

From November 3 to 5, 2005 the City and Regional Planning and the College of Architecture and Environmental Design promoted the International Symposium on Urban Disaster Risk Reduction and Regeneration Planning: Integrating Practice, Policy and Theory. Christina Batteate presents an overview of these three intense days when more than thirty leading professionals from the US and abroad presented their work and their views, and participants were able to engage in important discussions. FOCUS has also published a special issue with the complete proceedings of the symposium.¹

Statistics show that disasters are on the rise in frequency and severity. The year 2005 brought disasters to the front stage with the category five Hurricane Katrina and the 7.6 magnitude Pakistani earthquake. The estimated 9.0 magnitude Indian Ocean Earthquake of 2004 created a tsunami that leveled coastlines in multiple countries and claimed the lives of over 283,000 people. A growing world population and its contribution to environmental degradation, climate change and rapid urbanization further add to the already rising disaster potential. In lieu of this imminent disaster threat, Cal Poly State University San Luis Obispo held the International Symposium on Urban Disaster Risk Reduction and Regeneration Planning: Integrating Practice, Policy and Theory from November 3-5, 2005 and invited prominent professionals and academics specialized in the field, from six different countries, to participate and help answer the question: "How do we build more disaster resistant communities that provide safer places for people and their individual and collective property?"

The main goal of the symposium was to contribute to the creation of an international foundation of knowledge furthering effective actions enhancing sustainability through mitigation of disaster risks and facilitation of recovery. The symposium's objectives were:

- Expand the international knowledge among academics and practitioners in community development and disaster management.
- Create university level education plans for integrating and strengthening undergraduate and graduate curriculae for the design and implementation of disaster resistant communities.

- Prepare faculty, students, and professionals to provide technical assistance to disaster-stricken regions, such as Southeast Asia, Pakistan, and the Gulf Coast.

The symposium was organized around five sets of themes explored through presenters, panel discussions and audience input: a) Threats and Vulnerabilities, b) Location and Design Issues, c) Economic and Social Issues, d) Educational and Institutional Issues, and e) Technical Assistance. What follows is a summary of the main discussions and conclusions related to each theme.

Threats and Vulnerabilities: What is at Risk?

At the highest risk to disasters is human life, followed by property or assets, and finally environment or source of livelihood. Assessing highly vulnerable areas is a multi-phase process. At what point a region picks up in this process depends largely upon their level of development. Technological advances in geology and meteorology aid us in creating GIS (Geographic Information Systems) maps that catalog elements such as severity of disasters and frequency of disasters. SDI (Spatial Data Infrastructures), explained by Mark Sorenson (University of Redlands), help identify the fragility of the population, reaction capacity, and ability to recover, in what he calls "lifecycle disaster management". Stanley Goosby (Pacific Disaster Center) and Feng-Tyan Lin (Taiwan) are spearheading the creation of these GIS composite maps. Once complete, these technical and comprehensive maps provide design professionals with clear guidance.

The built environment is most often the culprit in claiming lives when disaster strikes. Be it shanty-towns of squatters or metropolises with poor architectural configurations, these forms pose a substantial challenge to reducing disaster-risk. The lack of resources and trained professionals in developing countries too often result in a recipe for catastrophe. As Marjorie Greene (Earthquake Engineering Research Institute)

¹ The CD-ROM with the complete proceedings of the International Symposium on Urban Disaster Risk Reduction and Regeneration Planning: Integrating Practice, Policy and Theory can be obtained by request from Cal Poly's City and Regional Planning Department.

noted in her presentation, “the world’s poor are forced to build in the most dangerous urban zones- steep hillsides, river banks, floodplains, in the shadow of refineries, chemical factories and toxic dumps.” The widespread existence of this type of living conditions led her to the strong claim that “poverty has constructed the urban disaster problem.”

A closer look at the built environment by Teresa Guevara-Perez (Venezuela) examined the evolution of modern architectural configurations. Her analysis identified the weakest architectural configurations most prone to failure during earthquakes. Despite the continued collapse of certain structures in disasters, their construction is still prevalent, which she attributes to a disconnect between architects, engineers, and the urban codes and zoning. Charles Real (California Geological Survey) shared how the state of California is currently involved in a process of mapping areas most prone to liquefaction and ground failure during earthquakes and transmitting those maps to local agencies with the power to begin seismic retrofitting processes. This effort at state level provides critical risk assessment information to local governments and operating agencies.

Most challenging to disaster-risk assessment is the varied perceptions of threats, vulnerability, and risk. Because in general it is the citizens who bear the brunt of the cost on safer construction techniques or retrofitting, a paradigm shift must occur before stakeholders initiate the first steps in disaster mitigation. To close this gap, Eve Gruntfest’s (University

of Utah) project WAS*IS (Weather and Society* Integrated Studies) lies between the physical and the social sciences. The project goal is to help people fully understand the vulnerability of their region and to design appropriate zoning regulations, a process in which community education workshops proved to be vital in encouraging the paradigm shift.

Knowing where natural hazards are most likely to occur spatially is only the first step in reducing urban disaster risk. Better design, collaboration between the design (engineering and architecture) and construction fields; and public relations on disaster awareness must follow. As the discussions in the next session showed, this is not as simple as it sounds. Many factors arise to hinder and weaken a successful disaster risk reduction program.

Location and Design Issues: What are the Obstacles and Opportunities Influencing Disaster Mitigation and Recovery?

When a disaster impacts a community or a region, buildings, trees and families are not the only things uprooted. Disasters bring to the surface social and institutional relationships and issues that have long been ignored. Paul Farmer (American Planning Association) and Raymond Burby (University of North Carolina) both used New Orleans as an example of how competing interests within society and governmental bodies can slow or sabotage as successful recovery. Farmer illustrated the rush for every interest group to get their hands into the rebuilding process. While this can slow the process, public officials and planners need to embrace the input and attempt to accommodate as many of the groups’ needs as possible. Disasters are inherently a terrible thing but they do present an opportunity to completely refurbish an areas’ built environment and policies.

Burby warned us of two paradoxes: the safe development and local government paradoxes. The safe development paradox argues that society is amiss in the belief that we can conquer nature. However, an unsafe area is unsafe no matter how advanced our technology and engineering capabilities become. Attempting to build in these high-risk areas only invites a higher risk and greater damage in terms of loss of life and property. The local government paradox purports that governments do not devote adequate resources to risk-assessment and mitigation. For example, the city government of New Orleans lobbied the Army Corps of Engineers for smaller levees to cut costs, and in turn that local government was sued by FEMA for inadequate levees. Then, after all that, additional billions of dollars were lost from the disaster



Figure 1. An example from Caracas , Venezuela, of how unstable self-built housing can be. (photo by W. Siembieda)

itself, which perhaps could have been prevented or softened by proper building standards and levee maintenance.

Multiple spheres of pre-disaster mitigation are to be explored. In non-developed areas that are deemed hazardous, the proper steps must be taken by the government to prohibit building there. In areas deemed hazardous through detection technology or GIS mapping, the appropriate zoning and mitigation must occur, in some cases relocating residents. There are saw successful examples in California, such as the seismic retrofit project of the City of San Luis Obispo California, and Berkeley's efforts in community disaster preparedness and hazard mitigation over a two decade period. Success was achieved through incorporating legislation and community safety initiative strategies. The experience of the City of Berkeley contains strong sustainability practices down to the household level. While scientists and policy-makers may know which areas are unsafe, legislation will not be well-received until citizens and communities understand the risk and support measures to channel funding for pre-disaster mitigation upgrades.

Mitigation in the developed world is the first and less problematic challenge we face. Applying first world technology to third world situations must also occur if we are to alleviate the impact of disasters worldwide. Statistics continually show that more deaths occur in developing nations than in developed nations under equal natural hazard conditions. The developing world is challenged by lack of funds and sufficient education of the poor in techniques of self protection and risk reduction. The developed world needs to improve technology transfer so that poor people can build

safer buildings at affordable prices. Transfer of assessment technology, mitigation techniques and upgrading processes often break social, political and geographic boundaries and should be viewed not as threatening or burdensome but for the life-saving potential that is offered.

We can plan as much as possible and disasters will still catch us by surprise. In relating her post-Katrina experiences, Laura Steinberg (Tulane University, Louisiana) listed a slough of unpredicted problems that arose such as garbage disposal, hazardous waste clean-up, and an unraveling of the social fabric. In helping to deal with these unexpected post-disaster crises, Aseem Inam (author and Los Angeles consultant) discussed his model of comparative analysis of post-disaster reconstruction programs which studied successful programs under divergent conditions. In comparing reconstruction in Los Angeles and Mexico he discussed fund channeling, community outreach and participation, institutional coordination, rate of response, and the overall success of each case study. What this format produces is an archive of successful recovery elements under vastly different circumstances. We can draw from these lessons and conclusions to aid us in future recovery responses.

Economic and Social Issues: Stakeholder Based Risk Reduction and Recovery Planning

Why is it that keeping people out of harms' way proves to be so difficult? Cultural perceptions, old habits, misunderstanding or insufficient hazard education, socio-economics and political dodging of responsibility all complicate the reduction of disaster- risk. Paul Farmer's recommendation to "make self-interest a common interest" holds the key to remedying this problem. Grassroots groups and communities are the largest untapped resource in disaster-risk reduction. They are also our clients, but often do not understand how and why disasters affect them. By educating the public and fostering an understanding of disaster-risk we garner the support that provides the leeway for successful retrofitting, mitigation and recovery program implementation. The critical role of local grassroots organizations was illustrated in Inam's cross national case comparisons. As demonstrated by the successful programs in Marikina (Phillipines), Kobe (Japan), and Berkeley (California) social projects, like community workshops, stir stakeholders' interest and gain community participation. Community members are also the best detectors for opportunities and vulnerabilities within their sphere, and they are the best able to network disaster related consciousness and to serve as first responders.



Figure 2. Effect of the earthquake in Kobe.
(photo from T. Guevara-Perez presentation)

Often hindering community educators is the gap between science, politics, and the population. Attempting to make weather warnings more palatable to the general public is Grunfest's WAS*IS project bridging the physical and social sciences. Burdening this process is poor social, political and risk-reduction infrastructure. We generally associate these characteristics with developing countries, but this dilemma was seen in New Orleans as well. Without standard zoning and land-use regulations, funding for disaster prevention and recovery, and the political and social will to drive improvement, we cannot progress in our disaster-risk reduction program.

Paulina Chevarri (Costa Rica) poignantly noted that "the entities in charge of control, enforcement and damage reporting are still different actors and that regional high level managers, emergency entities, municipal engineers, community groups and inspectors hardly speak to each other, let alone work together." Only through infrastructure organization and better communication between the risk reduction professionals and the public, can we progress in achieving our goal. Barreling through bureaucracy and holding public officials responsible is a major step, but ultimately it will be the will of the people that are the driving force to safer communities. Hazard awareness and risk reduction education is needed for all governmental sectors so they can work with communities in productive partnerships. Risk reduction needs to become an across the board public objective; not left solely to specialized agencies.

Education and Institutional Issues: Obstacles and Opportunities Affecting Interdisciplinary Collaboration

Educational institutions shoulder special responsibility in promoting disaster risk reduction and regeneration planning. National and international presenters spoke on the various curricula being practiced in their institutions. However, universities are not the only place where learning is happening: grassroots groups, political bodies, and cross-field collaboration can also serve to generate knowledge, mitigation and funding strategies for disaster risk reduction. The most common recommendations in the university arena are interdisciplinary curricula and field-work in recovery planning. Rob Olshansky (University of Illinois) recommended that instead of creating new disaster courses we should integrate disaster and hazard management into the regular coursework of the following:

- Physical planning courses (to consider site planning and mitigation related to flood areas, storm-water runoffs, landslides, coastal erosion, and earthquake impacts)

- Housing courses (to consider safe locations for housing, insurance and financing of rehabilitation, retrofitting, relocation and reconstruction)
- Comprehensive planning courses (to consider mitigation and recovery elements)
- Economic development courses (to develop job development, job training, small business assistance and business retention following disasters)
- GIS courses (to identify sources of hazard data, relevant vulnerability data, land use, economic and structure data and infrastructure data)
- Neighborhood planning courses (to utilize neighborhood organization as a means for community disaster preparedness and also crime-watch and community clean-up projects)

Sudha Arlikatti (Texas A&M University) presented the success of the Hazard Reduction and Recovery Center and the Graduate Certificate in Environmental Hazard Management at Texas A&M. She emphasized supporting international study exchange whenever possible. Alejandro Linayo (Venezuela) presented the work at the Ejido Technologic Institute of Merida, a three-year program in "disastrology", with areas of instruction being urban operations, industrial operations and citizen self-protection. As Venezuela's ministries of Higher Education and of Science and Technology are interested in expanding the number of disaster management professionals, they want "to provide the same courses in other institutions of learning around the country, ensuring that training courses in disaster management are accredited by the National System of Higher Education and creating a competency program to meet the needs of non-professionals with many years of experience in disaster management bodies."

In the U.S., the similar and successful program Partners for Disaster Resistance & Resilience: Oregon Showcase State Program was presented by Michelle Steinberg (National Fire Protection Association) and Andre LeDuc (University of Oregon). The University of Oregon statewide partnership was initiated by the Institute for Business & Home Safety (IBHS) and is now operated by the Oregon Natural Hazards Workgroup with a number of public and private sponsors. It functions as an interagency/interorganizational clearinghouse for natural hazards information, education, grants and resources, as well as an active participant in local capacity-building through projects and planning. It also educates city planning students and improves field practice by sending them out to communities to assist with hazards planning

and projects. At the federal level, FEMA launched a Higher Education Project that included the development of college-level courses that could be used by teachers and students in a wide variety of disciplines. The consensus was best summed up by Michelle Steinberg in her declaration on the need for “service learning programs in universities that provide hands-on experiences for students that simultaneously boost capacity and knowledge at the community level and extend learning to long-term practitioners.”

Businesses, political bodies, and grassroots groups are also proving instrumental in promoting community disaster risk awareness. Drawing upon business organizational security, James Sena (Cal Poly) showed how businesses are more efficient at disaster assessment, management, and recovery than are public agencies. He listed the methods currently in use by businesses and how public agencies can easily augment them to fit their goals. Politics and grassroots groups entered the discussion in the course of Haruo Hayashi (Kyoto University, Japan) imparting lessons learned from recent projects on holistic earthquake disaster management planning based on a participatory strategic planning method. This methodology resulted in the development of a format in which participatory strategic planning processes can be described in terms of activity, input, output, control, and mobilization (AIOCM). Community members are invited to establish comprehensive goals, policies and programs which then direct the appropriate agencies in implementation. Hayashi acknowledged that the hardest part of the process is getting commitment from top officials in the form of funding and resource development.

Paulina Chevarri also addressed poor commitment from the top as a major problem: “Entities in charge of the reconstruction, (such as housing, human settlements, transportation and health authorities) show the slowness of bureaucracy, the lack of procedures, mechanisms, funding, and planning. Annual plans and budgets do not include recovery with better development standards. Nor have they mainstreamed risk-reduction in their policy framework and investments.”

On a more positive note, Marikina in the Phillipines provided a thriving example of a city with the concept of safety as the organizing principle for risk-reduction. Tomas Aguilar, Marikina’s Economic Development Director, showed us how local government induced the mobilization of stakeholders and accomplished prevention and disaster preparedness programs that make for a safer society. Safety as the central organizing concept also leads to economic sustainability in that businesses know they can invest there with a minimum potential for loss.

Discussions showed that all players involved in the process must be in synch in reaching for the goal. More vertical and horizontal collaboration between grassroots groups, businesses, and governmental agencies must be achieved in order to reduce risk and to increase preparedness. On the other hand, the responsibility for hazard risk reduction must be awakened in students through multi-disciplinary hands-on experience, and in the community through charrettes and educational workshops. Practicing risk-reduction exercises is also effective training.

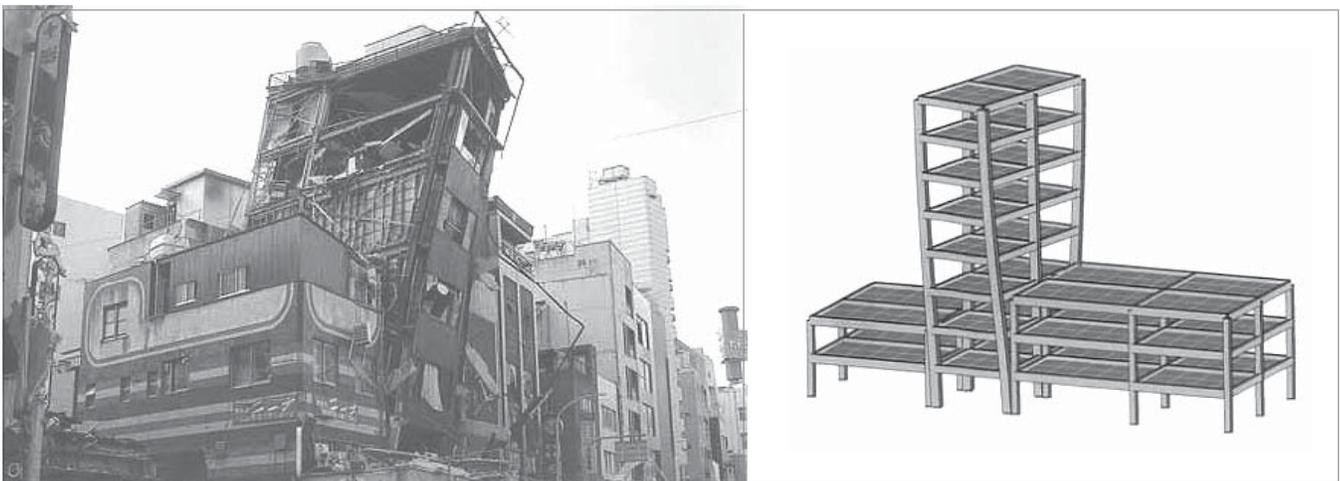


Figure 3. The “hammer effect” during a shake: high and narrow buildings will oscillate more and “hammer” their neighbors. (photo and schem from T. Guevara-Perez presentation)

Technical Assistant: Participation in Rebuilding Disaster Stricken Areas and Guidance in Designing Sustainable Disaster Resistant Cities

After a disaster event occurs, a three-phase process follows and while it may not always be so linear it follows as response, recovery, and reconstruction. Discussions in the symposium's first session showed that identification and assessment of risk is the first step in reduction of impacts. After a disaster hits there is no longer the need to identify it, but rather to recover from it and prevent it from happening again. Lack of integration between governing bodies, funding for reconstruction, and information availability on the causes for disaster propel this cycle of repeating disasters. Prevalent in the developing world is the rush of displaced people back to the same site where the disaster occurred. Mismanagement by governing bodies and top-down control policies have not prevented people from rebuilding in the same high risk area. We must learn from past experiences and build management models that capitalize on the disaster event to impose appropriate land use zoning (locational) and building (design) guidelines.

Out of Taiwan's National, Regional and Urban Planning Act and the Disaster Prevention and Response Act comes Feng-Tyan Lin's work on Mitigation Plans Embedded in Zoning Maps, which involves collecting relevant data, reviewing city maps by hazard potentials individually and comprehensively, simulating urban development under hazard potential, delimiting the areas under hazard potential, and reviewing refuge sites, evacuation roads and other spaces in mitigation plan. Areas with high hazard risk are grouped into three hazard categories: "prohibited or move out", "no growth" and "managed growth", and zoning maps are then designed with hazard potentials considered. The results reflect a myriad of benefits as the maps offer comprehensive, concise data that allows for maximum accuracy in land use, urban development and insurance policies with disaster potential in mind. The maps can also be made available online thereby allowing citizens to educate themselves and form their own disaster mitigation strategies. The more effective governance and management permits a balance between urban development and sustainable environment and disaster mitigation.

Because most deaths result from the failure of man-made structures (buildings, bridges and roadways), the need to focus on these structures and strengthen their withholding capacity is of utmost importance. After her in-depth study of contemporary cities, Teresa Guevara-Perez noted that current "mitigation of seismic vulnerability is concentrated mainly in the application of seismic codes to individual buildings as

independent units and not as components of the city system." She concluded that "professionals in planning, design and construction should work as a team, not independently" and that "to mitigate seismic risk in contemporary cities, buildings have to be considered as components of the urban system." While Perez's recommendations apply to new buildings, there is also the issue of existing high-risk structures, especially in self-built housing occupied by the poor.

Fred Turner (California Seismic Safety Commission) walked us through the seismic retrofitting process that is ongoing in California. After a series of unsuccessful mitigation laws designed to enforce retrofitting of unreinforced masonry buildings, the state realized that without citizen initiative their goal was unattainable. Arietta Chakos (City of Berkeley, CA) maintained that "by reframing a fatalistic acceptance of disasters and their consequences, it is possible to cultivate and implement a positive, resilient response to societal risk." Because it is the citizens and property-owners that often bear the brunt of the cost in seismic retrofitting, governments and municipalities must offer incentives for the public to undertake the cost burden. As seen in Marikina Phillipines and Berkeley California informed citizens inherently make the right decisions. Some of the common incentive methods are levying tax rebates for residential seismic upgrades, waiving permit fees for retrofits, and city grants to low-income homeowners and seniors to make their homes safer.

Now we know that it takes citizens initiatives to make headway in the disaster risk reduction program; but where do governmental agencies procure funding to provide these initiatives (tax breaks and grants) to motivate citizens? The money is there but appropriate lobbying with the right governmental bodies is needed. The overseeing bodies governing disaster management are not always in coordination with one another. Allen Settle (Cal Poly) warned that "elected officials and citizens are caught between competing agencies with considerable power to issue legal sanctions even if they contradict each other." He used the vulnerability of the California Central Valley levee system as a framework to display this quagmire. The levees were haphazardly constructed, they are not properly maintained, and are now subject to a similar fate of New Orleans' should extreme weather hit. Regrettably, to receive post-disaster funds FEMA requires that there be some documented value of the assets lost. These values should be included in the capital improvement plans and list of fixed assets and depreciation schedules, but the State has not yet created these documents, thus voiding any potential post-disaster relief funds.

All players in the local, state and federal arena must fulfill their duties so that we avoid being caught up in bureaucratic loopholes that undermine our goal. Another part of fulfilling this obligation is tapping all available financial resources. Laurie Johnson (Risk Management Solutions Inc.) reminds us that programs such as FEMA, the National Flood Insurance Program, H.U.D., the U.S. Dept of Transportation, the U.S. Army Corps of Engineers, state programs and projects, local programs, non-profits, corporations and individuals are all sources of potential funding and support for disaster-risk reduction and recovery. The tools are out there for us to achieve our goal. It's a matter of synchronizing our agency players, tapping all available financial resources and mobilizing programs of disaster risk reduction.

Conclusions

After nearly three full days of immersion in disaster risk reduction topics, everyone came away from the symposium with a broader and deeper understanding of the context in which disasters happen, the forces that still encouraged them, and the needs to reduce their risk and impacts. Presentations and discussions fully addressed and advanced the original symposium question "How do we build more disaster-resistant communities that provide safer places for people and their individual and collective property?". The presentation by William Siembieda (Cal Poly) served perhaps as the best summary of the concluding lessons, when he proposed a new three Ps paradigm for disaster prevention through the investment in Places, People and Process.

Investing in Place means identifying vulnerable areas using GIS and SDI technology. That information is then used to create composite maps that direct design professionals and local agencies in zoning, building regulations, mitigation and retrofitting processes. Becoming aware of malfunctioning building configurations leads the way to creating newer and stronger ones. Transferring technology to poor people will help them build safer and more affordably.

Investing in People is crucial because they are the greatest resource we have to draw upon. Once educated, these people become conscious stake-holders with interest vested in protecting their lives, livelihoods and property. Community education workshops promote a heightened awareness and responsibility in citizens that logically leads them to the roles in enforcing mitigation, implementing retrofitting processes and training to be first responders to disasters. Through an process of community education a dialogue based on self interest equals common interest language is built, allowing us to archive our experiences and draw from them in the future.

Investing in Processes requires the most energy and coordination. The first step is putting in place the legal, institutional and

operational mechanisms that make people accountable for their actions. Reducing disaster risk does not lie solely on one agency, or entity. It must be viewed as an across the board public objective; not the sole responsibility of specialized agencies. Local, state and federal governments, risk reduction professionals, universities, businesses, grassroots organizations, and the public are obliged to heed this call. This echoes many of the lessons brought to us by the international presenters. Interdisciplinary collaboration in the public, professional and educational fields is mandatory for optimum success in reducing disaster risk and impact. The ultimate result we hope to see is competent infrastructure organization between communities, risk reduction professionals and governmental agencies.

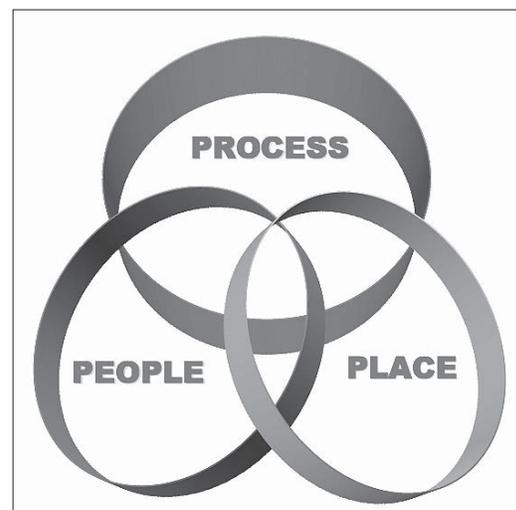


Figure 4. The three Ps: a new paradigm for disaster prevention (from W.Siembieda presentation).