Can Architects Contribute to Making a Difference in Post-Disaster Reconstruction? Post-Disaster Housing and the Role of Architects: a Case Study in Rural South India.

First author: **Gertrud Tauber**, PhD student, TU Darmstadt / Email: gerti_t@yahoo.com

Abstract[1]

The key to the acceptance of post-disaster houses lies in meeting the peoples' wishes and needs, and in integrating local know-how into the course of the project process (a premise intensively discussed in theory). After the tsunami of 2004 many NGOs appointed architects, assuming that these professionals would be qualified to facilitate the implementation of people-oriented houses (and villages). In this intricate set-up, however, most NGOs ignored the importance, as argued here, of defining precisely the architect's role and his/her scope of work. This research examines three housing projects implemented by local NGOs and planned by local architects after the Indian Ocean tsunami of 2004 in rural South India (Tamil Nadu and the Union Territory of Puducherry). However, their approaches and the architects' scope of work vary significantly. A comparative analysis examines three different project processes (within the same legal and cultural framework), seeking to comprehend the villagers' perspective on the projects' process, the projects' outcome and the villagers' perception of an architect's role. Five phases of each project are studied, juxtaposing what and how things were done by the architect with the results obtained in the village. This seeks to illustrate that in a, predominantly, hegemonic context villagers need a 'mediator' advocating between two divergent cultures of knowledge: the 'local' and the 'modern'. Yet local aspirations and know-how with regard to housing need to be identified, translated and incorporated into the course of the project process. Architects, as discussed here, can be a valuable resource. However, it will be argued that a key element is, among others, a strategic interplay of the 'right' personnel in the course of a complex project process, and not necessarily the appointment of an architect. Primary data for this study was gathered through household questionnaires (110); informal interaction; participant-observation (work assignment: 2.5 years; field survey: 4 months); semi-structured interviews (NGO representatives and project architects). Secondary literature was studied on post-disaster housing and cultures of knowledge.

Keywords: Permanent post-disaster housing, NGOs and role of the architect, clash of 'local' (villagers) and 'modern' (providers) cultures of knowledge.

---

[1] The empirical data presented in this paper constitute part of my doctoral thesis (in progress) with the working title: '*The Role of Architects in the Context of Post-Disaster Housing'.* The field-results obtained in three villages reconstructed after the tsunami of 2004 in South India provide the basis (first part) of my PhD. The second part will then examine how these findings challenge the designing of project processes, and the architect as 'expert'.

Introduction

This paper is based on a recent field-survey of three different housing projects carried out by local NGOs following the Indian Ocean tsunami of 2004 in rural Tamil Nadu and the Union Territory of Puducherry. Each project, it was claimed, built people-oriented and sustainable houses. Architects were appointed for the three projects, as it was expected by the NGOs involved that the inclusion of these experts would lead to people-oriented projects. However, four years after completion, the author found that this expectation was unfulfilled in two of the three case studies. The plots and houses were too small, the layout and the rooms provided inadequate, the construction of poor quality, and the sanitary facilities and new technologies put in place unsuitable. In short, two of the projects failed to meet the villagers' needs and thus the goals formulated by the NGOs. Hence, the key question in this context is, are architects the best response?

The demand for professionals of the built environment has been growing in the past ten years due to the increase of large-scale, post-disaster housing programmes in various regions all over the world.[2] Since the tsunami of 2004 the profession of the architect has been 'recognised of critical value to long-term recovery.' (Harris, 2011: 16). At the same time, however, a controversial debate about the role of this profession has emerged. Sanderson (2010) stated that architects are the last people needed in post-disaster reconstruction as their traditional role and knowledge in the building industry is inappropriate for humanitarian responses. Zetter *et al.* question the role of the architect by defining the action of place making as 'not just the domain of the powerful or of design professionals' (2010: 210). De Soto suggests that the role of the architect in the context of post-disaster housing is to 'interpret the ways of living of affected residents and the housing typologies of disaster-affected areas, to analyse those ways of living and those typologies and to translate them into technical, organizational and design solutions capable of promoting long-term development' (2010: 24). Boano *et al.* argue that the disciplines of architecture and urban design provide 'significant power to reconstruct social networks, raise solidarity, empower communities and encourage partnerships' (2010: quoted in Boano *et al.* 2011: 306). As in most post-disaster scenarios, the relationship between decision makers (including professionals) and the people is constituted by the knowledge and the categories defined by those in power (see Foucault 1971, Hobart, 1993, Turner, 2009)[3] Boano *et al.* discuss the potential of 'experts as translators' who aim to 'include the voices of those excluded by dominant forms of knowledge' (2011: 295).

Acknowledging the ability of architects to 'adapt in intricate contexts'[4] this paper aims to contribute to the debate by analysing the potentials (and limitations) of this professional in rural post-disaster scenarios. The following questions will be addressed: in which set-up can the appointment of an architect be an appropriate response; which critical parameters need to be considered when assigning an architect; and, by which criteria should the architect's role and the scope of work be defined so to enable the realisation of people-oriented housing?

---

[2] Some examples of post-disaster large-scale housing programmes undertaken within the past 10 years are: the Bam/Iran earthquake 2003, the Indian Ocean tsunami 2004, the Pakistan earthquake 2005, the Pakistan floods 2010, the Chile earthquake 2010, the Haiti earthquake 2010, and the Japan tsunami 2011.

[3] Hierarchical structures of large-scale housing projects are not only an issue in the context of post-disaster housing in so-called developing countries. 'Who decides what for whom […]' with regard to housing and human settlement is, according to Turner (2009: 11), a central question in so-called developing and industrialised countries alike.

[4] Interview with Cameron Sinclair, Co-Founder and Director of the American NGO Architecture for Humanity, 18.07.2011 (Skype).

For this study three rural housing projects implemented by local NGOs (and planned by local architects) were identified. However, the architect's scope of work and his/her role in the course of the project cycle vary significantly from the 'project management consultant', to the 'draftsman', and the 'surveyor-anthropologist'[5]. Five phases of each of the project will be examined juxtaposing what, in which phase and how things were done by the project architect with the results obtained in the village.[6] In doing so, it will, first of all, seek to highlight which of the three operational designs and which of the three architects were – from the villagers' perspective – a 'success'. Secondly, the study will highlight critical themes raised by the villagers and to what extent they fall within the architects' realm. In addition, it will explore which of the five project phases are critical and why. Finally, it will consider if, and how, architects can play a role.

Locating the field:
The opportunity to do research in rural Tamil Nadu and the Union Territory of Puducherry provided an arena in which the impact of post-disaster housing could be studied across a range of different projects.[7] Many projects were implemented as a public-private-partnership (government/NGO). However, NGOs were free to develop the Master plan of the new village and the layout, the design, and the construction technologies of the new houses. The government, on the other hand provided new land (in the case of relocation) and infrastructure services such as roads, electricity and water. The NGOs did not have to follow a model-house design predefined by each respective government.[8] A variety of process designs was possible within the same legal context. Hence, this region proved to be ideal for the research focus of this study.

Research Method:
The case histories presented in this paper illustrate different operational designs and different roles for the architect. Information for each of the projects was obtained from a three-stage research plan. The first stage involved studying secondary material, selecting the case studies, making contact with NGOs' key-personnel and getting prepared for the field survey (the preparation of the household questionnaire and semi-structured interviews). The second was the field survey itself (from November 2011 to March 2012), collecting quantitative and qualitative data by means of a household questionnaire, participant-observation, informal interaction[9], and

---

[5] It was found important to name the different types of architects respectively to highlight possible roles. The name 'project management consultant' was given by the relevant NGO (see Caritas India, 2005: 3). The names 'draftsman' and 'surveyor-anthropologist' were given by the author based on their scope of work for that particular project.

[6] The five phases in the course of the post-disaster housing programme in the context of this research were: programme formulation (definition of legal parameters of the master programme of reconstruction); project formulation (definition of parameters for the respective project); planning (master plan for the village and house plan); construction; and, finally, post occupation (houses inhabited).

[7] In Tamil Nadu an overall of 89,206 permanent houses were planned for reconstruction, and 7,670 houses for repair. This stock was divided into two phases. 53,562 houses were reconstructed/repaired in a first phase, out of which 32,552 houses were constructed by NGOs (Government of Tamil Nadu 2005: 49). In the Union Territory of Puducherry NGOs constructed 10,131 houses (out of 12,380 in total) (Government of Puducherry 2006).

[8] In the states of Andhra Pradesh, Kerala and the Union Territory of the Andaman & Nicobar Islands NGOs providing houses had to follow a model house predefined by the respective government.

[9] As I do not speak Tamil, the field-survey was conducted with the support of five PhD students from the Department of Social Work, Pondicherry University, Puducherry. In total, 110 household questionnaires were collected in the following hamlets: 40 in Keezhakazakudy-Tsunami Nagar, 30 in Shanmuga Nagar and 40 in Tarangambadi-Tsunami Nagar. The results presented are descriptive (Bortz et al., 2006: 25) and they are relevant only for the households

semi-structured interviews with NGO representatives and project architects. The final stage was the screening, computing and analysis of quantitative and qualitative data, as well as the preparation of tables and diagrams.

Selection Criteria for the Case Studies:

Having studied substantial secondary material, it became evident to the author that the case studies should not be taken as representative of the number of projects implemented in that region. Rather, they illustrated diverse approaches, the different profiles of project architects and their respective results (based on the villagers' feedback) within the same legal, political and cultural context. Thus, the criteria upon which the selection was based, were: (a) location, rural; (b) type, the new construction of permanent housing; (c) provider, an NGO; (d) planner, an architect; e) goal, people-oriented; (f) status, completed and occupied.

The three case studies selected are located in the most affected districts of rural Tamil Nadu and the Union Territory of Puducherry. Case 1, Keezhakazakudy-Tsunami Nagar, is located in Karaikal district. Case 2, Shanmuga Nagar, is situated in Cuddalore and case 3, Tarangambadi, in Nagapattinam district.
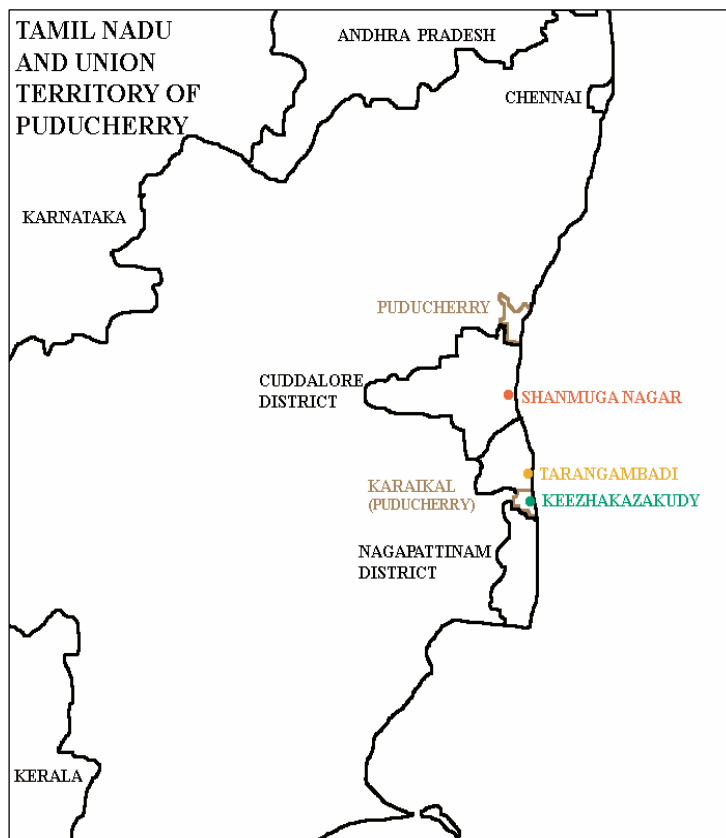

Fig. 1: Location of the three case studies

Case 1: The Project Management Consultant (Keezhakazakudy-Tsunami Nagar)

Context and Objectives:

After the tsunami of 2004 the local NGO PMSSS[10] decided to venture into post-disaster housing and signed a Memorandum of Understanding (MoU) with the Government of Puducherry. Thereby, PMSSS agreed to enter into a public-private-partnership for the construction of 200 permanent houses for the villagers of Keezhakazakudy-medu at a new site, named Keezhakazakudy-Tsunami Nagar. The NGO was responsible for developing the Master plan of the new site, for designing the new type of house and for the construction of the houses. The goal formulated by PMSSS for this project was the construction of 'people-oriented houses and good quality homes.'[11] To achieve this objective an architect – the project management consultant (hereafter PMC) – was appointed and was 'responsible for handling the shelter programme throughout the various phases.' (Caritas India 2005: 3)

Project Organisation:
A local architecture firm, based in Puducherry, was assigned for this project and the scope of work was defined as follows:

	PHASE I Programme formulation	PHASE II Project formulation	PHASE III Planning	PHASE IV Construction	PHASE V Post-Occupation
ARCHITECT / P MC			Conceptual design Master plan House design Tender documents/ cost estimation Pre-selection of contractors	Quality control Progress of work Certificate of completion	

Table 1: The scope of work of the project management consultant

A village-housing-team was formed by PMSSS that should have, on behalf of the entire village, interacted with the PMC during the course of the planning stage, namely in phase III. The Master plan that was developed followed the concept of clusters. One type of house was designed for the entire village. The project was built by two local contractors and completed in December 2006. The houses were allocated to the villagers through lot only after the completion of construction.

The Villagers' Voices after Four Years:
'I don't know the architect who planned our village. I have never seen him. Only after construction was completed did I get to know which would be my house. I could not share my wishes with him. The house is much smaller then my old one. They forgot a puja room[12] and they did not provide space for cooking outside! No woman in the village cooks inside the house, because of the smoke. No one in our village would build a pucca house without a puja room. If I could choose who to

---

[10] Pondicherry Multipurpose Social Service Societies, registered in Puducherry (member of the Caritas Network).
[11] Interview with the former director of PMSSS, 12.12.2011, in Neyvelli (TN).
[12] *Puja* room: prayer room

Based on the data obtained in the village, eight aspects of the project were identified as unsatisfactory (or a failure): (1) the list of beneficiaries (unjust allocation of houses); (2) the technology used (climatic condition inside the house); (3) the sanitary facilities (the location and technology); (4) the size of the plot (too small when compared with the old plot); (5) the size of the house (too small when compared with the old house); (6) the house plan (the layout and façade); (7) the quality of construction materials; and, (8) the quality of construction.

The table below illustrates the breakdown of responsibilities and the results obtained in the villages (from 40 household questionnaires). The grey columns illustrate the PMC's responsibilities as defined in the contract (see Table 1, p. 5).
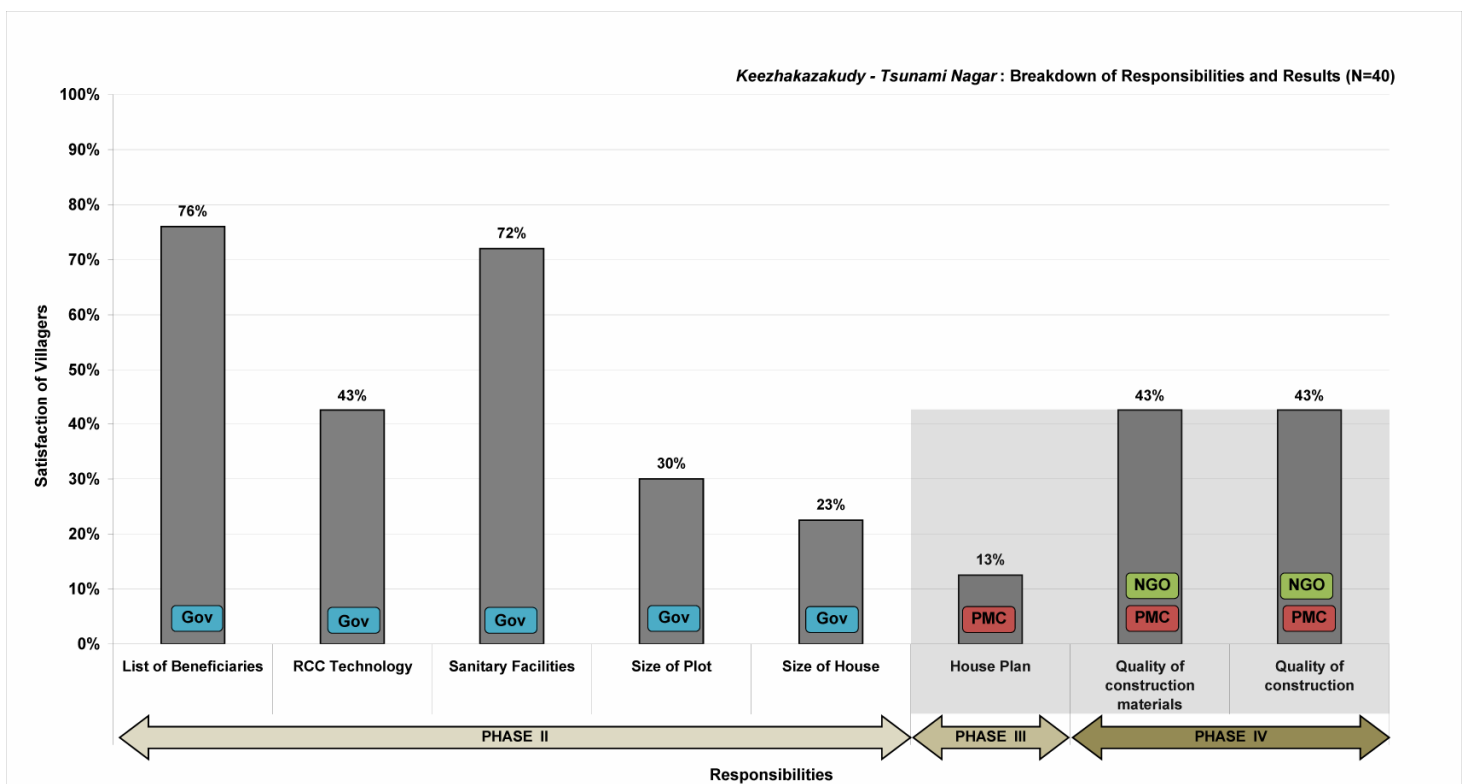

Table 2: Breakdown of the responsibilities and results in Keezhakazakudy-Tsunami Nagar

Case 2: The Draftsman (Shanmuga Nagar)

Context and Objectives:
The locally-registered NGO Bless had already been working with the community living in Shanmuga Nagar for many years and came forward to construct 62 new dwellings (31 semi-detached houses) on the same site. The conception of the masterplan, the design and the construction of the new houses, including sanitary facilities as well as a community hall, a

---

[13] A fisherwoman in Keezhakazakudy-Tsunami Nagar, 19.12.2011.

balvadi[14] and some shops were all taken on by Bless. The government, on the other hand, was responsible for the provision of electricity and water. The goal formulated by the funding agency was the construction of a 'good house for them [the Irulas] using an alternative technology and saying no to RCC [reinforced cement concrete].'[15] Bless decided to work with Compressed Stabilised Earth Blocks (hereafter CSEB) developed by the local research institute, the Auroville Earth Institute.[16]

Project Organisation:
A locally-based architect was appointed who, however, had never worked with this technology before. Hence, the architect attended a training course at the Auroville Earth Institute and the scope of work for the architect was defined by Bless, as shown in the table below.

	PHASE I Programme formulation	**PHASE II** Project formulation	**PHASE III** Planning	**PHASE IV** Construction	**PHASE V** Post-Occupation
ARCHITECT / DRAFTSMAN			Master plan Adaptation of house plan to CSEB Cost estimation Demarcation of new village layout		

Table 3: The scope of work of the draftsman

Preparatory work and planning were completed after eight months. Skilled masons were appointed for the construction of the houses and the villagers were engaged as unskilled labour producing the earth blocks. During construction, the families lived in temporary huts right next to their new houses. The project was completed and occupied by the people of the village in June 2007.

The Villagers' Voices after Four Years:
'With these new houses we struggle a lot. We are not able to repair the leaking roofs and the walls as we do not have the tools and the financial means. When cyclone Thane[17] hit, we were evacuated as water entered the houses. For several days we had to stay in a school nearby. When coming back, the water was gone. However, our floors and walls were still damp. We never wanted such houses. We asked for a normal house made out of bricks and plastered. However, we had no say. Who would I like to build the house with? Either with my family members, as we used to do, or with the mason.'[18]

---

[14] *Balvadi*: nursery school.

[15] This project was funded by the French NGO Solidarité (based at Puducherry). Interview with the director of Solidarité, 15.12.2011, in Puducherry.

[16] This technology has already been implemented in various post-disaster projects in India and beyond. See also: http://www.earth-auroville.com/ (20.11.2012)

[17] This village, among many others, was badly hit by cyclone *Thane* on 30th December 2011. The field survey was started three weeks later, on 21st January 2012.

[18] Informal interaction with an Irula woman in Shanmuga Nagar (22.01.2012).

In Shanmuga Nagar the field survey revealed seven aspects of the project as unsatisfactory (or a failure): (1) the CSEB technology[19]; (2) the sanitary facilities (unfamiliar with the technology); (3) the size of plot; (4) the size of house; (5) the house plan (semi-detached houses/layout/design); (6) the quality of construction materials; and, (7) the quality of construction. The table below shows the breakdown of responsibilities and the results obtained in the village (from 30 household questionnaires). The grey columns show the draftsman's scope of work.
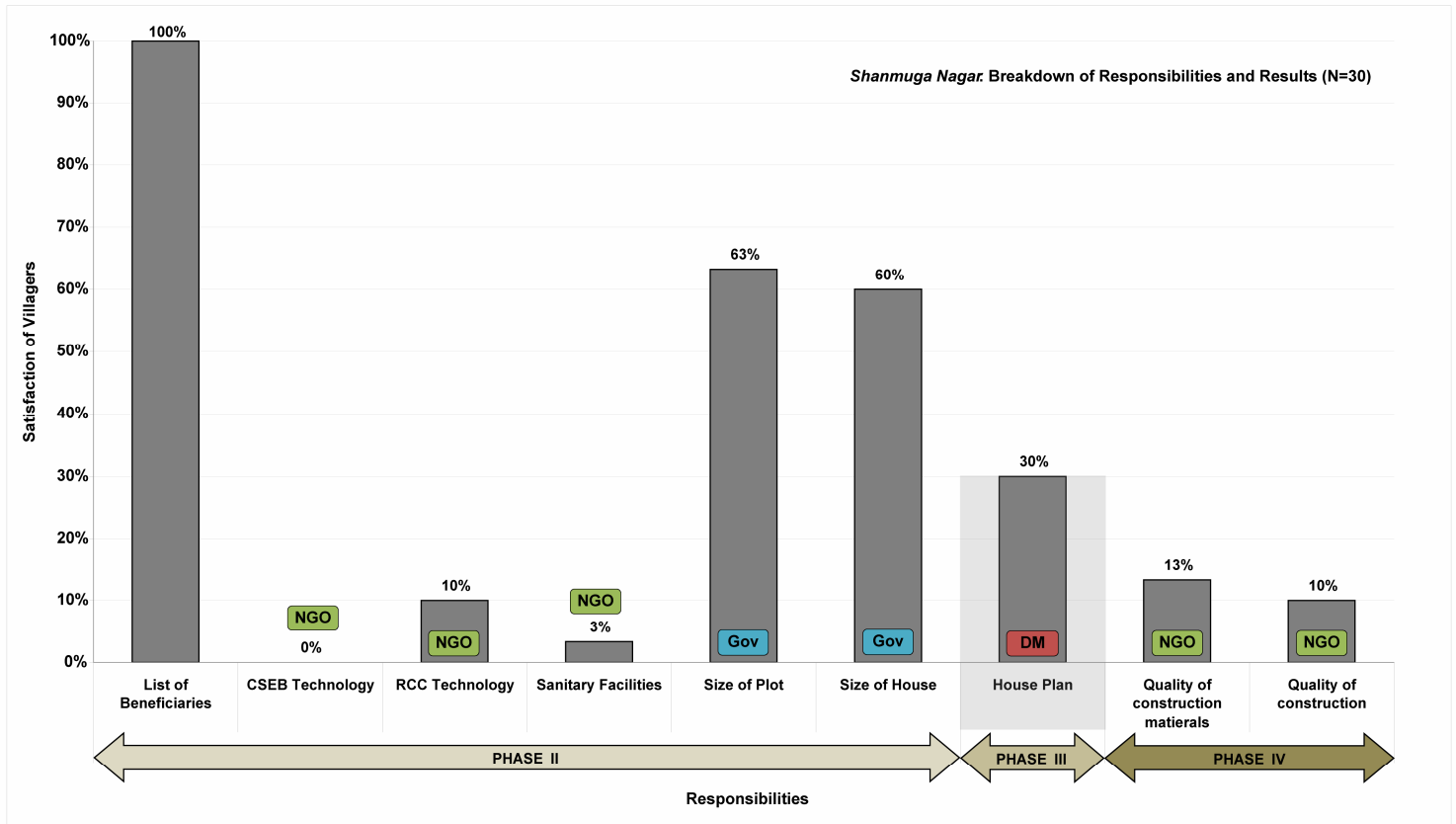

Table 4: Breakdown of responsibilities and results in Shanmuga Nagar

Case 3: The Surveyor-Anthropologist (Tarangambadi)

Context and Objectives:
The Kerala-based NGO SIFFS (the South Indian Federation of Fishermen Societies) decided to venture into post-disaster housing in Tarangambadi, the most affected village in Tamil Nadu, constructing 1,091 houses. Its response was conditioned by the fact that it had an ongoing relationship with many of the affected communities through its work with artisanal fishermen/women. SIFFS's aim for this project was to overcome the limitations caused by three aspects typical of this type of project, namely 'callousness towards community perception, lack of attention to individual needs, and contractor-driven method which pre-empted the possibility of peoples' participation in the process' (SIFFS 2009: 6).

---

[19] Out of 62 houses, three were constructed in RCC as model houses. The villagers hoped, initially, that they would get this type of house. These houses were not affected by cyclone *Thane* in December 2011. The results in Table 4 illustrate that the villagers living in the houses made out of RCC are satisfied.

Project Organisation:

To achieve this aim, two critical aspects were examined beforehand: the order issued by the government; and, the villagers' wishes and needs regarding the new village and the new house. SIFFS expressed its concerns with regard to the government's order. Thus, along with traditional *panchayat*[20] leaders and the fishermen/women of Tarangambadi*,* negotiations with the government led to changes to the order. However, confronting the government with new parameters was only possible with a comprehensive data-set, so it was decided to carry out habitat mapping, and during the course of this to identify the villagers' aspirations and local know-how. From this, the scope of work of the locally-based architect was defined, as shown below.

	PHASE I Programme formulation	**PHASE II** Project formulation	**PHASE III** Planning	**PHASE IV** Construction	**PHASE V** Post-Occupation
ARCHITECT / SURVEYOR-ANTHROPOLOGIST		Detailed village survey of: damage, topography, socio-economic, local know-how, resources, architectural data, size and use of private spaces, use of common spaces, preferences regarding reconstruction in-situ or relocation	Comprehensive Master plan for "old" and "new" village (in-situ and relocation) Customised house plans Construction technology Cost estimation		

Table 5: The scope of work of the surveyor-anthropologist

The habitat mapping took eight months.[21] One of the results was that the villagers could choose if they wanted their house to be constructed in-situ or be relocated to the new site close by, named Tarangambadi-Tsunami Nagar. For either option the NGO offered full support (technical and financial). In total, based on the results of the habitat mapping, six model houses were developed, constructed and adapted during the course of 'face-to-face interviews with the villagers' (SIFFS 2009: 21). Due to its size, the project was completed in several stages. Before starting construction, however, a house was allocated to the villagers based on their preferences with regard to neighbourhood.

The Villagers' Voices after Four Years:

---

[20] Along the Coromandel Coast, almost every village has a *panchayat* of nominated members or elected members who represent the various lineages, headed by a man called *chettiyar* or *naddar*. This council, which consists wholly of adult males, is closely tied into a system of village membership and decision-making. Important matters are decided upon consensually in the context of the village meeting (Bavinck 2003: 650).
[21] A team of architects (graduates and students) and a social team in charge of this survey were based at Tarangambadi for the entire period of the survey.

'We were lucky that this architect worked on our project. Many things are well done. However, there are some things that could have been done much better. For example, the orientation of the bathroom and the toilet. They should not face the neighbour's house. We had to build compound walls. And then there is the quality of construction which is, in some cases, poor; better of course than in many other villages that we saw, however, not always satisfying. Who I would like to build my house with? I would call this architect again, if he would like to plan a single small house. I would tell him about the toilet and the quality. But I think he goes for big projects in cities only. So, I would call the mason.'[22]

In Tarangambadi-Tsunami Nagar the villagers named three aspects which were unsatisfactory: (1) the RCC technology (the climate inside the house); (2) the quality of construction materials; and, (3) the quality of construction. The following table illustrates the results obtained at village level (from 40 household questionnaires). The grey columns highlight the surveyor-anthropologist's scope of work.
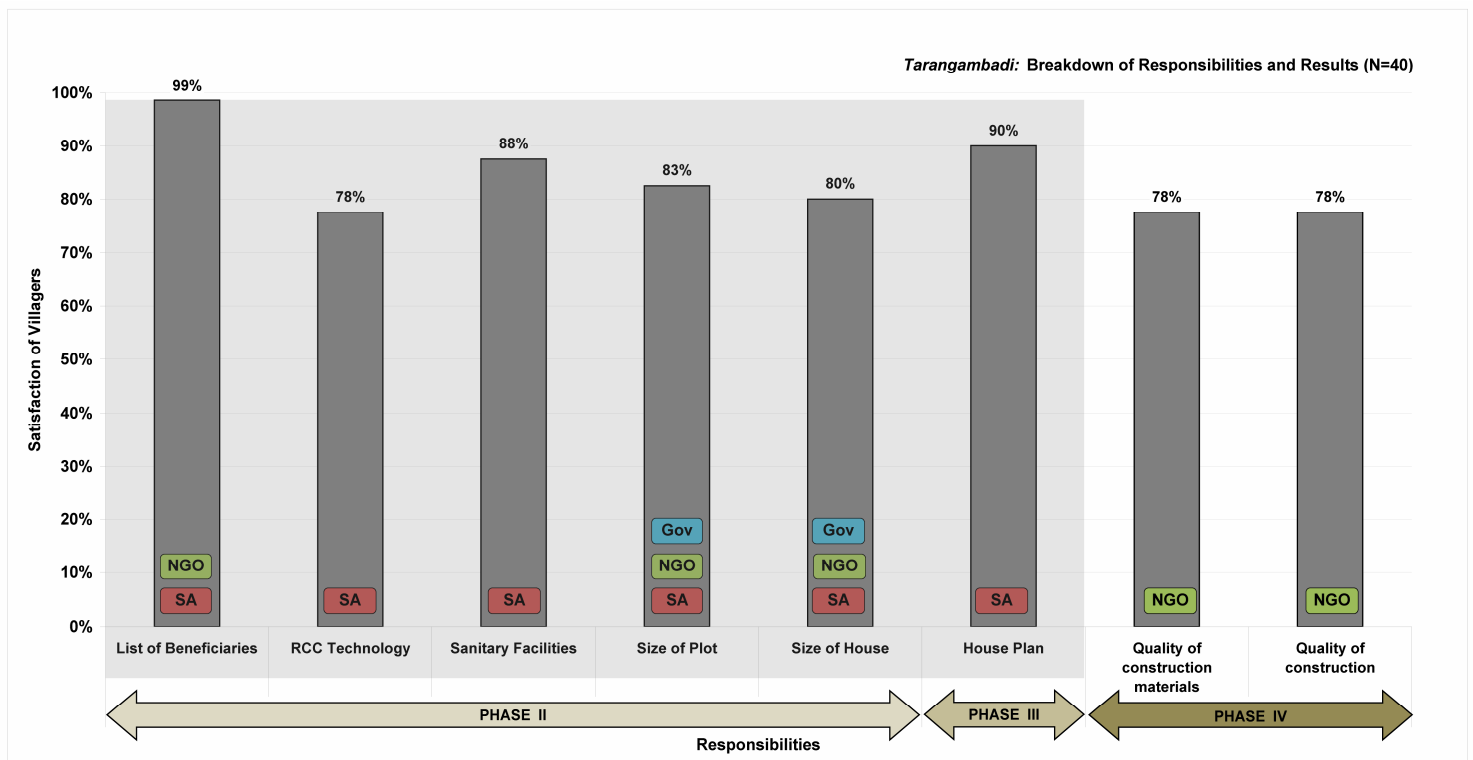

Table 6: Breakdown of responsibilities and results in Tarangambadi –Tsunami Nagar

Discussion

'Having an understanding of the character of rural habitations and their internal structure is an essential prerequisite for the successful formulation and implementation of any programme of rural development, especially those concerning the physical environment.'

(Chandhoke, 1990: 1)

As has already been discussed, many NGOs expected architects to be the key to realising people-oriented projects. However, as the results demonstrate, this expectation was fulfilled only in one

---

[22] Informal interaction with a fisherman in Tarangambadi-Tsunami Nagar, 29.12.2011.

of the three cases presented here. While the 'surveyor-anthropologist' received the highest level of approval, the 'draftsman' and the 'project management consultant' failed to meet the villagers' needs and aspirations (see following table).
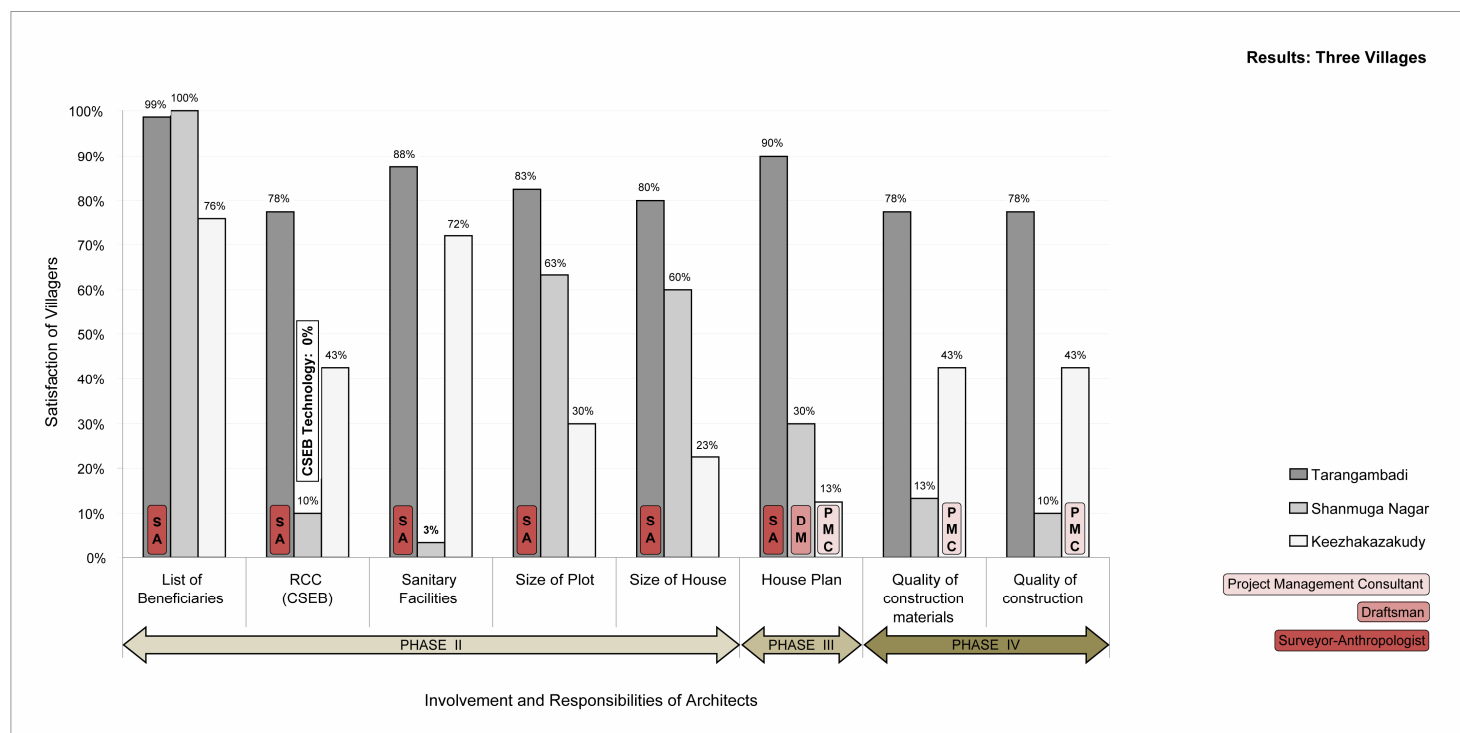

Table 7: Comparison of the results of the three villages

The case studies illustrate that the architect's role and his/her scope of work can take on a number of forms in the context of post-disaster reconstruction. However, as the data indicates, appointing an architect does not necessarily lead to the realisation of people-oriented housing. Rather, as two of the case studies highlight, architects appear to be of no relevance. What are the reasons? The findings suggest that there is little knowledge of the process-related dimension of the relationship between the village, the architect and the decision makers, and of the relationships between the various project phases in this particular set-up. Most NGOs, first of all, ignored the fact that, in this intricate reality, a pre-modern, modern and post-modern society with diverging knowledge- and building-systems (housing needs, values and construction cycles) clashed; the 'modern' (providers) with the 'local' (villagers)[23]. Coastal cultures and habitats were labelled as backward (see also Subramanian 2009: 248) and decision makers (of public and private entities) formulated parameters, without any prior assessment of 'local' aspirations, pushing for the 'modernisation' of rural housing. Moreover, NGOs were ignorant about rural housing systems and practices followed in normal times: it is the mason (depending on the economic situation of the family), and not the architect, who plays a vital role. Thus, in the context of post-tsunami reconstruction most architects were perceived as 'outsiders'[24], lacking

---

[23] The vast existing literature uses different terms for the various cultures of knowledge. In this study the terms 'modern' and 'local' are used. They are intended to describe a condition and not to evaluate the competences of the two different cultures of knowledge.

[24] Interview with Rajendra Desai, Co-Founder and Director of the Indian Architecture Studio Citizen Architects, Ahmedabad, 22.12.2011 (Skype).

the villagers' confidence, a fundamental prerequisite, however, for a successful implementation. As the 'mediator' (Rieger-Jandl, 2005) or, according to Boano *et al.* (2011), the 'translator' between those in power and the villagers was the missing link, in most cases, the use of unsuitable parameters and inappropriate assigning of architects were the result.

It would be foolish to formulate a single theoretical model for the project process, or a single role for an architect, and to imply that this results in 'better' projects, 'since there are many notions of what is 'better' as there are participants and as there are contexts' (Davidson *et al.* 2007: 112). The data, though, demonstrates that, in a set-up as portrayed here, there is a urgent need for someone to fill the gap. In phase II, the entire project approach is designed and the parameters defined at that point, ultimately, have major implications for phase III, phase IV (see Table 8) and, finally, for the villagers' level of satisfaction. For example, the size of the plot affects the masterplan, and the relationship between public and private space significantly. This parameter was, among others, defined by the government. The government had stipulated a housing density of 25 per acre. Each house was to be built on three cents[25] (121.40m²) in rural areas and the balance of 25 cents (1,011.67m²) was to be assigned as common space. This order was not accepted by the NGO SIFFS, as the data obtained through the habitat mapping carried out in the old village by the surveyor-anthropologist showed, 'that the requirement of common space was much higher and hence, in Tarangambadi the house density was fixed at 20 per acre' (SIFFS 2009: 14). The villagers' degree of satisfaction regarding the house plan, as found in this study, was strongly linked to the fact that the relationship between private space and common space reflected that of their old village.

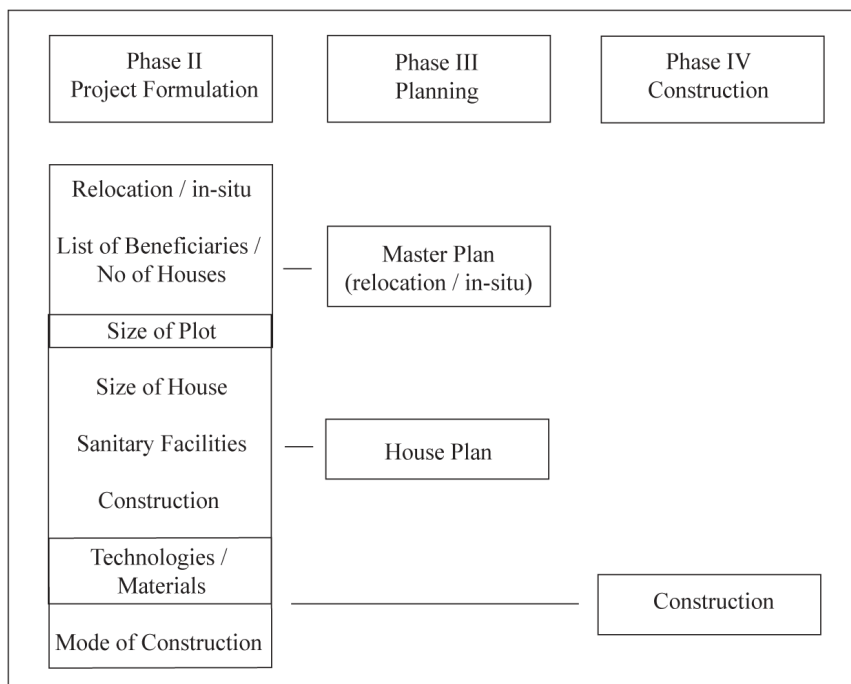| Phase II Project Formulation	Phase III Planning	Phase IV Construction
Relocation / in-situ List of Beneficiaries / No of Houses	Master Plan (relocation / in-situ)	
Size of Plot		
Size of House Sanitary Facilities Construction	House Plan	
Technologies / Materials		Construction
Mode of Construction		

Table 8: Formulation of the parameters and implications of Phase III and Phase IV

Hence, as argued here, it is critical that the local context is assessed thoroughly prior to the formulation of the following parameters: (1) a list of beneficiaries/number of houses; (2) whether reconstruction should be in-situ or a relocation; (3) the size of the plot; (4) the size of the house;

---

[25] 1 cent is equivalent to 40.467m².

(5) the sanitary facilities; (6) the construction technology and materials; and, (7) the mode of construction. How can this be achieved?

The results obtained in the case of the surveyor-anthropologist indicate a promising approach. Thereby, the NGO SIFFS assigned the architect a role that went far beyond mere technical, managerial and design tasks (see table 5). The NGO formulated a strategy that took into account the village's 'cultural, economic, technical and political dimensions' (SIFFS 2009: 6). Habitat mapping was the main tool used to achieve that goal. The data obtained was used to transform the government's order and to design the entire project process. In the course of the survey, methods from various disciplines were combined. Anthropological[26] and sociological techniques were applied to explore the cultural aspects of housing (and the village), and to assess local resources as well as the socio-economic situation. Techniques from the fields of geology and land surveying were used to study the topography of the village and the surrounding area, and to identify risk-zones. Architectural data was gathered by surveying the foundations of the houses left after the tsunami, and from the descriptions of the inhabitants. From this, important parameters were identified, categorised and incorporated into the planning of new types of houses. In short, the habitat mapping comprised: damage-, socio-economic- and resource-mapping; architectural data; visual documentation; and a list of the villagers' preferences regarding reconstruction in-situ or relocation and neighbourhood. Changes to the government's order were possible only because of the availability of this complex data-set giving insight into, and offering solutions to, technical and cultural challenges. Thorough damage assessment, for instance, brought down the number of houses to be constructed substantially.[27] Furthermore, the mapping revealed that relocation to the new site identified was not at all a guarantee of safety, as certain areas within the new site were inundated frequently. Based on the outcome of the 'hazard mapping' (SIFFS 2009: 9) a new construction site was identified. In addition, villagers could opt for a new house at the new site or, if they preferred, a new house at another spot in the old village. Also, the construction mode (phase IV) was based on the outcome of this survey, as local knowledge and resources were assessed as a part of it. The conduct of NGO staff in charge of procuring and storing construction materials, contracting labour, local masons, and local unskilled labour was found appropriate in this particular context. The architect, for instance, did not play any role in this: however, a team of engineers was assigned responsibility for the supervision of the quality of materials and the construction. The information obtained during the course of the habitat mapping was the base for finalising critical parameters and for defining crucial roles at various levels over the course of the entire project cycle.

The case studies presented in this paper illustrate that post-disaster housing in rural areas is a sensitive endeavour whereby many 'levels of complexity' (Lizarralde *et al.* 2010: 248) need to be considered to facilitate the realisation of people-oriented housing. This study reveals that, in the course of the project process, there is a crying need to appoint the 'right' personnel having, first of all, the 'capacity to fit into existing social dynamics' (Matthews 2006: 58), and, secondly, being able to address those aspects critical for the realisation of people-oriented housing. Architects

---

[26] Rieger-Jandl (2005) suggests that the field of anthropology offers useful tools for (expatriate) architects working on projects in so-called developing countries. As this case study shows, however, anthropological techniques are also vital for local architects working in the context of post-disaster housing.

[27] 'The number of houses to be built was brought down from, initially, 1,800, as estimated by the government, to 1,081. Finally we constructed 1,091.' (Interview with X. Joseph, project manager for SIFFS, 31.01.2012, in Tarangambadi)

can be an appropriate response. However, as shown in this paper, key to this is, among other considerations, a strategic interplay of various roles and responsibilities during the course of an intricate process and not, necessarily, the appointment of an architect.

Acknowledgements

References

Books:
Bortz, Jürgen, Döring, Nicola. 2006. (1984). *Forschungsmethoden und Evaluation für Human- und Sozialwissenschaftler*. Springer, Heidelberg.
Chandhoke, S.K. 1990. *Nature and Structure of Rural Habitations*. Concept Publishing. New Delhi.
Foucault, Michel. 1971. *L' ordre du Discours: Leçon Inaugural au Collège de France.* Paris: Gallimard.
Hobart, Mark (ed). 1993. *An Anthropological Critique of Development. The Growth of Ignorance.* Routledge.
Riegerl-Jandl, Andrea. 2005. *Living Culture in the Himalayas. Anthropological Guidelines for Building in Developing Countries.* WUV Universitätsverlag, Wien.
SIFFS 2009. *Rebuilding Habitats – Process Document*. Published by SIFFS. Trivandrum, Kerala.
Subramanian, Ajantha. 2009. *Shorelines. Space and Rights in South India.* Stanford University Press. Stanford California.
Turner, John F.C. 2009 (1976). *Housing by People. Towards Autonomy in Building Environments*. Marion Boyars Publischers, London.

Book Chapter:
De Soto Herando. 2010. *Preface*. In: Lizarralde, Gonzalo, Johnson Cassidy, Davidson, Colin (eds.). *Rebuilding after Disasters. From Emergency to Sustainability*. Spon Press, Oxford and New York.
Harris, L. Victoria. 2011. *The Architecture of Risk*. In: Aquilino, J. Marie (ed). *Beyond Shelter. Architecture and Human Dignity*. Metropolis Books. New York.
Lizzaralde, Gonzalo, Johnson Cassidy, Davidson Colins. 2010. *From Complexity to Strategic Planning for Sustainable Reconstruction*. In: Lizzaralde Gonzalo, Johnson Cassidy, Davidson Colins (eds.). Rebuilding after Disasters: From Emergency to Sustainability. Taylor and Francis.
Zetter, Roger, Boano Camillo. 2010. *Space and Place after Natural Disaster and Forced Displacement*. In: Lizarralde, Gonzalo, Cassidy Johnson and Davidson, Colin (eds.). Rebuilding after Disasters. From Emergency to Sustainability. Spon Press, Oxford and New York.

Journal articles:
Bavinck, Maarten. 2003. *The Spatially Splintered State: Myths and Realities in the Regulation of Marine Fisheries in Tamil Nadu, India*. Development and Change 34(4): 633-57.
Boano, Camillo, Hunter William. 2010. *Risks in Post-Disaster Housing: Architecture and the Production of Space*. In: ABACUS International Journal on Architecture, Conservation and Urban Studies 5(2): 23-31.

Boano Camillo, Garcia Marisol. 2011. *Lost in Translation. The Challenges of an Equitable Post-disaster Reconstruction Process: Lessons from Chile*. In: Environmental Hazards 10: 293-309.

Davidson, Colin H., Johnson Cassidy, Lizarralde Gonzalo, Dikem Nese, Sliwinski Alicia 2007. *Truths and Myths about Community Participation in Post-Disaster Housing Projects*. In: Habitat International 31: 100-115.

Matthews, Sally. 2006. *Responding to Poverty in the Light of the Post-Development Debate: Some Insights from the NGO Enda Graf Sahel*. In: Africa Development. Vol.XXXI, No.4: 52-72

Online documents:

Government of Puducherry. 2006. *Village Wise Summary of Rehabilitation of Tsunami Affected Villages as on 2.02.2006*. Available under:
http://www.pon.nic.in/tsunami/villagewise_summary_of_rehabilit.htm (accessed on 11.05.2012).

Government of Tamil Nadu. 2005. *Tiding over Tsunami - Part 1*. Published by the Government of Tamil Nadu. Available under:
http://www.preventionweb.net/english/professional/publications/v.php?id=12223 (accessed on 20.10.2012)

Sanderson, David. 2010. *Architects are often the last People Needed in Disaster Reconstruction*. In: The Guardian, 3rd March 2010.
http://www.guardian.co.uk/commentisfree/2010/mar/03/architects-disaster-reconstruction-haiti-chile (accessed on 17. 09. 2012)

Unpublished documents:

Caritas India. 2005. *Tsunami Rehabilitation shelter programme for Tamil Nadu and Puducherry by Caritas Network*. Unpublished document, with courtesy from Caritas India.