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Post-Disaster Housing Reconstruction and Social Inequality: A Challenge to Policy and Practice

ANTHONY OLIVER-SMITH

In post-disaster reconstruction the social aspects of housing provision are important for the success of both emergency shelters and permanent housing, particularly in settlements that have been permanently relocated or entirely rebuilt. The social dimensions of housing reconstruction after disaster are discussed in the context of the long-term effects of reconstruction after the Yungay, Peru Earthquake-Avalanche of 1970. Consideration of these issues presents questions regarding the tension between continuity and change in affected populations, the importance of pre-disaster socio-economic patterns for reconstruction and the criteria used for assessing the success of post-disaster reconstruction and development projects. The author contends that post-disaster housing reconstruction must avoid rebuilding structures which reflect, sustain and reproduce patterns of inequality and exploitation.

INTRODUCTION

It is axiomatic that humans live in built environments. That is, they live in environments that they at least partially design and construct themselves. Human beings sense, interpret, and respond to objective environmental conditions according to their culturally derived perceptions of physical, cultural and social needs and desires. As with any other biological organism, an integral part of a human environment is the presence of other members of the same species who are, in the case of human beings, defined as similar or different and viewed as either potential resources or competitors in gaining access to the means of survival. That part of the built environment involving the way humans organize and construct their shelters is thus in part a response to other human beings in their immediate surroundings. There is, therefore, some sort of correspondence between the built form of a community and the culture and social structure of that community.

In post-disaster urban reconstruction, the social aspects of shelter and housing provision take on considerable importance in both the delivery and success of emergency shelters as well as the long-term viability and development potential of permanent reconstruction, particularly among populations that must be relocated for geological safety or settlements which must be entirely rebuilt. Indeed, the social dimensions of post-impact shelter and housing provision can prove to be among the most difficult of problems faced by assistance and reconstruction agencies. This article will deal with some of the social dimensions of post-disaster reconstruction in the presentation and discussion of a

particular case. Consideration of these particular aspects of shelter and housing provision after disaster in turn poses some interesting questions about the tension between continuity and change in afflicted populations, the importance of pre-disaster socio-economic patterns for reconstruction, and the criteria used for assessing the success of post-disaster reconstruction or development projects.

The social aspects of shelter and housing programs have received somewhat less attention than, for example, such issues as improved construction techniques, traditional and innovative building materials, or the cultural appropriateness of housing design. While not devaluing in any sense the importance of these issues, in this paper I consider the significance of such social factors as internal stratification and inequality for the design and construction of not only housing, but of settlements themselves in post-earthquake strategies of development. The importance of pre-disaster social patterns, the tension between continuity and change and the criteria used to assess project success in reconstruction will be considered in the context of the long-term effects of reconstruction after the Yungay earthquake-avalanche of 1970. Research on the Yungay case was undertaken within three months of impact in 1970 and continued periodically over the next thirteen years by the author and others (see, for example, Oliver-Smith 1977; Goldman 1985; Oliver-Smith 1986; Oliver-Smith and Goldman 1988; Bode 1989).

SOCIAL STRATIFICATION, DISASTERS AND DEVELOPMENT

All human, and many non-human, societies are stratified, dividing their members into levels of inequality in terms of role specialization, occupation, wealth, prestige or power. Even the most egalitarian of groups differentiated among people on the basis of sex, age and prestige. However, much more commonly, groups in all parts of the world are becoming increasingly stratified according to a hierarchy of social classes, determined largely by different relationships to means of production and other sources of economic wealth, and buttressed often by ideologies of racial or ethnic superiority. In societies founded on egalitarian principles such as the United States or the Soviet Union, systems of internal stratification are mystified or obscured by ideological constructs which legitimize resulting patterns of inequality (Howard 1989).

The behavioural manifestations of these patterns of stratification in disaster events and their aftermaths have been the subject of some attention in the social sciences addressing particularly issues of social solidarity and conflict (see, for example, Turner 1967; Barton 1969; Oliver-Smith 1979). Research on ethnic divisions has focused on such topics as variations in adopting adjustments (Turner et al., 1981), hazard perception (Turner et al. 1981) and warning responses (Perry, Greene and Mushkatel 1983) and recovery processes (Bolin and Bolton 1986).

Interestingly, particularly given our own ideological constructs, class has generally not been the focus of many social scientific studies of disaster. Whether this scarcity of class based studies is due to the difficulties of operationalizing the concept of class or a reluctance to deal with class issues is open to question. Notwithstanding this situation, some researchers who have probed the issues have found that disasters tend to intensify pre-existing status differences and inequalities (Haas, Kates and Bowden 1977; Peacock and Bates 1982, Geipel 1982; Bolin and Bolton 1986; Oliver-Smith 1986; Low 1988). Others have noted that post-disaster assistance is often assistance to the poor, especially in the developing world (e.g., Davis 1978). In addition, Davis states that the study of disasters almost by definition is the study of poverty in the Third World, which is

where most disasters occur (1978: 11–12). In general, however, it seems fair to say that greater attention needs to be paid to the issue of social stratification and its relationship to post-disaster reconstruction for social change and development. Indeed, post-disaster reconstruction in both design and implementation may play an important role in the re-establishment of traditional patterns of inequality and domination in the built form of the society or, conversely, may create new conditions which will sustain movements toward more equitable social and economic institutions.

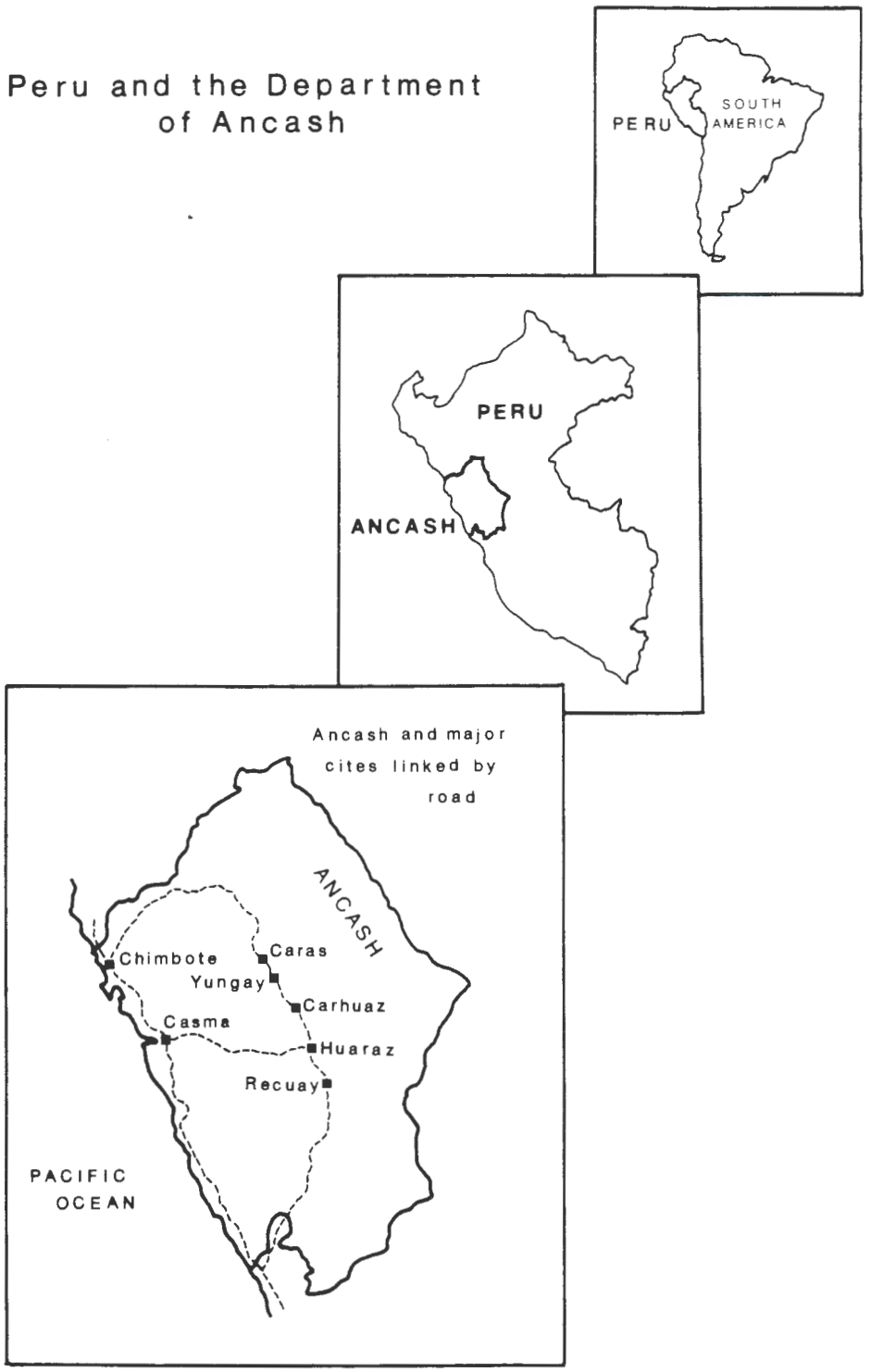
The idea that disaster reconstruction should be linked to development strategies is hardly new, but the concept of development which has driven such disaster linked efforts deals mostly with infrastructural improvements, technology and knowledge transfer. In housing and settlement reconstruction, the focus has been largely on materials, construction techniques, occasionally on financing and other economic issues, and, most recently, culturally appropriate design with the aim of getting people housed in environmentally and culturally adequate dwellings (Aysan and Oliver 1987). Certainly, the long-term viability of a settlement and its potential to sustain further social development is as dependent on its arrangement in social space as it is on the cultural appropriateness of each individual dwelling or the safety of the terrain. Successful reconstruction unquestionably requires building safe, culturally appropriate dwellings, but such dwellings also have or acquire social meaning in terms of both the materials of which they are built and their location in space. Consequently, successful reconstruction also involves arranging houses on the ground, which itself may be socially categorized and valued, and filling such houses with specific people who are equally socially categorized and valued.

In effect, housing is a relational term. Houses occupy space in some sort of socio-culturally defined relation to other houses, or perhaps, more accurately, to the occupants of other houses. Ultimately, houses are always situated in social as well as geographic space. Houses are physical objects with social meaning expressed in their material components and their location in space. This social space and the situation of houses and other structures within it may have profound implications for the success or failure of post-disaster urban reconstruction in terms of positive social change and development.

THE YUNGAY EARTHQUAKE-AVALANCHE AND POST-DISASTER RECONSTRUCTION

On the afternoon of May 31, 1970 the north central coastal and Andean regions of Peru were rocked by a massive earthquake. The earthquake registered 7.7 on the Richter scale and unleashed forces which brought about the worst natural disaster in the history of the western hemisphere. Approximately 86% of all the structures in an area of about 65,000 square kilometres were destroyed and roughly 70,000 people were killed. A central tragedy of the disaster was an earthquake triggered avalanche which buried the city of Yungay, a provincial capital of some 4,500 inhabitants in the intermontaine valley of the Callejon de Huaylas (see Map 1). Approximately 4,000 of Yungay's inhabitants perished, and with the exception of a few scattered houses on the outskirts, virtually nothing remained of the city less than four minutes after the initial shocks of the earthquake.

Yungay, situated at roughly midpoint of the valley at the foot of Mt. Huascaran, the source of the avalanche and the highest peak of the massive glaciated Cordillera Blanca, was the seat of most of the provincial educational, economic, political and religious institutions. The population of the entire region was composed primarily of a small, powerful, urban elite of land,



MAP 1 Peru and the Department of Ancash

commercial and professional interests, a small urban service and trade sector and a vast rural Indian peasant population living in exploited and poverty stricken conditions. The society as a whole was characterized by a rigid system of social stratification buttressed by ideologies of racial and cultural superiority which justified systematic exploitation of the Indian peasant population through a variety of mechanisms of appropriation. In addition, there was also a small, predominantly rural group known as *cholos* which occasionally combined agriculture with small commercial ventures or artisan skills. These people, while not denying their Indian origins, directed their attention and ambitions as much toward the city with the hope of some upward mobility as toward their home villages.

Thus, Yungay serviced not only an urban population, but was also a regional center for a large rural population. A peasantry three to four times the size of the urban population was structurally dependent on the city as a market place for both labor and commodities, as a ritual center for a complex politico-religious authority system and as the locus of political and administrative power for the province. The city in turn exploited the peasantry for their agricultural produce obtained through structurally maintained unfavorable terms of trade in the market and for their labor services, often through a corvee system, and as consumers for the economic, religious and administrative services of the urban institutions.

The earthquake began at 3:23 in the afternoon with a swaying motion for several seconds and then violent lateral tremors for roughly 45 seconds. Some people in Yungay sought refuge in the church, the largest structure in the city, or they ran to the main plaza to avoid the hail of roof tiles from the taller buildings in the center of town. All too few, sensing a further danger after the final tremors, began to climb the slopes surrounding the city. Still others fled to the cemetery which was built on a steep sided pre-columbian temple mound to the west of the city's center.

The tremors of the quake shook loose an emormous slab of ice and rock about 800 meters wide and 1,800 meters long from the sheer northwest face of Huascaran, between 5,000 and 6,500 meters high. The huge mass fell almost a vertical mile before it struck glacier 511, creating a debris wave more than a kilometer wide and almost two kilometers long which hurtled down the mountainside at speeds of up to 435 kilometers per hour, adding to its massive volume by picking up morainal material and thousands of boulders, some weighing thousands of tons, careering down upon the valley floor four minutes after the initial tremors of the earthquake. The momentum of the avalanche carried it over a protective ridge which had shielded Yungay from previous avalanches, its mass appearing suddenly over the city 'like a ten story building' and obliterating it in seconds. All that remained of Yungay four minutes after the earthquake had ceased were four palm trees where the main plaza had been, one outlying neighbourhood of perhaps a dozen houses, and between 3–500 terrified survivors. An immense mass of dull grey, viscous mud had spread over 15 square kilometers (Erikson, Plafker and Fernandez Concha, 1970).

As evening descended upon the shattered valley, survivors in the hills surrounding the buried city began clustering in protected areas. The provincial subprefect and one of the city's five physicians escaped the avalanche and took shelter in Pashulpampa, a gently sloping field protected by a large hill that promised protection from further avalanches. In the four days of isolation before outside aid arrived, many more people, both rural and urban, gravitated toward Pashulpampa where the subprefect was in charge and the doctor could treat the wounded. Thus,

geological security and the urban functions of political authority and medical care constituted the core elements around which a new city would eventually form in Pashulpampa.

When emergency assistance agencies finally made contact with the area on the fourth day, they found a growing population, composed largely of rural refugees clustered around the core of urban survivors in Pashulpampa. Sheltered in lean-tos made of palm fronds, they awaited aid and rescue while they fended for themselves, caring for the wounded and searching for useable goods from the destroyed peasant communities surrounding Yungay. When aid arrived, and a general 'settling in' period began, better shelter was needed. The lean-tos and the subsequent *quinchas* (wattle and daub huts) would not stand up to the rapidly approaching rainy season and the government soon replaced them with family camping tents. Efficient use of the tents required occupancy by four people, a factor which accounted in part for the reformation of household groups in the aftermath.

The actual reconstruction of urban institutions and services had begun almost spontaneously after the disaster. The sub-prefect provided a locus of authority around which the hundreds of refugees could group. A provisional city mayor was appointed there also. Within two weeks of the tragedy Indian peasants began selling their produce in an open, improvised 'plaza' area in the tent camp. Small rural merchants with salvaged stocks set up *quincha* shops. In addition, several inter-provincial bus lines established stations on the road constructed over the avalanche which passed by the camp. By December of 1970, only six months after the disaster, the market had grown to be the fourth largest in the entire valley, a region of over 2,500 square kilometers and 150,000 people.

At the end of June 1970 the government announced the design of a provisional pre-fabricated housing program for the approximately 100,000 people left homeless by the disaster in the entire valley. Because of geological insecurity and the threat of further avalanches, however, the settlement in Pashulpampa was considered temporary. Requests for housing loans were turned down and a provisional prefabricated housing program was instituted. Construction of the prefabricated houses in Pashulpampa, beginning in November, stimulated more rural migration, attracted by the housing as well as the wages paid by the reconstruction authority, the Committee for the Reconstruction and Rehabilitation of the Affected Zone (CRYRZA). The buildings in Yungay, located on three tiers bulldozed out of the hillside, were 30 by 6 meters each, and were divided into I and L shaped rooms which were alloted to domestic groups. The distribution of the houses on a first-come, first-served basis impeded the initial formation of class based neighborhoods and conflicted with traditional patterns of social stratification and status preferenciality which had dictated aid distribution up to that point. Urban survivors vented their fury on the social workers in charge for distributing housing to urbanites and peasants in such a fashion as to create a form of housing integration. It was not long, however, before the tiers and their sub-sections acquired specific class and ethnic identifications, the higher areas corresponding to peasant immigrants and the lower sections close to the market and the road associated with middle and upper class urban survivors. This inverse relationship between class residence and altitude had characterized the old city and Peruvian society in general.

The hillside field called Pashulpampa was located in a triangular area formed between the avalanche from Huascaran on the south and the steep-sided canyon descending from Huandoy, another snow-capped colossus on the north which had

been the source of a 1745 avalanche which had destroyed the town of Ancash. Although the area was protected by a steep hill, the authorities speculated that if a provincial capital were located there, the resulting population would spill into dangerous zones. Consequently, within the year they declared that the capital would be relocated to a safer zone some fifteen kilometers south. The survivors and rural refugees in the provisional settlement flatly rejected the plan and undertook a bitter struggle with CRYRZA and the national government to have the city of Yungay reconstructed in Pashulpampa.[1]

The battle for permanence was eventually won by the survivors, but the problems of the rapidly urbanizing settlement were far from over. The city would remain where it was and would retain its provincial capital status but, since permanent construction had been prohibited, essentially a whole new city had to be planned and built for an already resident, growing and increasingly stratified population in which, once permanence had been achieved, old class and ethnic conflicts began to reappear.

A Lima based architectual firm was awarded the contract for the design of the new city of Yungay. The thrust of the plan was to create a provincial urban-industrial society through a system of regulated population centers connected by a network of transportation routes.[2] Yungay was to be the central administrative and commercial locus for the system. The plan called for a highly ordered zoning system for the new city with distinct sectors for specific activities. Insofar as the main plaza would be the hub of activities in the community, the plan followed certain traditional dictates. Most of the city's major institutions, the subprefecture, the town hall, police, courts, post office, hospital, schools, church, stores and markets were situated on or near the plaza. The entire area was to be electrified and have a potable water and underground sewage system, urban services that the old city had not fully enjoyed.

This ambitious plan was greeted by the Yungainos with formal enthusiasm and private skepticism. Residents who examined the proposed plan in the early 1970s state that as designed, the plans were not objectionable. For both economic and political reasons, however, important elements of the plans were omitted. In effect, the final result in Yungay reflects for the most part the concerns of government agencies and planners for order and efficient use of the scarce reconstruction resources as well as a lack of sensitivity to the social implications of their plans. Yungainos fault the plan for the failure to deliver many of the promised structural improvements such as cement house foundations, poor implementation which resulted in some house lots being split between two tiers on the hillside and serious problems of erosion and drainage in the city. Progressive elements in the community also cite the housing program as highly problematical and conflictive.

In March 1973 the first permanent housing was begun. After waiting for two years on the docks near Lima for transport to Yungay, the famous 'Casas Rusas' (Russian prefabricated chalets) arrived (see Figure 1). The reconstruction authority established a system of priorities for housing distribution which ultimately proved to be a key factor in the reproduction of certain material aspects of urban class divisions. First priority went to landowners whose property had been expropriated for the new community. Second and third priorities were for landowning disaster victims and renting disaster victims in the old city. Impoverished peasant migrants were considered last. These priorities were cross-cut by a series of mitigating variables such as income, family size, and pre-disaster origin. A point system was designed and each individual

FIGURE 1 The 'Casas Rusas' (Russian Houses) of Yungay as they appeared immediately after construction.

was given points in accordance with his or her priority and the other variables. One's points had to be defended in public, a requirement which created considerable ill-feeling. Also, the houses had different prices, although they were all of the same design: three rooms, kitchen, bathroom and glassed-in porch. The houses became less expensive with increasing distance from the plaza and altitude on the hillside.

The priorities, the prices and the houses themselves were all causes of considerable dissatisfaction. The price system, in particular, offended all but the most wealthy. Thus, the centerpiece of Yungay's housing reconstruction and development, the prefabricated Russian chalets, became a primary factor and marker in the re-establishment of socio-economic class distinctions in the new city. The housing distribution and the three tiered pricing of the Russian houses assured that elites, both old and new, were able to re-establish themselves in the most favorable circumstances. Those with less abundant resources occupied the higher tiers, which ascended the hill at increasingly sharp inclines.

The majority of the population, however, remained in the provisional housing buildings. For them, a self-help housing program known as *auto-construccion* was developed in which the rest of the residential zone was divided into lots and assigned to people by a similar system of priorities. The *auto-construccion* program grouped together from ten to fifty families to obtain block loans for materials and for cooperation in home construction. Groups were restricted to one of two house designs (see Figure 2). Because of funding delays, some participants were still unable to finish their homes as of 1983. Furthermore, the program split up family and village groups often puting together people who had n

FIGURE 2 An 'auto-construccion' (self-help) home.

prior association and who had widely differing resources and capabilities to perform cooperative tasks. Although old Yungay was characterized by marked and rigid stratification, the city itself, with the exception of one new outlying neighborhood, possessed a certain homogeneous appearance. Houses, large and small, were made of whitewashed adobe brick with red Spanish tile roofs. Class differences are now even more marked not only by house size, but by material, design and construction as well. Nothing expresses the difference so well as the Latin American phrase for bricks, cement and steel reinforcement — *material noble*, 'noble materials', with all the attendant differences between noble and humble implied.

Some families whose priority rating, economic and labor resources are too low, or who have recently arrived, live still higher on the hill. Continued cityward migration and some return migration from the coast have created a vertical urban sprawl (see Figure 3). Unable to spread laterally because of avalanche vulnerability, the city can only grow up the 1500 meter hill. Although this area has a semblance of streets which were designated by the urban plan, the dirt roads soon disappear into trails which cut higher into the steep slope. Many of the dwellings on the high slopes of the hillside are rudimentary. Although some people are attempting to construct adobe dwellings, most have scavenged the old tents, tin roofing sheets, and the deteriorating composition wall board from the provisional houses. Here and there a whole module segment survives as a family dwelling. In this area public services are sporadic or non-existent. The reconstruction authority has provided a public spigot for water, allegedly potable, but boiled by most residents to ensure purity. Electrical wires are strung on thin eucalyptus poles for those who can afford the service. Because

undermines the formation of any community solidarity. The delivery of housing aggravated class relations and, in the final analysis, the housing itself has accentuated the conflict and become one of the clearest markers of class differences in material, spatial and symbolic terms in the new city. At one point, I predicted, on the basis of observations of the city's struggle to survive over several years, a more cohesive and integrated community (1977). Perhaps this was optimistic, but the analysis on which the conclusion was based could not take into account the divisive and erosive impacts on the social fabric which the design and construction, particularly of housing in the new city, were to have on the population (Goldman 1985). Indeed, given the miseries of life in the refugee camp, the solidarity expressed in the relocation struggle, and the populist and participatory rhetoric of the Peruvian regimes of the 1970s, such reasoning might have seemed justified. Current conditions in Yungay, however, indicate that the clearest conclusion that can be reached regarding the design and delivery of the new city is that the reconstruction has resulted in the reproduction in urban design and space of the traditional highly stratified and exploitive political economic structures.

In many ways Yungay represents a major challenge to the field of post-disaster reconstruction. Clearly, Yungay is an extreme case, since post-disaster housing is usually not provided in such disparate forms, but extreme cases often bring problems to our attention. Consideration of the long-term social effects of housing reconstruction in Yungay presents us with a fundamental question about the methods and goals of post-disaster reconstruction. As Aysan and Oliver (1987:12), among others, have recently noted, disaster stricken societies generally seek to re-establish themselves in forms similar to pre-disaster patterns. The need and desire for continuity are profoundly rooted in human cognition and must be reflected in the reconstruction of communities. On the other hand, sectors both within and without the stricken society recognize disasters as opportunities to enact much needed social changes, particularly in societies characterized by rigid social stratification based on racial and ethnic ideologies of domination.

I am neither so naive as to think that such social changes are easily designed and constructed by planners and architects into the built form of a community, nor of such an authoritarian frame of mind as to think they can or should be imposed by fiat without regard for potential conflict, disruption and pain. I also do not favor the drab uniformity that often characterizes post-disaster reconstruction and/or resettlement, but housing and settlement patterns which support greater equality do not necessarily have to result in greater uniformity.

Those of us involved in both research and implementation in post-disaster reconstruction should recognize that our policies and practices should not result in the rebuilding of structures which reflect, sustain and reproduce patterns of inequality, domination, and exploitation. We need to be attentive to issues of social stratification in the communities we seek to aid. We cannot assume homogeneity even in the smallest of peasant villages. When houses and settlements are reconstructed in the aftermath of disaster, we need to recognize that materials and social space have profound meanings for people, meanings that divide and separate as well as unify communities. Reconstruction must be based on research which explores and discovers those meanings. And the criteria upon which the success or failure of a project is assessed must include impacts on the social fabric of the community in terms of increased integration or differentiation. Ultimately, engineers, architects, planners and social scientists, in assuming their responsibilities in reconstruction, are faced

with walking a very fine line between a stricken population's need for continuity and the design of a community which will sustain the further development of social institutions of greater equity and justice.

Notes

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1. For a more complete discussion of the resistance to resettlement, see Oliver-Smith (1982).
2. For a more complete discussion of the planning process, see Oliver-Smith and Goldman (1988).

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