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POST-EARTHQUAKE HOUSING RECONSTRUCTION IN MEXICO CITY: MAKING OF A NEW PARADIGM

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SUMMARY

Two functional characteristics of housing reconstruction following the Mexico City earthquakes - broad-based decision-making process and its policy-oriented organization - are depicted as sources of significant innovations in the realization of three important goals of the program; the economic basis of financial arrangements, physical upgrading of housing, and safeguarding the social and economic fabric of the community. Focussing on the organization and achievements of two main projects, this analysis stresses the distinctive character of the program's main features and their significance for reshaping the theory and practice of post-disaster reconstruction policies.

Introduction In September 1985 Mexico City was affected by two large earthquakes causing death of approximately 10,000 people, injuring another 40,000, and leaving 300,000 homeless. Economic loss was estimated at \$6 billion. Housing was most seriously affected of all social sectors. Out of 5,728 collapsed and damaged buildings, 3,745 (or 65 per cent) were residential (Refs. 1 & 2) containing almost 90,000 housing units (Ref.3). Following search and rescue, the most vivid testimony of the disaster were the people who lost their homes and took to camping in the city parks and plazas. The disaster further aggravated the already critical housing situation in the Federal District. A year before the earthquake a deficit of 800,000 residential units was reported (Ref. 2); overcrowding was a serious problem in most older and low-income neighborhoods; the housing stock was substandard, poorly maintained, and almost exclusively (up to 97 per cent) tenant-occupied (Ref. 4). Additionally, the national economic austerity program was grappling with a foreign debt estimated at \$96 billion; unemployment was growing, as was the inflation which, at the time of the disaster, reached the rate of 60 per cent.

Given this difficult situation, few believed that only two years later more than 70,000 new and rehabilitated old housing units will be completed for the earthquake homeless in Mexico City (Ref. 5). Two of the four separate, government-sponsored housing reconstruction programs, Renovacion habitacional popular, and Programa emergente de vivienda - Fase Dos, provided 48,800 and 12,000 units respectively (Refs. 4 & 5). First surveys show that a vast majority of the homeless participated in the programs, that little or no population was displaced from the location of their original vecindades, that housing quality as well as seismic safety were improved, and that residential ownership outweighed tenancy (Refs. 4 & 6). On top of that, it appears that most of the program participants

are satisfied with the final products of both Renovacion and Fase Dos (Refs. 6 & 7).

Remarkable results of the Mexico City reconstruction program seem even more impressive when compared with other notable post-disaster reconstruction efforts. Studies of previous disasters suggest that housing programs in the wake of massive earthquakes tend to amplify the pre-earthquake problems or create new ones. Although analysts and major funding agencies of post-disaster recovery have identified the major pitfalls of past experiences (Refs. 8 & 9), it was not until the Mexico City case that a really major housing reconstruction effort attempted to incorporate this knowledge. The Mexico City reconstruction program was based on a general, but precisely defined, philosophy which took into consideration all the basic theoretical principles derived from the international experience, and adapted them to the dictum of local conditions. In order to understand the character and explain the principal reasons for the success of housing reconstruction in Mexico City, I identify two sets of features characteristic for their strategy. The functional aspect emphasizes the significance of two innovative procedures in planning and implementation of the program. First, a broad-based decision-making process was initiated which sought to involve all interested parties. And second, a specific "policy organization" which dealt with a particular problem while it lasted and was dissolved upon its solution.

The functional features of the program were a necessary prerequisite for defining and carrying out of its substantive features. This was a set of policy goals consisting of three main themes. First, the economic policy of financing housing reconstruction which was based on loan mechanism, rather than gifts to the homeless. Second, physical upgrading of housing stock aimed at improving the living conditions as well as incorporating the latest earthquake resistance code requirements. And third, safeguarding of social and economic continuity of community life by preserving and reconstructing the old neighborhood structure in the same location, but also integrating new small business facilities into new residential neighborhoods.

In my analysis I attempt to highlight the innovative approach of the Mexico City program by contrasting it to other notable cases of post-earthquake housing reconstruction. Two main projects initiated in this City after the 1985 disaster, Renovacion habitacional popular, and Program emergente de vivienda - Fase Dos, serve to illustrate the specific elements and the distinctive character of this reconstruction program. Finally, I argue that this case indeed opens a new chapter in the theory of housing reconstruction in the wake of earthquakes, drawing lessons for all disaster recovery planners.

Broad-based decision-making process Both the participants and the officials of the two projects agree that broadening the base of contributors to the planning process was a prerequisite for the ultimate resolution of an exceedingly complicated housing situation following the earthquakes (Refs. 4, 6 & 7). Renovacion, and later Fase Dos, were created as ad-hoc organizations, which provided the necessary framework for the involvement of all concerned parties in the decision-making process. Renovacion organized extensive meetings, involving "earthquake victims, governmental and non-governmental agencies, universities, technical support groups, professional associations and international organizations" (Ref. 4, p. 2). Between October 1985 and May 1986, these preliminary meetings laid down the groundwork for reaching a compromise among the interested parties. The agreement was formalized as a social contract, and signed by more than one hundred entities.

Although the need has been identified in the literature, very few post-earthquake housing reconstruction programs have broadened their planning to

include the homeless and other concerned groups. While in the case of Guatemalan earthquake of 1976, there was no coordination on the macro-level between the international agencies providing housing, some individual programs closely involved the people who lost their homes into the planning process. Such was, for instance, Programa Kuchub al, described by Cuny (Ref. 11). More frequent, however, are experiences similar to those of Kotor, Yugoslavia. Following the 1979 Montenegrin earthquake, the majority of population from the medieval town of Kotor expressed their preference for, and readiness to cooperate in, the immediate repair of damaged housing within the town walls. Contrary to popular demands, the town was evacuated and expensive prefabricated temporary dwellings were provided, with the justification that the central decision-making body needs time to develop a detailed reconstruction plan. Almost ten years after the earthquake, repair of damaged housing is still in limbo (Ref. 12).

In Mexico City, however, the involvement of the concerned groups, and the homeless especially, did not expire following the official signing of the social contract. Rather, their participation continued through the implementation phase. Since both Renovacion and Fase Dos were designed as decentralized organizations, their field offices became the focal points of interaction between the program officials, contractors and the disaster victims. In order for the homeless to be able to observe the construction process, the temporary shelters were located in the streets, right next to, or across, building sites. Thus, future homeowners could see for themselves that the set standards of quality of materials and workmanship were observed. This type of cooperation of all concerned parties laid the groundwork for planning of housing reconstruction, and its successful implementation.

Policy organization One of the most significant tests of housing reconstruction programs is taken during the process of implementation. The success of a plan, among other factors, hinges on the timing, nature of institutions and procedures selected for putting the program into life. In the past two principal ways have been used for implementation either an existing organization was vested with new powers and charged with new tasks or an entirely new organization was created for this purpose. The World Bank experience suggests that existing institutional structure is preferable for carrying out reconstruction because administrative costs, and many pitfalls connected with establishing new organizations are in this way avoided, while existing organizations are reinforced in the process of intensified reconstruction activity (Ref. 13). It must be mentioned, however, that both new and existing organizations dealing with housing reconstruction tend to accumulate too much power which sometimes may alienate the decision-making process and turn it into an exercise of central authority.

Mexico City set up a new temporary organization as a task force by combining the expertise of the public and private sector. Members of this group were on "loan" from their original organizations, to which they were to return after the completion of the reconstruction program. For example, in the implementation phase Renovacion included representatives of SEDUE (Secretariat for Urban Development and Ecology), DDF (Department of Federal District), from the public sector, and many distinguished experts from private firms, especially from construction industry (Ref. 6 & 14). Having accomplished their goals, both Renovacion and Fase Dos dissolved. Meltsner and Bellavita (Ref. 15) refer to this concept of organizational development and adaptation around a particular issue as policy organization. "Each public policy brings with it the need for organization and for structures and procedures that are required to carry out tasks mandated by the policy." As they describe it, "the policy organization has goals its members pursue. It exists in, is affected by, and influences its environment. It has structures and resources, it carries out tasks, makes

decisions..." and upon accomplishment of its mandate, it dissolves (Ref. 15, p.94).

The concept of policy organization is extremely helpful in understanding the process of housing reconstruction in Mexico City, and reasons for its successful achievements. The reconstruction program brought together the best and most competent actors from various quarters of social life, who contributed not only their own expertise, but also provided valuable assistance of their parent organizations. The public sector provided institutional support, timely flow of information and funds, and shortcuts in the bureaucratic procedures, while the private sector contributed its practical experience in finance, design and construction, as well as their managerial skills. By adopting this functional approach, Mexico City housing reconstruction program avoided centralization of decision-making and concentration of power in a single body, because the awareness among its members of the temporary status of the organizations helped individuals focus on their tasks rather than on securing their positions, or widening their powers.

Economic policy of financing housing reconstruction Financing simultaneous reconstruction of tens of thousands of dwellings required very careful planning, especially in times of economic recession and high inflation rate. The government could provide only a portion of needed funds from its fiscal resources, which in the case of Renovacion was around 40 percent (Ref. 4), while the rest of the money came from the World Bank in the form of a loan. The total amount of this loan is estimated at U.S. \$400 million for all reconstruction projects (Ref. 16). In developing an economically viable strategy for investing this money into reconstruction of housing, three major problems had to be dealt with. The first was the problem of the absentee landlords who owned most of the residential property damaged in the earthquake. Due to strict rent control which kept all rents at 1940's level, they had very little interest to maintain the buildings, let alone invest into their reconstruction (Ref. 2). The decision was made, therefore, to use the fiscal resources for expropriation of damaged properties, and for providing low interest loans to tenants to purchase the unexpropriated ones. Apart from ridding the owners of their almost valueless properties, this provided a material basis for establishing the two main reconstruction projects. Renovacion took over the expropriated land (Ref. 4), while Fase Dos organized reconstruction of housing newly acquired by their previous tenants (Ref. 14).

The second problem was to develop a financial arrangement under which the tenants from damaged properties would assume the responsibility for the cost of reconstruction, thus effectively becoming the owners of new houses. Since the physical structure of the original vecindad, consisting of multiple housing units, was to be recreated, an ownership agreement was made with each family in the neighborhood (Ref. 6). In order for the this agreement to function, it was important to make the loans affordable for the low-income participants in the program who, on the average, earned between 2 and 2½ minimum wages (Ref. 4). Given the low average incomes of the homeless and high inflation rate, a special system of loan repayment was devised. It determined the size of a monthly installment as a percentage of a minimum monthly wage which is regularly readjusted to reflect inflation. To qualify for the Renovacion, a household had to have an income at least 2½ times the minimum wage. Poorer families were usually assisted by numerous church charities in meeting the eligibility standards.

Physical upgrading of housing Given the fact that less than 10 per cent of pre-earthquake housing stock was in good condition while the rest varied from bad to average (Ref. 4), physical upgrading of residential structures became one of the main themes of the Mexico City reconstruction program. A survey conducted by

Renovacion (quoted in Ref. 4) reported that before the disaster 63 per cent of households shared bathrooms, and 30 per cent shared the kitchen with another family; large number of households had problems with utilities (e.g., 54 per cent had deficient drainage in their flats); old dwellings were overcrowded, with an average of 4.37 occupants per unit which was very small, with an average size of 22.25 sq.m. Now housing units of both Renovacion and Fase Dos had an average size of 40 sq.m. which almost doubled the available living space of a typical family. The apartments consisted of two bedrooms, living and dining area, bathroom, kitchenette, and washing area (Refs. 6 & 14).

Increasing the size of the unit and the number and quality of its amenities was only one aspect of the physical upgrading policy. Another was concerned with the seismic safety of new buildings. For each of the building sites, careful investigation of soil properties was conducted and the reports were available for public inspection. Structural systems of individual housing projects were, almost exclusively, of reinforced concrete. Future occupants were very much interested in the construction process, and frequently visited building sites. Thus, reinforcement bars were left exposed as long as possible in order to convince the people that everything was done according to specifications (Ref. 14).

Since many of the participants in the housing program spent more than 30 years in the same neighborhood, they cherished their lifestyle of community interaction which hinged on a particular physical arrangement of the vecindad (Ref. 7). New residential development, therefore, attempted to emulate the ambience values of open communal spaces around which apartment buildings were clustered. In order to accommodate the same residential density on the plot where the victims lived in crowded conditions, new buildings acquired a third floor as an addition to the traditional type of two-story high tenement structure. Since each group wanted their vecindad to make an individual statement about them as a community, very careful design treatment was applied to each of them. Individualized entrance portals, small courtyard chapels, and liberal use of a variety of bright colors fulfilled this requirement, and also greatly contributed to the attractiveness of the urban scene in the area.

Safeguarding of social and economic continuity of community life The principal rationale for housing reconstruction after disasters is to provide healthy and safe permanent housing for the victims, and help them bridge the gap between their "normal" pre-disaster and their post-disaster life. Frequently, inadequate physical, economic, or social circumstances of the communities prompt more substantial reconstruction efforts, which inevitably result in the change of community life. The reasons for such actions may vary considerably. Increasing the safety of all future construction in the risk area prompted the change of construction practices in London following the 1666 fire, and in Lisbon, after the 18th century earthquake (Ref. 17). Avoiding future disaster served as a pretext for relocating the village of Lice, following the 1975 earthquake (Ref. 8), and regional tourist development was the principal reason for driving the population of Kotor out of the historic Old Town (Ref.12). No wonder that communities are sometimes reluctant to accept reconstruction plans for their area fearing that, irrespective of anticipated improvements, the resulting changes will substantially impair their way of life. Hence, the request for recovery efforts to seek a balance between preserving the fabric of community life and the inevitable changes resulting from reconstruction. This balance is very difficult to achieve without a direct and active participation of the affected community in such a process. By promoting continuous cooperation between the homeless and the government, Mexico City program successfully introduced a number of improvement, while maintaining the important features of local community's social structure. Rebuilding in the same location, in the

heart of the city which, owing to its mixture of formal and informal economies, enables people to survive even without stable income and regular employment, helped preserve this important feature of local lifestyle (Ref. 2). In addition to safeguarding the existing socio-economic profile of the community, the program significantly contributed to its development. A large portion of reconstruction funds were refunnelled back into the community, strengthening in the short-term, its economic structure. Construction industry was a massive job generator in the aftermath of the disaster, offering a whole range of employment opportunities. An RHP official reported that more than 115,000 new jobs were created, 62 per cent of which were for unskilled labor, mainly recruited locally (Ref. 6). Residential ownership and integration of commercial spaces and small production shops in the physical structure of *vecindades* provided a firm economic base for long-term community development.

Conclusions Innovative planning procedures and approach to implementation of housing reconstruction in Mexico City after the 1985 earthquakes, opened a new chapter in post-disaster recovery planning. Cooperation of all concerned groups and policy orientation of the planning process brought about successful implementation of the major policy goals - feasible financial arrangements, physical upgrading of housing, and maintaining the social fabric of the community. Organization and the accomplishments of *Renovacion* and *Fase Dos* will undoubtedly become an important source of inspiration for future recovery planners.

REFERENCES

1. Rabell, C., and M. Mier y Teran. "Los damnificados por los sismos de 1985 en la ciudad de Mexico." *Revista Mexicana de Sociologia*. Vol XLVIII, No. 2, pp. 3-28. (1986).
2. Ziccardi, A, "Politica de vivienda para un espacio destruido." *Revista Mexicana de Sociologia*. Vol XLVIII, No. 2, pp. 121-193. (1986).
3. CEPAL. Danos causados por el movimiento telurico en Mexico y sus repercusiones sobre la economia del pais. (October 1985).
4. RHP. Housing Reconstruction Program in Mexico City; DDF, *Renovacion*, SEDUE. (1987).
5. SEDUE. "The 19th of September Earthquake and Mexico City Housing Reconstruction Programs." SEDUE. (1987).
6. In-depth interview with N. Stolarski, Official of *Renovacion*. (1987).
7. Series of interviews with participants in the *Renovacion* and *Fase Dos* Programs in the boroughs of Venustiano Carranza and Cuauhtemoc. (1987).
8. Davis, I. *Shelter after Disaster*. Oxford: Oxford Polytechnic Press. (1978).
9. UNDR0. *Shelter after Disaster*. New York: UN. (1982).
10. Cuny, F.C. "Sheltering the Urban Poor". *Open House International*. Vol. 12, No. 3, pp. 16-20. (1987).
11. Cuny, F.C. *Disasters and Development*. New York: Oxford University Press. (1983)
12. Pantelic, J. "Social Change as an Aspect of Post-Earthquake Reconstruction." Unpublished M.Arch. Thesis, University of California, Berkeley. (1985).
13. TUE. "Recovering from Sudden Natural Disasters." *The Urban Edge*. Vol. 10, No. 10, pp. 1-7. (1986).
14. In-depth interview with R. Puertos, Official of *Fase Dos*. (1987).
15. Meltsner, A.J. and Bellavita, C. *The Policy Organization*. Beverly Hills, CA; Sage Publications. (1983).
16. TUE. "Mexico: Reconstruction, Urban Management." *The Urban Edge*. Vol. 10, No. 5, p. 6. (1986).
17. Davis, I. "Form Follows Failure" *Habitat International*. Vol. 7, No. 5/6, pp. 277-310. (1983).