Increasingly over the past year, many international cooperation agencies now include a line item for projects related to training, construction projects, health and hygiene, and management aspects for service providers in water and sanitation in Latin America and the Caribbean However, these same agencies consider disaster risk management an area belonging to the humanitarian divisions of their own agencies and not as a cross cutting development issue. This means that it has been virtually impossible to include aspects of vulnerability reduction in their interventions, and thus, there have been setbacks in obtaining concrete results in both urban and rural areas. PAHO/WHO must work to achieve a horizontal collaboration within these same development agencies so that water and sanitation interventions include aspects of vulnerability reduction.

PAHO and COSUDE join forces on vulnerability reduction in rural water systems

For more than 20 years, the Swiss Cooperation (COSUDE) has worked in rural areas of Peru to build or rehabilitate water and sanitation services, provide community level training and promote community participation in the planning, construction and operation of these systems.

Considering that Peru is highly vulnerable to many different types of natural hazards, and that many of the communities in which COSUDE works are located in these same at-risk areas, PAHO/WHO is working with COSUDE's humanitarian aid programs in this region to incorporate risk reduction into their projects PAHO/WHO and COSUDE have both assigned resources for PAHO to develop materials that facilitate community participation in the identification of hazards in areas in which water systems will be built. Additional reference material on risk management in rural water and sanitation systems is being prepared and

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Six technical or training information products developed in consultation with governments, national professionals, and universities.

Efforts in recent years revolving around the promotion of the topic of disaster mitigation in health facilities are bearing fruit. It is interesting to note that several countries, on their own initiative, have prepared technical material based on the technical message promoted by PAHO El Salvador, for example, has produced Seismic Norms for the Design and Construction of Health Facilities, Guatemala has developed an instrument to rate its health facilities, Colombia has developed a methodology to evaluate the vulnerability of its built infrastructure, Peru's Ministry of Health looks at the functional vulnerability of infrastructure, while in Chile the Infrastructure Department of the Ministry of Health prepared technical material on non-structural aspects of disaster mitigation.

PAHO's role has been to develop overarching materials to complement national efforts, particularly on those topics that have shown to be of most interest and potential benefit to the countries These include:

Vulnerability of Health Facilities to Flood Situations: Flooding is the most commonly occurring natural disaster. In the Americas, it affects the widest geographical extension and is the most severe, although conversely, not the most publicized. Recent experience with floods in the Region has revealed the vulnerability of health systems and structures to severe flooding, however, PAHO had produced no technical material on this subject. At the request of countries like Bolivia, Ecuador and Peru that frequently fall victim to this situation, a draft publication was produced and many multisectoral actors were involved in the process of validating the content, including universities and researchers, civil defense, professional associations as well as the health sector. Their local experiences, lessons learned and technical contributions were incorporated into the text. Subsequently, a similar process took place in Central America. The publication, in addition to illustrating potential damage to health facilities from floods and the importance of emergency plans, includes case studies intended to help avoid similar devastating effects in other countries. The inter-country process of finalizing the material was, in itself, a valuable step, and the final product is a technical tool that can be used by local health facilities and/or adapted to specific national situations.

Outside view of the pharmacy showing how the health center floor was raised.

Chone, Ecuador Protects Health Facilities from Floods

The Dr. Amadeo Aizpura Health Center meets the health care needs of 120,000 people in the province of Manabi, an area of Ecuador that annually experiences serious flooding from January through April, when the Chone River overflows its banks. The Health Center had frequently fallen victim to this recurring cycle, with the water sometimes reaching a level of one meter inside the Center. Past floods have damaged sanitation facilities, the roof, equipment, supplies in the stockroom and pharmacies and caused the loss of medical records. Waste water that spilled from cistern tanks increased the vector (rodent and mosquito) population. All in all, the Center was out of service usually for up to a week at a time.

Initial steps were taken to raise the level of the first floor to avoid flood waters and relocate basic services. Priority was given to the pharmacy, stock room and the water tanks, followed by the administrative areas. In the next cycle of flooding, those areas escaped damage, although the rest of the Center was not as fortunate. This prompted authorities to apply to the Ministry of Health for financing to complete the project in the remaining areas of the Health Center. With a relatively modest sum—US$75,000—a permanent solution was found to this recurring problem. This experience motivated other sectors to seek solutions and as a result, the government has initiated a large-scale project to reduce vulnerability city-wide.

Water tank and machine room, raised to above flood levels.

potential relocating of hospital beds, moving critical equipment, defining priorities and contingency plans, coordinating with the hospital network to reduce hospital stays and redirect critical service needs to other non-

Reducing Functional Vulnerability in Health Facilities: Hospitals and health facilities must remain operational in the aftermath of disasters to provide medical attention to the injured and sick. To accomplish this, these complex systems require well-trained human resources, technology in keeping with their level of service, the necessary medical supplies, and basic functioning services. The failure of any of these components (even in the absence of an external disaster) can cause the functional collapse of the health facility. Previous publications looked primarily at the physical integrity of health facilities following disasters. But their functional vulnerability can have equally drastic consequences.

Many health facilities have suffered this fate in the aftermath of disaster situations despite the fact that the structure's physical components remain in tact. Frequently the emergency services will cease to function when they are overwhelmed with injured patients seeking attention. In these cases, if a service network has not been pre-established, if physical spaces have not been planned to deal with a massive influx of patients, and if an emergency plan has not been developed to outline the human resources needed to deal with events or the interruption of basic services, the hospital can cease to function. These scenarios can be problematic in day-to-day situations, but become more acute in emergency situations. Planning for and dealing with these situations is the central premise of this publication.

Other technical materials developed or improved upon during this reporting period:

- A special eight-page supplement to the newsletter *Disasters* (see Annex 7), detailed the significant advances made in many countries in this Region. This information, available in English and Spanish, reached more than 26,000 persons worldwide and was used to reinforce work on the Safe Hospitals campaign. Several years ago, it was decided to cease publication of a separate newsletter on hospital disaster mitigation and incorporate these special supplements into the quarterly newsletter to achieve maximum reach at a minimum cost.
- A pilot website on disaster mitigation has been developed to provide "under one roof" all relevant technical publications, interactive training materials, country reports and case studies, national norms and legislation, and a directory of contacts dealing with the issue in Latin America and the Caribbean. This site was developed because frequently, efforts were being duplicated in an isolated manner, with one country unaware of what another had already produced. The site deals with the crosscutting

issue of disaster mitigation and includes documents that while not specifically on disaster mitigation, can assist in the work of those responsible for policy development and implementation.

- Along the same lines as with the evaluation of damage and needs, PAHO and the WHO collaborating with the Center for Disaster Mitigation at the University of Chile have begun to develop simple, practical guidelines to help countries assess vulnerability in existing health facilities in the face of a variety of natural disasters—earthquakes, floods, landslides, volcanic eruptions, etc. This material will provide the technical basis for decision makers to prepare terms of reference for vulnerability analyses.

-----Mensaje original-----
De: Ricardo Andres Rincon
[mailto:rarincon@aguasdemanizales.com.co]
Enviado el: Monday, February 14, 2005 2:26 PM
Para: osoriocl@paho org
Asunto: RE: solicitud de información Mitigación de desastres en sistemas de agua potable y alcantarillado

. . Manizales' has quite a disaster history (you will remember we are located in the coffee-growing region of Colombia, where the 1999 Armenia earthquake occurred and the Nevado del Ruiz volcano erupted in 1985), The results of several vulnerability studies of Aguas de Manizales over the last decade made it clear that we must redouble efforts to be prepared for disaster and provide an effective response in terms of restoring as quickly as possible the vital services of the aqueduct and sewerage system following a disaster. Currently we are particularly interested in creating disaster prevention and response program and a plan of action to address each of the company's infrastructure components.

For these reasons, we are particularly grateful for the material and welcome any assistance PAHO can provide (bibliography, training, technical assistance, etc.)

RICARDO ANDRÉS RINCÓN CANO
Líder de Diseño y Evaluación Técnica

The head of the technical design and evaluation team of the Manizales, Colombia water company, Aguas de Manizales, requested technical training material to reduce the vulnerability of his institution to disasters. Upon receiving, using and disseminating the material, he wrote the following:

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New training and educational opportunities related to disaster mitigation provided to at least 1,000 disaster professionals region-wide in consultation with governments, national professionals and universities.

In many countries, PAHO has directly supported the participation of nationals in training activities. Some of these activities have dealt specifically with disaster mitigation issues while others were limited to certain aspects of the topic in the agenda. In Colombia, Ecuador, Argentina (both at the central level as well as in several provinces), Costa Rica and others, the health sector has organized events on their own initiative and sponsored the participants. PAHO provided support in presenting certain topics, together with national experts.

By no means were all of these activities initiated by the health sector. Training opportunities were also organized by universities, professional associations, the military and other groups. One Argentine university included the topic of disaster mitigation in an international congress on Architecture in High-risk Areas and another in Colombia did the same in an inter-American meeting of risk reduction. Showing the support of local universities, Ecuador's College of Civil Engineers organized a seminar on disaster mitigation in health facilities, while Ecuador's College of Geological Engineers held a panel discussion on the topic at one of their conferences. Several associations of engineers and architects have also arranged sessions to share experiences. All of these opportunities have allowed us to capitalize on the work of allied actors, promote knowledge, and gain support for health sector disaster mitigation, all at little or no cost.

As part of the preparatory work for the World conference on disaster reduction, workshops on vulnerability reduction in health facilities were held in Latin America and in the Caribbean, in which participants evaluated national progress in reducing vulnerability and agreed upon common priorities and needs These opportunities allowed the Region to prepare a common position on the topic which is to be presented at the Kobe Conference. A multisectoral range of experts participated in these regional preparatory meetings.

The strategy used to train technicians and professionals in the water and sanitation sector in disaster risk management is similar to that used in the hospital sector. PAHO piggybacks on their ongoing training programs to include and introduce modules related to disaster preparedness and mitigation, and vulnerability and risk reduction. For the most part, this cooperation has been established through continuing education programs. This helps to ensure sustainability over time, as these continuing education programs are provided by the water sector institutions who are responsible for strengthening the technical capacity of the sector with regard to new realities and challenges facing the water sector—and needless to say, emergencies and disasters are an ever-growing reality that the sector cannot afford to ignore. Bolivia's water authorities have incorporated modules on risk management in water and sanitation services and in training programs developed by the Association of Water Agencies. Universities in Peru have incorporated similar modules in their diploma programs as well.

Training modules on risk reduction incorporated into water sector training

Bolivia's national association of drinking water and sewage providers have joined an organization of similar providers in small and medium sized cities called PROAPAC[1] sponsored by the German aid agency GTZ, to prepare a modular training system for professionals and technicians in the water sector.

The modular system is comprised of 50 courses and includes reference and training materials on a variety of issues pertinent to the water sector, including management, technical operations, financial and commercial management, etc. Within the course on technical operations, two modules on risk reduction have been incorporated—one deals with disaster prevention and the other with preparedness and response of these services in emergency situations.

This initiative contributes to similar human resources development efforts being conducted by PAHO, the Inter-American Association of