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Provision of Social Infrastructure for Resettled Victims of the 2004 Tsunami: Evidence from the grass roots

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Abstract

2004 Indian ocean tsunami is one of the deadliest disasters in the history of Sri Lanka, which led to the loss of family members, employment, inherited lands and houses, regular income, and former social standing of the coastal population of the country. Studies show that social infrastructure is one of the critical components in promoting social well-being of disaster victims, particularly for the affected population who had lost their tangible and intangible assets and had been resettled away from their familiar environments. Hence, the aim of this study is to examine the adequacy of social infrastructure provision for the resettled population. Case study approach has been adopted as the main method for this study. Accordingly, five tsunami resettlement sites were selected as cases in the Galle district, which is one of the highly affected districts in the country. In-depth interviews, focus group discussions, informal discussions and field observations were employed as data collection techniques. The findings of the study revealed that the provision of essential social infrastructure facilities to improve the quality of life of the people in one resettlement site has been highly successful. While in others, either the basic facilities had not been adequate, or they were provided at the initial stages but since then has been neglected by both the external agencies as well as the communities. As a result, most of the settlers are facing hardships even today, and some have moved back to their original coastal settlements, at least partly due to poor social infrastructure in the new settlement.

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Keywords: Relocation; Resettlement; Social infrastructure; Well-being of resettlers

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1. Introduction

Social infrastructure is of vital importance to promote the social well-being of the victims affected by disasters, particularly those displaced populations who had lost their tangible and intangible assets and had been relocated away from their familiar environments. Thousands of people who were displaced from their homes or residences due to the Tsunami that occurred in December 2004, were resettled either in their former villages or newly built villages. The introduction of a 100-meter-wide buffer zone on the coast had also prevented the affected people from settling down in their former homes. The government, local private institutions, international non-governmental organisations and local and foreign business firms provided houses and other infrastructure facilities for the settlers in the new villages. When rebuilding the lives of these victims, social infrastructure facilities had to be provided along with houses. It is not possible to re-establish the lives of victims without services such as education and health facilities as well as financial services and transport. Therefore, reestablishing the lives of victims and constructing social infrastructure had to take place simultaneously. In this context, the main focus of the paper is based on the consideration of social infrastructure as an effective means of promoting community resilience after the tsunami.

2. Literature review

On December 26th 2004, one-third of Sri Lanka's coastal area was devastated by the Indian Ocean Tsunami. Around 552,000 people have been displaced during this event [1]. Implementation of the buffer zone policy of the government to restrict the reconstruction along the coast, made the displaced people more vulnerable. Consequently, it prompted a considerable amount of involuntary relocations [2]. Gunawardena and Wickramasinghe [3] stated that, among tsunami-induced displacements, 40% of the households have resettled in different locations.

Moving people to a different location generally, results in social disruptions as communities lose access to their social infrastructure and their capacity to produce community resources [4]. The displaced communities have often been resettled in existing facilities in the host environment or new developments. Practices and systems for waste disposal, energy usage, health and safety procedures, and environmental care would be different or inadequate in the new built environment compared to that which the displaced community was used to. Therefore, particular attention needs to be paid in this context to enable the displaced community to the built environment in which it is relocated. Also, it is important to minimise the incompatibility between the lifestyles of displaced community and what the built environment and its infrastructure facilities offer.

Numerous studies have been undertaken immediately following the 2004 Indian ocean tsunami, particularly from 2005 to 2008 to examine the short and long-term impacts of interventions on settlements. Shortly after the tsunami relocations, it has created tension among the people who received new houses and their hosts [1]. Belgian Red Cross [5] explained this tension as, the host community's resentfulness towards the settlers for the disruptions they cause and the stress they put on the common resources. Cox and Hamlen [6] state that housing, transportation, water, power distribution, transportation, and food security are resources related factors that determine the disaster resilience of a community. Alterations in the level of these factors and inadequate provision of the social infrastructure would change the resilience of the community towards potential future disasters.

However, many donor organisations that sponsored new settlements for tsunami victims have included various social infrastructure facilities in the settlement plans. Such infrastructure has often included sports facilities, multi-purpose community buildings, medical centres and children's parks. However, in most settlements, such facilities have not been maintained and fallen into disuse over time [7]. As a consequence, the competition for social infrastructure could weaken social networks and reduce cooperation between communities and lead to resettlement failures [8]. Therefore, identifying the adequacy of the social infrastructure for the communities is necessary to take measures to sustain resettlements in the long term.

The perusal of studies reveals that an analysis of the adequacy of social infrastructure facilities provided at the initial stage of resettlement and the identification of issues that have emerged in these settlements due to the inadequacy of

social infrastructure facilities during the past years have not been undertaken in Sri Lanka, particularly from a sociological perspective. This study is an attempt to bridge that gap through case studies with the aim of examining the adequacy of social infrastructure in tsunami resettlements.

3. Research method

The case study presented in this paper was carried out in 05 resettled villages of Tsunami victims in the Galle District, where the Tsunami caused massive damages. Semi-structured interviews were considered as the most appropriate data collection technique to elicit answers from the participants. Therefore, case study data were collected through semi-structured interviews (50 in total) with resettled persons, village leaders, officers and others. 10 interviews were carried out in each identified village by taking each of them as cases, in addition to supplementary informal discussions. Further, careful field observation was conducted by the research team which also provided valuable information and insights for the survey. The villages for field research were selected purposively, to represent a cross -section of the new settlements in the district. Collected data were analysed using content analysis technique to identify themes. The China Friendship village, Kesbepana village, Karitas village, Galagodawatta village and UNESCO village were the villages selected, and a brief profile of each community is discussed in the following subsections. The settlements are also indicated in the map (Figure 1) shown below.

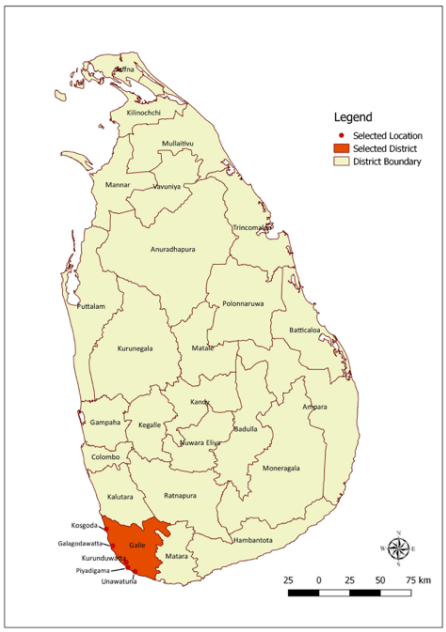

Fig. 1. Selected villages

3.1. China friendship village

China Friendship village is in the Akmeemana Pradesheeya Sabha (PS) area in the Akmeemana Divisional Secretariat Division (DSD). The China Friendship Society has built all (146) the houses in the village with the technical help of Sri Lankan Red Cross Society. The analysis of social infrastructure in the village revealed that there is no separate school built for the village children and most of the children attend Sri Sumangala Navodya school at Kurundhuwatta. Many informants reported that, in the beginning, the school refused to admit students from this Tsunami resettlement. Further, the school charges a large sum for admission which could be afforded by the low-income families. The China Friendship Society had provided for the establishment of a preschool for children does not function at present. The nearest hospital is the Karapitiya Teaching hospital in Galle. Besides, the villagers can get

treatment for minor ailments at the Maliban Maternity Clinic situated at Kuruduwatta. The Office of the Medical Officers of Health (MOH) located nearby has basic facilities for Maternity and Child health. The China Friendship society had constructed a building to house Maternity and Children's clinics, but it has never been used. Although a Children's Park has been constructed, the equipment has been abandoned and the ground is overgrown with weeds. The main road in the village is tarred but the minor roads have not been paved. Moreover, improper drains, unpaved roads, flooding, the absence of street lamps, inadequate garbage collection and burglary are also some of the issues faced by the villagers.

There are no transport problems since the China Friendship village is located close to the Galle – Udugama main road. However, most of the villagers had lived within the Galle Municipality limits, and they complain that they have to waste time and money to reach Galle. A Buddhist shrine room which was constructed is facing problems due to the lack of any arrangement to pay the electricity and water bills. Further, The China Friendship society has provided toilet facilities for houses, but some villagers complain that septic tanks had overflow after a few months. Consequently, the International Red Cross society has rebuilt standard septic tanks for all 146 houses in the village. In addition to the construction of houses, the China Friendship Society has built a large Community hall for the villagers. At present, a private shoe factory has been established at the premises, and the villagers are against it.

3.2. Kesbepana village

Kesbepana Tsunami village is located within the administrative boundaries of Habaradhuwa Divisional Secretariat Division (DSD) and the Habaradhuwa Pradesheeya Sabha. 74 houses in the village have been built by three institutions - the National Housing Development Authority (24 houses), KaritasSengol Foundation (35 houses) and with aid from the Netherlands (15 houses). Unlike the other Tsunami villages, this Tsunami resettlement is located in an urban area. Therefore, the settlers have facilities usually available in an urban area. Most of the children attend popular schools in Galle. The nearest hospital is the Malwatta Government hospital at Unawatuna. The villagers avail themselves of the services in the hospital and at the Maternity and Children's Clinics there.

As the village is located close to the Galle – Matara main road, there are no transport problems. In addition, the interior roads within the village are paved with concrete. The drains on either side of roads are not constructed properly. As a result, the whole area gets flooded during the rainy season. The reason for the frequent submersion of houses is due to the construction of village roads and drainage system at a level higher than the foundation of houses. Cracks have appeared on the walls of some houses. Some house owners have even build cement walls to stop rainwater seeping into their houses. There is no Community hall or a shrine room in the village although a block of land has been reserved for a shrine room and a community hall. Until recently, there was no playground for the village children. Recently a playground was constructed by filling up a paddy field. A children park for small children has not yet been constructed. All 74 houses in the village have been provided with electricity and water facilities. Street lamps have been fixed along the main road of the village. Every house has been provided with lavatory facilities. But the dwellers living on the ground floor houses of the National Housing Development Authority (NHDA) housing scheme, have numerous problems due to toilet water overflowing into their houses from the upper floors. The relevant officers have been informed about this matter, but no action has been taken so far.

3.3. Karitas village

Karitas Tsunami village is located in the Dadella-East Grama Niladhari Division in within the Galle Municipality area. 76 two storied twin houses have been built with the financial assistance of KaritasSengol Institution. In addition to the construction of houses, the institution has paid attention to providing other facilities, and officers of the institution have monitored the activities. However, it was observed that the villagers had been deprived of certain facilities.

Children of the village can attend the same schools they attended before the Tsunami as they live in the same town and the vicinity of their previous settlements. It has been observed that people rent or lease village houses in order to admit their children to urban schools. The residents of the village are able to make use of the health facilities in Galle.

They can reach the general hospital within a short time. Children's and Maternity clinics, as well as private and government medical clinics are also accessible. There are no transport problems as the village is located close to the Gintota – Piyadigama main road. The road system within the village is paved with concrete, and street lamps have been provided. Along with the construction of houses, the Karitas institution has built a Community hall in which are located the offices of the Grama Niladhari, the Samurdhi Niladhari and the Economic Development officer as well as an Assembly hall. Since all these offices are situated within the Tsunami village, which is a great advantage to the villagers who can discuss their problems with relevant officers. At present, a preschool is being conducted in the Community hall and the teacher in- charge pays the electricity and water bills. Children park with sports equipment has been supplied for the village children. The playground used by the villagers for New Year festivals and other special functions is also used for the weekly fair. The village has been provided with pipe – borne water, electricity and lavatory facilities, but the problem of overflowing toilets occurs in some houses. The garbage is collected by the Urban Council twice a week , but there are complaints that it is not collected regularly.

3.4. Galagodawatta village

Galagodawatta Tsunami village is located within the Hikkaduwa DSD and Rajgama PS. The settlement has 482 houses, built by 13 different organisations and institutions. As a result, the type of social infrastructure facilities in the Galagodawatta village mostly depending on the sponsoring institutions. There is no separate school for children in the village itself. The nearest school is Galagodawatta Junior School, and the majority of Tsunami village children, up to Grade 5 attend this school. The majority of children above Grade 5 study at the Kuleegoda Sumana Vidyalaya which is 1.5 km away from the village. Furthermore, children of some families attend urban schools in Galle or Ambalangoda. In addition to these, a preschool for small children was built by the Mallika Home Organization. The nearest hospital is Madampagama Rural hospital located 2.5 km away from the village. A Medical centre had been established in the village with financial aid from the Salvation Army and the government at the time the Tsunami village was constructed.

The main road was tarred recently. Except for the main road all other roads have not been paved. On rainy days the gravel roads get flooded with rainwater and become muddy, and it affects the transport. The villagers have requested the Divisional Secretariat and the PS to pave these roads, but so far they have not responded favourably. Some houses do not have proper access roads. As the village is situated 10 km away from the urban area, the villagers had to face problems of accessibility by public transport in the beginning. After numerous complaints and requests, a public bus service was introduced. Water and electricity facilities have been provided for all the houses. Electricity is given free of charge and water is provided at a concessionary rate. Since the houses in the village have been built by different organisations, there are differences among families in the quality of houses and lavatory facilities provided. The villagers complain that drains on either side of roads in the village are not properly built. Soil erosion and temporary floods also have created problems among the villagers. A Buddhist Temple named Sri Dharma Vijaya Maha Karuna Buddhist Viharaya has been constructed. A Community hall for public activities, a playground and a cemetery have also been provided.

3.5. UNESCO village

The UNESCO Tsunami village is located in the Balapitiya DSD and the Balapitiya PS area. All the houses in the village (52) were constructed by the German UNESCO. Further, financial and other assistance have been supplied by numerous international organisations and non-governmental organisations. The German UNESCO, an institution known as 'Future for Children' and the Holcim Cement group, have sponsored the development of social infrastructure facilities.

The infrastructure facilities in the UNESCO Tsunami village have been provided through the private sector, and the management and village administration is by community participation without any government involvement. The facilities have been described by the villagers and officers as 'excellent'. The German UNESCO and 'Future for Children' have sponsored a private school for village children. A pre-school with all the facilities have also been

bequeathed by the German UNESCO. A Medical centre was established within the village. Further, a free dental clinic is held once a year. Furthermore, the villagers have the responsibility for keeping the village clean. A separate place is allocated to dispose of household garbage. Although the villagers have requested the Pradeshiya Sabha Office several times, the roads within the village have not yet been paved. However, the Pradesheeya Sabha has provided the village with street lamps recently. All the villagers have been provided with water, electricity and lavatory facilities. As there is no pipe – borne water in this area, the German UNESCO has constructed two large wells within the village for drinking water. The village drainage system is well constructed and there is no danger of floods or rainwater overflow as observed in other resettled villages. An administrative building, playground, factory training centre, small-scale market, shrine room, and home for orphans are also established.

4. Data analysis and discussion

Three main issues related to social infrastructure are identified from the analysis in the selected villages. They are inadequacies in providing infrastructure, lack of maintenance of the infrastructure, and poor quality of infrastructure as shown in Figure 2.

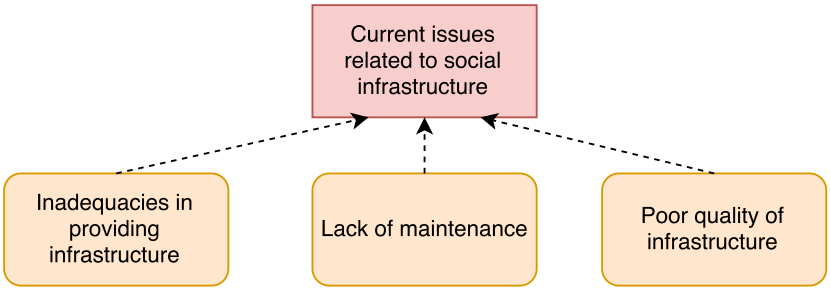

Fig. 2. Current issues related to social infrastructure

4.1. Inadequacies in the provision of facilities

The main feature that emerged from the analysis is that the social infrastructure facilities provided in to the 5 villages are dissimilar. The inequities in the provision of facilities are based on the financial capacity of the relevant organisations which sponsored the villages, poor planning of buildings, roads and the drainage system, the number of families resettled and the geographical setting.

Among the 5 villages, houses in the UNESCO village have been well constructed and provided with the necessary social infrastructure facilities from the very beginning. The Karitas village has also been supplied with the main infrastructure facilities, but not to the level and standard of those in the UNESCO village. Although larger (physical extent, population size and the number of houses) the China Friendship village and the Galagodawatta villages have not received facilities to the level provided to the UNESCO village and the Karitas village. For example, the UNESCO village, which consists of 52 houses have been provided with most of the essential facilities such as a temple, a school and a pre-school, a community hall, a maternity clinic and a dispensary, a vocational training centre, a market and a playground. It has a well-planned drainage system, a home for orphaned children and an administrative office. The views expressed by two villagers from the UNESCO village given below show the extent to which they are satisfied with the services: “We’re very happy that we got houses in this village. The way we live now is hundred times better than the way we lived before the Tsunami. We have much more facilities in this village than in other Tsunami villages. We have different workshops to train our young children and others in neighbouring villages, in carpentry, metalwork and motor mechanism. A doctor visits the village once a week and gives medicine free of charge, and I have a boutique in this village. Only the villagers can rent out these boutiques and outsiders can purchase goods from these stalls”.

Although the situation of the UNESCO village is very satisfactory, the Galadgodawatta village with 482 houses built by 13 organisations does not have a school, an efficient drainage system, an administrative centre, a vocational training

centre, or at least a small market. At the beginning, there was no temple or a garbage disposal system. Similarly, the China Friendship Village that consists of 146 houses does not have any of the facilities mentioned below: a school, a temple, a market an administrative building or a vocational training centre.

Two villagers from the China Friendship village expressed their opinion about the facilities as follows: "Our children attend the Sri Sumangala Navodya school which is close to the village. It was very difficult to admit children to that school. In the beginning, the children from the Tsunami village were not even admitted to school . Now they admit a few, but we have to donate a considerable amount of money. If we continued to live at Magalle, we would definitely send our children to a school in the town. If we are discriminated here, where can we send our children?". Some people in the village dumped their garbage on the roadside near our house. I used to burn this garbage at times. At last, I put a notice informing them not to throw garbage there. Now it is a bit restricted. But it is not only garbage that is being dumped along the main road, the Pradesheeya Sabha also does not collect garbage. As a result, the accumulated garbage is strewn everywhere by animals".

Karitas village with 76 houses, possesses a pre-school, a community hall, a playground and an administrative centre, but the Kesbepana village has not received any of these facilities. This indicates that some people who faced similar dreadful experiences and lost their relations and property have been re-settled with inadequate facilities. Imra -a resident in the Karitas village and Ravindra from Kesbepana spoke about their situation as follows: "We have a much better life now. Better than when we settled here at the beginning. We are economically better off. When compared to other Tsunami villages we are happy to have received so many benefits from this village. We have got houses from our former village area. The priest in the Church visits the village at times and inquires about our problems", "We have got a block of land of about 5 perches. There is no place for children to play. The road is in front of the house, and therefore it is dangerous for small children who might run into the road. I am not happy to live here like a prisoner. If I can, I'll sell this and go somewhere. Some people have done it".

4.2. Sustainability of the social infrastructure provision

The second important issue faced by residents resettled in Tsunami villages is that certain facilities provided at the beginning have not been maintained after some time. No organisation (Community-Based Organisations or government authorities) had taken the responsibility to look after the facilities. The China Friendship village received a building for a maternity and children's clinic, a Children's Park, a preschool and a Hall that can be used for weddings and festivals. The villagers complain that the Pradesheya Sabha has rented out the Hall for a factory. Secondly, the Children's Park is neglected and is overgrown with weeds. The building for the maternity and children's clinics has never been used.

The 'Ape Gedara' (our home) and 'Sellam Gedara' (Playhouse) introduced to Galagodawatta in 2008 by Sewa Lanka for recreation activities of children have been discontinued there. The village youth had used this centre for different anti-social activities, and the villagers had to drive them away. At present, the building has been closed by the Divisional Secretariat . The Sri Lanka Plantation Corporation had constructed a building to be used as a daycare centre, but the villagers have decided to establish a library and a computer centre in the building. This project functioned for some time but was abandoned later.

The government institutions in the areas have not taken over the responsibility to maintain the facilities. Therefore, even if a village had received infrastructure facilities at the inception of the project, the villagers do not have the know-how and financial resources to maintain and repair equipment and buildings.

4.3. Quality of infrastructure

The third issue is the poor quality of the facilities provided. The overflow of toilet pits during the rainy season, for example, is a common problem faced by settlers in 4 villages that have 2 storied flats. The water in the toilet pits in

the upper houses spill over to the lower flats. Officers of the National Housing Authority have been informed of the situation, but no action has been taken yet. Another problem is the poor condition of minor roads and the absence of a proper drainage system in most of the villages. The villagers complain that the local authorities do not intervene. Electricity is given to each house but street lamps are not been provided and the bulbs are not replaced regularly. The garbage collection is not efficient in most of the villages. The villagers protest that the garbage disposal vans are not sent regularly by the Pradesheeya Sabha.

Fewer problems have arisen in villages where the donor organisations constantly supervise the activities. The UNESCO village, for example, is being supervised to a certain extent. Therefore, villagers still enjoy the facilities they received at the beginning due to regular maintenance and careful use. The Karitas village is also being supervised by the organisation. On the other hand, the China Friendship village and Kesbepana village face numerous problems since they are no longer overseen by the funding organisations. The people who were settled either within or in close proximity to urban areas such as Kesbepana and Karitas, can use the facilities already available in the town. It is the people who were re-settled far away from urban areas who have to suffer most. Some settlers in villages such as the China Friendship village, where social infrastructure facilities are inadequate have left the settlement. Some of the repairs required for houses and other infrastructure facilities are structural and therefore require considerable financial outlays and institutional intervention, all of which are beyond the low-income families living in newly established communities.

5. Conclusion

The results of the field research show that essential social infrastructure facilities provided to improve the quality of life of the resettled population in the resettlement sites vary widely across communities. In most of the cases, either the basic facilities had not been adequate, or they were provided at the initial stage but discontinued after some time and the equipment and buildings abandoned. As a result, most of the settlers are currently facing hardships, and some have moved back to their original coastal settlements. The paper discussed the adequacy of social infrastructure provisions, particularly in 5 post-tsunami relocation sites. As the provision of social infrastructure play a major role in rebuilding the lives of displaced communities, this paper has addressed a significant issue. Results show that the three main issues associated with social infrastructure are inadequate provision, inadequate maintenance, and poor-quality construction. In this context, the paper reflects on the cases of long-term resettlement (10 years after the disaster) from the perspective of social infrastructure, highlights the significance of social infrastructure for long-term recovery and resilience . Accordingly, this research has a significant impact on policy-making, designing and implementing disaster-induced/ voluntary/ involuntary relocations. National and local governments, NGOs, and the like would benefit from the results of this research.

References

[1] C. Boano, "Housing anxiety and multiple geographies in post-tsunami Sri Lanka," *Disasters,* vol. 33, p. 762, 2009.
[2] J. E. D. Barenstein and E. Leemann, *Post-Disaster Reconstruction and Change: Communities' Perspectives*: CRC Press, 2012.
[3] A. Gunawardena and K. Wickramasinghe, "Social and economic impacts of resettlement on Tsunami affected coastal fishery households in Sri Lanka," in *Forced to Move : Involuntary Displacement and Resettlement — Policy and Practice*, P. Fernando, K. Fernando, and M. Kumarasiri, Eds., ed Colombo: Centre for Poverty Analysis, 2009, pp. 111-124.
[4] J. Manatunge, L. Herath, N. Takesada, and S. Miyata, "Livelihood Rebuilding of Dam-Affected Communities: Case Studies from Sri Lanka and Indonesia," *International Journal of Water Resources Development,* vol. 25, pp. 479-489, 2009.
[5] Belgian Red Cross. (2009). *Post-tsunami housing reconstruction Kalutara district, Sri Lanka*. Available: adore.ifrc.org/Download.aspx?FileId=83639&.pdf
[6] R. S. Cox and M. Hamlen, "Community Disaster Resilience and the Rural Resilience Index," *American Behavioral Scientist,* vol. 59, pp. 220-237, 2015.
[7] S. Hettige and R. Haigh, "An integrated social response to disasters: the case of the Indian Ocean tsunami in Sri Lanka," *Disaster Prevention and Management,* vol. 25, pp. 595-610, 2016.
[8] S. A. Badri, A. Asgary, A. R. Eftekhari, and J. Levy, "Post‐disaster resettlement, development and change: a case study of the 1990 Manjil earthquake in Iran," *Disasters,* vol. 30, pp. 451-468, 2006.