

Disasters and Development: Part 2: Understanding and Exploiting Disaster-Development Linkages

(continued from Volume 17, Number 3; July–September 2002)

Rob S. Stephenson; Charles DuFrane*

This publication was prepared by the University of Wisconsin-Disaster Management Center (UW-DMC) with the financial support from the United Nations Development Program (UNDP) and the United Nations Department of Humanitarian Affairs (UNDM) now the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA).

The Content is based on the training module, "Disasters and Development" written for the UN Disaster Management Training Programme (UN-DMTP): 1st Edition, 1991; 2nd Edition, 1994; and 3rd Edition, 1996. The UW-DMC and *Prehospital and Disaster Medicine (PDM)* gratefully acknowledge the DMTP as a principal resource for this course.

The original DMTP module was prepared by Rob S. Stephenson, as was the 2nd Edition. The content draws substantially from the work of Mary Anderson and Fred Cuny, and on the UNDP and the World Bank guidelines. The professional review team included Yasemin Aysan, Ian Davis, and Gustavo Wilches-Chaux. The 3rd Edition of this module, was prepared by Charles DuFrane of InterWorks in Madison, Wisconsin.

Many other individuals and organizations contributed to the realization of this work. Charles Dufresne from InterWorks prepared and developed the UW-DMC self-study components. Paul Thompson of InterWorks provided technical assistance and guidance. Original design and desktop publishing services were provided by Susan Kummer of Artifax. Others who helped along the way were Nahla Haidar, Kate Condon, and Peter Witham. Important feedback came from individuals who participated in DMTP activities in many countries.

Copyright ©1997 by the Board of Regents of the University of Wisconsin System. All Rights are reserved.

Produced by the University of Wisconsin Extension and manufactured in the United States of America.

Abstract

This lesson is a continuation of *Disasters and Development: Part 2: Understanding and Exploiting Disaster-Development Linkages* published in *Prehospital and Disaster Medicine* in Volume 17, Number 3. It identifies the goals of a specific damage mitigation project that can be incorporated into a regular development project and the mechanisms for obtaining the mitigation component of such a project. Mechanisms for assessing the success of such a project are discussed. It stresses the importance of the application of building codes, associated training programs, and more extensive use of zoning regulations in urban development that decrease the population at risk and the likelihood of damage to industrial facilities. Disasters can elevate the development potential of a society at risk for damage from a hazard. The political impact of damage and disruption can be a catalyst for change. Development opportunities often are compromised because of an excessive focus on relief assistance. Interventions designed to mitigate the damage from a given hazard are particularly effective when they focus on areas at particularly high risk for actualization of the hazard. Support from the private sector, including the non-formal sector, is a key element of successful reconstruction management. The period of recovery is an opportunity for general assistance to government with administrative procedures, including enhanced management training programs.

Stephenson RS, DuFrane C: *Disasters and development: Part 2: Understanding and exploiting disaster-development linkages* (continued from Volume 17, Number 3; July–September 2002). *Prehosp Disast Med* 2005; 20(1):61–65.

The University of Wisconsin Extension provides affirmative action and equal opportunities in education, programming, and employment for all qualified persons regardless of race, color, gender, creed, disability, religion, national origin, ancestry, age, sexual orientation, pregnancy, marital or parental status, arrest or conviction record, or veteran status.

If you require this material in an alternative format, please contact the Program Coordinator or the University of Wisconsin Affirmative Action Office.

Direct policy inquiries to the Office of Affirmative Action and Equal Opportunity Programs, 501 Extension Building, 432 Lake Street, Madison, Wisconsin 53706 USA.

For permission to reprint, contact the Disaster Management Center, Department of Engineering Professional Development, University of Wisconsin-Madison, 432 North Lake Street, Madison, WI 53706-1498 USA; E-mail: dmc@engr.wisc.edu.

This course may be enrolled for credits toward a Certificate in Disaster Management from the UW-DMC by completing and forwarding the form printed at the end of this lesson.

*The content has been edited and updated in 2004 by the Editorial Staff of PDM.

Keywords: agriculture; damage; deforestation; design; development; disaster; drought; earthquake; economy; energy; environmental degradation; farming; flooding; forest; linkages; mitigation; population density; reconstruction; risk; typhoon; vulnerability

Objectives

This part of the Series is designed to enhance your understanding of:

1. how disasters can impact development programs;
2. how development programs can increase vulnerability;
3. how development programs can be designed to decrease vulnerability; and
4. how disaster recovery programs can be designed to promote development at the same time that they can decrease vulnerability.

CASE STUDY 2c

Forestry Project in Nepal Combines Development and Mitigation Strategies

The deforestation of Nepal has occurred at an alarming rate, with 50,000 hectares of forest cover (or 2% of total forest land) lost each year. This loss of soil protection has resulted in serious erosion in the mountainous region. There, population density has increased to more than 500 people per square kilometer of cultivated land. An estimated 80% of Nepal's energy use comes from fuel wood, and forests contribute more than 33% of fodder needs. In addition, increasing numbers of livestock have led to overgrazing, which has contributed significantly to the degradation of the environment.

During the 1980s, the government of Nepal implemented a community forestry program to counteract these trends. This ongoing project is intended to stimulate increased production of such forest products as fuelwood, fodder, and timber, in order to simultaneously improve rural welfare and forest conditions. This strategy involves the decentralization of the existing Forestry Department's control, and a transformation of its Community Forestry and Afforestation Division from a custodial to a collaborative role, with communities assuming responsibility for planning and implementing their own forestry projects.

With deforestation, the dangers of environmental degradation, flooding, and drought are increased. The Ministry of Forest and Soil Conservation, together with funding from the United Nations Development Programme, is pursuing a project to increase community involvement in conservation and disaster mitigation practices. Activities being promoted include fodder tree planting, land use management, training, inclusion of people at the local and district levels in the planning process, and coordination of forestry activities of all of the community projects.

By giving rural farmers the commercial rights to forest products and providing them with information concerning forest conservation, it is hoped that they will have more of an economic interest in protecting forest land and increasing its productivity. Special emphasis is placed on training and extension activities for women, who perform most of the work related to forest products in Nepal.

Working at the grass roots level, Nepal's community forestry program is an innovative attempt to improve the productivity of the land and reduce potential disasters by linking increased production with protection of forest resources.

There are usually many opportunities to incorporate hazard-resistant building techniques in housing and other construction programs. These opportunities are usually specific to the type of housing used in the region and the nature of local hazards. Such measures can reduce the numbers of deaths and injuries from earthquakes and tropical storms. In addition, these programs can protect high value economic resources, reducing the total costs of damage and improving the chances of a more rapid recovery from such an event.

On a wider scale, the application of building codes, associated training programs, and more extensive use of zoning regulations in urban development decreases the size of the population at risk and the likelihood of damage to industrial facilities. Improved drainage systems and flood protection measures can help to protect people and facilities in hazardous areas.

Investments in improving the administration and strengthening the resource-base of public institutions will have a generally positive impact on the effectiveness of preparedness arrangements, emergency responses, and the quality of longer-term recovery planning. Training programs in general, and especially those with a management or technical focus, can be expected to improve the implementation of mitigation and response measures.

Lastly, agricultural and forestry programs provide a range of opportunities for mitigation of the damage resulting from the actualization of a hazard. Reforestation programs reduce risks of erosion, landslides, and flash flooding. Changes in cropping patterns also can ameliorate erosion problems and losses due to floods and drought. Introduction of pest-resistant crops reduces the economic and other impacts of infestations. Programs for soil conservation, water harvesting, and improved on-farm storage mitigate the effects of drought.

Each of the examples above represents an opportunity for mitigation of the damage from an event. Each also requires investment of scarce resources.

Disasters as Opportunities for Development Initiatives

Disasters can be a vehicle for major development programs. The political impact of damage and disruption can be a real catalyst for change. Disaster-inspired development initiatives are influenced in a number of ways, but two aspects are especially important. First, disasters can highlight particular areas of vulnerability, for example in areas which there is serious loss of life, the economic damage is disproportionate to the strength of the impact. The outcome usually highlights the general level of underdevelopment. Second, for a few weeks or months following the precipitating event, the political environment may favor a much higher rate of economic and social change. These changes may occur in land reform, new job training, housing improvements, and restructuring of the economic base (may involve a transfer of resources from other areas and sectors).

The value of direct international assistance provided during disasters may compensate partially for economic losses, although the amounts usually are rather small in

relation to the total loss. Early injections of aid rarely constitute >10% of the overall losses, and usually are considerably <10%. In the following months and years, there may be additional, longer-term development aid, which otherwise would not have been made available.

There also may be longer-term benefits from a drastic restructuring of the economy as a result of a disaster. For example, small island economies that previously were dependent upon a single crop may expand their economic base, often with international assistance.

The extent to which development opportunities can be followed-up after a disaster usually will be constrained or otherwise influenced by donor investment policies for emergency loans. It is helpful to review the World Bank criteria for emergency lending for post-disaster investment.

According to the World Bank:

1. the operation must be directed as restoring assets or productivity in a long-term development perspective—not relief;
2. the prospective economic returns should be high;
3. the effects of the emergency should be significant;
4. the event triggering the emergency should have a low probability of happening again;
5. the need for an urgent response should be evident;
6. emergency lending is limited to cases where effective action can be detected in two to three years; and
7. there should be some prospect for future reduction in the hazard.

Development opportunities often are missed or compromised because of an excessive focus on relief assistance. Relief assistance may introduce substantial flows of resources into small communities: resources that could be purchased locally. The method of injection of these resources—often involving free distribution through inappropriately chosen local structures—may discourage independence and entrepreneurship. The scale and variety of external relief sources provided during some disasters make this a difficult problem to contain and highlights the need for governments and international agencies to continually emphasize the development framework of the disaster response.

Designing Recovery Programs to Reduce Vulnerability

It is vital to ensure that rehabilitation and reconstruction do not leave the society as vulnerable, or even more vulnerable than before the disaster. This may occur for a variety of reasons, but two causes that need particular emphasis are: (1) lack of awareness of detailed risk factors among decision-makers and planners at both national and community levels; and (2) the related tendency for development options to be foreclosed when decisions are made quickly based on incomplete information. There is a great need to support and guide governments in developing strategic recovery programs that mesh with national development goals and lead to substantial reductions in vulnerability.

There are many ways of shaping and influencing the process of reconstruction. Mitigation of structural damage (absorbing capacity) will be enhanced by improvement in

and wider application of building codes and by restructuring land-use patterns. These administrative measures can be reinforced and complemented by changes in pricing policies and subsidy structures to encourage specific mitigation measures by the public.

Interventions are effective especially when they focus on areas of particularly high risk, for example, low-income housing design and construction in earthquake-prone areas. The non-formal sector offers special opportunities for intervention, such as support for craftsmen including training and loan funds for small construction businesses and other micro-enterprises.

The importance of basing measures to reduce physical vulnerability on detailed scientific evidence cannot be over-emphasized. A number of studies have shown how casualties and deaths associated with earthquakes and wind-storms often are associated with very specific risk factors, particularly the types of material used in construction and specific design features that affect the vulnerability of the structures and their occupants.

Other opportunities exist for reducing the vulnerability of infrastructure. These include specific technical improvements in the critical parts of “life-line” systems e.g., preventing flood—or debris—damage to switchgear or communications equipment.

Other areas for enhanced protection can include government offices, banking facilities, food warehouses, road transport facilities, and schools. Upgrading the transport infrastructure usually will facilitate evacuation and pre-positioning of emergency supplies, relief deliveries, and the subsequent restoration of markets and services in the affected area.

Similar general benefits also will result from improvements to government telecommunications. The ability to share information quickly can improve both the management of emergency response, and the coordination of longer term recovery.

There are many ways to facilitate reconstruction that also enhance mitigation of damage in the future. One way is to gather detailed technical information on the specific factors influencing vulnerability to specific hazards as quickly as is possible. The technical assistance component must be incorporated before planning decisions are finalized.

Support for the private sector, including the non-formal sector, is a key element of successful reconstruction management. This requires, particularly, reinforcing the role of the financial sector. Finance for reconstruction will come from government sources, local and international reconstruction loans, grant assistance from international sources, and capital generated from within the community. There usually will be opportunities for helping to strengthen existing banking structures, housing associations, and cooperative credit societies by providing technical advice and information system development.

Similar support for financial management during the recovery period usually will be needed within the government system. This may include advice on financial planning procedures, reporting, monitoring systems, auditing, and evaluation.

The period of recovery is an opportunity for general assistance to government with administrative procedures, including enhanced management training programs. Areas of special importance include:

1. Coordination of lending programs, grants, and subsidies;
2. Support at the higher levels for policy framework development;
3. Support for improvement of centrally driven accountability systems;
4. Reviews and enhancements of financial approval procedures; and
5. Assistance with donor liaison and reimbursement claims.

Support for training in the private sector can be a crucial tool for enhancing effective change during the reconstruction period. Strategic support for vocational training usually is of special value. Such training should focus on bottlenecks caused by shortages of skilled manpower, most commonly in the construction sector.

Summary

Disasters can delay development by: (1) Loss of resources; (2) Shifting of resources to emergency responses; (3) Depressing the investment climate; and (4) Affecting the non-formal sector.

Development can increase vulnerability through: (1) Building dense urban settlements; (2) Developing hazardous sites; (3) Degrading of the environment; (4) Failures or accidents of technology; and (5) Imbalancing pre-existing natural or social systems.

Development programs can reduce vulnerability through: (1) Strengthening of urban utility systems; (2) Using hazard-resistant building techniques; (3) Building of institutions and capacitation of local authorities; and (4) Building and implementation of agricultural and forestry programs.

Disasters can provide development opportunities by: (1) Creating a social and political atmosphere of acceptance

to change; (2) Highlighting the general level of underdevelopment that caused the disaster; and (3) Focusing international attention and aid on the disaster area.

Recovery programs should be designed to reduce vulnerability through: (1) Targeting areas of high risk; (2) Support of the private and non-formal sectors; and (3) Enhanced management training programs.

Self-Assessment Quiz:

1. Identify the goals of a specific mitigation project currently in progress, perhaps as part of a regular development project. How was funding obtained for the mitigation component? How might success be measured? Describe your answer below.

Answer: _____

2. How do disasters affect the willingness of societies to introduce mitigation measures?

Answer: _____

Answers:

1. a. Give farmers the commercial rights to forest products and provide them with information concerning reforestation; b. Incorporate hazard-resistant building techniques; c. Improve administration and strengthen the resource-base of public institutions; and d. Implement agricultural and forestry programs.
2. a. Points out areas of significant vulnerability; b. Provides an opportunity for external funding sources to pay for damage mitigation programs; and c. Increases awareness of benefits that would have been derived from the application of damage mitigation measures.

To register or enroll in this course, please complete and fax this form to UW-DMC. Completion of this course earns a Continuing Education Certificate and those credits can be part of a Disaster Management Diploma from the University of Wisconsin-Disaster Management Center. For further information, contact the Center at the address below.

**BB02 Principles of Disaster Management, Continuing Education Credits
(Prehospital and Disaster Medicine, Volume 20, No. 1)**

3 CEU

Fee: [US]\$120.00+\$50.00 (service charge) = \$170.00

Name _____

Company/Agency _____

Address _____

City _____ State/Province _____ Postal Code _____ Country _____

Social Security Number (only if USA) _____

E-mail address (if applicable) _____

(optional, but helpful for educational records)

Please make check or money order payable in US funds to: University of Wisconsin-DMC

Mail to:

University of Wisconsin-Department of Management Center (UW-DMC)
Department of Engineering Professional Development
University of Wisconsin
432 North Lake Street
Madison, Wisconsin 53706 USA

OR you may

Fax this form to: (+1) (608) 263-3160

E-mail: dmc@engr.wisc.edu

View the Website: <http://epdweb.engr.wisc.edudmc>