

Application of PDC's Integrated Risk Reduction Planning Framework



Risk and Vulnerability Program

PDC's Integrated Risk Reduction Planning Framework: Fostering Development of Disaster-Resilient Communities

PDC Strategic Program Areas

- Decision and Policy Support
- Institutional Capacity Development
- Risk and Vulnerability
- Humanitarian Assistance Support
- Security and Sustainability

Disaster Risk Reduction as a Vital Component of Sustainable Development
 Every year around the world, natural disasters affect millions of people and cause extensive damage and economic losses. The United Nations International Strategy for Disaster Reduction's *Living with Risk: A Global Review of Disaster Risk Management Initiatives*, 2004, estimates that approximately 100,000 lives are lost each year due to natural hazards, and that the global cost of natural disasters will exceed \$300 billion a year by 2050. Clearly, these dollars are diverted from sustaining national economies and protecting environments, as well as redirected from supporting basic social, educational, and infrastructure programs. The result is a negative effect on the overall quality of life, hampering, halting or reversing economic, social and development initiatives. In many cases it can take years to recover from a natural-disaster event. Devastating events—such as the 2004 Indian Ocean Tsunami, Hurricane Katrina (USA, 2005), and the Great Hanshin-Awaji Earthquake (Kobe, Japan, 1995)—may require a decade of recovery, with lasting negative effects on the economy, environment and society. Risk reduction is central to addressing these issues.

The Basis for PDC's Integrated Risk Reduction Planning Framework
 PDC is committed to assisting decision makers and communities to better understand their risk and vulnerability to multiple hazards in order to facilitate their goals of building safer, more disaster-resilient and sustainable communities. To this end, PDC has developed an *Integrated Risk Reduction Planning Framework* (Framework). Comprising four components, the Framework is a product of PDC's applied research, based on three year-long risk-assessment and mitigation-planning projects: 1) *American Samoa Hazard Mitigation Plan*, 2) *Multi-hazard Urban Risk Assessment for Marikina City, Philippines*, and 3) *Integrated Risk Planning Project for Metro Manila*.

The Risk and Vulnerability Program is central to the objectives of PDC:
 "The Pacific Disaster Center's mission is to provide applied information research and analysis support for the development of more effective policies, institutions, programs, and information products for the disaster management and humanitarian assistance communities of the Asia Pacific region and beyond."



To support decision makers, PDC uses powerful model visualization techniques and analyses to portray hazard risks and potential impacts. The example above simulates the tsunami inundation (dark blue) that occurred in the Banda Aceh region of Sumatra, Indonesia, in December 2004.

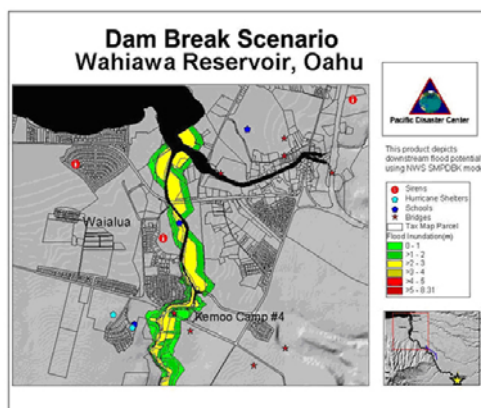


Figure 1: Heavy rains pose a risk to Hawaii's many earthen dams and reservoirs. Dam-break scenarios are modeled to help emergency managers plan evacuation and safety measures.

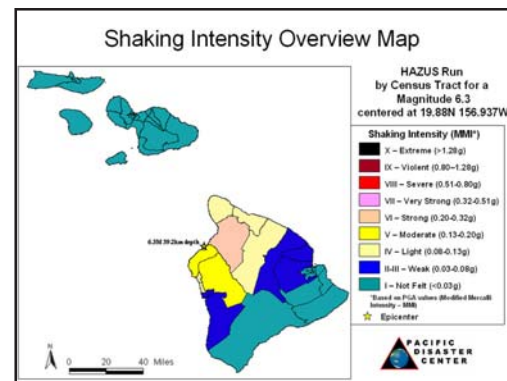


Figure 2: The Hawaii HAZUS Atlas allows disaster managers to quickly estimate potential damages from earthquakes based on the modeling of historical events.

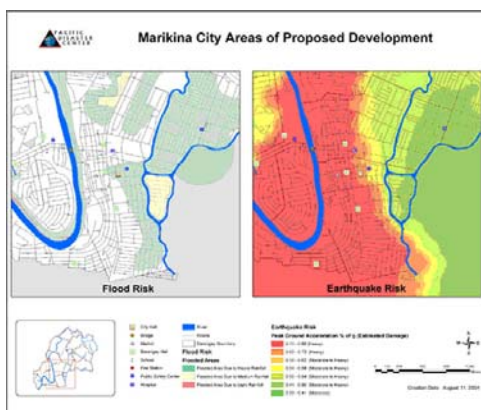


Figure 3: Earthquake and flood risk were taken into consideration by officials in Marikina City, Philippines, while deliberating on areas of potential development.

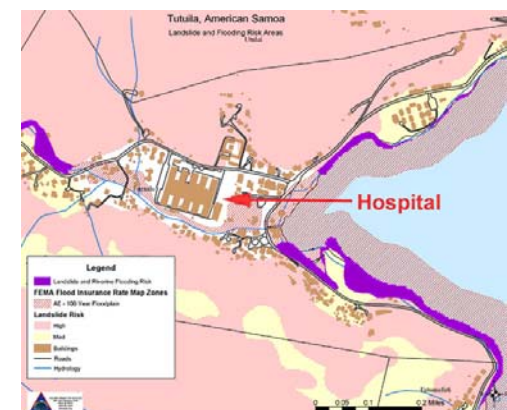


Figure 4: The only hospital on the island of Tutuila, American Samoa, is situated in a landslide- and flood-prone area. Mitigation activities have recently been employed to reduce the risk of flooding.

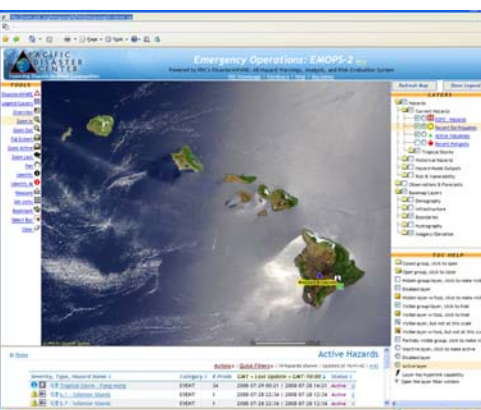


Figure 5: Internet Map Viewers are effective risk communication tools, using GIS technology to depict hazard zones, infrastructure and essential services.

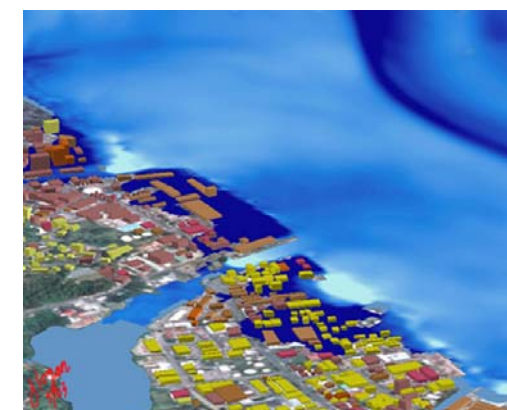


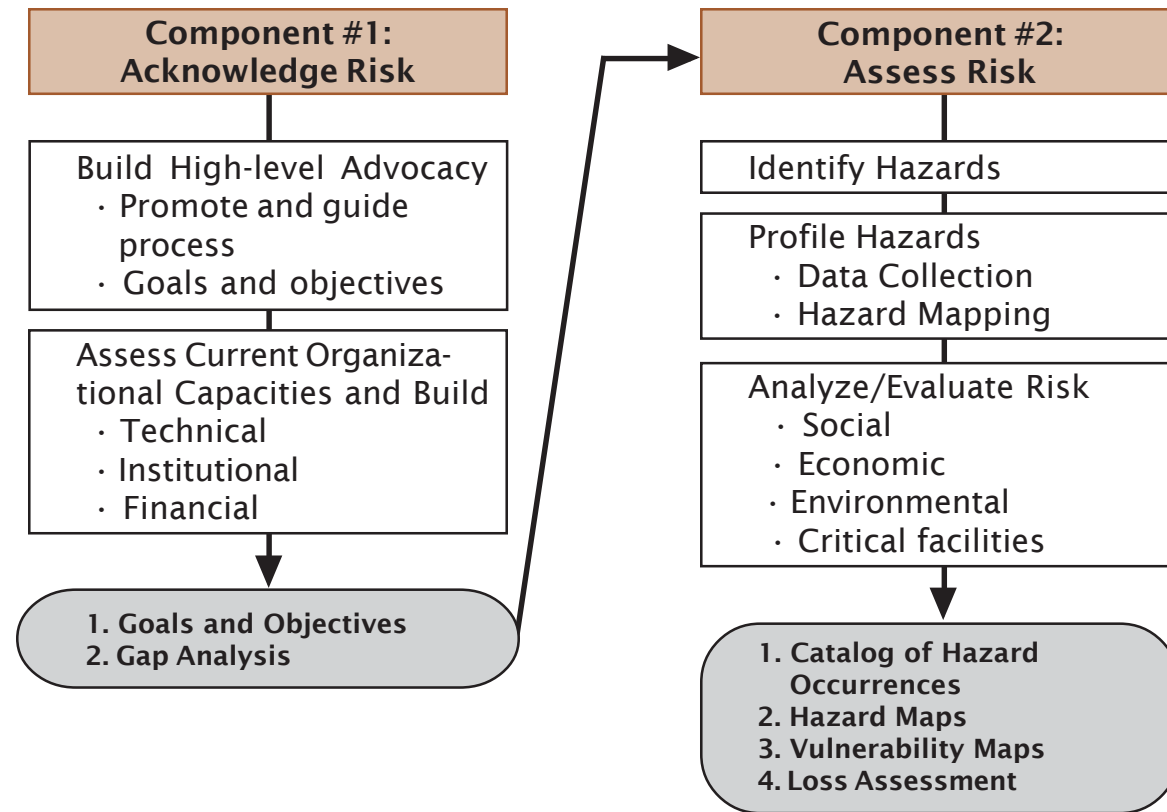
Figure 6: A combination of model visualization and GIS analysis illustrates, for Fiji's decision makers, potential tsunami inundation (dark blue) and resulting damage to the modern-day Suva Harbor area.

Components of PDC's Risk and Vulnerability Program

Component 1: Initiating the Planning Process

The first component of the Framework establishes the context for risk reduction and builds high-level advocacy to promote and guide the risk reduction process. Recognizing the value of addressing risk, this crucial first step lays the groundwork for subsequent activities, and defines goals and objectives at the government level. It also outlines the planning context by identifying existing policies as well as strategic and organizational capabilities that will support and sustain future activities.

Establishing Stakeholder Advisory Committees that engage international experts, community leaders, decision makers and local citizenry has proven critical to successful and sustained planning processes. These organizational coalitions contribute to local institutional capacity development within a community-based planning framework.



Component 2: Risk and Vulnerability Assessment

The second component of the Framework 1) identifies recurring hazards or multiple hazards in a geographical area, and 2) assesses the vulnerability of a community to these hazards through analysis of the potential impacts on economic, social and environmental sectors, as well as the effects on critical facilities and infrastructure. This crucial step yields a catalog of historical hazard occurrences for a particular study area, as well as maps showing hazard zones, assets at risk and areas of vulnerability. Loss estimations also are produced. Examining the root causes of vulnerability across these sectors is essential to the development of sound and viable strategies for risk reduction.

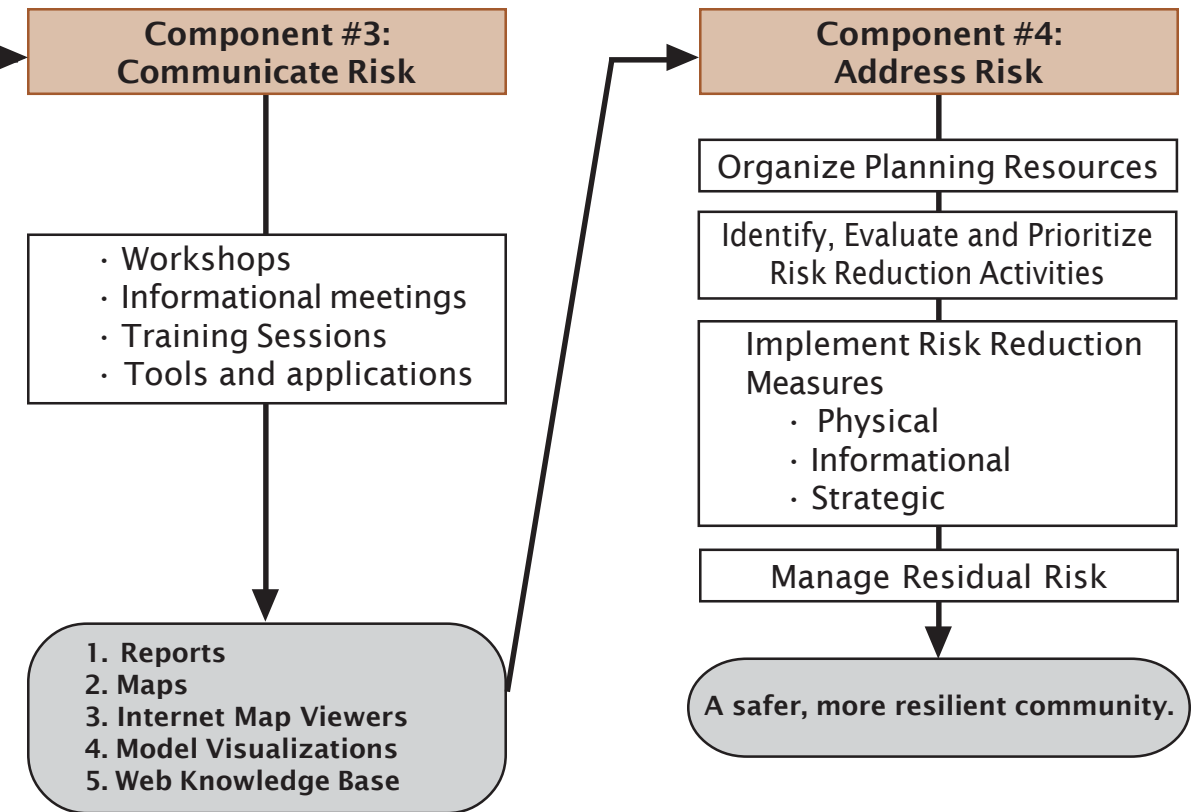
Component 3: Risk Communication and Awareness

Within the third component of the Framework, PDC incorporates risk-communication tools for improving risk awareness in many sectors, including government officials, local experts, businesses, schools, and community leaders. These tools include hazard scenarios (like the one shown on the back page in figures 1 and 2), GIS vulnerability and hazard risk maps (figures 3 and 4), Internet Map Viewers (figure 5), and visualization products to help decision makers and community planners become more aware of their risk and vulnerability to hazards (figure 6). Training sessions and informational meetings provide hands-on access to products and promote understanding and collaboration among stakeholders, researchers, and practitioners.

Component 4: Addressing Risk through Mitigation Countermeasures

The fourth component of the Framework builds upon the first three and incorporates hazard mitigation into decision-making processes that promote community sustainability.

Based on the results of the Risk and Vulnerability Assessment, a process is outlined for defining and prioritizing mitigation actions that aim to reduce a community's vulnerability to hazards. To establish priorities for risk reduction activities, a community must understand its technical, legal, and financial capacities and leverage these to implement mitigation countermeasures. Identified early in Component 1 of the Framework, these capabilities play a key role in addressing risk.



The careful consideration of how various mitigation countermeasures contribute to loss reduction, risk reduction and improved community sustainability is best accomplished by a dedicated group of professionals, experts, and community leaders who represent the interests of the community, businesses and all appropriate levels of government. As part of the Stakeholder Advisory Committee a Mitigation Council is established to oversee all aspects of the mitigation-planning process. The Mitigation Council helps organize resources, follows municipal protocols and creates efficiencies in the research, assessment and planning process. The Council would ideally evaluate the overall effectiveness of past, present and possible future mitigation projects and explore the costs and benefits associated with them. Once mitigation measures are selected, agencies and institutions that are responsible for carrying out these activities are identified.

Outcome: A safer, more resilient community

Collectively, applying the methodology derived from the Framework can improve community resilience—the ability to recover quickly and regain a sense of normalcy after a disaster. It can also increase a community's resistance to impacts—for example, a community may choose to improve building codes and building practices that will lessen losses to multiple hazards. For the achievement of sustainable development, these concepts of resilience and resistance to natural disasters are extremely important.