Intl. J. Humanities (2008) Vol. 15 (2): (33 – 52)

Utilizing Post-Disaster Development Opportunities after Bam Earthquake and the Role of Stakeholders

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Received: 25/4/2006 Accept: 10/11/2007

Abstract

Disasters provide physical, social, political and environmental development windows of opportunities that can be used not only to reconstruct the impacted areas, but also to improve the socio-economic and physical conditions of the impacted population in the long run. It is argued, however, that there is a limited time frame of approximately four years for such opportunities to be utilized efficiently. Bam earthquake in December 2003 that killed more than 27000 and devastated the historical part of the city opened several unique opportunities for mitigation, socio-economic and physical development.

This paper examines the roles that various stakeholders played in the Bam reconstruction and their contribution to the success and failure of utilizing disaster development opportunities. The results show that stakeholders' collaboration and participation, knowledge and experience, long-term and holistic visions, division of labour and use of resources have had significant influence on the success and failure of using post-disaster opportunities.

Keywords: Post-disaster reconstruction, Development opportunities, Bam earthquake, Iran.

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Introduction

Recognition of disasters as development opportunities is becoming one of the core principles of disaster and emergency management (Davis, 2005). Although disasters create major human sufferings and economic damages, they also bring opportunities for social, economical, cultural, physical, and political developments at local, regional, national and even sometimes international levels. However, disaster opportunities do not last long and need to be identified, planned for and utilized through partnership and collaboration between a large number of stakeholders often with different interests. On December 26, 2003 at 5:26 A.M. a 6.5 magnitude earthquake devastated the city of Bam, located in Kerman province and in the margin of Kavir-e- Lut desert in the south-eastern Iran that killed more than 27000 and left 75000 people homeless (Nadim *et al*., 2004; R. Wang *et al.*, 2004).

City's infrastructure including water supply, power, communication, healthcare services, government buildings, main roads and the only airport were crippled. The city of Bam is well known for its historical castle of Arg-e-Bam, the biggest mud-brick complex in the world and the world's largest dried clay structure, which is about 2400 years old. This historical monument is located on an igneous hill besides the Silk Road and has an area of some 240,000 m^2. This major tourist attraction in the area was totally destroyed as shown in Fig. 2 (Ahmadizadeh & Shakib, 2004; Akbari *et al*, 2004).

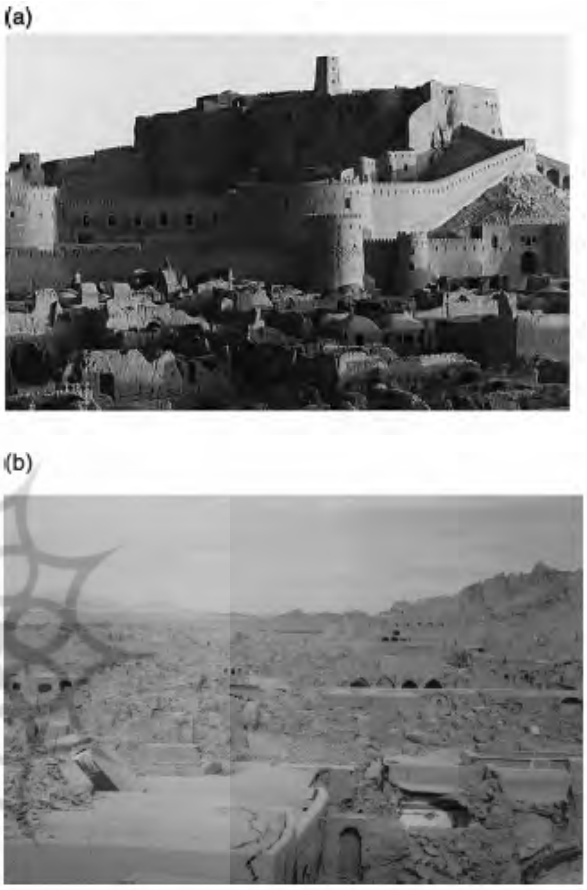


Figure 2 Arge-Bam before (a) and after (b) the earthquake.

Despite its huge human, economic and cultural losses, this earthquake also created number of socio-economic and physical development opportunities for the city and the region, which could be utilized during the reconstruction process.

Now, more than four years after the disaster, the question is whether these development opportunities have been used or lost. The aims

of this paper are twofold:

1) to identify development opportunities generated by the earthquake;

2) to understand the role of different stakeholders in utilizing disaster development opportunities.

As such, the rest of this paper is organized as follow. Section two provides a brief background literature on disaster and development relationships with special focus on disaster as development opportunities. Section three analyses the key stakeholders and activities in the Bam reconstruction. Section four examines the post disaster development opportunities and the roles that different stakeholders played in utilizing them. Section five concludes the paper with some recommendations for future reconstructions and research.

Disaster and Development

Disasters could be viewed as development problems. They tend to have greater effects on the developing countries than on the developed ones. Low level of development exacerbates disaster impacts. The long term impacts of disasters are considerably greater in less developed countries (Cuny, 1983). Disasters reveal the shortcomings and the strengths of the development process (Lewis, 1999). For a long time, the cause and effect relationship between disasters and socio-economic development had been ignored. At best, development planners hoped that disasters would not occur and, if they did, were most effectively handled by relief from donor countries and relief organizations. Development programs were not assessed in the context of disasters, neither from the effect of the disaster on the development programs nor from the point of whether the development programs increased either the likelihood of a disaster or increased the potential damaging effects of a disaster. Disasters were often seen in the context of emergency response –not as a part of long term development planning. When a disaster did occur, the response was directed to emergency needs and cleaning up. Communities under disaster distress were seen as unlikely places to institute development. The post-disaster environment was seen as too turbulent to promote institutional changes aimed at promoting long-term development (UNDRO & UNDP, 1992).

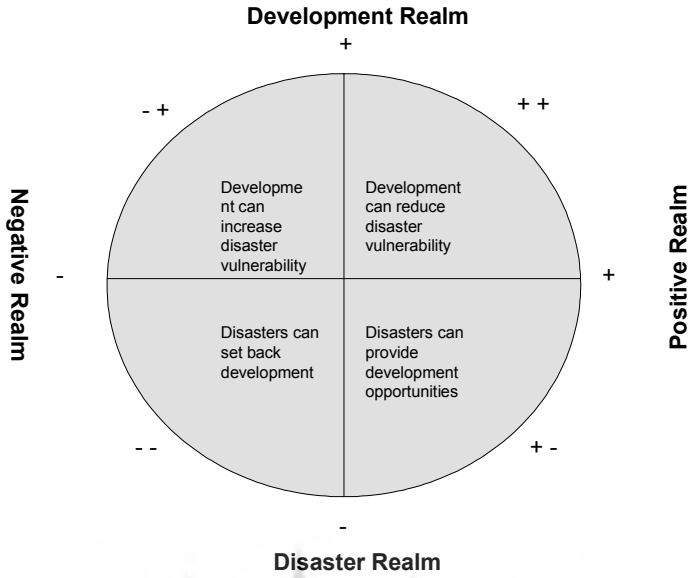
Disasters and development are linked in different ways and at least four models have been suggested in the literature:

1) Disasters set back development by destroying years of development initiatives;

2) Development can increase susceptibility and vulnerability to disasters;

3) Development can decrease the susceptibility and vulnerability to disasters and their negative consequences;

4) Disasters provide significant opportunities to initiate and enhance development (UNDP, 2004).



Source: UNDRO & UNDP, 1992, P. 25

Model one describes disasters as impediments to development because of the following reasons: 1) Disasters destroy the social and economic infrastructure of an area, region or a country; 2) Disasters redirect resources from productive economic investments to disaster mitigation and thus limit the growth potential of the country or region. This may depress development potential as a result of increased public expenditure on disaster mitigation and the potential declines in revenue owing to reduced economic activity as well as any losses incurred by actual disaster events; 3) Risky areas are less attractive to investors. In other words "disaster proneness may act as a disincentive to new investors, particularly during reconstruction when perceptions of hazard risks are heightened and the economy is unstable" (Pelling et al., 2002); 4) Disasters reduce governments' ability to invest in development projects through lowering the tax base as a result of development opportunities foregone and production failures, and the additional burdens of hazard mitigation and preparedness, relief and reconstruction.

There are various evidences showing the relationship between the level of development/underdevelopment and the existence and occurrence of natural and environmental hazards and disasters. For example, Benson (1997) link the distribution of rural poverty to regional variations in deforestation, flooding and drought in the mountains and to typhoons and poor soil on the coasts in Vietnam. Also in Dominica, repeated disasters have hampered long-term efforts of infrastructural improvement to such an extent that the government has continually identified

the weakness of the island's infrastructure base as a critical constraint to economic growth.

The second model views development as a source and cause for vulnerability to disasters. In this view, development can itself heighten disaster risk or economic vulnerability. In contrary to the previous perspective, the most vulnerable communities or countries to hazards are not necessarily those that are the most undeveloped. Here a link is made between the development policies and vulnerability to disasters. "Linkages between the industrial and agricultural sectors enable shocks to diffuse quickly throughout the economy. Similarly remittances from urban to rural workers can spread impacts throughout lower-income groups" (Pelling et al., 2002). Urbanization in both developed and developing countries is a prim example: whilst city growth can improve the quality of life for rural migrants and contributes to industrialization, the very process of denser cities increases the chance for greater casualties in the event of an earthquake, with harder accessibility and the greater threat of loss of lives and livelihoods through fire and building collapse. Rapid urbanization creates large concentrations of people and physical capital, mostly built with little regard for natural hazards either in choice of location or design. As a result of rising exposure to geophysical hazards disaster-related losses are also rising (Benson and Clay, 2001).

According to the third model, development could decrease vulnerability to disasters through different ways. If poor and socially disadvantaged groups are the most vulnerable, any effort to improve their conditions through development projects could reduce their long-term vulnerability to disasters. In an ideal form, development programs should even include vulnerability reduction as an integral component. There are numbers of mitigation and vulnerability reduction measures that planners can use to mitigate future risks and vulnerability to them in a sustainable hazard mitigation framework. Land use planning and zoning and building codes regulations, hazard monitoring and early warning measures, measures to reduce urbanization, training for builders and professional qualifications attainment, public awareness raising and education, professional training and education in technical and planning principles for building professionals, including architects, planners, civil engineers are among these measures (Meliti, 1999).

The fourth model views disasters as development opportunities. The destruction of unsafe infrastructure and buildings can provide an opportunity for rebuilding with better standards, or relocation if the site was particularly vulnerable. Large disasters involve extensive rehabilitation and reconstruction investment and hence provide opportunities that may not be available previously (Badri *et al*., 2006). For example, during the disaster recovery and reconstruction periods, flows

of foreign currency into a disaster-affected country from aid, debt relief, insurance, private transfers and remittances can produce an apparent improvement in national balance-of-payments, and provide the financial means for enacting new development priorities (Bertrand, 1993). Damaged buildings may highlight structural weaknesses, which could be rectified, and may serve to improve building and planning regulations. Post-disaster situations create some kind of social and political atmosphere that important social, institutional and physical development programs could be initiated and implemented.

Moreover, disruptions caused by disasters can open political space for alternative forms of social organizations. Support for such organizations is one way in which new development priorities might be carried forward beyond the immediate response period. Finally, reconstruction process can serve as an opportunity for building disaster risk reduction mechanisms into post-disaster development planning.

Stakeholders in Post-Disaster Reconstruction

Stakeholders' Analysis

Stakeholder analysis has developed as a tool, or set of tools, with different purposes in its applications in the fields of policy, management and development planning (Varvazovszky and Brugha, 2000; Brugha and Varvazovszky, 2000). Stakeholder analysis refers to a range of tools or an approach for understanding a system by identifying the key actors or stakeholders on the basis of their attributes, interrelationships and assessing their respective interests related to the system, issue or resource(Ramirez, 1999; Brocklesby et al., 2002). Stakeholder analysis is a central theme in conflict management and dispute resolution (Smith, 1993; Ramirez, 1999; Swiderska, 2002). Stakeholders' analysis can be used in post-disaster reconstruction to assess potential support or opposition to the reconstruction process among the interested parties such as the impacted people, administrators, private sector, and NGOs. A stakeholder is defined as persons, groups, organizations, systems, etc., that have a 'stake' in the reconstruction and that are either likely to be affected by the reconstruction, whose support is needed or who may oppose the reconstruction plans, policies, or projects. Stakeholders' analysis identifies the key stakeholders and analyses their relative power, influence priorities, resources, and their significance in the entire reconstruction process.

Stakeholders in a reconstruction process usually include representatives of the following:

1. Community members and citizens' groups.
2. Governments (national and local), encompassing public and semi-public entities in a wide range of sectors and roles.
3. Civil society organizations including NGOs, civic groups, and voluntary associations.
4. Private sector (i.e., the business and industrial groups).

5. Professional groups, including academic; researchers, and training organizations, consulting firms, etc.

6. Media including newspaper, radio, and television networks.

For the reconstruction process to be effective and successful, all these stakeholders should demonstrate commitment to the cause through transparency, bottom-up planning, democratization, accountability, cost effective measures, ensuring proper utilization of resources, and strengthening close collaboration and partnership. Table 1 shows the results of a preliminary stakeholders' analysis in Bam reconstruction. Information was gathered through field surveys and interviews with some of the key stakeholders.

Table 1 Stakeholders' analysis of Bam reconstruction process community

	Community and impacted populations	***The Local government***	***The National Government***	***Civil Society Organizations***	***Private corporate sector***	***International Organizations***
Key representatives	Impacted population City Residents Local citizens' groups	Bam Municipality Bam City Council	Iranian Housing Foundation National Heritage Organization Kerman provincial government	International NGOs National and Provincial NGOs Local NGOs	Building Materials Contractors Consultants Local businesses	United Nations UNDP UNESCO
Priorities	Housing Income and employment Improvement in Urban services	Urban infrastructure Urban planning Building permits Subdivision and setback applications	Housing National Cultural Heritage Infrastructure Agriculture	Social support Vulnerability reduction Psychological help Women and children Empowerment	Receiving contracts Selling the building materials	Capacity building Resource management Training and education Vulnerability reduction Coordination
Available resources	Human resources Financial resources Ideas	Information and knowledge resources Planning and decision making powers and resources Institutional resources	Financial resources Technical resources Material resources Planning and decision making powers and resources Institutional resources	Technical resources Financial resources	Technical resources	Technical and advisory resources Financial Support Educational and training resources Institutional resources
Relative significance	High	Moderate	Very High	Moderate	Moderate	Moderate

The Community Members and Civil Society Groups

Community members and citizens' groups are people who have been impacted by the disaster and many of them are directly involved in the reconstruction process. In Bam, they include more than 25,000 households and a number of civil society groups that emerged in response to the post-disaster reconstruction needs and shortcomings. The most important priorities for the impacted population are housing, employment and restoration of urban services and facilities (MNA, 2004). Households bring their time, human and financial resources (provided to them through low-interest rate loans) and ideas to the reconstruction process.

There are also a number of civil society groups that were established after the earthquake and contribute to the reconstruction process by their ideas, knowledge of the community and by their skills. One example of such groups is the Bam Reconstruction Society that has been very critical about the reconstruction process and often publicly demanded more government inputs, attention, investments, and accountability (MNA, 2005). This group of stakeholders have a significant importance in the reconstruction process both as the impacted population and as the main beneficiaries of the reconstruction process and as the final residents of the city.

The International Organizations

International organizations such as the United Nations and its related agencies have been among the key stakeholders in the Bam reconstruction process. The United Nations Development Program (UNDP) has worked very closely with the government of Iran, local and provincial authorities, as well as affected communities since the aftermath of the disaster have played a major role in various aspects of post-disaster reconstruction planning and implementation. The priorities of the UN related organizations such as UNDP mainly focused on capacity building, empowerment, vulnerability reduction, and coordination of international efforts through various training programs. UNESCO has been involved in the reconstruction process by providing scientific and technical advise, training and education, mobilizing financial assistance, and also by creating a task force to coordinate UNESCO's actions in response to the damage to one of the world heritage sites (Alavi, 2005).

The NGOs

Bam earthquake attracted a large number of NGOs in both response and reconstruction phases, which was somehow unique as compared to the previous disasters in Iran. NGOs included local, national and international non-governmental organizations that have been involved in the reconstruction process and have

played key roles mainly through the provision of social, cultural, and economic development programs such as needs assessment, fund raising, provision of social and community services, vocational training and public education, and environmental protection. For example, Action by Churches Together (ACT) has been one of the leading international NGOs that completed 48 housing units and also provided social and psychological supports for disaster victims. Another active international NGO is Arbeiter Samariter Bund - Workers' Samaritan Federation (ASB) that was very active in disaster recovery of schools and hospitals and assisting disadvantaged groups such as disabled and women headed households.

Local NGOs include Banuvan e Bam (Ladies of the Bam), Mashiz Charity Organization, Nejat Charity Organization, and Women Network. Banuvan e Bam and Women Network provide health services to women and conducts social and cultural activities and research that are supported also by the Iranian Handicraft Organization, Bam Governor and the Ministry of Health. Mashiz and Nejat Charity Organizations have been providing vocational trainings and conducting social and cultural activities in the city to help the social and economic recovery of the impacted population.

More than 30 NGOs from the province and other parts of the country have been directly active in the reconstruction of the city. In the early weeks of the reconstruction period, a coordinating council was formed to enhance the coordination of the NGOs and to facilitate the exchange of knowledge and best practices and experimental applications of new methods among them.

The Local Government

The Bam Municipality and the Bam City Council are the two most important local government bodies in the city. Issuing building permits, dealing with subdivision and set back applications, and recovering building titles and official documents have been among the major activities of the city during the past two years. Until January 2006, the City had issued more than 18,000 building permits. The Bam City Council also plays a critical role in the reconstruction process mainly through participation in decision making process and also by exercising its legal powers and authorities in the city. City council has divided the city into 15 reconstruction districts and each council member has been responsible to oversee and monitor the reconstruction process in one district.

The National Government

National government through the cabinet of ministers and individual ministries has the strongest planning and decision making power in the reconstruction process. Soon after the

earthquake a national reconstruction steering committee was formed that included members of different national government organizations and ministries. Ministry of Housing and Urban Development, Ministry of Economic and Finance, National Heritage and Tourism Organization, Management and Planning Organization, Ministry of Welfare and the Iranian Housing Foundation are the permanent members of this task force. The Housing Foundation of Islamic Revolution (HFIR) was given the responsibility to administer, coordinate and manage the reconstruct process. HFIR has been the leading agency in post-disaster reconstruction in Iran since its establishment in 1980. Most of the activities of the national government are implemented through their regional and local offices in Kerman province and the city of Bam. National government provides financial, technical, and material supports for the reconstruction. The main priorities of the national government are housing, national heritage and administration and coordination of the process at various levels as well as recovery and rebuilding of damaged urban infrastructure, facilities and services.

The Private Sector

More than 5,000 local businesses and industries were heavily impacted by the earthquake. They play the roles of disaster victims as well as stakeholders in the reconstruction process. Moreover, a considerable number of national building and construction companies have opened their branches in the city. They provide and supply various services and products and have been engaged in most of the small and large reconstruction projects and contracts.

Post-Disaster Reconstruction and Development Opportunities

Bam earthquake provided a number of development opportunities some of which were identified and listed by Asgary (2004). Similar to other disasters, this earthquake presented windows of opportunities for disaster mitigation, physical planning, and socio-economic and cultural developments.

The Bam earthquake damaged significant part of the city and created an opportunity for developing a resilient community that could be used as a model for other parts of the country. Moreover, the earthquake provided an opportunity for further development and growth of the city's unique and internationally known date production through more publicity, renovation of the old irrigation systems, and expansion of its related industries. The Bam disaster also created new opportunities for city's exceptional cultural heritage and further development of tourism. City could also use this disaster to reshape its physical planning and development by introducing new planning ideas and innovations. Now more than four yeas after

the disaster this section reviews the extent that these opportunities were capitalized.

Post Disaster Mitigation Opportunities

Most of the damaged buildings in the affected area were constructed by sun-dried brick masonry with extremely poor seismic resistance. Prior to the earthquake, less than three percent of the housing units in the city were made of steel frames. Bam earthquake created an opportunity that not only could mitigate the future losses of life and property damages but also could make the city as a disaster resilient that could be used as a model for the rest of the country. In order to achieve these goals, the UNDP in collaboration with other international organizations (UNIDO, ILO, WHO, WFP, UNICEF, UNESCO, UN-HABITAT) and some of the Iranian institutions (International Institute for Earthquake and Earthquake Engineering, Building and Housing Research Centre, and Disaster Reduction Institute of Iran, and the HFIR) organized several workshops and training programs for various groups of stakeholders involved in the reconstruction process.

At the decision and policy making level, a workshop was organized to provide national authorities with a menu of technological, financial and institutional approaches that have worked in other contexts and that could be adopted in Bam reconstruction program. This workshop brought together members of the Steering Council for Reconstruction of Bam, senior Government and UN officials and post-earthquake reconstruction experts from Iran, Japan, India and Turkey to share experiences and provide advice on issues such as institutional arrangements for reconstruction, site selection and land tenure, shelter sector reconstruction, rebuilding critical infrastructure and urban redevelopment and planning. The recommendations from the workshop have been submitted to the Bam Reconstruction Steering Committee to be included in the Government's reconstruction strategies.

At the engineering and technical level, several training workshops were held to establish appropriate delivery mechanisms that ensure rapid recovery, facilitate the mainstreaming of earthquake-resistant construction into the housing process, and optimize local employment opportunities. These training workshops provided an opportunity for policy-makers, reconstruction managers, engineers, architects and private sector contractors to consider the pros and cons of different building technologies and also helped participants to explore the potential linkages between different building technologies and the community's livelihood systems and end users needs.

At the operational and implementation levels, UNDP in collaboration with the HFIR,

Bam Technical and Vocational Training Organization, and NDRII organized several training programs for key construction workers. They helped construction workers to apply the basic methods that should be used for seismic resistant construction, especially those neglected in Bam before the earthquake. They focused on capacity building for the use of indigenous design and construction techniques and showcased the common bad practices to sharpen the local building workers on earthquake-resistant construction (UNDP, 2006).

At the community level, there was a need to understand people's preferences' for housing design and educate them about the importance of building codes and standards. In doing so, the UNDP in co-operation with the Swiss Agency for Development and Cooperation (SDC), together with a team of engineers, designers, technicians, contractors, members of the public and the beneficiaries prepared different housing designs and discussed them with the beneficiaries. As a result of this collaboration, people were provided with different choices using the results of these workshops. More than 60 housing models were designed and constructed in a designated site by the certified and authorized engineering consultants and showcased to people.

Although the reconstruction stared with delays and a full recovery and reconstruction take a few more years, there have been some achievements in the mitigation areas. Seismic building codes have been followed and construction engineers have applied even higher standards that in some cases have significantly increased the overall building costs. There is a general agreement among the stakeholders that the reconstruction of Bam is becoming a turning point in the history of reconstruction programs in the country. Therefore, an earthquake resilient city is not far reaching at least from a physical point of view. As such, the Bam reconstruction has the potential to become a successful recovery program, in that it has not only enhanced earthquake safety standards in Bam but also has created an overall earthquake awareness in other parts of the country (United Nations Office for the Coordination of Humanitarian Affairs, 2004). This has been achieved mainly through collaboration, participation and firm commitments of the stakeholders in this initiative.

Economic Development Opportunities

Bam economy has been based on its unique and internationally known dates production and also its main tourist attractions before the earthquake. Iran ranks number 1 in dates production and exports more than 250'000 tones of dates annually, considerable portion of which is produced in Bam. During the earthquake, there was no direct damage to palm

trees, but the traditional irrigation systems, known as Qanats, were heavily damaged and needed urgent repairer and reconstruction (UNESCO, 2005). The ancient Bam (Arg-e-Bam), the cities famous cultural heritage and the second source of employment and income was a remarkable example of ancient Iranian urban construction and one of the most representative examples of a fortified medieval town built in vernacular technique using mud layers. Most of this magnificent site, which was attracting more than 100,000 national and international tourists every year, was destroyed by the earthquake. Despite of that, earthquake created several economic development opportunities for both agriculture and tourism sectors.

In the agriculture and dates production sector, three major windows of opportunities were opened. First, the city's most famous product could be known to larger number of people worldwide. Second, during the reconstruction process, the traditional irrigation systems could be repaired and modernized and this would increase the quality and quantity of production. Third, earthquake highlighted the economic advantage of the city in date-production and the need for further investment on that by the government and the private sector.

Rapid reconstruction of the irrigation systems and timely support provided to the date producers prevented the collapse of the date production in the year following the earthquake. Reconstruction in this area was mainly done by the Ministry of Agriculture and technical assistance provided by some of the International NGOs.

As a result, the economic base of the city has come back to its pre-disaster situation and the amount of harvest increased significantly. However, more efforts should have been done to fully utilize these opportunities in the form of a major economic development program. Bam's agricultural and tourism economic bases have the potential not only to generate more jobs and income for the city, but also to create employment opportunities for the whole region. Expansion of the palm orchards, active marketing of the products and more investments in the relevant industries and infrastructure are among the major areas for further attention that have been relatively neglected almost by all of the stakeholders. More collaboration among the stakeholders and active role of the government could enhance the use of these economic development opportunities. Perhaps this was an area that neither the NGOs nor international agencies had little or knowledge and experience on that.

Earthquake also brought several opportunities for the tourism sector despite of the total destruction of Bam citadel. The first opportunity relates to the fact that the ancient

Citadel and surrounding cultural landscape of Bam was simultaneously inscribed on the UNESCO's world heritage list and on the list of the world heritage in danger list in 2004. The List of World Heritage in Danger is designed to inform the international community of conditions, which threaten the very characteristics for which a property was inscribed on the World Heritage List, and to encourage corrective action. There is no doubt that the inclusion of Bam's citadel on the World Heritage in Danger List gave a much-needed impetus to the reconstruction efforts and plans. Inscribing a site on the List of World Heritage in Danger allows the World Heritage Committee (WHC) to allocate immediate assistance from the World Heritage Fund to the endangered site.

Secondly, the earthquake created new excavation opportunities and as a result archaeologists discovered new historic evidences such as remains of an ancient settlement and its irrigation systems dating back at least to the Parthian-Hellenistic period (2nd century B.C.). These are added to the existing tourists' attractions of the city. The third opportunity was the fact that city and its unique cultural heritage became known to a larger number of people worldwide and it is expected that after the reconstruction and rebuilding of city's tourism facilities, it would attract more tourists that come to the city not only to see the Arg-e-Bam but also to visit a city that was completely destroyed by an earthquake once.

The fourth opportunity that is also relevant to the tourism development is the role that this city can play in earthquake education and research in the future. A better utilization of this opportunity requires an earthquake museum and a research centre to be created and some university programs to be established. Bam Azad University (private sector) used this opportunity and created new programs on civil engineering and archaeology.

Obviously, some of the economic development opportunities have been utilized very well through the international, national, and local collaborations. Technical knowledge, and financial supports were provided by the international agencies, foreign governments (Italy and Japan) and ample technical expertise of well-trained Iranian professionals came together to capitalize these opportunities. Several workshops and conferences were held in Bam, Tehran and other parts of the world to discuss the reconstruction strategy for Bam citadel and a restoration plan was jointly prepared by the UNESCO and the Iranian authorities. The first phase involved reinforcing the structures that were still standing to prevent them from collapsing. Then data were collected and all available information about Arg-e-Bam studied to lay the ground for the reconstruction, which is now undergoing. The restoration of

Bam citadel certainly needs several years to be completed. In the mean time, however, stakeholders' collaboration and support are needed so that the city can regain some of its tourists to be able to support its economy and the reconstruction process. It especially requires government and private sector collaboration in rebuilding of the basic tourism facilities such as hotels and restaurants.

Physical Planning and Development Opportunities

Disasters provide opportunities for planners to exercise new ideas and planning innovations. Chicago fire in 1871 and Halifax explosion in 1917 are classic examples of disasters that created significant physical development opportunities (Asgary, 2004). Similarly Bam earthquake created new opportunities for planners to try new physical planning and development ideas. To utilize these opportunities, a technical consultation on urban redevelopment and planning was held in April 2004 in which a large number of international, national, regional and local agencies were involved. UNDP, UNICEF, UNESCO, WHO, UNIDO and other UN agencies provided technical and capacity building assistance for micro-planning of the city.

Assessments began in close liaison with local, provincial and national authorities to identify physical, economic and social factors that influence the reconstruction of Bam and its infrastructure. For example, the possibility of a new master plan for the city created an opportunity to introduce the 'child friendly city' concept in the reconstruction plan initiated by the Iranian High Council of Architecture and Urban Planning and supported by the UNDP.

Despite of the existence of planning opportunities in the post disaster reconstruction phase, there have been major obstacles for capitalizing these rare and important opportunities. Stakeholders are less diverse and have conflicting interests and collaboration is relatively low. Moreover, there hasn't been much international support and involvement in this particular area. In fact, physical planning has become one of the most challenging parts of the reconstruction process. It took more than a year for the planning cosultant to prepare the city's new master plan.

More than four years after the disaster the plan has not been adopted and approved for implementation by the relevant authorities due to the conflict of interests that exists between the reconstruction office run by the HFIR and the municipality. As a result the actual reconstruction was started without considering the new master plan and, therefore most of the physical planning opportunities were almost lost.

Physical planning decisions are lengthy. For example, master plan recommended to widen several major city streets but because of the

conflict of interest between the stakeholders (land owners, municipality and reconstruction office) this recommendation has not been implemented yet. As land owners are reluctant to accept the recommendations and neither the offered prices not alternative lands are attractive to the previous owners, there is little chance for such physical planning opportunities to be used. Confusion over the land prices has partially created this problem. In order to widen the streets, city needs to purchase considerable number of properties. City has been able to purchase 1200 properties and had plans to buy another 500 properties hoping to facilitate and speed up the implementation of the new plan's recommendations. However, lack of financial resources as well as the confusion over the land prices has created major obstacles. There is little agreement between the stakeholders about the land prices because the city's real estate market has collapsed. Land owners are not willing to sell their lands based on the offered prices.

Post-disaster reconstruction created significant opportunities for improving urban facilities such as libraries, expansion of the Bam airport, highways, sport complexes, art and theatre houses, health clinics and hospitals. Again collaboration among the stakeholders and financial supports provided by the NGOs, private sector, international agencies played a key role in successful use of such social and physical development opportunities.

Our observations show that people are now playing significant role in the reconstruction process despite their initial expectations that government and other agencies will take care of everything. People have leaned many things about the modern urban planning process and building methods in the city as they need to follow proper planning and development processes. Most residents are now familiar with large number of development and planning terms, especially those relevant to earthquake resistant building codes and standards.

In the initial stages of the reconstruction, the Government insisted on using steel frame structure as its construction method of choice. However, as a result of several meetings and consultations with stakeholders, the government showed flexibility in handing over the choice of the design to the people by establishing an engineering services and exhibition site in Bam. This exhibition site has brought engineering consultants, building material suppliers and construction companies all in one place where they can offer their services and materials. The government has provided the facility for offering different design choices from a variety of standard building materials and even various styles of fences and walls for the housing units, commercial and public buildings. The government is now more open to alternative construction methods than before and instead of recommending a single technology she is

recommending policies for earthquake proof buildings that also safeguard the cultural integrity of Bam. Kerman Province Association of Engineers and the Council of Bam Architecture are providing these services free of charge to the people through their contract with the HFIR. This is a step forward towards a more participatory physical planning.

Conclusion

Bam earthquake provided numbers of pos-disaster mitigation, economic and physical development opportunities. Four years after the disaster, there are evidences showing that the city has been able to utilize some of these opportunities and has failed to benefit from others. Several factors have possibly contributed to the success and failure in using these opportunities. First, there is little doubt that in the successful cases such as mitigation and registration of Bam citadel in the world heritage in danger list, collaboration and participation of different stakeholders were very high. International organizations provided technical and training support, national government prepared the framework and financial and human resources, local government provided logistic and local knowledge, NGOs were active in capacity building and public education programs, and local citizens participated in the process with high level of motivation and interest. This success is partially attributed to the less conflict of interests and political commitment. On the other hand, in the physical planning or economic development cases, less collaboration existed and in fact in some cases there were little interests by stakeholders to get involved. The nature of post disaster reconstruction and the lack of cooperation among the stakeholders and less interest by NGOs and international organizations are among the factors contributed to these results.

Second, most of the stakeholders, specially the NGOs and international agencies involved in the post-disaster reconstruction paid more attention to the small scale capacity building and social recovery issues as compared to the large scale development programs in agriculture and tourism that could have more significant impacts on the long term recovery of the city and the region.

Third, there is a potential relationship between the accumulation of knowledge and experience and the use of post disaster opportunities. As we get to know these opportunities, we are utilizing them much better. Mitigation opportunities are a good example. Most of the stakeholders that were involved in the reconstruction process had much experience and knowledge to share and apply. This was not the case with some other opportunities such as the physical planning or economic development opportunities that were not fully utilized in this case.

Fourth, international agencies can play a major role in the success and failure of the post-disaster opportunities. This study provides evidences that post disaster opportunities were used better where international agencies were involved.

Acknowledgment

Authors would like to thank the Iranian Housing Foundation authorities for their collaboration and support of the field survey.

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بهره‌گیری از فرصتهای توسعه‌ای بعد از وقوع مخاطرات و نقش گروههای درگیر در بازسازی: مورد مطالعه زلزله بم

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تاریخ دریافت: ۱۳۸۵/۲/۵ تاریخ پذیرش: ۱۳۸٦/۸/۱۹

مخاطرات، دریچه‌ای از فرصت‌های توسعه فیزیکی، اجتماعی و زیست‌محیطی را به‌دست می‌دهند که نه تنها برای بازسازی نواحی آسیب‌دیده قابل استفاده هستند بلکه شرایط اجتماعی ـ اقتصادی و فیزیکی جمعیت متأثر را در بلندمدت بهبود می‌بخشند. با این همه، این بحث مطرح می‌شود که یک محدودیت زمانی تقریباً چهار ساله برای بهره‌برداری مؤثر از چنین فرصت‌هایی وجود دارد. زلزله پنجم دی‌ماه ۱۳۸۱ بم که طی آن بیش از ۲۷۰۰۰ نفر کشته شدند و بخش تاریخی شهر نابود شد، فرصت‌های بی‌نظیری برای کاهش آثار ناشی از زلزله و توسعه اجتماعی ـ اقتصادی و فیزیکی ایجاد کرد.

این مقاله نقش‌هایی را که گروههای مختلف درگیر در بازسازی بم ایفا کردند و سهم آنها را در توفیق و یا ناکامی در بهره‌برداری از فرصت‌های توسعه‌ای ناشی از زلزله مورد آزمون قرار می‌دهد. یافته‌ها نشان می‌دهند که همراهی و مشارکت گروههای دخیل در امر بازسازی، دانش و تجربه، دیدگاههای بلندمدت و کل‌نگرانه، تقسیم نیروی کار و استفاده از منابع تأثیر مهمی بر توفیق و ناکامی بهره‌گیری از فرصت‌های مخاطره داشته‌است.

واژگان کلیدی: بازسازی بعد از وقوع مخاطرات، فرصت‌های توسعه‌ای، زلزله بم، ایران.

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