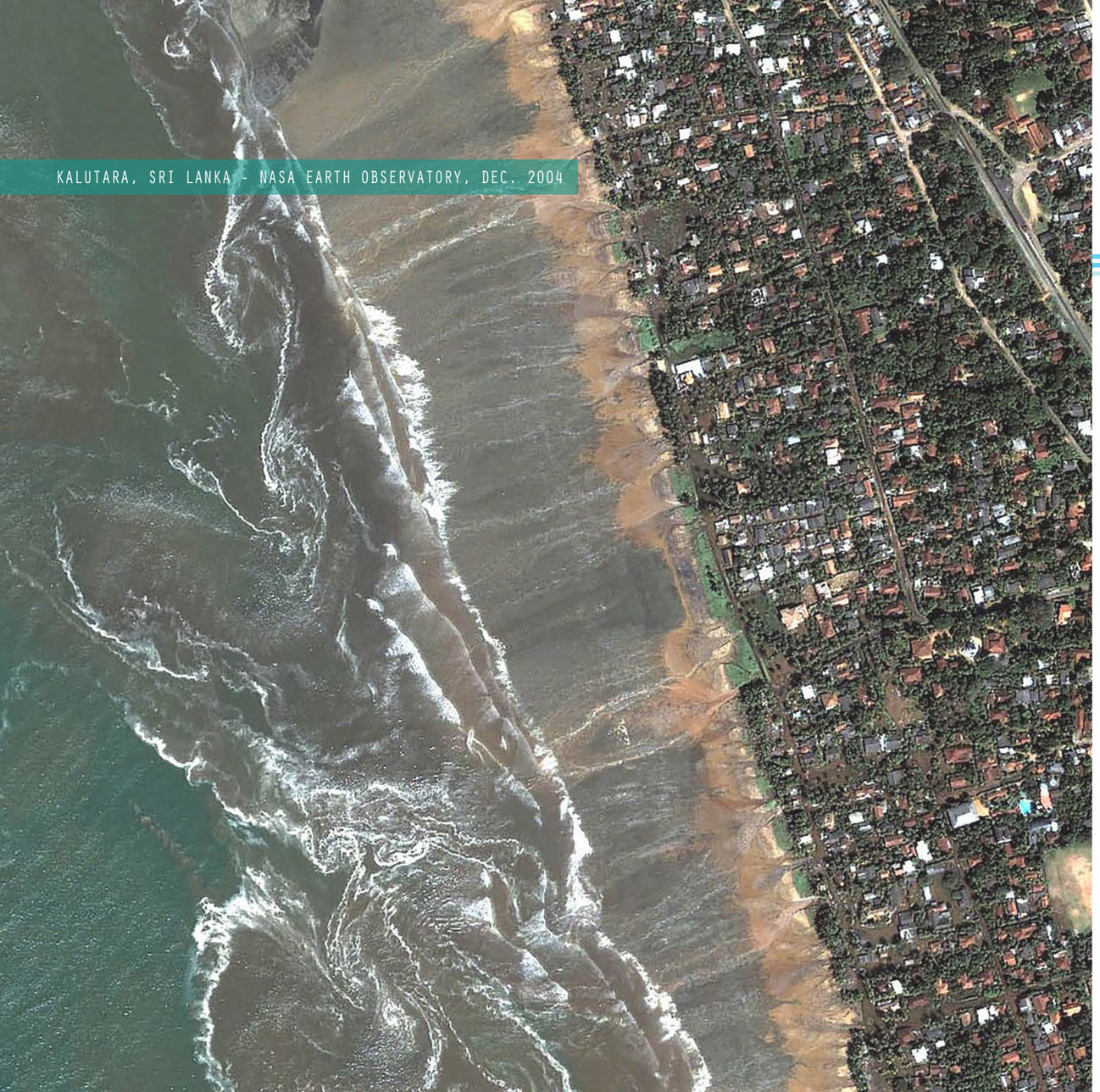
I WOULD LIKE TO THANK **CHARLES PARRACK** FOR HIS SUPPORT AND INSIGHT WHILE WRITING THIS DISSERTATION. MY THANKS TO **UNCLE IMTIAZ CASSIM** AND **SINDUJA JAYARTANE** FOR THEIR TIME AND SUPPORT AM MOST GRATEFUL TO **THE COMMUNITY OF TSUNAMIGAMA** FOR THEIR INCREDIBLE HOSPITALITY AND COOPERATION. LASTLY, THANK YOU TO **MY WONDERFUL PARENTS** WHO HAVE BEEN VERY UNDERSTANDING AND GENEROUS WITH THEIR TIME AND EFFORTS IN HELPING ME ORGANISE MY TRIPS TO TSUNAMIGAMA. WITHOUT THESE PEOPLE, I WOULD NOT HAVE BEEN ABLE TO CONDUCT MY RESEARCH SUCCESSFULLY.

A DISSERTATION PRESENTED TO THE SCHOOL OF ARCHITECTURE, OXFORD BROOKES UNIVERSITY IN PART FULFILLMENT TO THE REGULATIONS FOR BA (HONS) IN ARCHITECTURE.

SIGNED,

AYESHA ISSADEEN

THIS DISSERTATION INVOLVED HUMAN PARTICIPANTS. A FORM E1BE FOR EACH GROUP OF PARTICIPANTS, SHOWING ETHICS REVIEW APPROVAL, HAS BEEN ATTACHED TO THIS DISSERTATION AS AN APPENDIX.



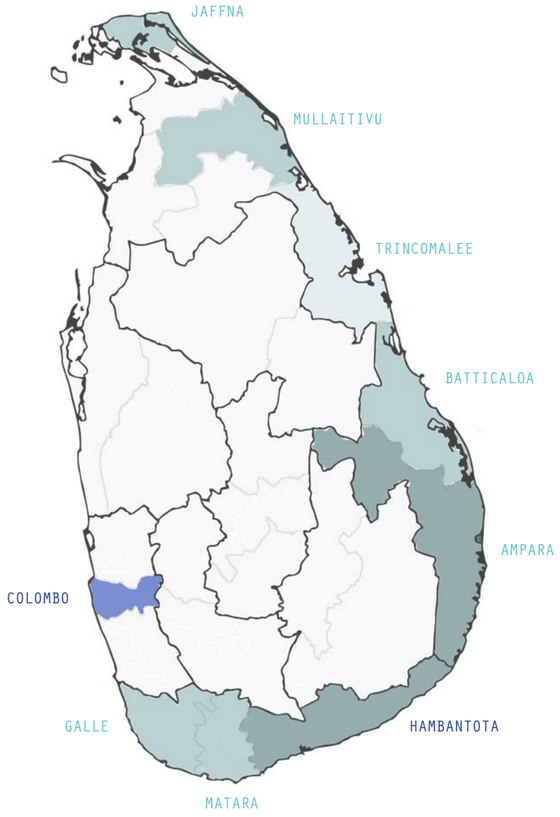
KALUTARA, SRI LANKA - NASA EARTH OBSERVATORY, DEC. 2004

"IT WAS AN EARTHQUAKE THAT IS THOUGHT TO HAVE HAD THE ENERGY OF **23,000 HIROSHIMA-TYPE ATOMIC BOMBS** CAUSING A TSUNAMI WHICH TRAVELLED AS FAR AS 3,000 MILES TO AFRICA AND STILL ARRIVED WITH SUFFICIENT FORCE TO **KILL PEOPLE AND DESTROY PROPERTIES.**"

- TVNZ, "Key facts about the 2004 Boxing Day tsunami", 2008

OPPOSITE IMAGE: THE RECEDING COASTLINE MINUTES BEFORE THE FIRST DESTRUCTIVE WAVE HIT

MAP OF SRI LANKA



NUMBER OF DEATHS

- 4,000 - >10,000
- 1,000 - 4,000
- 500 - 1,000
- CAPITAL CITY

CONTENTS

INTRODUCTION

Natural disasters can change many lives within a matter of seconds. On the 26th of December 2004, the world's most destructive earthquake since 1900 occurred close to the West Coast of Sumatra, Indonesia. The earthquake was the sixth largest ever recorded using a seismograph, measuring at a shocking 9.1-9.3 on the Richter scale. It caused the entirety of our planet to tremble, moving to the extent of one centimetre. As a result of this earthquake, the most devastating tsunami to have occurred in history was generated. The tsunami struck the coasts of thirteen countries with an overall death toll of approximately 275,000 (Pickrell, 2005). Many countries were left with severe damage to several areas and districts and public services such as roads and railways. The enormity of this devastation having created tremendous amounts of human suffering, generated the largest response from the world for any disaster throughout history. Countless eye witnesses, hundreds and thousands of stories to be told - it was the disaster that forced people to start from the very beginning again.

"We heard a roaring noise and could see ripples of frothy water bubbling up fast from the beach. Two or three minutes later the waves smashed into the hotel, breaking the windows and hitting the tables."

- Daniel Thebault, a tourist visiting South West Sri Lanka, 2004

This dissertation aims to explore and evaluate how the tsunami affected the architecture, focusing on Sri Lanka, paying attention to varied experiences and different perspectives of its reconstruction endeavour. Within Sri Lanka alone the death toll was a haunting 34,400 in addition to roughly 100,000 homes being very badly damaged and approximately 515,000 internally displaced persons (ADB, 2005). It was the most devastating natural disaster Sri Lanka has ever faced. Houses were destroyed or completely wiped out alongside several public realms including markets, places of worship as well areas of industrial and economic value. Many countries around the world as well as many International Non-Governmental Organisations (INGOs) were involved in the aid response to the tsunami, donating a total of almost US $14 billion to the affected countries. International response teams aided the Sri Lankan government in restoring the damaged areas of the country and rebuilding new communities. This period in time can definitely be classed as one of Sri Lanka's darkest moments, added to the wounds of decades of a brutal, ongoing civil war. The Liberation Tigers of Tamil Eelam (LTTE) were still in control of some parts of the northern districts at the time the tsunami struck.

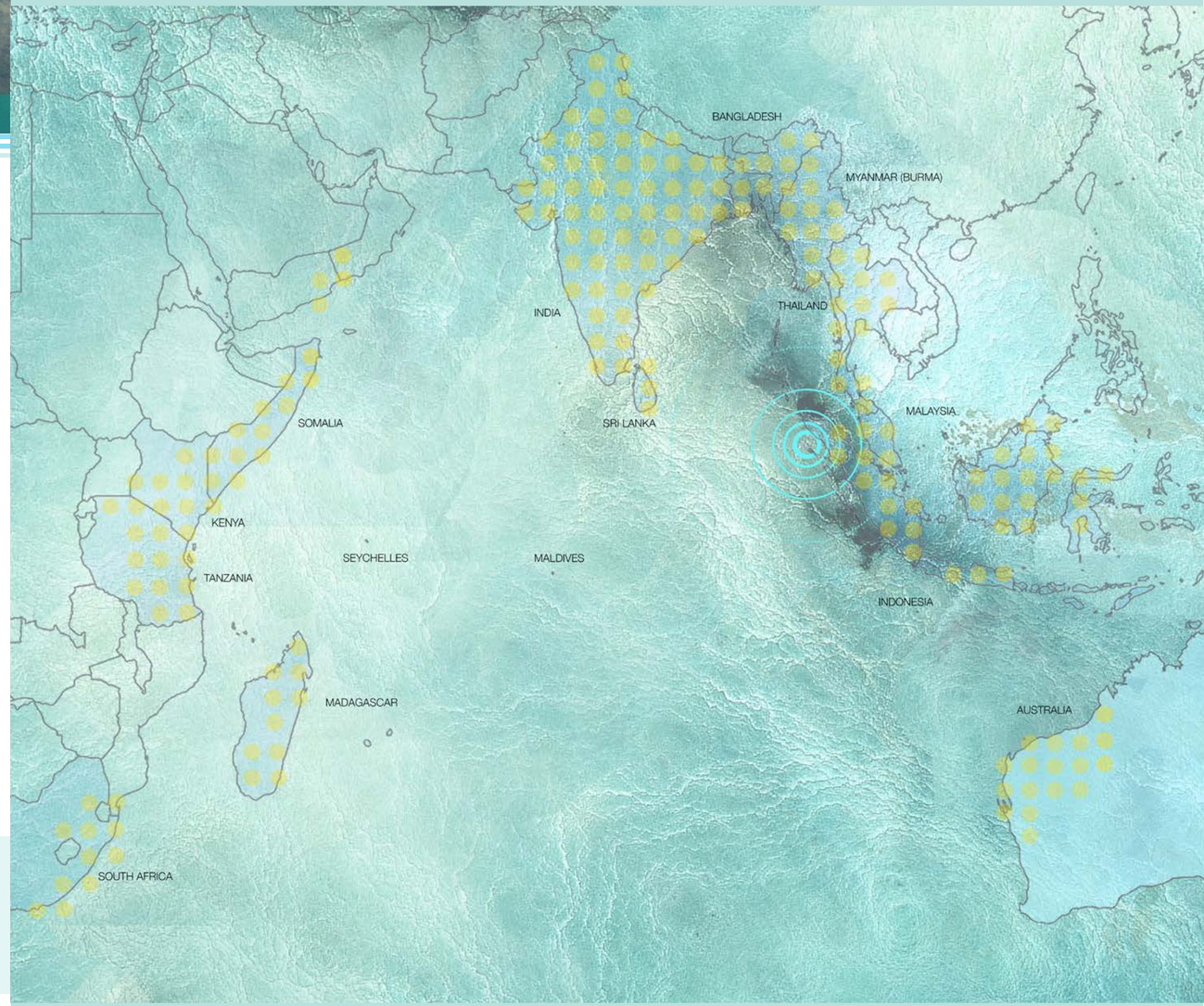
In 1976, at the UN Habitat conference in Vancouver, was the first formal recognition of the informal sector (INGOs) as a legitimate provider of housing and other assistance approaches (Hamdi, 2010). Hamdi describes the principle of investing in the collective good of the community with land regularisation, infrastructure and self-build opportunities (Hamdi, 2010).

This study will investigate the methods of post-disaster relief work executed in Sri Lanka, ranging from the very initial demands, shelter structures which are very temporary, to permanent housing developments.

"The shifting of the earth's plates in the Indian Ocean on Dec. 26, 2004 caused a rupture more than 600 miles long, displacing the seafloor above the rupture by perhaps 10 metres horizontally and several metres vertically. As a result, trillions of tons of rock were moved along hundreds of miles and caused the planet to shudder with the largest magnitude earthquake in 40 years."

- DoSomething.org:
11 Key Facts About The 2004 Indian Ocean Tsunami

MAP OF COUNTRIES AFFECTED BY THE TSUNAMI



TIME STOPPED ON THIS WATCH WITH THE IMPACT OF THE FIRST WAVE, FOREVER MARKING ONE OF SRI LANKA'S DARKEST MOMENTS.

As a person of Sri Lankan heritage, I was able to witness the damage first hand at the age of fourteen, which led me to be very interested in the actions and responses to the situation. My family was involved in the fundraising towards the construction of a village for tsunami affected people in the Southern Province of Sri Lanka, which I first visited in 2007. It was one of the most powerful experiences I have had and I believe it lead me to study architecture. I visited the same village, named "Tsunamigama" (literally translated as Tsunami Village) over the summer of 2013 and again in December. I managed to glimpse the current living conditions within this growing community. These visits made me think about how the rebuilt areas were dealt with and to question whether they could have been designed more successfully.

Tsunamigama is located in a town called Hambantota, which is the main town in its district of Sri Lanka and is developing at a rapid speed. Many locals believe that this is due to Hambantota being the hometown of the current president, Mahinda Rajapaksa. Since becoming President in 2005, Rajapaksa has made sure to leave his mark in history by spending substantial amounts of money on this particular town. Rajapaksa even built a cricket stadium for the ICC Cricket World Cup in 2011, as well as a new harbour and airport in Hambantota, both designed for international use.

By comparing the development of Tsunamigama to a few projects within the area and in Aceh, Indonesia, this thesis endeavours to evaluate a conclusive analysis of the construction, development and community of Tsunamigama. It will also question the role of the architect and profession of architecture within these conditions. The village will be considered as a case study and will be a touchstone throughout the thesis, using comparative techniques to assess the growth of the village and ascertain the successes and failures.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1: SISTERS AT SCHOOL
2: FATHIMA FAHEEMA + SON, AND I
3: TSUNAMIGAMA RESIDENTS WHO ASSISTED MY RESEARCH
4: SETHI, 3, AND I
5: SOCIAL INTERACTIONS AT TSUNAMIGAMA

1-4: TSUNAMI DAMAGE IN HAMBANTOTA
5: NURSES FROM THE EMERGENCY MEDICAL EFFORTS TEAM

INITIAL ASSESSMENTS + DAMAGE ANALYSIS

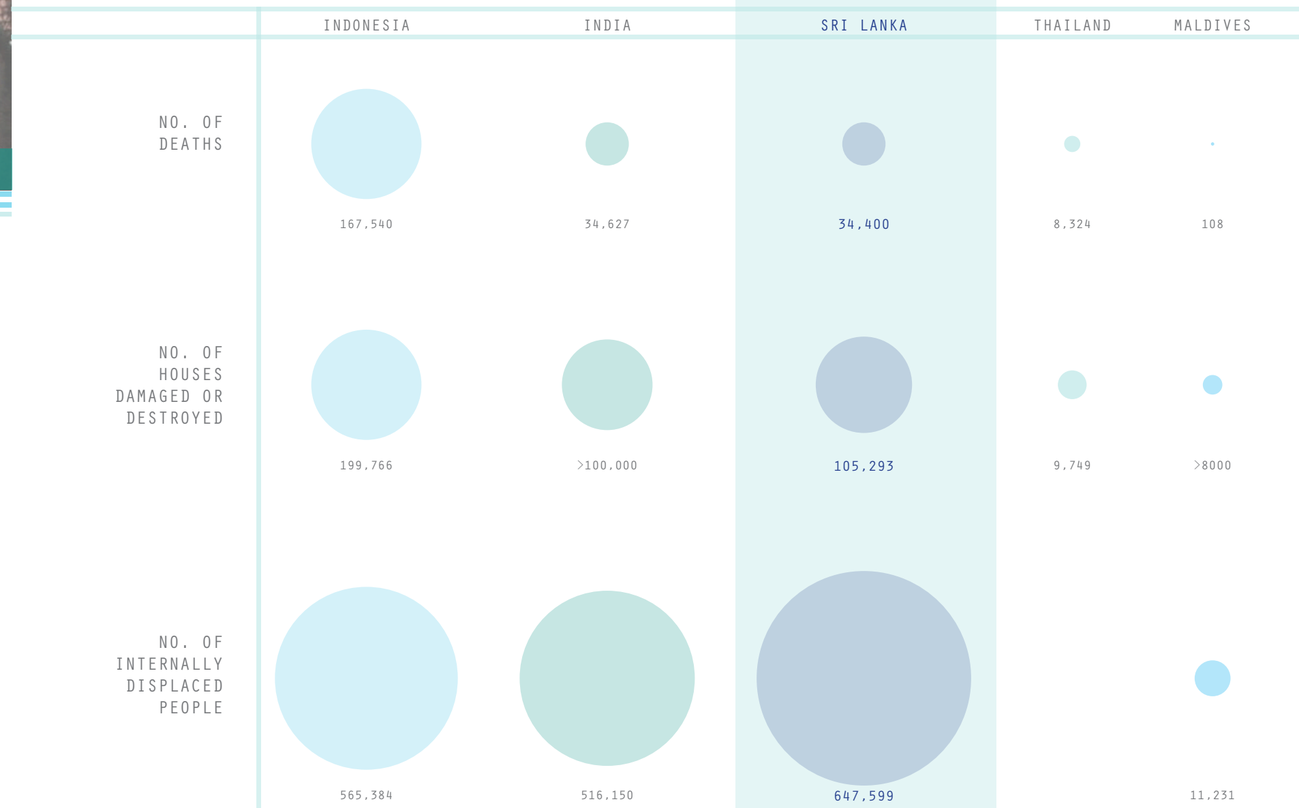
Every disaster situation requires an efficient Needs Assessment to be performed to determine a plan of action for each damaged area. With a variety of different techniques available to carry out a Needs Assessment, this chapter will look at a few techniques in particular focusing on advantages and disadvantages of them in relation to the culture in Sri Lanka. A concise, comprehensive and thorough initial Needs Assessment is essential to the success of a project. Although this may lengthen the time required to reconstruct and rebuild, it allows for more permanent projects to be established, promoting sustainability and allowing victims of disaster to return to a normal life as soon as possible.

There are many different types of Needs Assessment that are not always easy to arrange. An assessment of the most immediate needs including medical assistance, shelter and food is the first priority. Secondly, an assessment of the long-term damage and needs, investigating infrastructure, economy and housing. Cross-sectoral reviews and more specialised reports are required, clearly focusing on the context and cultural practices. It is also essential to provide mapping of various aspects: the damaged areas and potential land to build on, the displacement of people over time and if required due to loss of records, mapping the area as it was pre-disaster. This information then needs to be easily accessible for all bodies involved.

A Needs Assessment resolves a number of issues, the main purpose can be seen as defining and identifying a clear link between the emergency response required and what information is needed to provide a useful and necessary report post-disaster. It also allows the coordinating bodies to determine the tools that are essential to complete the Needs Assessment and ensure a way of minimising bias within the assessment. A survey can be formatted and supplied to every household (IFRC, 2000).

After having completed a Needs Assessment, the government and NGOs overlooking a specific area are able to begin to prioritise, plan and to determine how to raise funding, as well as to check if the local community is able to provide the required building materials and / or man power. The report is a key piece of evidence when appealing for international aid or any other form of funding assistance. Some vital information to a profitable report include: determining how serious a disaster situation is and logging all details relevant to the disaster, ascertaining the number of people affected either due to displacement, injury or loss of life and damage to housing. Also looking into: the capability of the locals, availability of resources, logistical and organisational priorities, the potential for problems in the future.

Quite regularly, there are difficulties one may face when researching and collecting information for a Needs Assessment report. There can be a lack of local participation sometimes due to religious or cultural reasons, or the locals simply do not trust the new faces that fly in straight after disaster and claim that they can help - it can appear to good to be true. There can also be a lack of cooperation from local governing bodies, not only effecting the Needs Assessment but also in clearing debris, land management, and planning permission for reconstruction. With the addition of an architect to the team of coordinators, visually representing information from a Needs Assessment could be made significantly easier and more rewarding. It could enable all involved to comprehend the processes of evaluating what needs to be done, focusing on those affected, as a priority.



The diagram above shows the destruction caused by the tsunami in five countries surrounding the point at which the earthquake struck.

With fourteen countries being involved, there was a large number and variety of ethnic groups. The magnitude of this reconstruction effort was one of the largest in the world, requiring many intensive Needs Assessments to be carried out. It is important to acknowledge the many different perspectives that require to be considered during a relief effort such as this, which directly affect the Needs Assessment. Layers of analysis, covering historical, social, political, cultural and religious contexts needed to be reviewed and evaluated during a very short period of time. This is why local input is a key factor to make any relief effort a success. It is important to designate the roles of community, local governments and NGOs and INGOs clearly to ensure a successful, time-efficient recovery.

The tsunami damaged or destroyed over 100,000 homes in Sri Lanka. This summed to 13% of housing in the coastal divisions. An estimate of the total damage amounted to $325 million with reconstruction efforts estimated at $460 million (ADB, 2005).

There was also the issue of clearing debris to prepare land for reconstruction after the tsunami. In some of the affected countries, debris was burnt on large designated pieces of land. Minister A.H.M Fowzie of the Sri Lankan government advised locals not to burn debris due to the toxic waste being released, as well as a fear that fires may spread. There was also a concern of illness as a lot of the waste was flammable as well as hazardous due to being contaminated with oils and / or chemicals (Wickramage, 2005). The most haunting images many people seem to recollect are those of the very same bulldozers that cleared the debris from their homes, later filled with hundreds of dead bodies which were emptied into large trenches dug into the ground in public spaces. Many locals assisted in the clean up process through "Cash for Work" (CFW) programmes which are common after these types of disaster. A CFW programme allows locals to be involved in the labour processes of cleaning up in return for a small daily payment.

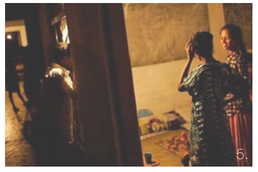
"Cash-for-work programmes are usually associated with disasters and emergencies and have been implemented in Afghanistan, Bangladesh, Haiti, Indonesia, Pakistan and Uganda. Many organisations employed cash interventions after the Asian tsunami of 2004 and cash-for-work programmes were widespread in Aceh, Indonesia, and in Sri Lanka. However, when implemented incorrectly, these programmes can disrupt the local economy, artificially inflate wages and result in unsustainable shifts in the labour force."

- World Health Organisation, Sept. 2010

Although this method was successfully implemented within the tsunami crisis of 2004, some have said that it was much less successful in Sri Lanka. Many cultural differences need to be taken into account in any disaster relief situation. This is an example of how without sufficient prior research or a lack of communication with the locals can result in an inefficient programme which can disrupt cultural practices, sometimes permanently. The Sri Lankan culture has been the same for many years; a "love thy neighbour" approach, with a strong community bond. In most villages, someone within the community will happily assist anyone without immediate payment - in return for a favour at another time. This practice suffered after the CFW program was applied in Sri Lanka. This has had a negative impact in certain areas as confirmed by Mr Shiraj Morugama, Programme Director at RedR Lanka, as the culture has been compromised where people are much less willing to help without immediate payment.








The more remote areas of the country had no digital governmental records. As the tsunami was so unexpected, many government offices and their contents near the coast were essentially obliterated. This made a number of tasks significantly more difficult, in particular identifying and locating missing people. The process of reinstating entire villages was long, tedious and painful for many people.

"Hambantota residents are particularly vulnerable to the economic shock caused by the tsunami. It is estimated that between one-quarter to a one-third of the population in the Southern province lived below the poverty line even before the tsunami, with these numbers climbing in the immediate aftermath of the disaster."

- Asian Development Bank, 'Rebuilding Sri Lanka', p.51

IMAGES

1-4. Devastation after the tsunami in Hambantota
5-6. Moments captured in the first few days in emergency camps
7. Bodies being buried in trenches near the beach
8. Locals getting involved in the reconstruction process

TEMPORARY, SEMI-PERMANENT + TRANSITIONAL SHELTERS

In the few days after a disaster has occurred there are many things which require tending to and it can be extremely overwhelming as people are dealing with lost lives, missing people and in some cases the trauma of losing everything. Prior to collecting information for Needs Assessment purposes, it is necessary to allocate shelters for those who have no place to stay whilst the clean up is carried out. These are often very large tents pitched in any safe area where a suitable space can be found. A vast number of shelter structures were built across the tsunami affected areas of Sri Lanka. The immediate need for shelter was supplied by INGOs, NGOs as well as the local governing bodies wherever possible. In many cases, as local hospitals and clinics were severely oversubscribed, make-shift medical facilities were also provided in tents or any available buildings. Almost immediately, the government put into place a 100m 'no build buffer zone' in the west and south, and a 200m buffer zone in the east and north coasts of affected areas. This did previously exist, however it was not strictly enforced.

"The general consensus is that emergency relief was singularly successful in meeting the immediate needs of the affected people. The unprecedented outpouring of private and institutional generosity meant that families were provided with a place to stay, food was distributed, medical assistance was made available, and orphaned children were taken into care."

- Asian Development Bank, 2005, p.3

There was an abundance of areas which needed immediate assistance, as well as organisations willing to assist them. A number of issues became apparent during the allocation of the areas to aiding bodies as there were advantages and disadvantages within each area. This was a chaotic period as many arguments arose over this, starting an inter-agency competition. Due to the disruption caused by the tsunami, the government was not entirely able to control what some may say was not far from a bidding war for areas (Stirrat, 2006). This was unfortunate as it required time to coordinate the final allocations whilst there were many affected people trying to survive. It is something which many reports have commented on, but fortunately this did not occur as severely in relation to medical assistance. Stirrat states, "competition was not just a matter of getting rid of money but getting rid of it in the 'right' way which would fit with Western donors' visions of what relief should be". This ultimately portrays the donor as the client, which is viewed as incorrect. It is necessary for organisations to rethink this process to ensure that it is more time efficient and emphasise who they are there to help.

Over the first few weeks various organisations began building semi-permanent structures, more commonly referred to as 'transitional shelters', built with the idea that they will be used for up to five years whilst other recovery projects are administered. Transitional shelters have been a topic of debate within the disaster relief sector as they are seen by some as a waste of money in a situation where budgeting is crucial. They have also been linked to corruption and a form of marketing within organisations. These are not always successful and can be found empty and derelict today as there is a tendency to build anywhere with viable land nearby where villages may have been previously situated. There are a number of examples of this in the past, one of which was near the village of Vondh in India, which was affected by the 2001 Gujarati earthquake. Eight hundred houses were built, yet today Vondh is a ghost town. As these are often built very quickly, there is evidence of a lack of communication with the local inhabitants and internally displaced persons (IDPs). This repeatedly ends in significantly less successful projects. The owners of the houses in Vondh have relocated back to their original village and have built their own homes without any architectural knowledge - which can sometimes result in yet another vulnerable community (Sanderson, 2011).

1: A TENT DONATED BY A UK-BASED INGO ON THE BEACH
2: CLEAN UP EFFORTS IN HAMBANTHOTA

"In Sri Lanka, the government's policy tended to support household involvement in managing construction. This strategy recognised that active participation in reconstructing one's own home and community not only contributes to the best possible results, but also provides a psychological boost to post-disaster mental health recovery."

- Humanitarian Exchange Magazine, 2007

A coordinating body called "Helping Hambantota" was also set up by current president Mahinda Rajapaksa who was the Prime Minister at the time. The then-president, Chandrika Kumaratunga was in London when the tsunami struck Sri Lanka and only returned in the following days, leaving Rajapaksa in charge temporarily. There were numerous reports in the media accusing Rajapaksa of siphoning up to Rs.82 million (approximately £450,000) from donated funds (Samarasinghe, 2005). Corruption within disaster relief situations is unfortunately present, most commonly in third world countries with unstable economies. Such corruption is an urgent matter, however with the disruptions caused by such calamities and the surge of financial aid pouring into the affected countries it is very difficult to account for all the donations.

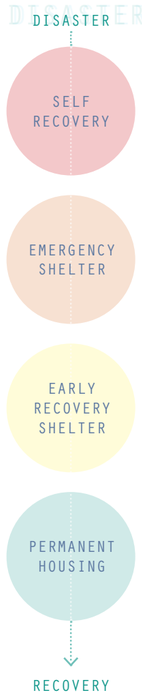
TRANSITIONAL COMMUNITY
TANGALLE, HAMBANTHOTA

This project was a successful transitional project carried out by OXFAM in an area within Hambantota. Many victims of the tsunami had found somewhere to stay, either with friends or relatives within the area except for seventeen families, verified by the community leaders. OXFAM carried out a small series of workshops to ensure the families and local community were involved to design small shelters, each to accommodate one family. The results of their workshop and Needs Assessment were successful.

The design of the shelters was approved by the government authorities and planning permission was granted. OXFAM managed to convince the local government to allow building on a children's playground within the village to ensure that the families were not separated from the rest of the village. This allowed building to start much sooner as OXFAM did not need to wait for local authorities to approve the land.

The shelters were built with the intention of them being dismantled, with bolted timber joints and cement tiles as opposed to a slab of concrete. This allowed the occupants to use and / or sell the materials once the shelters were taken apart. These shelters were built by people within the community who were paid a daily wage and the process was overlooked by both a site supervisor and engineer. The project was funded by the Disasters Emergency Committee (DEC), with the cost of each unit being $580, bringing the project to a total cost of $9,860.

(Sinclair, 2006)



PERMANENT STRUCTURES + DIVISION OF LAND

Sri Lanka is predominantly a Buddhist country; however Hambantota is home to a large number of Muslims. Religion, alongside the post-civil war grudges, which are still often evident, were tricky issues to work around in the permanent rebuilding of communities. Care had to be taken to ensure new neighbourhoods were sufficiently integrated so as to prevent any domestic uproar. With the buffer zone no-build laws, many fishing communities had to move further inland and join or form new villages. Most locals were living in poverty and saw the donation of housing as a chance to start over. A surprising number of people did not have a permanent home before the tsunami, staying wherever possible but not able to settle fully enough to begin earning money for themselves.

Two types of housing structures became apparent: donor built shelters aiming to rehouse those previously living in the buffer zone, or a home owner driven shelter to assist those affected outside of the buffer zone (Ratnasooriya et al 2007). The new buffer zone caused some issues as many inhabitants were reluctant to relocate, especially fishing communities as it was more convenient for their livelihood. Since October 2005, the 'no build' restrictions have been relaxed.

Some key design elements to consider are listed below:

Shelter Design for Hot, Dry Climates:

- source materials with a high thermal mass
- minimize window sizes, provide shade
- an insulating roof;
    - an earth roof provides thermal mass
    - a thatched roof insulate through the creating an air chamber
- thick walls reduce heat gain during the day and increase heat storage at night
- consider and avoid prevailing winds when positing doors and windows

Shelter Design for Hot, Wet Climates:

- designs should ensure protection from water as well as good ventilation
- wall footings must be protect with tiling or plaster include a roof overhang to protect walls from water a suitable drainage system to allow preservation of rainwater

(IFRC, n.d.)

TSUNAMIGAMA HAMBANTOTA

1.

2.

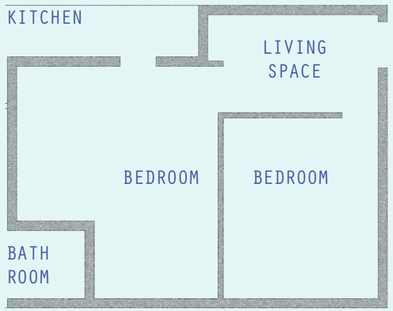
Mr Imtiaz Cassim was a key member of the coordinating team who built this village. Tsunamigama was funded and evolved through private parties without any help from the government or other international organisations. Mr Cassim first became involved with the relief efforts as part of a medical assistance programme. A lawyer approached him with a donation of Rs. 3 million (approximately £16 700) with the intention of providing something more sustainable for the tsunami victims. Mr Razeen, a local resident of Hambantota who is very well-known within the area, was willing to provide some land for housing. Mr. Cassim informed Mr Razeen that he had the money to build a few houses, but unfortunately the money although promised, was never transferred. This led Mr. Razeen and two new donors to raise funds to build three houses. Once the houses were built, no one came forward to receive them as locals could not be sure of whom to trust. This was due to the fact that many victims had been asked to fill in a number of forms with the promise of a house which was never received. Eventually, three families were chosen and presented with a house each. To establish a non biased manner about this project, the first three houses were given to a Muslim family, a Christian family and a Sinhalese Buddhist family. The design of the houses was not heavily considered and the addition of an architect or engineer to the team was thought to be too time consuming. Mr Razeen decided that each house should have two rooms, a kitchen space and a toilet. The final cost per unit was in the region of Rs. 150,000 (approximately £830). As he is well networked with the local governments, no planning permission was required and no questions were asked after the houses were built. A tactful method of raising funds was inviting donors to present the houses to the family receiving it. This allowed both the benefactor and the recipient a moment of pride and a well deserved small celebration for everyone to enjoy. The reception the donors were given was incredible, as many members of the community who were available were ready and waiting to greet their guests. Guests were invited to have tea in the recipients new home and small shows or concerts were frequently organised and performed by the children of the village for the donors. Often donors would invite their friends to hand over the house and by word of mouth almost 200 houses were built in Tsunamigama. Members of the community including electricians, plumbers and builders were offered houses in return for their skills.

1: THE VILLAGE LEADER AND MYSELF
2: MAIN ROAD RUNNING THROUGH TSUNAMIGAMA
3: KITCHEN ENTRANCE AND BACK YARD
4: HOUSE PAINTED BY OWNER

4.

The selection process was difficult but conducted successfully by the coordinating members, including Mr Razeen and Mr Cassim. A simple form was formatted, the forms were numbered and put into a box. The forms were then picked at random in plain view of all concerned. The chosen candidates were then interviewed openly with as many members of the community who were present to allow for a fair and honest interview.

As the areas are not very large and with the caring spirit of Sri Lankan culture, everybody knows one another. This allowed for a verification of claims as people were not able to present false information without the community objecting. This process was carried out successfully although it was challenging deciding and choosing the most suitable candidates.



TSUNAMIGAMA
PLAN 1:100

As part of this a community-building programme, funding was also provided to initiate a sustainable project which could support the village and would make jobs available. A Montessori was opened for the children of the village and is still functioning successfully. This encourages education from a young age and with the school situated in the village itself, many children start schooling here.
A brick factory also started in 2007 and successfully ran for approximately two years. This provided between three and eighteen jobs over its time, with employees earning between Rs.5000-15000 (approximately £25-75) per month, which is considered a sufficient salary for some. The first few months were successful with some employees earning much more than the average projected earnings. The project also provided an opportunity for women to work as it was organised within the village. There were others indirectly involved with supplying soil and other materials into the project. A number of issues arose over this project, initially the water used in the project was taken from a pond nearby. This was not appropriate and forced the project to be relocated. Eventually, after local authorities banned the use of soil as the main raw material for the manufacturing of bricks, the project had to shut down.

CARE HAMBANTOTA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2.

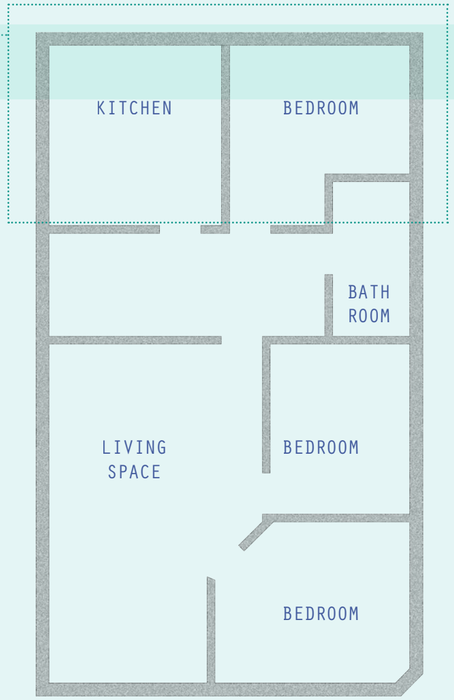
Cooperative for Assistance and Relief Everywhere (CARE) provided a number of houses after the tsunami, with their largest projects in Indonesia and Sri Lanka. These houses were large and well constructed to suit the climate in Sri Lanka. A thatched roof creates an air chamber and thick walls provide insulation for cold nights and the positioning of the windows and doors comply with the prevailing winds. Each family was given a sizeable piece of land, approximately 300 square metres, with a house of roughly 90 square metres. The excess of land donated to families allowed for the building of possibly two small houses with the idea of married children living in their own homes within the same property. Reviewing the project, on the outskirts of Hambantota, the location of the project is not ideal. With the infrastructure of Hambantota currently changing, the distance from the CARE project to the centre of Hambantota is inconvenient to inhabitants. I visited one home in the CARE project whilst in Hambantota. The daughter of a village senior in Tsunamigama, Mr. Kamaldeen, lived there with her husband and two children. After receiving the house, Mr. Kamaldeen's daughter and husband built extensions and painted it. They are looking to sell this house and move closer to Tsunamigama as the distance and size is not suitable for their family. Such renovation and reselling of homes was common in the CARE project.


3.


4.

1: FRONT ENTRANCE TO CARE HOMES
2: MR. KAMALDEEN'S DAUGHTER, ON THE FRONT VERANDA
3: LIVING SPACE
4: ROOF STRUCTURE + LOCAL THATCHED ROOF

EXTENSIONS CONSTRUCTED BY OWNER



CARE HOUSING PROJECT
PLAN 1:100

TZU CHI HAMBANTOTA

1.

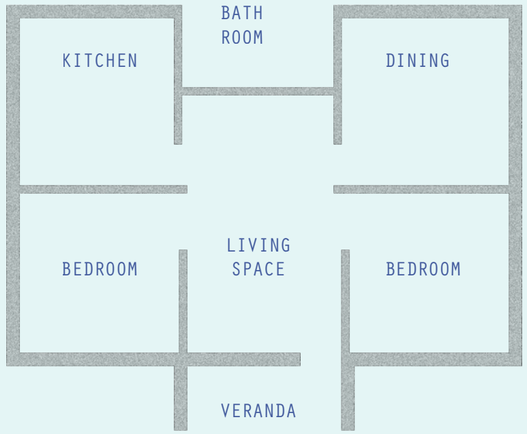

2.

A Taiwanese INGO and Buddhist Compassionate Relief Foundation "Tzu-Chi" coordinated a large construction project in the Hambantota district. The foundation prioritises community and outreach, carrying out relief projects in many countries across the globe. The substantial "Great Love" project in Hambantota aimed to build a just over 900 houses, with a neighbourhood centre, community centre, vocational training facility, two schools, a shopping complex and an assembly hall. They successfully built and distributed just over 800 houses, as well as providing a school, community centre, vocational training centre and neighbourhood centre.

"While Tzu Chi has built many Great Love Communities in different countries, each community has a unique design that suits the local custom. The 920 houses in the community will be built in two variations. Both have the same floor plan and differ only in the style of the entrance awning. Each house has an area of 58.56 square metres. Including the surrounding yard, the total amount of land is 20 perches (505.8m2) per unit"

- Tzu-Chi, Project Portfolio

Many recipients have had problems with these houses as the rammed earth walls have cracked for the severe heat. Families have carried out their own repairs for the damage, but with little knowledge of building construction and hence the problem is recurring.



TZU-CHI GREAT LOVE FOUNDATION
PLAN 1:100

1: ENTRANCE SIGN AT FIRST ROAD ACCESS POINT
2: CRACKED RAMMED EARTH WALL

TZU-CHI VILLAGE KADE (SMALL SHOP), RUN BY A HOME OWNER FROM THE VILLAGE.


1.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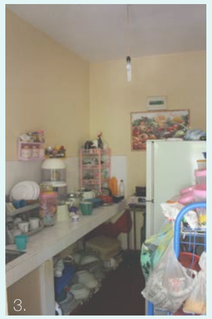
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1: WORLD VISION FLATS, HAMBANTOTA
2: BEDROOM SHARED BY A FAMILY OF FOUR
3: KITCHEN
4: SETHI, CHALADHI AKKI'S YOUNGEST
5: SQUATTER TOILET
6: AKKI AND CHILDREN WITH SINDUJA
7: LIVING SPACE AND ENTRANCE
8: THE CHILDREN AND I


7.


8.

Chaladhi Akki (as I would call her, Akki meaning 'older sister') now 26, is one of many people whose life changed completely after the tsunami. She is from a wealthy Sinhalese family who are well known within the community. Her mother worked as a teacher at the school Chaladhi attended - St Mary's Convent in Matara, a reputable school just outside of Hambantota. Her father worked for the government, for the electricity board. Culturally, in rural areas the bonds within a family that develop follow a trend: the father provides for the family financially, with the mother commonly staying at home providing emotionally and day to day needs. Fathers and their sons maintain a strong relationship, whilst mothers and daughters develop a strong bond. Often the bond between a mother and son or father and daughter is less apparent.

On the Sunday morning when the tsunami struck, Chaladhi Akki and her mother were at the market. She described how the almost black, crushing water raged onto the beach front obliterating everything in its path. She lost her mother to the tsunami and was left traumatised and injured. Her mother's body was recognised by some local villagers and removed from the pile of unclaimed bodies that were to be buried in trenches. A respectable funeral was organised by the family. She did not feel capable of finishing her education and stayed at home after the disaster. Unfortunately, as her strongest ties lay with her mother, her brother and father severely mistreated her. The government initiated a dole for single women, a small fee to assist them as they recovered from the tsunami, but unfortunately this money was taken by her father. She eloped in January 2005 and lived with her in-laws for a year before being given a house by World Vision, an INGO in Sri Lanka.

She now has two lovely children, a daughter aged 7 and a son aged 3. Her husband works for the Animal Department of the local area, however his income is not sufficient to support the family. To resolve their financial issues, Chaladhi Akki and family share one of the two bedrooms and rent out the second bedroom to a lodger. This means that two adults and two growing children all share one bedroom, which is not an ideal living situation.

The World Vision flats constructed in Hambantota consist of two, four storey blocks of apartments. I personally visited one of the 32 flats in the World Vision project. Each apartment is a decent size, roughly 50 square metres, providing two bedrooms, a living space, kitchen and toilet. A large shared garden space is available for the inhabitants, which also allocates parking. Every family living in the World Vision apartments had at least one member their family who was lost to the tsunami.

QUALITY OF COMMUNITY LIFE, INFRASTRUCTURE AND ECONOMY

Prior to the tsunami, Hambantota was a relatively poor area. After the tsunami, there were a significant number of locals who were given much more than they had to begin with, allowing them to rebuild their lives with more stability. Conversely, with the collapse of the economic sector it was very difficult to find jobs and in many cases people were too injured or found it too demanding to continue working the jobs they had pre-tsunami. Many builders, contractors and fishermen had to find new jobs within their local communities. Skills sets that many had learned in their childhoods were used as fall back options where possible, especially when it came to the reconstruction phase. The tourism sector also suffered badly after the tsunami.

To restore livelihoods, tsunami-affected households require:
- short-term economic opportunities that generate quick cash flow
- replacement of productive assets damaged or lost financial services so that income generating activities are self-sustaining;
- the skills needed to earn a living in the altered economic landscape

- Asian Development Bank (2005), p.57

Although the Cash for Work programs had a negative effect on some cultural aspects of the community, they were very significant in the economic boost they provided for the area. The ADB report suggests that other CFW programs need to be considered for weaker or disable victims as well as women. A lot of focus was required on widows and single women as they were dismissed without a man to represent them. Unfortunately there is a clear gender inequality complex in Sri Lanka, especially in the rural or less developed areas. During the emergency stages of handing out of food packages, without a man representing a family or couple it was very difficult for a woman to come forward alone. Commonly, women are registered under their spouse's name There were also fears of domestic violence rising, a common problem before the tsunami, during the recovery phase due to the sudden increase of pressure on a family or couple. Analysing the relief efforts, looking CFW programs specifically, shows that the recognition and inclusion of women in such programs in essential in boosting them as individuals to allow them to begin to support themselves.

Every Sunday, on the beach in a large open space there was a market. This unlucky coincidence meant that many members of the community were out at the market on that Sunday morning, even more so as it was Boxing Day. The large open space has very few trees and leads towards a road, with a facade of shops and buildings. The distance from the road to the beach is a mere few hundred metres. As the waves came in, many people were left scrambling for their lives, however with so few structures on this beach, the lack of high structures or trees to grab onto was evident - resulting in a lot of casualties. The death tolls show that more women than men died at the cause of the tsunami, ADB anticipated that this was possibly due to the women being inside their homes at the time of the first wave, as well as the fact that men are more likely to have been taught how to swim and / or climb and because of this, would have had a higher chance of surviving.


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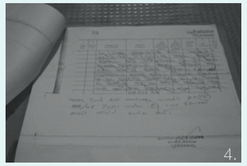
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1: IRESHA, 23, AND HER DAUGHTER 2: TWINS OUTSIDE THEIR HOME 3: WATER SOURCE OF A HOUSE 4: DEATH CERTIFICATE
5: NIROSHA, THE TEACHER AT THE MONTESSORI, AND DAUGHTER, BEVERLY 6: LOCAL HARBOUR 7/8: SUNDAY MARKET LOCATION

ONE OWNER EXTENDED THE KITCHEN SPACE, USING SCRAP OR FOUND MATERIALS

The fishing communities of Hambantota were severely affected by the tsunami, with many survivors having lost their boats. A tsunami typically hits with a number of large waves with small time gaps between five minutes to an hour. In many coastal areas of Sri Lanka, there were two large waves recorded with a gap of about fifteen minutes. Many fisherman were a fair distance into the ocean when the first wave hit, this carried them inland, clinging onto whatever they passed to survive. Those fishermen who were on the beach as the water retreated before the second wave ventured back in to see what they could save of their boats. Unfortunately many lost their lives as the second violent wave hit. With the no build buffer zone, these families had no choice but to move away from the coast and start looking for new means of livelihood.

One of the most remarked upon aspects of the tsunami relief effort in Sri Lanka was the unbelievable lack of coordination in relation to the aid given to fishing communities, which created a troubled framework within the sector. Many fishing boats were donated from a variety of people including INGOs, local organisations and private donors. However, these were incorrectly distributed, with families without fisherman receiving boats and previous fishermen receiving no boat and no other means of compensation (TGLL, 2009). This opportunity was grabbed by countless victims who then tried to sell their boats. A severe mix up also occurred whereby the wrong type of boat was distributed in different areas across the coasts - which could have resulted in overfishing.

"The level of infrastructure in Hambantota is also below national standard. The Sri Lankan 2001 census classified 38% of all dwelling in the district as 'temporary', based on the use on non-durable construction materials – 11% higher than the national average"

- Asian Development Bank, 2005, p.51

The infrastructure was hit hard as well, even though it was comparatively basic. There was an opportunity to redevelop these aspects of life within the district and across Sri Lanka. This opportunity has been taken with pride. Many speculate that this is on account of Mahinda Rajapaksa's personal interest in the area, as previously mentioned. Since the tsunami, the area has undergone major reconstruction and planning. In 2013, and for the first time in 24 years, the Commonwealth Heads of Government Meeting (CHOGM) was hosted by an Asian country: Sri Lanka. This meeting is held every other year allowing leaders of the Commonwealth countries to convene, review and decide on mutual initiatives regarding global issues. It was a great honour and achievement for Sri Lanka to host this event, with major construction efforts focused on infrastructure - particularly the fabrication of roads and highways providing easier access to these areas. The local tsunami victims may benefit from these infrastructure improvements in the future and these could possibly bring new economic opportunities to the area.

"Hambantota has become a political showcase for competing interests' reconstruction effort. While the validity of these claim could not be confirmed, it was clear that the various institutions created in Hambantota bore the unique stamp of the respective political body that has created it."

- Asian Development Bank, 2005, p.56

With Hambantota being a candidate city for the 2018 Commonwealth Games, there are many more plans to develop this area further, with the aim of the city being one of the five future metro cities of Sri Lanka. Funding for this has been focused on investing in transport and communication systems. The beginnings of this can be seen with the improved links across the district, nationally and internationally with the new airport and harbour.

TSUNAMIGAMA A CHILD'S PERSPECTIVE


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2.


3.


4.


5.

1: AN EXCITED GIRL WHO SHARES MY NAME, AYESHA + AYESHA
2: SINDU, CONDUCTING THE WORKSHOP
3: A YOUNG GIRL DRINKING COCONUT WATER, A COMMON DRINK
4: A 5 YEAR OLD CAREFULLY PLANNING HER DRAWING
5: EXPLAINING WHAT I ASKED THEM TO DRAW

During my second visit to Tsunamigama in December 2013, I conducted a workshop with 24 children from the village with an age range of 5-15 years. I asked them to first draw the house that they currently live in, I then asked them to draw the house they hope to live in one day. It was rewarding to see almost 10 children draw houses of roughly the same size, which gives the impression that they are happy with their current home. Some children were very ambitious with drawings of two-storey houses with a car and pool shown. This is inspiring to see as a lot of these children are very intelligent (I was told many stories of children coming first and second in the province in some academic national competitions) and have the potential to succeed which can be viewed as a result of having a stable house and supportive community values instilled through the reconstruction efforts. Culturally, education is of the utmost importance all over Sri Lanka with children constantly pressured to achieve more and it is a gruelling, competitive education system. An older boy of seventeen, Isham Mohamed wrote out his thoughts instead of drawing. He also drew a map of the village, showing access routes and the houses of Tsunamigama.

RIGHT:
A SAMPLE OF FOUR CHILDREN'S' WORK, AGED: 7, 11 AND 14

AN OVERVIEW OF RELIEF EFFORTS: ACEH

The province of Aceh, situated at the tip of the of Sumatra, was one of the worst hit regions in the world. Aceh is located almost 2500km away from the capital, Jakarta. International aid was key in the rebuilding of Aceh as it was such a large task with whole villages being left behind as rubble. There are many similarities between Aceh and Sri Lanka: a recent history of / or ongoing civil conflict, indigenous cultural practices and poverty, providing a strong connection between the two. While the tsunami reconstruction efforts in Aceh instigated peace talks, Sri Lanka recovered with the added tension of a civil war. There were a number of INGOs working in both countries, supplying immediate relief as well as more permanent structures to assist the government and local residents to resurrect the area. Aceh was a very predominant topic in the media following the tsunami, with it being the closest point of land to the epicentre of the earthquake.

"In recognition of the scale of the problem, DEC Trustees agreed to extend the period in which funds could be used from their usual eighteen months to three years. Final expenditure was invested in measures to make communities more resilient to future disasters."
- Brendan Gormely, CEO of Disasters Emergency Committee, Lessons from Aceh, p.5

The case study of Tsunamigama is an example of how a disaster village can be very successful in regards to community life being boosted by the coming together of a variety of individuals from a similar yet different background. This chapter will provide an overview of Aceh's relief efforts alongside those carried out in Sri Lanka, providing an international perspective on the efforts.

After these relief efforts were conducted, the "Journal of Contingencies and Crisis Management" (2008) developed a list of recommendations. It states that community involvement is essential, but it does not necessarily mean that the community is in control entirely, in making key decisions. Any organisations involved in implementing transitional settlements and shelters must consider their capability and links to other sectors. To integrate relief and development with long-term planning, thinking ahead and looking at the bigger picture is crucial.

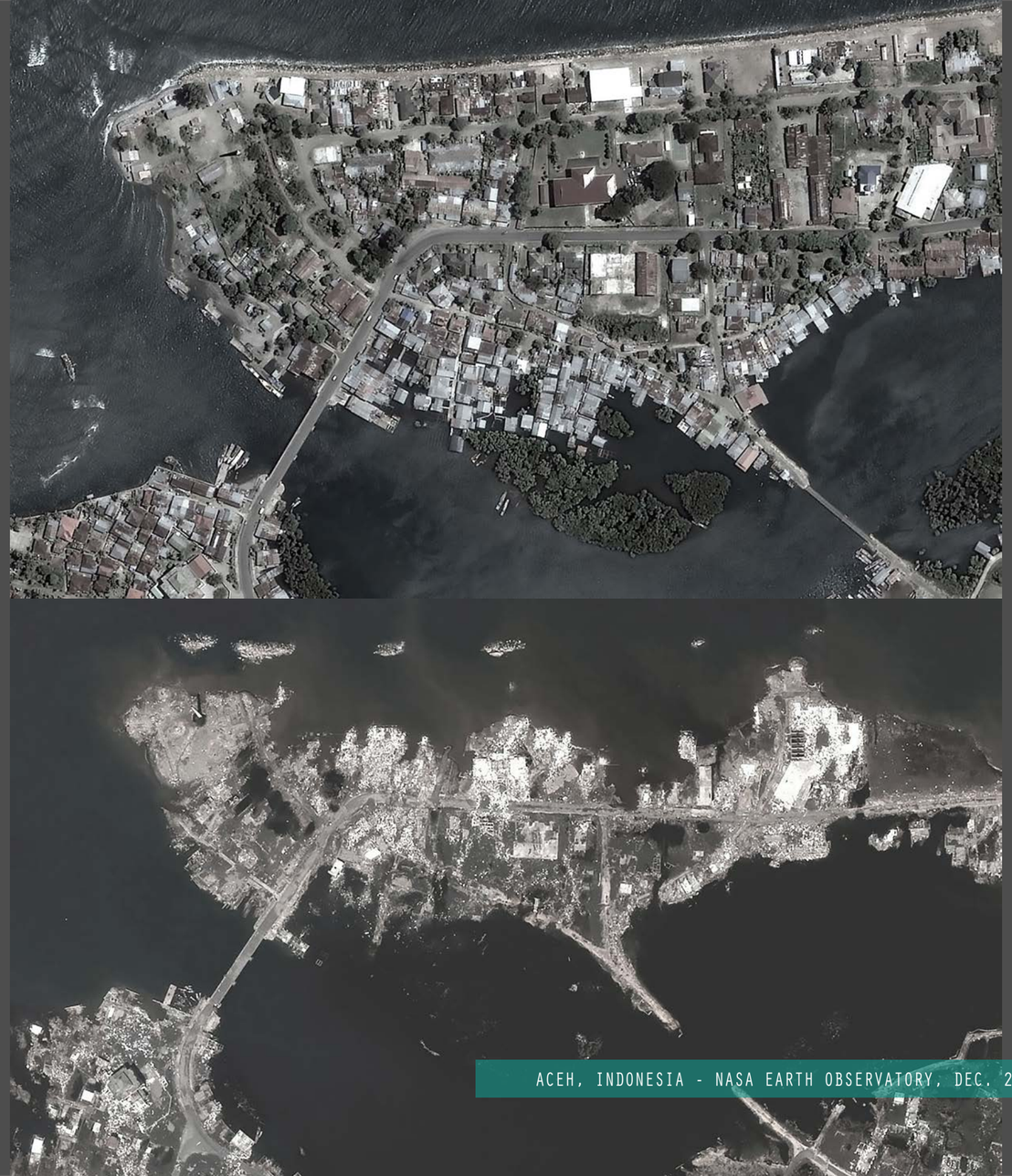
The relief efforts in Banda Aceh were very similar to those in Sri Lanka for the most part, with many common INGOs including as Oxfam, World Vision and the International Federation of Red Cross and Red Crescent Societies (IFRC) contributing heavily. The Needs Assessments were undertaken by the government as well as INGOs and local organisations. At an estimated cost of damage of $4.45 billion, the damage was a staggering 97% of Aceh's GDP (Silva, 2010). With most of the country between Jakarta and Aceh, their governments found it difficult to cope with the coordination of relief efforts. The Rehabilitation and Reconstruction Agency (RRA) was established in April of 2005. The main aim of the RRA was to undertake the master plan for the area, after local governments had been almost rendered powerless after the tsunami.

Within Aceh itself, all relief housing was given a standard size of 36 square metres per family (Silva, 2010). The people affected consisted of a large mix of backgrounds, with the majority being Muslims. One aid agency (a member of the DEC) focused it's effort on the gender inequalities very effectively by insisting that the women were the decision makers for one village. This meant the issue of relocation had to be resolved solely by female members of the community. Once the decision was made to relocate, the lead roles were held by females who also contributed to the participatory planning process. A substantial amount of money was donated to this region, allowing a very rare situation to occur: adequate funding for everyone (Silva, 2010). However, this initiated a rivalry between aiding agencies with each of them justifying how best the money could be spent in their eyes.

Similarly to Sri Lanka, many IDPs were reluctant to move away from their original villages, which is very understandable as everyone is attached to the place they feel is home. However, for some 25,000 unfortunate families in Aceh this move was unavoidable. The land they lived on previously was deemed unsafe, with it assessed as not suitable for reconstruction, being particularly exposed to flooding (Silva, 2010). The demand for local materials was a far outweighing the supply - it was a strain as such large quantities were required in such a small amount of time unexpectedly. There were illegal sources available, however this would have sparked many debates and organisations were reluctant to take this unethical approach. The local construction industry was under tremendous pressure with so many projects beginning at the same time, all requiring to be finished as quickly as possible. Consequently, the industry produced work of a substandard quality. Many locals were left disappointed with the houses presented, with the 36 square metre plan being smaller than many previously owned homes. The local vernacular could not be duplicated in the new build housing as traditional Acehnese housing consists of an intricately carved timber A-frame. This type of house was customary and very different to what was built newly, the locals preferred the old houses. Common types of construction seen in the rebuilding were:

- Concrete frames with a masonry infill: unsuccessful due to being structurally brittle and vulnerable to earthquakes.
- Reinforced Blockwork: hollow concrete block construction, with both horizontal and vertical reinforcement: successful being robust, simple and quick to build, less dependant on workmanship. issues faced: high quality blocks were not available locally and had to be imported
- timber frame: traditional build, houses built on posts to protect against animal attack and flooding. Successes: a familiarity in the vernacular structure. Failures: initially, these were built as transitional shelters. Families realised they were entitled to a permanent house and demand for these quickly fell away.

- (Silva, 2010)



ACEH, INDONESIA - NASA EARTH OBSERVATORY, DEC. 2004

THE POTENTIAL OF SUCCESSFUL ARCHITECTURE WITHIN RELIEF SITUATIONS

Disaster relief as a business has evolved rapidly in the last decade, as more people begin to empathise with others. Although many INGOs and governments have assisted in numerous disaster relief situations over the years, ranging from earthquakes to hurricanes as well as conflicts, there is still a lot to be done in terms of the efficiency of successful disaster relief. Different cultures, lifestyles and beliefs can all affect attempts at reconstruction. Each and every disaster relief situation is different, requiring a tailor-made plan of action including a thorough consideration of what materials and skills are locally available. The sector as a whole has made tremendous progress over the years, but there is still plenty to learn and it is essential the methodologies used are constantly updated.

There are many key skills of an architect which could be incredibly useful in disaster relief situations, the inclusion of an architect to a disaster relief team can particularly benefit vulnerable communities. The idea of rebuilding such communities to prevent severe damage should a natural disaster occur is very promising as this could reduce the death toll in many situations. An example of this is the Port au Prince earthquake in Haiti which affected 3.5 million people, with a death toll of roughly 220,000. Successful relief effort methodologies, in theory, can be derived from previous experiences at this point in time. The people of Port au Prince were already living in susceptible conditions, with structurally unstable structures and severe poverty (DEC, n.d.). Humanitarian architects need to identify communities that may be at risk of earthquakes, situated on or close to the boundaries of tectonic plates, and consider redeveloping these areas by means of workshops with locals, to bring about awareness of how to build safely to avoid the risks of disaster as far as possible. This method should be applied to all forms of disasters and conflict situations.

The technologies used to assess and caution humankind regarding natural disasters are developing swiftly. Are architects responsible for ensuring that our practice and abilities to respond to natural disaster are progressing in a similar way? It may be a personal decision that each individual architect needs to consider for themselves. With the help of those who are truly passionate towards the cause, will architects be able to contribute to building successful and sustainable communities? Architects and engineers are playing a stronger role in disaster aid, in partnership with INGOs. The manifestos of up and coming humanitarian architecture firms may offer an insight into the positive potential for this type of architecture.

The nature of architecture as a profession is highly competitive. Architects continuously strive to achieve excellence, making every effort to design the next innovative and revolutionary building, on a number of levels. The profession is also severely based around the needs of the client. Whilst this is also true for disaster relief efforts, the needs of the user should be the main focus. There are many differences between humanitarian architects and other architects in terms of their thinking within the profession. As architecture students, we naturally look towards the exceptional architects who have designed remarkable buildings, wondering if we will one day be able to leave our mark in the same way. But this idea is not appealing to all architects - some may look at these aesthetically and structurally beautiful buildings still with the same admiration, without feeling the need to follow in the footsteps of those architects. Is it possible that the architectural opportunities to provide for the greater good are not clearly made known to young architects? Or could it be that the profession does not highlight the importance of 'giving back' where possible, which could allow thousands or even hundreds of thousands to benefit from this profession?

With the changing context of our world today, it is important that we are able to adapt. "(Architects) need to consider how better to engage and effectively seek themselves to the international development community. According to Graham only two INGOs directly employ built environmental professionals." (Toale, 2012). This quote is from "Article 25: Building Solutions to Global Problems", Toale goes on to question the sustainability of a career as an architect within the disaster relief sector and states that people are not able to spend more than a couple of years executing field work without having to succumb to the commercial sector to obtain job stability. Is it possible to pioneer a more desirable and sensible architectural career within this sector?

The Sphere Project Humanitarian Charter is widely known in the humanitarian sector. This set of principles is the most established and is recognised internationally. The project was founded in 1997, and constitutes of a worldwide network of humanitarian practitioners and agencies.

"The Humanitarian Charter expresses our shared conviction as humanitarian agencies that all people affected by disaster or conflict have a right to receive protection and assistance to ensure the basic conditions for life with dignity. We believe that the principles described in this Humanitarian Charter are universal, applying to all those affected by disaster or conflict wherever they may be, and to all those who seek to assist them or provide for their security. These principles are reflected in international law, but derive their force ultimately from the fundamental moral principle of humanity: that all human beings are born free and equal in dignity and rights. Based on this principle, we affirm the primacy of the humanitarian imperative: that action should be taken to prevent or alleviate human suffering arising out of disaster or conflict, and that nothing should override this principle."

- The Sphere Humanitarian Charter 2010

Below is a section of the charter, listed as questions to be asked regarding Shelter & Settlement before relief work can commence:

- How many people form a typical household?
- What is the immediate and potential risks to life of the lack of shelter and inadequate shelter, and how many people are at risk?
- What are the potential further risks to lives, health and security of the affected population as a result of the ongoing effects of the disaster on the provision of shelter?
- What household and livelihood support activities typically take place in the shelters of the affected population, and how does the resulting space provision and design reflect these activities?
- What existing materials can be salvaged from the damaged site (if applicable) for use in the reconstruction of shelters?
- What are the typical building practices of the displaced and host populations, and what are the different materials that are used to provide the structural frame and roof and external wall enclosures?
- What alternative design or materials solutions are potentially available and familiar or acceptable to the affected population?
- How can women, youths and older people be trained or assisted to participate in the building of their own shelters, and what are the constraints?

I believe these questions can be critically reviewed by an architect above other professionals, most successfully, as a widespread knowledge of structures is available and an awareness of local vernacular architecture can quickly be analysed and understood. This enables an architect to directly influence the design via customary local practices in the best way to benefit the community.

The key skills of an architect which could surely serve the disaster relief sector include:

- successful, concise and legible mapping

This is an indispensable tool as the creative mind of an architect is able to convey a lot of information in a comprehensive way which can cater for multiple audiences. This is significant as it allows everyone to hold the same information presented in an illustrative manner. This removes any language barriers and victims may feel more comfortable and important when included as part of the reconstruction process.

- spacial awareness

The ability to process contextual information relative to the important aspects of community life (main sources of income, understanding of the area i.e. distance from schools, hospitals, coastlines) and design according to the needs of the user. Simple workshops could be carried out using makeshift models at a large scale to help understand drawings.

- structural awareness and widespread knowledge of materials, possibly even local materials

Being able to investigate local materials and determine how they may perform structurally quickly and efficiently. this would best be done with an engineer on the team, with the details of the construction to be designed and agreed by both parties to enable local skilled workers to assist when building.

ABOVE:
POTENTIAL TO BE ARCHITECTS?
CHILDREN AT THE WORKSHOP IN TSUNAMIGAMA

From the initial stages of Needs Assessments to the final stages of permanent housing, all of these skills can be used profitably. One of the principles of disaster relief which is repeated at every stage is to “ensure that the local community is involved”. The end product ideally establishes an ownership, which instils a sense of empowerment and pride and these feelings can be emphasised if the victims are involved in the process. This self-help method can shape victims for the long-term, the visiting bodies should act as a catalyst to progression as a whole as opposed to providing their own solutions for the problems they face. To successfully work in the field of relief efforts, it is also important for architects to take a step back from how the profession regularly functions and look at the big picture. The well-known proverb “give a man a fish and you feed him for a day, teach a man to fish and you feed him for a lifetime” can clearly be applied here, the solutions to the vulnerable situations one enters must be applied using local skills and brainpower to supply a long term solution. This requires versatility and the capacity to bring people together by having social awareness and by way of communicating ideas through creative processes. Architects are typically socially aware and capable of quickly gathering, reviewing, analysing and conclusively translating social trends, cultural practices and mapping for the benefit of everyone involved.

Personally, after visiting Tsunamigama, although I found it to be a very successful project on the whole, there are a few things which I feel were overlooked. The skills of an architect as previously listed explain a number of aspects which could have been improved upon, most remarkably allowing the same information to be presented to the local communities, governments as well as visiting aid agencies. This provides a way to incorporate everyone into the same process, moving towards total local participation - a commonly raised topic in post-disaster reports. This may not have been the case if there was an architect on the design team for the village. The layout of the entire village was decided at random - when there were funds available, a new house was built on whatever land was available. The lack of a master plan may result in problems being unearthed after the community has settled in to their new homes. For example, Isham Mohamed, a 17 year old living within the Tsunamigama community described how his home has a drainage system running just across the road. This is unpleasant and likely to be unhygienic. A master plan can also ensure to strengthen the community bond with shared open spaces and by providing a common environment for group activities. Without an allocation of land per family, families may not be able to expand their houses if they ever should need or want to do so.

"ALL THAT I HAD EARNED IN THE PAST 30 YEARS WAS LOST IN 30 MINUTES"

- Premananda, tsunami victim, South West Sri Lanka, 2004

To have lost everything you have worked for your entire life and start from the beginning maybe be one of the hardest things an individual can face. Rebuilding after a disaster is a highly complex, taxing and wearing process for everyone, but especially for those who have lived through it. Necessities in our efforts of rebuilding to ensure that everyone will benefit should include spending an appropriate amount of time considering all the facts, and that qualified, socially aware, professionals are key contributors. In providing for the underprivileged, it is unlikely that those receiving these benefits will fully voice their opinions to the world. For this reason, we as architects should always strive for excellence and not compromise the quality of our work regardless of whom we are designing for.

A CURIOUS YOUNG BOY, OBSERVING THE WORKSHOP

ACRONYMS

CARE Cooperative for Assistance and Relief Everywhere

CHOGM Commonwealth Heads of Governments Meeting

CFW Cash for Work Programmes

DEC Disasters Emergency Committee

IDP Internally Displaced Person

IFRC International Federation of the Red Cross and Red Crescent Societies

INGO International Non-Governmental Organisation

NGO Non-Governmental Organisation

LTTE Liberation Tigers of Tamil Eelam

RRA Rehabilitation and Reconstruction Agency, Aceh

WHO World Health Organisation

UNDP United Nations Development Programme

APPENDIX

Faculty of Technology, Design and Environment

Ethics Review Form E1

This form should be completed by the Principal Investigator / Supervisor / Student undertaking a research project which involves human participants. The form will identify whether a more detailed E2 form needs to be submitted to the Faculty Research Ethics Officer.

Before completing this form, please refer to the University Code of Practice for the Ethical Standards for Research involving Human Participants, available at http://www.brookes.ac.uk/Research/Research-ethics/, and to any guidelines provided by relevant academic or professional associations.

It is the Principal Investigator / Supervisor who is responsible for exercising appropriate professional judgement in this review. Note that all necessary forms should be fully completed and signed before fieldwork commences.

Project Title: Life After the Tsunami: Sri Lanka - The Architecture of Disaster Relief
Principal Investigator / Supervisor: Charles Parrack
Student Investigator: Ayesha Issadeen, Student Number: 11077342

1. Does the study involve participants who are unable to give informed consent? (e.g. children, people with learning disabilities, unconscious patients) No

2. If the study will involve participants who are unable to give informed consent (e.g. children under the age of 16, people with learning disabilities), will you be unable to obtain permission from their parents or guardians (as appropriate) No

3. Will the study require the cooperation of a gatekeeper for initial access to groups or individuals to be recruited? (e.g. students, members of a self-help group, employees of a company, residents of a nursing home) No

4. Are there any problems with the participants' right to remain anonymous, or to have the information they give not identifiable as theirs? No

5. Will it be necessary for the participants to take part in the study without their knowledge/consent at the time? (eg, covert observation of people in non-public places?) No

6. Will the study involve discussion of or responses to questions the participants might find sensitive? (e.g. own drug use, own traumatic experiences) No

7. Are drugs, placebos or other substances (e.g. food substances, vitamins) to be administered to the study participants? No

8. Will blood or tissue samples be obtained from participants? No

9. Is pain or more than mild discomfort likely to result from the study? No

10. Could the study induce psychological stress or anxiety? No

11. Will the study involve prolonged or repetitive testing? No

12. Will financial inducements (other than reasonable expenses and compensation for time) be offered to participants? No

13. Will deception of participants be necessary during the study? No

14. Will the study involve NHS patients, staff, carers or premises? No

Signed:

Charles Parrack
Principal Investigator / Supervisor

Signed:

Ayesha Issadeen
11077342
Student Investigator

Date: 24/01/2014

REFERENCES

BOOKS

Tsunami Global Lessons Learned Project (TGLL), (2009), 'The Tsunami Legacy: Innovation, Breakthroughs and Change', Aceh, Tsunami Global Lessons Learned Project

Asian Development Bank, (n.d.), 'Rebuilding Sri Lanka: Assessment of Tsunami Recovery Implementation', Sri Lanka, Civil Society Post-Tsunami Steering Committee,

Silva, J., 2010, "Lessons from Aceh: Key Considerations in Post-Disaster Reconstruction", United Kingdom, Practical Action Publishing

Sinclair, C., 2006, 'Design Like You Give A Damn', London, Thames & Hudson

Hamdi, N., 2010, 'The Placemaker's Guide to Building Community', London, Earthscan

Nicol, B., (2013), "Tsunami Chronicles Adventures in Disaster Management", CreateSpace Independent Publishing Platform, Books 1, 3, 4, 6

JOURNALS + ARTICLES

Pickrell, J., 2005, "Facts and Figures: Asian Tsunami Disaster"
Available at: http://www.newscientist.com/article/dn9931-facts-and-figures-asian-tsunami-disaster.html#.UtrNjGTFK2w
Accessed: 18/01/14

Wickramage, F., 2005, "Don't Burn Tsunami Debris, appeals Fowzie", Daily News LK
Available at: http://archives.dailynews.lk/2005/01/06/new12.html
Accessed: 14/01/14

IFRC, 2000, "Disaster Emergency Needs Assessment", International Federation of Red Cross and Red Crescent Societies
Available at: http://www.ifrc.org/Global/Disemnas.pdf
Accessed: 18/01/14

Stirrat, J., 2006, "Competitive Humanitarianism: Relief and the tsunami in Sri Lanka", University of Sussex
Available at: http://onlinelibrary.wiley.com/store/10.1111/j.1467-8322.2006.00459.x/asset/j.1467-8322.2006.00459.x.pdf?v=1&t=hql9xpjw&s=aa0f399ff5df9946ef6439ec2cd20e303f65b71a
Accessed: 18/01/14

Samarasinghe, S., 2005, "Helping Hambantota Investigation", Lanka Standard,
Available at: http://www.lankastandard.com/vault/helping-hambantota-investigation/
Accessed: 18/01/14

Wright, 2005, "UN failed to coordinate tsunami relief, Red Cross report says", New York Times
Available at: http://www.nytimes.com/2005/10/05/world/asia/05iht-relief.html?_r=0
Accessed: 15/01/14

Ratnasooriya, A.R., Samarawickrama, P., Imamura, F., 2007, "Post Tsunami Recovery Process", University of Morutawa and Tohoku University
Available at: http://jsnds.org/contents/jnds/29_1_3.pdf
Accessed: 18/01/14

IFRC, (n.d), "Emergency Shelter in Natural Disasters", International Federation of Red Cross and Red Crescent Societies
www.ifrc.org/PageFiles/.../Shelter%20in%20Natural%20Disasters.pptx

The Sphere Project, 2011, "Humanitarian Charter and Minimum Standards in Humanitarian Response", Edition 3, The Sphere Project
Available at: http://www.ifrc.org/PageFiles/95530/The-Sphere-Project-Handbook-20111.pdf
Accessed: 18/01/14

Sanderson, D., 2011, "Design Like You Give A Damn", Module U30006, Week 3, Semester 1, Oxford Brookes University

Ching, E., 2011, "Best Practices and Lessons Learned: The Humanitarian Response in Post-Tsunami Sri Lanka", University of Denver
Available at: http://www.du.edu/korbel/criic/humanitarianbriefs/erinching.pdf
Accessed: 18/01/14

Kennedy, J. et al, 2007, "Post-tsunami transitional settlement and shelter: field experience from Aceh and Sri Lanka ", Humanitarian Exchange Magazine
Available at: http://www.odihpn.org/humanitarian-exchange-magazine/issue-37/post-tsunami-transitional-settlement-and-shelter-field-experience-from-aceh-and-sri-lanka
Accessed: 18/01/14

BIBLIOGRAPHY

Hamdi, N., 2004, "Small Change: About the Art of Practice and the Limits of Planning in Cities", Routledge

Kingsbury, D., 2007, "Peace Processes in Aceh and Sri Lanka: A Comparative Assessment", Security Challenges Australia
Available at: http://www.securitychallenges.org.au/ArticlePDFs/vol3no2Kingsbury.pdf
Accessed 18/01/14

Shmulevitch, J., "Ethics and the Architect in Post Disaster Housing Reconstruction", BA Education, Oxford Brookes University

Vaes, B., Goddeeris, M., "A Donor and Owner Driven Reconstruction Approach Construction Delegates", Sri Lankan Tsunami 2004 Lessons Learned
http://www.ifrc.org/docs/Evaluations/Evaluations%202012/AsiaPacific/SLtsunamiReconstructionLessons.BelgianRCF12.pdf

Sinclair, C., 2006, "My Wish: A Call for Open Source Architecture", TED Talks,
CAMERON SINCLAIR: MY WISH: A CALL FOR OPEN SOURCE ARCHITECTURE
Available at: http://www.ted.com/talks/cameron_sinclair_on_open_source_architecture.html
Accessed 15/01/14

The Sphere Project, 2013, "Humanitarian standards in context - Bringing the Sphere Handbook to life",
Available at: http://www.youtube.com/watch?v=xuqFG1Fm1vw#t=27
Accessed 15/01/14

IMAGES

Image, p.6 NASA Earth Observatory, 2004
Available at:
http://news.satimagingcorp.com/2009/09/satellite_images_and_gis_aid_in_tsunami_and_earthquake_disaster_recovery.html

Chapter Title Images:
Introduction, Chapters: 2, 3: Photographs by Imtiaz Cassim, Sri Lanka 2004/5
Contents, Chapters: 1, 4, 6: Photographs by Ayesha Issadeen, Sri Lanka 2013
Chapter 5: J Carrier, Aceh, 2005
Available at: http://www.foto-j.com/#/editorial-portfolio/Web_Portfolio_004

Introduction: p.12-13
Photographs by Ayesha Issadeen, Sri Lanka 2013

Chapter 1: p.14-15
1. Photographs by Imtiaz Cassim, Sri Lanka 2004/5

Chapter 2: p.19
Photograph by Agron Dragaj
2-5. Available at:
http://www.agrondragaj.com/#/sri-lanka/Sri_Lanka_056

Timeout Photos: Asia's Tsunami:
6. Available at: http://img.timeinc.net/time/asia/photoessays/tsunami/reflow/srilanka/stanmeyer/01.jpg

Photograph by Chulie de Silva
Available at: http://chulie.wordpress.com/tag/idps/
http://news.nationalpost.com/2013/10/28/suresh-
7. sriskandarajah-who-pleaded-guilty-to-terrorism-is-a-role-model-ndp-mp-writes/

8. Photograph by Helen Kudrich
Available at: http://www.wfp.org/photos/sri-lanka-mullaitivu-november-2005-food-work-1

Chapter 2: p.19
Article by Stuart Bell, 2013
Available at: http://news.nationalpost.com/2013/10/28/suresh-sriskandarajah-who-pleaded-guilty-to-terrorism-is-a-role-model-ndp-mp-writes/

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Images by Digital Globe, 2004
Available at: http://www.unep.org/tsunami/Information_Requirement/PhotoGallery/photogallery.asp

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