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Communities of Practice and Disaster Risk Reduction

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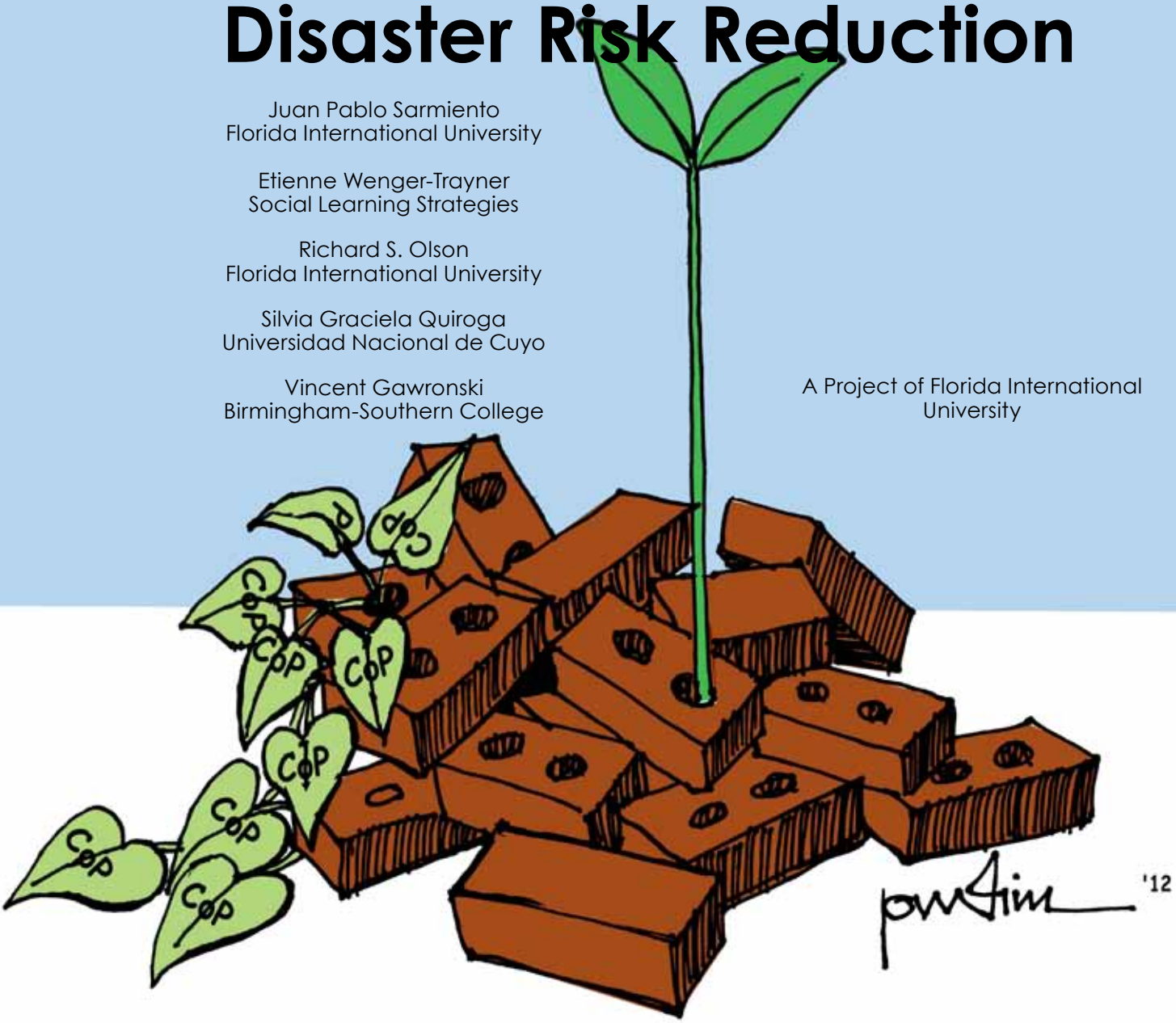

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TABLE OF CONTENTS

Prologue—Page 6

About the authors—Page 8

Foreword **Communities of Practice in a Futures Context**—Page 10
Randolph Kent

Chapter I **A New Concept: Communities of Practice as "Horizontal Organizations"**—Page 14
Juan Pablo Sarmiento P. and Richard S. Olson

Characteristics of a Community of Practice
The Importance of CoPs in Disaster Risk Reduction
CoP Activities in Disaster Risk Reduction
CoP Development Stages
Distributed CoP
Communities of Practice and Organizations
References

Chapter II **Communities of Practice and Disaster Risk Reduction**—Page 21
Juan Pablo Sarmiento P.

Background
Knowledge Management
Knowledge Management Concept
Knowledge Construction and Communities of Practice
Legitimate Peripheral Participation within DRR Communities of Practice
Measuring Success
Structural and Operational Characteristics of CoPs
Leadership within CoPs
What does success mean for a CoP?
Metrics & CoPs
References

Chapter III **Disaster Risk Reduction in Latin America: Communities of Practice as a Mode of Approach from Universities**—Page 31
Juan Pablo Sarmiento P., Silvia Graciela Quiroga, and Vincent T. Gawronski

Invitation to Universities in Latin America and the Caribbean
Accepted Proposals
Administrative Mechanisms
Follow-up
Evaluation
CoP Membership
Knowledge Management in the CoPs
Results obtained by the CoPs in relation to Disaster Risk Reduction
Some Reflections

Chapter IV Enrichment of the Community of Practice (CoP) Concept Based on Experiences in Latin America—Page 51

Juan Pablo Sarmiento P. and Silvia Graciela Quiroga

Envisioning the CoP concept
Diversity and Visualization of CoPs in Latin America
CoP initiated by the USAID/OFDA Regional Disaster Assistance Program and continued by FIU
Perceptions of the CoP Members
Some reflections on the chapter

Chapter V Developing Complex Capabilities: The Case of Disaster Risk Reduction—Page 59

Etienne Wenger-Trayner

Complex learning challenges: the perspective of practice
Dynamics of learning capability
Communities of practice as interventions
Some key ingredients
An urgent learning imperative

Epilogue—Page 69
Juan Pablo Sarmiento P.

TABLES AND GRAPHS

Chapter I

Table 1. CoP activities in disaster risk reduction

Table 2. CoP development stages

Chapter II

Table 1. Knowledge construction and communities of practice

Table 2. Structural characteristics

Table 3. Knowledge management and observable activities

Table 4. Leadership within CoPs

Chapter III

Table 1. Proposals accepted by the by the Bell Risk Management Program

Table 2. Proposals financed by the Bell Risk Management Program

Table 3. Proposals financed by the Disaster Risk Reduction Program

Table 4. Orientation and area of action with risk management

Table 5. Orientation and moment of action

Table 6. Organizational context and creation process

Table 7. Life span, level of maturity and age

Table 8. Correlation between phases and age

Table 9. Interaction, border crossings, and context or external circumstances

Table 10. Operative aspects: Leadership, formalization, and financing

Table 11. CoP membership

Table 12. Knowledge generation and related actors

Table 13. Results obtained according to work area

Chapter IV

Figure 1. Community of practice

Table 1. Visualization of the communities of practice participating in the Bell and DRR programs

Figure 2. CoP initiated by the USAID/OFDA RDAP and continued by FIU

Figure 3. Standard organization of a CoP

PROLOGUE

This publication builds on real experiences in disaster risk management (DRM) and reflects a long-standing interest in promoting DRM in the Latin American and Caribbean region by Florida International University (FIU) and the United States Agency for International Development's Office of U.S. Foreign Disaster Assistance (USAID/OFDA). The publication identifies strategic themes, stakeholders, and non-conventional means and mechanisms for the implementation of a series of DRM projects, initially at a regional scale and subsequently at the national level in Chile, Colombia, Costa Rica, El Salvador, Perú, and Venezuela.

We hope that this book will serve as reference material to universities, private and public entities, cooperation agencies, non-governmental organizations, civil-society associations, and independent professionals interested in creative and innovative DRM approaches.

Four objectives guided the preparation of this book: (1) to examine communities of practice as a viable alternative approach to stimulate and implement effective DRM; (2) to document experiences of USAID/OFDA, Florida International University, and several Latin American universities with the CoP framework; (3) to systematize CoP lessons learned; and (4) to assess the various experiences by one of the founding authors of the CoP theory.

This book comprises a prologue, five chapters, and an epilogue developed and written by different authors in different phases of the original project. Consequently, the reader will perceive different voices, writing styles, and tempos.

The **Foreword**, prepared by Randolph Kent, director of the Humanitarian Futures Programme of King's College of London, offers an independent and bold perspective on the disaster future awaiting contemporary societies, proposing crisis drivers and possible scenarios, as well as an anticipatory methodology where CoPs have a potential role to play.

Chapter I, developed by Juan Pablo Sarmiento, co-director of the Disaster Risk Reduction Program at Florida International University, and Richard Stuart Olson, chair of the Department of Politics and International Relations at Florida International University, discusses the concept of CoP, its evolution and relation with DRM, and advocating for an operational definition of CoP. After analyzing the different CoP characteristics and phases, the chapter concludes by assessing the relationship between the more "horizontal" CoP concept with the more traditional "vertical" or institutional approach to DRM.

In **Chapter II**, Juan Pablo Sarmiento deepens the analysis of two aspects of CoP: (1) knowledge management and participation, and (2) monitoring and evaluation. A special effort is given to the structural and functional characterization of CoP, from a DRM perspective.

Chapter III reflects a joint preparation by Juan Pablo Sarmiento, Silvia Quiroga from Universidad de Cuyo-Argentina, and Vincent T. Gawronski from Birmingham-Southern College. This chapter applies the CoP framework to describe and analyze CoP projects carried out by various Latin American universities, supported by Florida International University with funding from USAID/OFDA. The analysis includes the results and findings within the risk management field.

In **Chapter IV**, Juan Pablo Sarmiento and Silvia Quiroga revise the CoP concept in light of the experiences described in Chapter III, generating graphic representations for each of the CoPs and including an internal analysis, by leaders and project coordinators of the communities under study.

Chapter V, authored by Ettienne Wenger, a founder of the CoP theory, reflects on the FIU and USAID experiences as a learning imperative. Wenger offers a set of observations on the application of the CoP framework to deal with such complex challenges of social learning as DRM. He also offers an intricate scenario where practices, institutions, and people must interact to be successful in complex social learning situations. Finally, Wenger's chapter suggests the need to move from an experimental phase to a more active one—especially now when humanity is facing challenges without precedent that pose new risks and new burdens—to develop our capacity to learn together.

In the **Epilogue**, Juan Pablo Sarmiento summarizes the communities of practice and disaster risk management experience, revealing the current challenges in dealing with its long-term sustainability.

About the authors

Juan Pablo Sarmiento P.

Dr. Juan Pablo Sarmiento is a professor at the Department of Health Policy and Management in the Robert Stempel College of Public Health and Social Work, and a research professor in the Latin American and Caribbean Center, College of Arts and Sciences, located at Florida International University. Dr. Sarmiento is the director of the Paul C. Bell Program, and the co-director of the Disaster Risk Reduction in the Americas Program.

Dr. Sarmiento is medical doctor and surgeon graduated from the University of the Rosario (Colombia) with studies in disaster management at Oxford (Great Britain); high level public administration from the Colombian Superior School of Public Administration; a master's degree in medical education from the University of the Sabana (Colombia); a residence in nutrition at Tufts University (United States of America); and a master's degree in project administration from the University for International Cooperation (Costa Rica).

He has worked for the U.S. Agency for International Development's Office of U.S. Foreign Disaster Assistance (USAID/OFDA), Pan American Health Organization (PAHO), and in Colombia he worked for Pontificia Universidad Javeriana, Colombian Red Cross, Ministry of Health, Central Military Hospital and the Civil Defense. Dr. sarmiento has 30 years of professional and research experience; he has publications in the fields of health, health education, risks and disaster management in Latin America and the Caribbean.

Sarmiento's work encompasses a wide range of activities, including the evaluation of health systems, institutional capacity building on disaster risk reduction and disaster management, as well as responding to emergencies and disasters, conducting damage assessment and needs analyses, and designing post-disaster rehabilitation and reconstruction programs.

Etienne Wenger-Trayner

Dr. Etienne Wenger-Trayner has a B.S. in computer science, University of Geneva, Switzerland, M.S. in information and computer science, University of California at Irvine and a Ph.D. in artificial intelligence from University of California at Irvine. Etienne Wenger joined the Institute for Research on Learning in Palo Alto, California, where he developed his new learning theory centered on the concept of community of practice.

For the last six years, he has been helping organizations develop and implement knowledge strategies based on communities of practice. In the course of his career, he has provided a seminal conceptual framework for two different fields. His first book on artificial intelligence in education shaped the field known as "intelligent tutoring systems" in the 1980s. Then in the 1990s his work shaped the field of "situated learning" and "communities of practice."

He was the co-author with Jean Lave of *Situated Learning*, where the term "community of practice" was coined. Building on these original ideas, he later wrote *Communities of Practice: Learning, Meaning, and Identity*, a seminal book that lays out the theory of communities of practice. Another book, *Cultivating Communities of Practice: a Guide to Managing Knowledge* (co-authored with Richard McDermott and William Snyder) is addressed to practitioners in organizations. His more recent publication, which deals with issues of technology, *Digital Habitats: Stewarding Technology for Communities*, is co-authored with Nancy White and John Smith. Dr. Wenger's work is influencing both theory and practice in a wide range of disciplines and organizations across private and public sectors.

Richard S. Olson

Dr. Richard S. Olson is the director of the Extreme Events Institute at Florida International University (FIU) and a professor of the Department of Politics and International Relations at FIU. He is also the director of the Disaster Risk Reduction in the Americas Program at FIU. Dr. Olson received a B.A. degree in political science from the University of California, Davis in 1967. He received his M.A. degree from University of California, Los Angeles in 1968 and his Ph.D. in 1974 from the University of Oregon, both in political science, emphasizing comparative and Latin American politics.

A Fulbright Fellow in Colombia in 1968-69, Professor Olson returned to Latin America in 1972 to conduct field research on the Managua, Nicaragua earthquake disaster of that year. Since then he has been directly involved in disaster response, evaluation, and research in more than 20 events, including Guatemala 1976 (earthquake), Chile 1985 (earthquake), Mexico City 1985 (earthquakes), Colombia 1985 (volcanic eruption and lahar) and 1994 (earthquake and landslide), the Dominican Republic, Honduras and Nicaragua 1998 (hurricanes), and El Salvador 1986 and 2001 (earthquakes).

In addition to more than 60 research articles, monographs, and major papers, Professor Olson has been lead author on the books, *The Politics of Earthquake Prediction*, and *Some Buildings Just Can't Dance: Politics, Life Safety, and Disaster*.

Silvia Graciela Quiroga de Benegas

Silvia Quiroga has a licentiate degree in geography, and a specialization in risk management and in environmental management, professor of middle and upper-level education in geography, specialist in the career of planning, prevention and management of disaster-prone areas, and researcher for the Center for Territorial Strategies for MERCOSUR. She is preparing her doctoral thesis in management of river basins in arid zones through land use management at Cuyo National University.

She works as a professor in the Geography Department of the Faculty of Philosophy and Letters, and as a

professional in the Land Use Management Department of the Municipality of Luján de Cuyo. She has become specialized via scholarships in her country and abroad, and has extensively participated in research projects and generated a solid collection of published articles and books, covering issues of environmental management, risk management and land use management. In the professional field, she currently works in different municipalities, where she has made important contributions to land use management.

It is important to highlight her direction of the Land Use Management Program for the Andean Corridor and Lakeshore of the Potrerillos Reservoir, Mendoza, Argentina, proposal for risk management and the reduction of vulnerability, in the framework of an agreement between the Ministry of Environment and Public Works (Government of Mendoza) and Cuyo National University.

Vincent Gawronski

Dr. Vincent Gawronski is an associate professor of political science at Birmingham-Southern College. Dr. Gawronski received his B.A. in history and Spanish from the University of Texas at Austin (1987) and his M.A. (1993) and Ph.D. (1998) in political science from Arizona State University. He taught at Mesa Community College in Mesa, Arizona, Arizona State University in Tempe, and Florida International University in Miami, Florida, before coming to Birmingham-Southern College in 2001.

Dr. Gawronski has also worked as a consultant for the U.S. Agency for International Development, Office of Foreign Disaster Assistance where he has been involved in the evaluation of training programs for Latin American civil defense personnel and in the assessment of post-impact disaster response and nongovernmental organization capabilities.

Dr. Gawronski's area of expertise is Mexico and Central America, where he has maintained two research tracks: political development and the "politics of disaster." As such, he has worked on several federally-sponsored projects focusing on the political impacts of natural disasters in Latin America. Past projects have focused on governmental and institutional disaster response in the Dominican Republic, Guatemala, Honduras, Nicaragua, El Salvador, Peru, Bolivia, and Ecuador as well as political change after the 1985 Mexico City earthquakes.

FOREWORD

Communities of Practice in a Futures Context

> At the simplest level, a community of practice is a small group of people … who have worked together for some time. They are not a team, they are not a task force, they are not even necessarily an identifiable or authorized group ... They are equals in the performance of "real work." What keeps them together is a common sense of purpose and a real need to know what their counterparts know.[1]

The Semicon West conference in San Francisco is an annual event, bringing together microchip manufacturers and those who make microchip producing machines. The industry is fast moving, highly competitive and faced with formidable challenges. Consistent with the precept of "Moore's law," the power of microchips doubles at least every two years and their physical size reduces in inverse proportions. The importance of being ahead of the game in that crowded high tech world is measured in terms of billions of dollars. In such a supercharged environment, one naturally would assume that secrecy and information hoarding would be bywords. And yet, the opposite is the case. The conference, and particularly its International Technology Roadshow for Semiconductors, is an open and freewheeling market of researchers and microchip machine and microchip manufacturers—trading information about new and potential innovations, techniques and even in some instances emerging markets.

And why? In the words of one participant, "It is all too evident. The only way to stay on top of all that is happening in the industry is to share information. We could keep it to ourselves, but that means we would close ourselves off from the research and possible opportunities that others may be generating. We don't necessarily like each other, but the benefits of cooperating and sharing information in this instance far outweigh the benefits of hiding what we have."

This anecdote is indicative of a pattern in which communities of practice will play an ever more prominent role in dealing with a growing number of highly complex issues in environments increasingly marked by ambiguity, uncertainty and volatility.[2] Disaster risk reduction is certainly one such issue. And while what might be described as "conventional" or "formal" humanitarian and development organisations are recognising DRR's importance, the new dimensions, dynamics and types of crisis threats which will have to be faced in the foreseeable future mean that DRR will require highly agile, cross-disciplinary networks to keep pace with future challenges.

Such networks—or in this case communities of practice—will also have to relate to formal organisations within and outside governments, including inter- and non-governmental bodies. These will undoubtedly continue to provide the main resource and governance roles and responsibilities for promoting effective and sustainable DRR. Hence, DRR that is sensitive to increasing types of crisis threats and their changing dimensions and dynamics will depend in no small part upon the effective interaction between communities and networks of practice and traditional governance institutions and mechanisms.[3]

Both CoPs and formal institutions will have to be sensitive to potential future crisis drivers and their plausible impacts, and each will have to accommodate the characteristics of the other. Conventional governance organisations will have to accept the reality that one will often have to trade consistency and predictability for the informal, more unpredictable and self-organising nature of CoPs. CoPs in turn will have to accept what might be seen as the frustratingly slow receptive and adaptive capacities of their formal counterparts. Ensuring the effective interaction between both will be essential in a world marked by volatility, ambiguity, complexity and frequently rapid change.

Crisis drivers of the future

From a DRR perspective that world will in part be based upon an expanding number of potential crisis drivers and various changes in the nature of vulnerability and the vulnerable. Disasters range from small, scattered, and low visibility local events (but which cumulatively produce chronic degradation in many lower-income communities) to high impact disasters, or even catastrophes, that attract both great media coverage and political interest.

An interesting example comes from NASA's Task Force on Planetary Defense, which has warned that the international community should increase its capacities to deflect in-coming asteroids—a suggestion endorsed by the White House's Office of Science and Technology Policy. These are seen as plausible and indeed possible threats, threats for which one can prepare through the creation of

1 Seely Brown and Solomon Grey cited by Kimble (2000), as referenced in A new concept: Communities of practice as 'horizontal organisations'" by Richard S. Olson, Ph.D. and Juan Pablo Sarmiento P., M.D., M.P.H in *Communities of Practice and Disaster Risk Reduction*—Draft 2011.

2 Development of Concepts and Doctrine Centre, UK MoD, *Global Strategic Trends Programme, Global Strategic Trends Out to 2040*, Version 20080RT, February 2010.

3 For the purposes of this note, the terms, community of practice and networks of practice, are used interchangeably, though clearly there are well defined differences. The differences are described in Marlous Agterberg et al., *Leadership in online knowledge networks: Challenges and coping strategies in a network of practice*, VU University Amsterdam, magterberg@feweb.vu.nl, paper presented at OLKC, Copenhagen, April 2008

"We don't necessarily like each other, but the benefits of cooperating and sharing information in this instance far outweigh the benefits of hiding what we have."

relatively inexpensive deflection systems.[4] If such threats were to manifest, their impacts might well challenge the standard assumption that those who are poorest are necessarily the most vulnerable. They will expand the scope and concept of vulnerability, a consideration not lost recently on the Japanese in the aftermath of the inter-related earthquake-tsunami-radiologic events in March 2011.

Increasingly as one looks at risk reduction one will have to begin to readjust what have become conventional assumptions about not only the nature of threat but also the impact, duration and interactive dynamics of threats.

Types of future crisis drivers

The dimensions and dynamics of conventional crisis drivers, such as volcanic eruptions, floods and earthquakes, will increase exponentially, principally because of a confluence of such hazards and what might be described as context factors—economic short-termism and environmental changes, including climate change. They will join a growing number of technological and infrastructural threats that will intensify vulnerability across the globe. Some of these new crisis drivers will be part of the desiderata of spent technologies or the consequence of poorly planned development; others will derive directly from technologies presently in use, while others will be the result of the abuse of such technologies.

In the first category, there is ample evidence of a growing link between disaster risks and abandoned technologies. In this category, the potential catastrophes that could arise within Central Asia and beyond from radioactive waste and nuclear tailings are cases in point. According to one analysis, the festering remnants of the Soviet nuclear arms industry could poison significant portions of the water sources and agricultural lands of countries in the region, and—in a resource strapped environment—could ultimately be the source of conflicts within and among those countries. Such waste could also have far more extensive effects if caught in airstreams that carry it well beyond the region, itself.[5] Similarly the "red sludge" from a burst bauxite storage reservoir near the Hungarian town of Ajka that almost entered the River Danube offers another case in which the sheer cost and complexity of industrial and waste storage around the world are exacerbating risk.

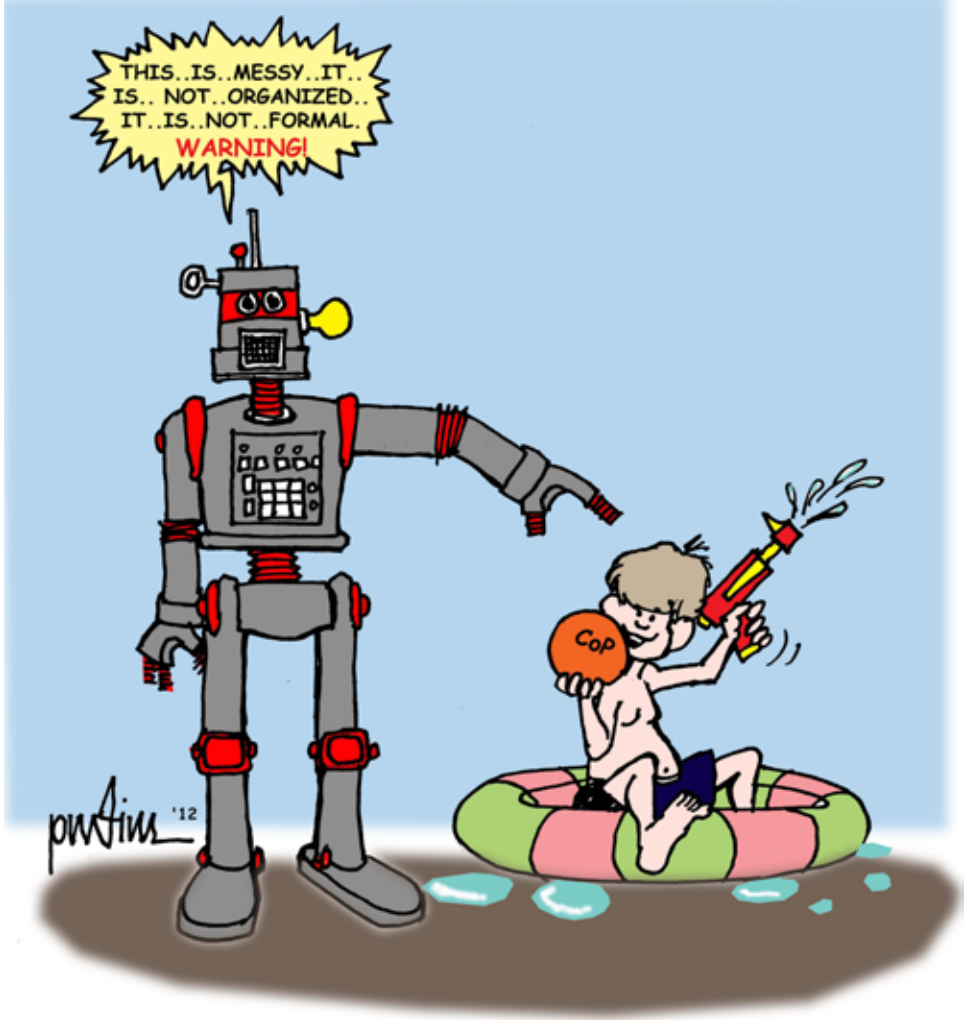
Technology's impact upon vulnerability is also reflected in issues such as cybernetic collapse, nanotechnology, and biotechnology. All three reflect scientific innovations that will be increasingly important and positive parts of modern society, while at the same time all three will present potential hazards that could generate vulnerabilities

4 See Task Force on Planetary Defense of the NASA Advisory Council. Note that estimates for deflection systems are $250 million to $300 million, with an annual maintenance budget of $75 million. Also see White House Office of Science and Technology Policy message to US Congress, October 2010

5 Hobbs, C. 2010. Current and future risks posed by unprotected radioactive waste sites in Central Asia. Background Paper prepared for the 2011 Global Assessment Report on Disaster Risk Reduction. Geneva, Switzerland: UNISDR.

which in turn could translate into large-scale crises. Only recently the British government ranked cybernetic terror as the second greatest threat to the nation,[6] and the negative as well as positive aspects of nanotechnology and biotechnology have been a source of considerable debate over the past decade.[7]

The disaster risks that will emerge from what might be regarded as poorly planned development are numerous and frequently recognised as such. The evident dilemma for policy makers is the need to reconcile seemingly incompatible objectives, for example, between economic growth and longer-term risk. Hence, displacement caused by large infrastructure projects, especially dam construction, has become common in China—as in other Asian countries—in response to the escalating demand for electricity and water associated with rapid urbanisation. The sorts of risks that projects such as China's Three Gorges Dam create are reflected in the potential environmental catastrophe that is forecast in the aftermath of moving more than 1.4 million people away from in and around the dam site.[8]



However, while these "Hobson's choices" may be inevitable, the equally disturbing fact is that the full consequences of such choices are not analysed or understood sufficiently. As highlighted in the recent controversy over the Zipingpu dam's contribution to the 2008 earthquake in Sichuan, dams can end up becoming agents of their own demise. The pressure of the water in lakes of several square kilometers locked behind a large dam may contribute to an increase in the seismic activity beneath it, especially if the dam is built directly over a fault.

In search of the "what might be's"

To meet these threats it has become more important than ever to consider who knows and how does one know. Clearly the role that natural and social sciences play in determining possible and plausible threats and solutions should be fundamental—essential if there is to be a sustainable approach for engaging and reducing risks consistently and systematically. However, as made evident in an increasing number of instances, the gap between the sciences and policy makers remains wide. The sciences are not used well by policy makers. They may increasingly be represented in the room, but not at the policy-makers' table.[9]

The reason for this in part is the stove-piped, over-institutionalised processes that normally determine the sorts of information and knowledge that filters into policy preparation and decision-making. More and more governmental and related military as well as corporate sector organisations, however, are recognising that they have to deal with complexity, ambiguity, rapid change and uncertainty. They increasingly are willing to consider the what might be's, or develop plausible scenarios and simulations about the types of factors that might affect their strategic and operational objectives.

While such processes do enable new perspectives to penetrate normally narrow institutional screening mechanisms, there is always the danger that "new scenarios" are deemed to be "predictions" and forecasts, and merely serve as new certitudes struggling to replace old ones. What is lost in these processes is the importance of the

6 HM Government, *A Strong Britain in an Age of Uncertainty*, UK National Security Strategy, October 2010, p.11.

7 "There are a great many studies on cells and animals suggesting that nanomaterials can have damaging effects on the health and the environment," says conference organiser Professor Bengt Fadeel, vice chairman at the Institute of Environmental Medicine at Karolinska Institutet. "When you shrink material down to the nanoscale, you change their properties and we still don't really understand which properties are hazardous." Swedish Research institutions warns on health hazards of nanotechnology, *Finfact Ireland* 15 October 2010.

8 Xinhua News Agency (2010a), International scientists to launch environmental studies on HKH region. 8 March 2010 http://news.xinhuanet.com/english/2010-03/09/content_13129540.htm.

9 *Supplementary Government Response to the Science and Technology Committee's Third Report of Session 2010–12.* "We are concerned that the Government's attitude to scientific advice is that it is something to reach for once an emergency happens, not a key factor for consideration from the start of the process. We conclude that scientific advice and an evidence-based approach must be better integrated into risk assessment and policy processes early on" (paragraph 229).

process itself, of an intensely active search for new risk threats and opportunities, an anticipatory methodology that fosters a dynamic exchange between explorers of ideas, possible threats, opportunities and solutions and those who are potential implementers. It is not about forecasting or prediction. Its purpose is to provide space and time to look for possible causal factors and inter-relationships, which when it comes to DRR, points to types of possible disaster risks and ways to reduce them.

The relevance of anticipatory methodology is at least threefold. In the first place, anticipatory methodology moves planners away from the limitations of trends analysis, and offers opportunities to speculate about possible and plausible crisis drivers without the limitations imposed by only looking at the future as an extension of the past.

Second, anticipatory methodology promotes connections that normally are not made in conventional strategic and operational planning.

A third reason for anticipatory methodology in the DRR context is that it facilitates speculation about the relevance and sustainability of existing risk reduction programmes and projects.

Anticipatory methodology and Communities of Practice

Anticipatory methodology, while supported by a host of tools from simulations through to horizon scanning, is in and of itself about a willingness to explore new ideas and approaches. It is sustained by an enabling environment that is receptive to its importance and supportive without attempting to over manage. In light of the challenges that those who focus on risk reduction face, there is a clear need for more innovative approaches to identify and mitigate risk. This in turn requires collaborative partners who can expand the range of possible next moves. With that in mind, the message of one observer rings true, "Good ideas are networks;" they normally arise out of "the connected mind."[10] They bear in that sense the hallmarks of communities of practice.

To maximize their potential effect, communities of practice must have receptive counterparts in formal organisations with whom they can actively engage. The former might be embedded in a single organisation or across several, but in one way or another, creating interactive channels between the two is essential. The CoP can challenge, promote new ideas, and foster positive disquiet, while at this stage, the formal organisation still has a critical implementation role. And while CoPs and other networks of practice may well assume major risk reduction roles in the future, for now the interaction between the formal and that "small group of people bound by a common purpose" will be essential.

Randolph Kent, director
Humanitarian Futures Programme
Kings College

10 Steven Johnson, *Where Good Ideas Come From*, Allan Lane, London, 2010, p 174

Chapter I

A New Concept: Communities of Practice as "Horizontal Organizations

By Juan Pablo Sarmiento P. and Richard S. Olson

Most 21st century national and international problems are multi-dimensional and do not conform easily to treatment from traditional 19th and 20th century style institutions, which are overwhelmingly bounded, rigid, and hierarchic. That is, more often than not current problems are complex and cross-cutting, requiring commensurately new approaches and solutions, one of which is Communities of Practice (CoPs), a concept first advanced in the late 1980s by Jean Lave and Etienne Wenger as part of an attempt to "rethink learning" at the Institute for Research on Learning. The term, however, exists in a broader milieu because skill development and the learning of trades [oficios] take place in a social context:

> "Being alive as human beings means that we are constantly engaged in the pursuit of enterprises of all kinds, from ensuring our physical survival to seeking the most lofty pleasures. As we define these enterprises and engage in their pursuit together, we interact with each other and with the world and we tune our relations with each other and with the world accordingly. In other words we learn.
>
> Over time, this collective learning results in practices that reflect both the pursuit of our enterprises and the attendant social relations. These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise. It makes sense, therefore to call these kinds of communities of practice" (Wenger 1998).

CoP definitions vary based on the particular goals and fields of the interested parties, but for this book we selected two that represent the more solid contributions:

> "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly"(Wenger 1998).
> "At the simplest level, they are a small group of people … who've worked together over a period of time. Not a team not a task force not necessarily an authorised or identified group … They are peers in the execution of 'real work'. What holds them together is a common sense of purposes and a real need to know what each other knows" Seely Brown and Solomon Grey cited by Kimble (2000).

Wenger (1998) has summarized the importance of CoPs this way: "Communities of practice develop around things that matter to people. As a result, their practices reflect the members' own understanding of what is important."

For the work on Disaster Risk Reduction (DRR) we would like to suggest a somewhat different and more operationally pragmatic definition: A community of practice is a temporary horizontal organization with varying levels of formality whose primary mission is to identify and solve complex, institutionally cross-cutting problems and whose major characteristics are: (1) a task-focused existence, (2) flexible and evolving membership, (3) openness to a wide input array, (4) shifting loci of leadership, (5) democratic decision-making, and (6) autonomous funding, within a continuous learning environment.

Characteristics of a CoP

Based on Wenger, Nickols (2003) has offered the following three main CoP characteristics:

- **Joint Enterprise.** The members of a CoP are there to accomplish something on an ongoing basis; they have some kind of work in common and they see clearly the larger purpose of that work. They have a 'mission.' In the simplest of terms, they are "up to something."
- **Mutual Engagement.** The members of a CoP interact with one another not just in the course of doing their work but to clarify that work, to define how it is done and even to change how it is done. Through this mutual engagement, members also establish their identities at work.
- **Shared Repertoire.** The members of a CoP have not just work in common but also methods, tools, techniques and even language, stories and behavior patterns. There is a cultural context for the work."

Kimble et al. (2000) probed more deeply into the second characteristic, "Mutual Engagement," and assigned special value to the affinity factor by adding a fourth characteristic: "a strong feeling of identity."

CoPs and disaster risk reduction

Staying current in today's knowledge explosion is

JOINT ENTERPRISE
MUTUAL ENGAGEMENT
SHARED REPERTOIRE

daunting for anyone, with disaster risk management no exception. Indeed, Stahl (1998) has explained why "lifelong learning" is increasingly necessary:

> • Innovative tasks are ill-defined; their solution involves the learning of information that could not have been predicted.
> • There is too much knowledge, even within specific subject areas, for anyone to master it all in advance or on one's own.
> • The knowledge in many domains evolves rapidly and often depends upon the context of one's task situation, including one's support community.
> •Frequently, the most important information has to do with a work group's own structure and history, its standard practices and roles, the details and design rationale of its local accomplishments.
> • People's careers and self-directed interests require various new forms of learning at different stages as their roles in communities change.
> • Learning — especially collaborative learning — has become a new form of labor, an integral component of work and organizations.
> • The contemporary need to extend the learning process from schooling into organizational and community realms is known as lifelong learning."

Interestingly, all of these points apply to Disaster Risk Reduction, which is a recently developed field with several disciplines and multiple sectors. Given the complexity of the topic and the rapid accumulation of DRR knowledge, CoPs are particularly apt, as Nickols (2003) has captured in a discussion of mission: "The mission and outcomes of a particular CoP depend upon the issue, process, or practice area around which it is organized and upon which it is focused." In general, however, the mission/outcomes encompass:

- stimulating interaction;
- identifying and sharing best practices;
- creating new knowledge; and
- fostering learning.

CoP Activities in Disaster Risk Reduction

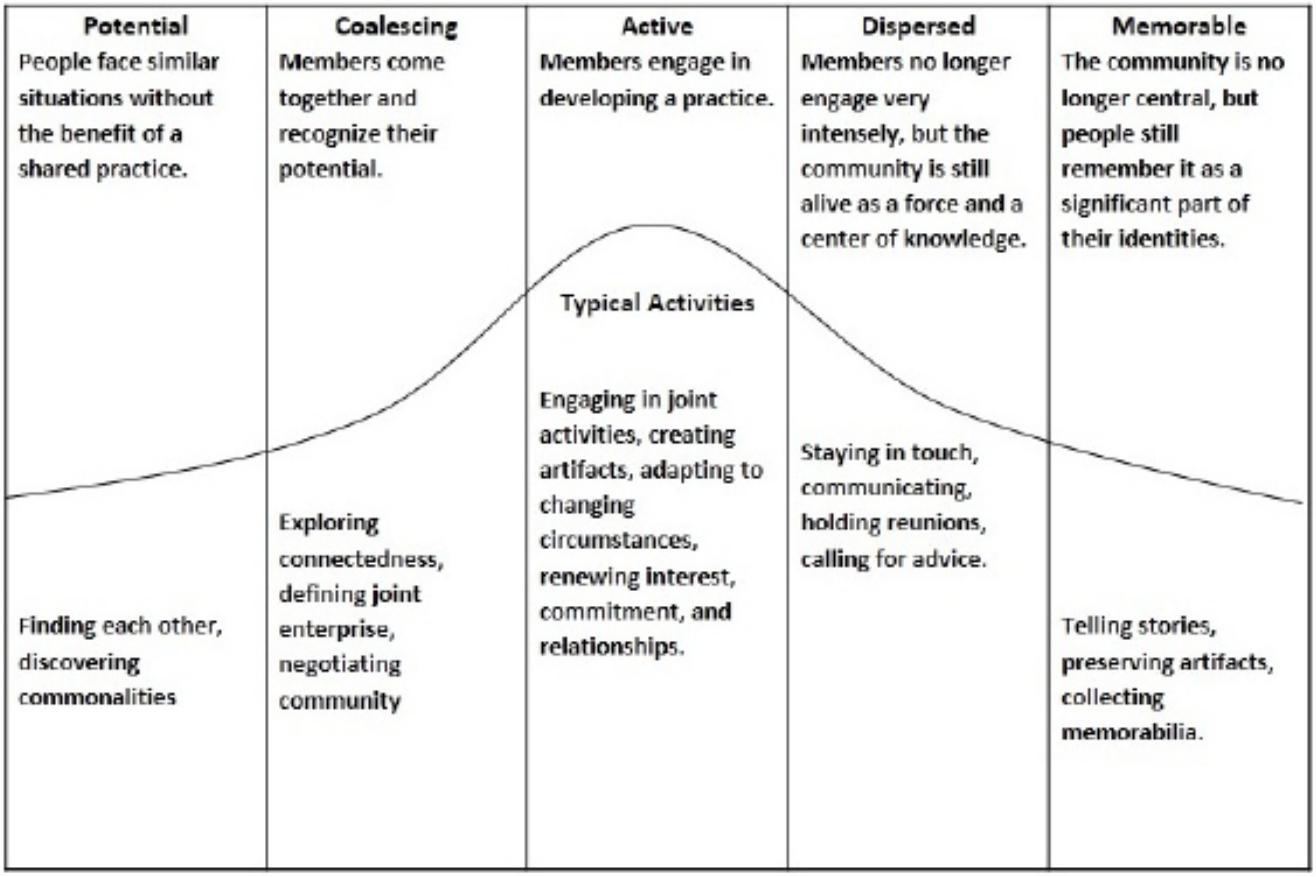
DRR-focused CoPs may perform a variety of functions (based on Wenger's[1] description of common CoP activities), which we have adapted to the FIU-USAID/OFDA project:

1 Communities of practice: a brief introduction. Wenger's official webpage.

CoP activities in disaster risk reduction

Problem solving	Can we identify mutually beneficial overlap areas between land use management and risk management?
Requests for information	Where may we find examples of environmental management laws and/or regulations with risk management already incorporated?
Seeking experience	Has anyone prepared an urban development plan that explicitly includes natural hazards?
Reusing assets	I worked on a risk transfer mechanism using a multi-hazard risk analysis in a small city. I can share that project's multivariable analysis with you, which you can then adapt for your own uses.
Coordination and synergy	Now that we are working on similar projects we can define standardized criteria for M&E. Later, we can compare outcomes and processes.
Discussing developments	We will use the Z/GIS software; is it compatible with the operational system we have in place and the type of information we are going to use?
Documentation projects	Several attempts have been made to relocate this neighborhood, but records are insufficient to analyze what happened. Let us collect and analyze the previous information available and commit to documenting our current efforts.
Visits	Can you come and see our DRR community program? We still face problems and would like to have an external view.
Mapping knowledge and identifying gaps	"Who knows what, and what are we missing? What other groups should we connect with?"

CoP development stages



CoP Development Stages[2]

Wenger proposes 5 stages for CoPs, based on member dynamics and performance (see chart above).

Most authors who have written on CoPs have focused on the first three of the five stages,[3] thereby losing Wenger's more comprehensive view. For that reason the FIU-DRR project decided to start with Wenger's original approach.

Distributed CoP

Citing Lave and Wenger, Kimble, Hildreth and Wright (2000) have discussed the so-called CoP "co-located communities" where members share the same location, but they have also introduced the concept of the "distributed international environment," where the physical distance between CoP members constitutes a permanent operational challenge.

In Kimble et al.'s discussion, we see three possible circumstances for a distributed CoP:

1. The distributed CoP evolves from an initial informal contact between its members or from an official grouping. It develops into a CoP because of the way the members interact and work together.
2. A co-located CoP may develop links with individuals in other locations who are doing similar work. These people may also be members of other CoPs.
3. The developing CoP may then link with a similar group possibly in another country.

The evolution of the USAID/OFDA-supported CoP has been interesting. The original group, convened in 2005, was composed by experts from different countries, with some members staying and others leaving. The ones who stayed started involving other constituents located in different countries, resulting in a "distributed CoP" web, almost exactly as Lave and Wenger postulated.

CoPs and organizations

It may appear that communities of practice and existing (and more formal) organizations are incompatible with each other. Indeed, Wenger (1998) argued that "communities of practice are fundamentally self-organizing systems" and Wenger and Synder (2000) defined CoPs as "spontaneously emerging groups," so CoPs might even be seen as posing threats to established organizations. Organizations themselves, however, often see complex problems crossing traditional boundaries, and Bourhis et al. (2005) highlighted that "organizations have an important role to play in facilitating … [CoP] emergence, supporting their development and sustaining their activities to reap

2 Wenger, 1998.

3 See an interesting document prepared by the U.K. Information Authority, National Health Services (2004).

their full benefits."

Confirming the Bourhis et al. perspective, USAID/OFDA initially convened and has supported for several years a DRR-focused CoP. The idea was to stimulate and sustain a DRR capacity development strategy and see a DRR community evolve and gain autonomy and self-acknowledgment, while also generating practical outputs (artifacts). This CoP has received particular recognition for its achievements in the Americas region.

This new concept of CoP as a temporary horizontal organization may be seen as the antithesis of the vertical, hierarchic institutions that have historically dominated both nationally and internationally, it would be more accurate, and more helpful, to see CoPs as potential horizontal complements to vertical institutions when societies require solutions to problems that cross traditional boundaries. In our particular case, "Disaster Risk Reduction," it makes eminent sense to employ a CoP approach for problem definition and solution design and financing, but then have CoPs cooperate wherever possible with more traditional institutions on actual implementation.

Under this new approach FIU and USAID/OFDA have two current CoP-related objectives: (1) to promote and support DRR knowledge advances, and (2) to identify and support the educational/professional development of the next generation of DRR "thinkers" and "agents of change" in the LAC region. FIU and USAID/OFDA are thus consistent with Wenger's recent (2008) argument that international development players may be "conveners of such communities, rather than providers of knowledge." FIU, in fact, sees this approach as a means for local empowerment and buy-in and as a contribution to the sustainability of localDRR accomplishments.

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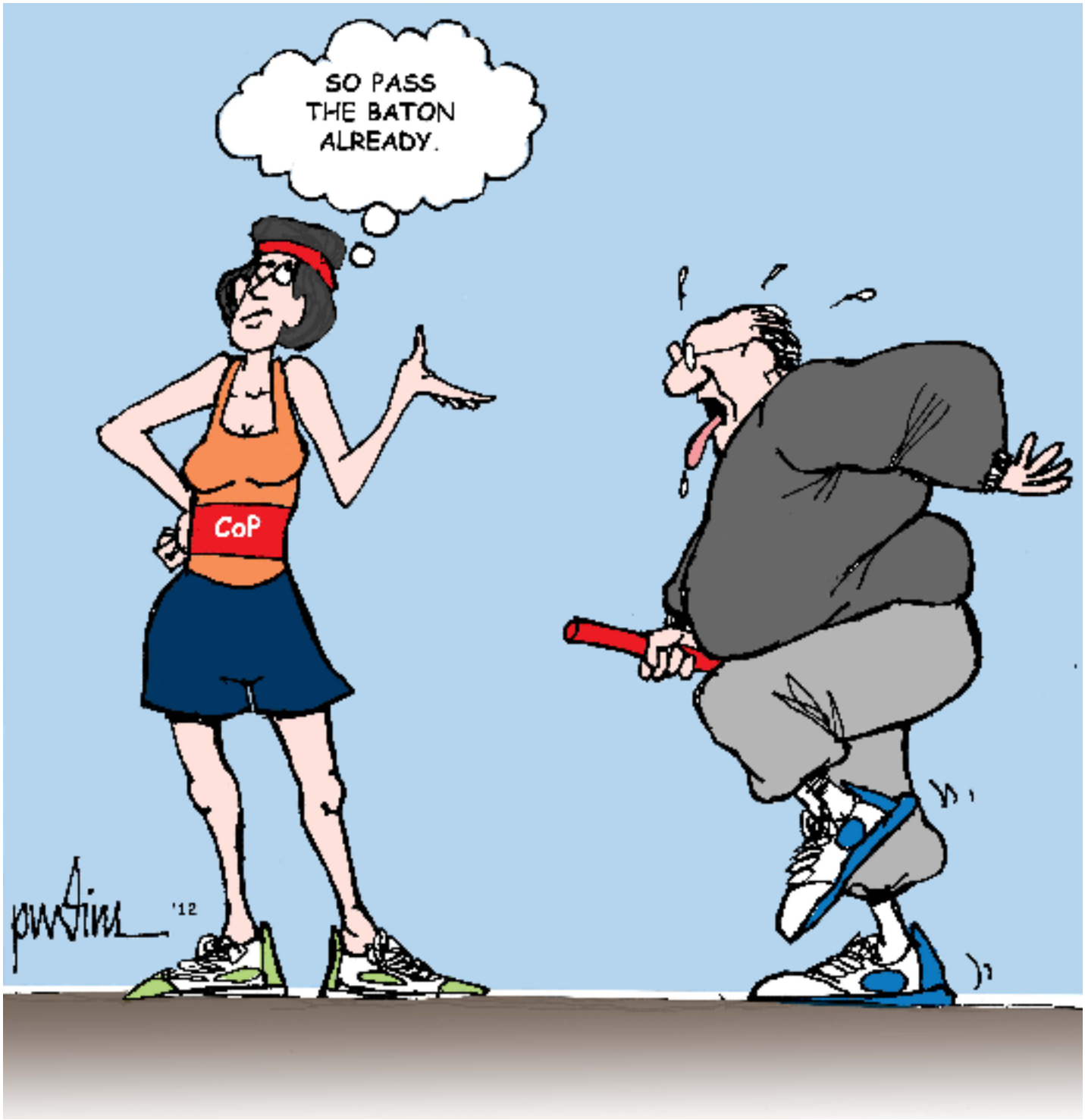
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CoP
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Chapter II

Communities of Practice and Disaster Risk Reduction

By Juan Pablo Sarmiento P.

This chapter refers to the partnership between U.S. Agency for International Development's Office of U.S. Foreign Disaster Assistance (USAID/OFDA) and Florida International University in the topic of Communities of Practice. A specific approach for monitoring and evaluating Florida International University's projects on Disaster Risk Reduction is also presented. This chapter is comprised of three sections (1) Background; (2) Knowledge management; and (3) Measuring the impact of CoPs.

Background

In 2001, USAID/OFDA took on the responsibility of organizing the First Disaster Risk Reduction Hemispheric Conference for the Americas, which was held under the Inter-American mechanism known as "Summit of the Americas." The event, which included specific sectors and cross-cutting topics, sought the involvement and buy-in of the key development players in Disaster Risk Reduction (DRR).

The sectors represented were: health, food and agriculture, education, and critical facilities. The cross-cutting topics discussed were: land use management, finance and public investment, civil society and information technology. The conference results were published in 2003, and the English and Spanish versions of this book[1] have enjoyed a wide distribution throughout the Americas and beyond.

The following year, in 2002, USAID/OFDA began a systematic process to advance strategic DRR issue areas, building on the results of the 2001 conference and involving well known experts who had participated in that event. The four topics selected were: (1) environmental management, (2) land-use management, (3) finance and public investment, and (4) education.

In September 2005, USAID/OFDA convened a working group of international specialists in Buenos Aires, Argentina to discuss practical overlaps in environmental management, land-use management, and DRR. A second working group met in Bogotá, Colombia in March 2006 to discuss the links between finance and public investment and DRR.

These two meetings' participants agreed to generate a document on DRR's state-of-the-art practices from the perspective of environmental management, land-use management, and finance and public investment. The works were compiled in the book "Time to Pass the Baton"[2] and in May 2007 the Spanish version was released during a workshop at Florida International University's (FIU) facilities in Miami, Florida.

In November 2007, a third working group met in Santiago, Chile. This time the group was composed of some members from the previous two meetings and new participants, mostly academics and public sector servants involved in socioeconomic development, planning, and public administration. The ongoing presence of so many professionals facilitated the attainment of a common, more integrated, and coherent DRR vision with three foci: territory, environment, and development.

Three years after the group's first meeting in 2008 a most favorable evolution became evident. The group perceived itself as a CoP with six major characteristics: (1) DRR's multidisciplinary perspective as a common objective; (2) its own internal dynamic, (3) community ownership, (4) solid links to academic institutions with clear extensions to field work; (5) clearly identified outcomes, evident in artifacts such as publications, memories, diagrams, and thematic layouts, and (6) a healthy and mutually beneficial interaction among thinkers, practitioners, and newcomers.

That same year, FIU's Latin American and Caribbean Center (LACC), with the support of USAID/OFDA, decided to promote and support the CoPs through the ongoing Paul C. Bell disaster management initiative (PCB)[3]. Subsequently, FIU and USAID/OFDA agreed on a five-year Disaster Risk Reduction Program (FIU/DRR)[4] in which the CoPs would play a central role.

1 *Hemispheric Risk Reduction Conference*, follow-up contribution to the "Third Summit of the Americas" Ed. San José, C.R. INTERNEM, 2003.

2 "Time to Pass the Baton: Disaster Risk Reduction from the Perspective of Environmental Management, Land Use Management, Finance and Public Investment" International Resources Group, IRG, 1st. Ed., San Jose, C.R., 2007.

3 The Paul C. Bell, Jr. Risk Management Programme is an initiative of the Florida International University's Latin American and Caribbean Center, established in 2004 and supported by USAID/OFDA. The "Bell Programme" is intended to help stimulate new or strengthen existing university-level education programmes in risk management in Latin America and the Caribbean.

4 The "Disaster Risk Reduction (DRR) in the Americas: Conceptualizing, Identifying, Analyzing, Stimulating, and Strengthening Transferable DRR Models" is a five year cooperative agreement between Florida International University and USAID/OFDA. The overall goal of the program is to fully conceptualize "Disaster Risk Reduction" (DRR) within the OFDA three-dimensional mandate and stimulate new and strengthen existing DRR activities and programs in the LAC region and to document and analyze them in global context so that they may serve as models or templates (i.e., as potentially multiplier platforms) for use within the LAC region and possibly in other regions.

In early 2009, Richard Olson and Juan Pablo Sarmiento presented "A New Concept: Communities of Practice as "Horizontal Organizations," which became Chapter I of this publication.

Knowledge management

Obviously, apprenticeship and knowledge management are intrinsic elements of CoPs. In fact, both are fundamental to the DRR capacity development strategy implemented by USAID/OFDA since 2005 and more recently by Florida International University. Therefore, a conceptual framework had to be developed to serve as a means for evaluating the performance of FIU/DRR-promoted CoPs in the Americas.

People are the most important asset in any organization. Understanding people in this context entails taking into account their knowledge, skills, and behaviors. In Chapter I reference is made to the challenge of keeping up with today's knowledge explosion, including the rapid expansion of DRR knowledge.

Regarding knowledge transfer and management, the DRR contribution can be analyzed in terms of long-, medium-, and short-term visions. The long- and medium-term contributions are related to the incorporation of the DRR concept within formal education, from citizenship formation to the development of specific knowledge, skills, and abilities for a particular trade [oficio].

Important advancements have been made, such as curricular adaptations at all levels in formal education: undergraduate and postgraduate studies, continuing education, and professional development programs, among others.

The short-term approach is connected to an organizational environment in which decision makers face day-to-day challenges related to downsizing and outsourcing (Kimble et al. 2000). Both of these trends are present in public administration, the private sector, NGOs, and many other institutions. Consequently, staff reductions, salary cuts, and high turn-over rates have generated losses in the valuable stock of institutional knowledge, even without considering the political instability and corruption prevalent in so many developing countries.

It is in this organizational environment where the concept of knowledge management becomes preeminent. While there are many definitions with subtle differences, the U.K. National Health Services (NHS) definition most closely aligns with the values of DRR:

> "Knowledge management is a process that emphasises generating, capturing and sharing information know how and integrating these into business practices and decision making for greater organisational benefit." (NHS 2004)

Numerous approaches to exploring knowledge management exist, as Kimble et al. (2000) mention, many of which are oppositional:

> "…tacit/explicit (Nonaka 1991; Nonaka and Konno 1998); tacit/focal (Sveiby1 Conklin2); know-what/knowhow (Seely Brown and Duguid 1998) and cognitivist/constructionist (von Krogh1998) and work in practice and domain knowledge (Sachs 1995). Leonard and Sensiper (1998) however prefer to view knowledge as a continuum rather than a pair of opposites. They regard the two extremes as being tacit knowledge that is unconscious and held within people's minds, and totally explicit which is codified and structured. They observe that most knowledge will reside somewhere between the extremes."

Kimble et al. (2000) build on Leonard and Sensiper's theory, introducing the concept of 'hard' and 'soft' knowledge as "being two parts of a duality" which means that a person would always manifest some of both simultaneously. According to them," hard knowledge is more formalized and structured" and "soft knowledge is more subtle; it is implicit and no easily articulated".

Abundant frameworks and resources are available to capture-codify-store 'hard' information, but such methods can be easily extrapolated and applied to 'soft knowledge'.

Kimble et al. (2000) proposed at least two forms of "soft knowledge": (1) "socially constructed knowledge" and (2) "internalized domain knowledge." For the former they recognize that work knowledge is really generated by a social activity, and that "the social culture environment always affects human condition." In regards to the latter, "soft knowledge" is linked to skills, expertise and proficiency, which means it is related to practice and experience.

Knowledge management and Communities of Practice

The CoPs constitute a means by which "hard knowledge" is used extensively and is readily available while at the same time "soft knowledge" management is directly addressed. In that regard, Kimble et al. (2000) comment:

> "We can discern three methods of soft knowledge construction in such communities. Firstly there is the gathering of domain knowledge ... Secondly, the construction of knowledge of work practices specific to the community ... Finally, there is the knowledge that the community constructs about the competencies of its members."

Indeed the association of CoPs and soft knowledge management is not always evident. However, the following table establishes a clear relationship among the previous contributions of Kimble at al., Wenger (1998), and the actions observed by the FIU/DRR project in the field.

Table 1. Knowledge Construction and Communities of Practice

Gathering of domain knowledge	Problem solving	Can we identify mutually beneficial overlap areas between land use management and risk management?
	Search for information	Where may we find examples of environmental management laws and/or regulations with risk management already incorporated?
Construction of knowledge of work practices	Search for experience	Has anyone prepared an urban development plan that explicitly includes natural hazards?
	Reutilization of assets	I worked on a risk transfer mechanism using a multi-hazard risk analysis in a small city. I can share that project's multivariable analysis with you, which you can then adapt for your own uses.
Knowledge that the community constructs about the competencies of its members	Coordination and synergy	Now that we are working on similar projects we can define standardized criteria for M&E. Later, we can compare outcomes and processes.
	Discussion of advances and accomplishments	We will use the Z/GIS software; is it compatible with the operational system we have in place and the type of information we are going to use?
	Documentation projects	Several attempts have been made to relocate this neighborhood, but records are insufficient to analyze what happened. Let us collect and analyze the previous information that is available and commit to documenting our current efforts.
	Visits	Can you come and see our DRR community program? We still face problems and would like to have an external view.
	Mapping of knowledge and gap identification	"Who knows what, and what are we missing? What other groups should we connect with?"

These activities, which in the past might have appeared to be spontaneous and isolated, begin form a logical framework, in which they become expressions of different stages of the CoPs involved in DRR work.

Those expressions when combined constitute what we call experience, which is then related to Wenger's (1998) concept of reification. This is an essential action of the CoPs –that is, giving experience actual and concrete form by creating artifacts. Both the artifact itself and the process involved in its creation are important. The CoP artifacts that USAID/OFDA and FIU have identified and registered thus far include articles, books, schemas, charts and diagrams.

The construction of knowledge associated to communities of practice occurs within a very dynamic learning environment where the members interact and the concept of legitimate peripheral participation becomes relevant.

Legitimate peripheral participation within DRR's Communities of Practice

Essential to understanding the concept of Legitimate Peripheral Participation (LPP) within CoPs is that a con-

tinual learning process exists among different types of members. The newcomer is a key member of a CoP. He or she is an integral part of the apprenticeship process, which occurs between newcomers and the old-timers. That is, the first ones are encouraged to participate in certain tasks that relate to the practice of the community, Lave and Wenger (2001). Eventually, the newcomer moves from peripheral to full participation. Importantly, "LPP is not just learning situated in practice but learning as an integral factor of practice". Legitimation refers to the relations of power and authority within the community. Peripherality is associated with the degree of participant engagement. Of course, participation is essential to CoP formation, and forging relationships builds trust and identity, which are crucial to fostering a community.

Kimble et al. (2000) based on Lave and Wenger mention,

> "A CoP does not necessarily imply co-presence socially visible boundaries or a well defined or identifiable group. However, it does imply participation in an activity where participants have a common understanding about what it is and what it means for their lives and community. The community and the degree of participation in it are inseparable from the practice."

Systematically, the sponsor—USAID/OFDA—and the CoP's members have identified and convened new members during the last three years, many started peripherally and then evolved into full participants.

Participation occurs through physical presence (face-to-face) or from geographic distance (geographically distributed or co-located) using different communications means.

Geographically distributed CoPs constitute a real challenge for participation, and face-to-face interaction is an essential component. Kimble et al. (2000) describe face-to-face meetings as a "re-charging of the relationship" which then contributes to the further evolution of the CoP. For the USAID/OFDA-promoted CoP, the geographical distribution of members was a challenge from the very beginning, but periodic face-to-face meetings held the CoP together and contributed to the genuine feeling of joint ownership of CoP artifacts.

Throughout Latin America, FIU is now promoting CoPs whose individual members are co-located, but they still maintain ties and communication with other CoPs. This is not accidental; these relationships have been intentionally promoted from the early stages through different regional activities including electronic correspondence, telephone conversations, interviews and meetings, among other means.

What types of interactions, how frequently they occurred, and how integral they were for the CoPs' mission are some of the questions that need to be measured and evaluated.

Measuring success

From 2002 to 2007, USAID/OFDA experienced the value of CoPs in the Americas region, exploring the roles they might play in DRR and disaster risk management and disaster risk. Identifying individuals integral to DRR and the regional DRR experts was crucial to the success of the CoPs project.

Starting a second phase directed by Florida International University through the Paul C. Bell Initiative and the DRR Program, a group of nine CoPs are receiving technical and financial support to implement DRR projects in eight countries in Central and South America.

The decision to promote and strengthen CoPs as strategy to mainstream DRR within socio-economic development and as a means for DRR capacity development, requires a careful monitoring and evaluation (M&E) methodology. Such a methodology must emphasize the processes and outcomes of the supported CoPs.

The following chapter section focuses on some of the M&E parameters that the FIU/DRR program has considered. They are based on the available literature and the accumulated experience working with CoPs. The topics covered include structural and operational characteristics of CoPs; leadership within the CoP; what success means for a CoP, and metrics & CoPs.

Structural and Operational Characteristics of CoPs

The FIU/DRR program has been influenced by the original literature—developed around the general concept of CoPs—and the emerging tendency to focus on virtual communities. The program addresses the so-called "co-located" CoPs (which share the same location) and the "distributed" CoPs (geographically disperse—virtual) in a comprehensive way, going into specificities only when it is necessary.

Structural Characteristics. Bourhis et al. (2005) reviewed the prior work done on CoPs, and they centered their attention on structural characteristics. In the following chart, they proposed a typology applicable to any CoP without regard to the current stage or community size, or the geographical location of its members.

Table 2. Structural Characteristics

Characteristics		Description
Demographics	Orientation	Overall objective: strategic implications or operational efficiency.
	Life span	Time period for which the CoP is created: on a temporary basis (for a specific purpose) or permanent (undefined time period).
	Age	Period of time the CoP has been active.
	Level of maturity	Phase or state reached by the CoP.
Organizational Context	Creation process	Orchestrated by management (top-down) or spontaneously created by interested members (bottom-up)
	Boundary crossing	Refers to the number of interconnections across work groups, organizational units and even organizations.
	Environment	Forces from the larger context that include the characteristics of the work environment, the culture and subcultures of the organization(s) involved, the management style(s), and the political context.
	Organizational efficiency	Resources available to the organization to allocate to the CoP in order to absorb the costs associated with the non-productive phases inherent to the learning curve.
	Institutional formalization	Degree to which a CoP has been integrated into the formal structure of an organization..
	Leadership	Governance structure; individuals can be appointed to specific roles or roles can be allowed to emerge through the interaction.
Membership	Size	Number of members in the CoP.
	Geographic distribution	Physical location of the participants.

Characteristics		Description
Membership (cont'd)	Member selection process	Type of membership: open (anyone can become a member) or closed (limited to selected members).
	Member enrollment	The way people enroll: on a voluntary or compulsory basis.
	Members' prior experience	Created from an existing network of individuals or a new group of people assembled for the first time.
	Membership stability	Membership can be relatively permanent or transitory in nature
	Member literacy	Members' general level of comfort and experience using technology
	Cultural diversity	Mix of nationalities, professions, and organizational cultures within a CoP.
	Relevant topics	While day-to-day topics may vary, CoPs are usually assigned a broad theme or objective that may be more or less relevant to its members' daily work.
Technological Environment	Degree of reliance on information and communication technologies (ICT)	While a CoP needs to be using ICT to be called "virtual," CoPs may use technology to varying degrees.
	ICT availability	Means available for interaction (in addition to phone, fax, teleconference and e-mail).

Chart adapted from Dubé et al. (2003) by Bourhis et al. (2005).

Although this is not an exhaustive list of characteristics, the four delineated above constitute the basis for the CoP categorization within the FIU/DRR program.

Operational Characteristics. Beyond the intention to name a group or team as a CoP—which may result due to institutional convenience or the genuine interest of its members—some operational characteristics should be identified to determine whether a CoP is active or not and to establish the area of Knowledge Management within which it is working.

The fact the CoP is not active does not mean it does not exist. The CoP can be in another stage—potential, coalescing, dispersed, or memorable, according to Wenger (1998).

Leadership within CoPs

Bourhis et al. (2005) have a particular understanding of leadership within a CoP. They acknowledge the phases and dynamics of the CoP and the consequent implications they might have in leadership, taking into consideration the leaders, followers, and activities or assignments.

As described, the typology proposed can be applied in both co-located and distributed CoPs. (See table 4, next page.)

Table 3. Knowledge Management and Observable Activities

Knowledge Management	Observable Activities
Gathering of domain knowledge	Problem solving Research for information
Construction of knowledge of work practices	Search for experience Reutilization of assets
Knowledge that the community constructs about the competencies of its members	Coordination and synergy Discussing of advances and accomplishments Documentation of projects Visits Mapping of knowledge and gap identification

This table is extracted from the one on page 23.

What does success mean for a CoP?

No consensus exists on what constitutes success for a CoP. However, Bourhis et al. (2005), APQC (2001) and Wenger et al. (2002) agree that success should be discussed in terms of impacts (results) and processes.

According to Bourhis et al. (2005), impact includes,:

- "... the meeting of the community's initial objectives (Cothrel & Williams 1999);
- the value provided to the organization (Lesser & Everest 2001); and
- the benefits to its members (Cothrel & Williams 1999; McDermott 1999; 2001)."

In regards to processes they mention:

- "... member satisfaction (Adams & Freeman 2000);
- level of activity, i.e. level of interactions among members (APQC 2001)."

If a senior manager were asked which of the five aspects described above was most relevant, the likely answer would be "the value provided to the organization." Indeed creating value is a key component of CoP success. In fact, Lesser and Everest (2001) link the creation of value and social capital with social capital and CoP:

> "the vehicle through which communities are able to influence organizational performance is the development and maintenance of social capital among community members. By developing connections among practitioners who may or may not be colocated, fostering relationships that build a sense of trust and mutual obligation, and creating a common language and context that can be shared by community members, communities of practice serve as generators for social capital. This social capital, in turn, creates an environment in which business performance is positively impacted."

Undoubtedly, to generate the value that Lesser and Everest describe, a careful balance between process and impact is required.

Measuring the impact of CoPs

Before any discussion of CoPs and their evaluation, the purpose of the assessment must be clarified. In the case of the FIU/DRR program, the intention is to determine whether the supported CoPs have been:

- effective at advancing DRR in a specific territory;
- useful as a vehicle for information exchange, knowledge generation and learning; and
- valuable for identifying new players with the ability to build development-DRR bridges.

Ideally the evaluation should be highly participatory. Involving CoP members in the evaluation process would be a true learning experience, one that would help them better understand their own CoP. Moreover, FIU/DRR's external support role would provide objectivity and ensure continuity in the process.

Taking into consideration the framework described in these first two chapters, five areas promoted/supported by the FIU/DRR program were proposed for evaluating the CoPs:

1. Evolution, based on the five phases or stages of a CoP according to Wenger (1998);
2. Characterization, based on the CoP typology proposed by Dubé et al. (2003);
3. DRR scope, based on the conceptualization of the first chapter of the book "Time to Pass the Baton";
4. Identification and codification of the results or artifacts generated;
5. Identification of key players, both individual and institutional.

The evaluation results are expected to feed back into the FIU/DRR program, the Latin American and Caribbean Center at FIU, USAID/OFDA and the international community involved in developing capacities for disaster risk management in general and disaster risk reduction in particular. These first two chapters have evolved from the first versions in 2008, when they were used for the design of the FIU/DRR program itself.

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Table 4. Leadership within CoPs

	Role	Description
Knowledge	Experts	Keepers of the community's knowledge domain or practice who serve as centers of specialized tacit knowledge for the community and its members.
Domain Roles	Core Team Members	Looked upon for guidance and leadership before or after a leader emerges or is selected; guidance includes developing the community's mission and purpose.
	Community Members	Take active ownership in the community by participating in its events and activities and driving the level of commitment and growth of the community.
Leadership Roles	Community Leaders	Provide the overall guidance and management needed to build and maintain the community, its relevance and strategic importance in the organization and level of visibility.
	Sponsors	Nurture and provide top-level recognition for the community while ensuring its exposure, support, and strategic importance in the organization.
	Facilitators	Network and connect community members by encouraging participation, facilitating and seeding discussions and keeping events and community activities engaging and vibrant.
	Content Coordinators	Serve as the ultimate source of explicit knowledge by searching, retrieving, transferring and responding to direct requests for the community's knowledge and content.
Knowledge Intermediary Roles	Journalist	Responsible for identifying, capturing, and editing relevant knowledge, best practices, new approaches and lessons learned into documents, presentations and reports.
	Mentors	Act as community elders, who take a personal stake in helping new members navigate the community, its norms and policies and their place in the organization.
Community Roles	Administrators or Event Coordinators	Coordinate, organize and plan community events and activities.
	Technologists	Oversee and maintain the community's collaborative echnology and help members navigate its terrain.

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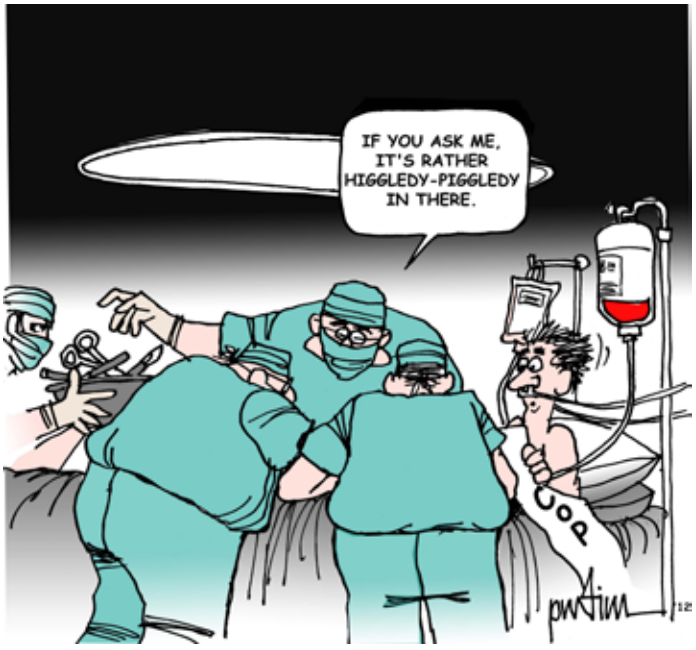


Chapter III

Disaster Risk Reduction in Latin America: Communities of Practice as a Mode of Approach from Universities

By Juan Pablo Sarmiento P., Silvia Graciela Quiroga, and Vincent T. Gawronski

Based on the objectives achieved by Communities of Practice since 2003, the Paul C. Bell Program at Florida International University (FIU), with support from the U.S. Agency for International Development's Office of U.S. Foreign Disaster Assistance (USAID/OFDA), issued a call for proposals in mid-2008.

Invitation to universities in Latin America and the Caribbean

The Community of Practice (CoP) concept does not entail one specific and universal definition. Indeed it encompasses multiple interpretations promoted by scholars, authors, institutions, and other groups interested in seeking innovative alternatives to tackle complex problems. Of course, universities are among these institutions.

As such, the call for proposals targeted universities that could develop projects that would advance disaster management and disaster risk reduction (DRR) under the CoP modality.

Consequently, particular action principles were identified that would modify traditional approaches to DRR in Latin America:

1. **Strengthening or starting university-level DRR programs in Latin America and the Caribbean:** Initiative to promote, strengthen and develop the universities' active role in the subject of DRR, focusing on undergraduate and postgraduate programs in the region.
2. **Involvement with CoPs:** These communities can be understood as an "Area for debate, reflection, exchange of experiences and information, as well as the proactive generation of future work directions, in which academics, experts, professionals, interns and apprentices interact."
3. **Generation of "major" and "minor" proposals**:

Award the best "major"[1] proposals with funding of up to $20,000 each, and award "minor"[2] proposals with funding of up to $5,000 each.

4. **Definition of the role of universities in CoPs:** Contribute to the subject of DRR with the benefit of interaction with groups of interest, as well as with the experience of dealing with local realities.
5. **Multi-sectoral and multi-institutional approach:** DRR transcends disciplines, institutions and sectors; this approach invites universities to interact in a more open and competitive space.
6. **Methodological proposal preparation:** Five pages of narrative, plus a page for the budget and another explaining the budget (a total of seven pages, in 12-point type, single-spaced), in addition to a description of: (a) the initiative and the link with an existing or initial community of practice, (b) expected scope, (c) administrative capacity of the responsible institution, and (d) brief information about the persons responsible for the project; and institutional funding of no less than 10% of the proposed budget (cash or in-kind contributions).
7. **Preparation of detailed timelines specifying intermediate and final products:** Periods in which specific tangible products will be generated.
8. **Institutional backing:** Attached confirmation of university backing and only one proposal per university.
9. **Criteria for approval:** Emphasis on the current or protential role of universities on the subject of DRR using the CoP approach (20 points); initiative demonstrates a multi-sectoral and multi-institutional character (10 points); minimum level for selection 80 percent (24 points).

The call for proposals announcement was widely distributed throughout Latin America and the Caribbean, using the FIU network of universities, the Bell Program graduate network, recipients of the USAID/OFDA/LAC Newsletter, and contacts of the USAID/OFDA-supported IRG-implemented Regional Disaster Assistance Program.

The systematization of experiences obtained since 2005 paralleled the implementation of accepted proposals. This involved working with materials produced from exploring points of convergence between risk management, land use management, environmental management, finance and public investment. For this analysis, the parameters advanced by education and social science experts in the 80s and 90s were employed, but later developments in the fields of engineering, systems and information technologies were also added.

Table 1. Proposals Accepted by the by the Bell Risk Management Program

Country	University
Argentina	Universidad Nacional de Río Cuarto (UNRC)
Colombia	Universidad Tecnológica de Pereira (UTP)
Colombia	Universidad del Valle (UV)
Chile	Universidad de Chile (UCh)
Costa Rica	Universidad de Costa Rica (UCR)
El Salvador	Universidad de El Salvador—San Miguel (UES)
Guatemala	Universidad San Carlos de Guatemala (USAC)
Peru	Universidad Católica de San Pablo—Arequipa (UCSP)
Peru	Universidad Nacional de Educación (UNE)
Venezuela	Instituto Metropolitano de Urbismo Taller Caracas
Venezuela	Instituto Metropolitano de Urbanismo Taller Caracas (IMUTC) and Centro de Estudios Integrales del Ambiente (CENAMB), of the Universidad Central de Venezuela (UCV)

Accepted proposals

Table 1 contains the ten proposals that met the requirements and were eventually accepted.

Two of the ten accepted proposals, the Universidad del Valle (Colombia) and the Universidad Nacional de Río Cuarto (Argentina), were locally financed. Even though FIU did not provide financing or support, reference to the Río Cuarto project results have been included in this chapter due to the project's concordance with the principles outlined in the call for proposals.

Of the remaining eight proposals, four were considered to be "major" (UTP, USAC, UNE and IMUTC/CENAMB) and four "minor" (UCh, UCR, UES and UCSP).

To ensure transparency during the process, a decision was made to regroup the proposals into two categories, one comprised of those universities without prior experience working with CoPs (Table 2) and the other configured by the two academic centers that were already participating in CoPs promoted by FIU (Table 3). The former were financed by the FIU Bell Risk Management Program and the latter by the FIU/DRR program; both of which are sponsored by USAID/OFDA.

Administrative mechanisms

Aside from the differences in the origin of the funding, the proposals were subjected to similar administrative processes. The eight academic institutions signed subcontracts with FIU, using the proposal submissions as a reference. Without exception, the time for establishing the sub-contracts exceeded the 30 days initially estimated. The

1 "Major" proposals have a complete structure and development.
2 "Minor" or preliminary initiatives require support for development ("capacity-building").

Table 2. Proposals Financed by the Bell Risk Management Program

Bell Program			
Country	**University**	**Project**	**Principal Researcher**
Costa Rica	Universidad de Costa Rica School of Geology / Master in Disaster Risk Management and Emergency Response	Preventing community risk	Elena Badilla Coto
Colombia	Universidad Tecnológica de Pereira	Proposal to strengthen the UTP disaster prevention and response management specialization program	Jesus Herney Moreno
El Salvador	Universidad de El Salvador, Eastern Multi-disciplinary School of San Miguel	Volcanic risk management capacity building for trainers of elementary school educators and high school teachers in training at the Universidad de El Salvador	Gloria Larios
Guatemala	Universidad de San Carlos School of Architecture / Master in Risk Reduction Management	Strengthen post-graduate courses in risk management at the community of practice level	Mario Ceballos
Peru	Universidad Católica de San Pablo—Arequipa School of Professional Industrial Engineering	Center for investigation for the promotion of risk management in Arequipa	Ana L. Vizcardo Munoz
Peru	Universidad Nacional de Educación—Chosica, UNE Committee for Risk Management Education	University risk management and knowledge transfer to the local community	Luis Rueda

Table 3. Proposals Financed by the Disaster Risk Reduction Program

DRR Program			
Country	University	Project	Principal Researcher
Chile	Universidad de Chile School of Architecture and Urban Planning	Population displacement due to Chaité Volcano (CHile): Relocation alternatives propsal	Jorge Ortiz Carmen Paz Castro
Venezuela	Metropolitcan Urban Planning Institute Caracas Workshop (IMUTC) and Center for Integral Environmental Studies (CENAMB) of the Universidad Central de Venezuela (UCV)	Integral training in environmental risk reduction, and land use management (professional and community capacity building). V.I.D.E.O. Strategy[3]	Jesús Delgado

first three contracts were signed at the end of March 2009, after a six-month delay, and the last was signed in October 2009, one year after the announcement. These delays stemmed from the chosen sub-contracting mechanism and the necessity to reconcile the requirements of the beneficiary universities in Latin America with the regulations of the U.S. federal government (since USAID was sponsoring this initiative), the Florida state government (since FIU is a public state university), and the internal norms of FIU.

The sub-contracts specified in great detail the scope, timeframe, and resources involved, and all of the projects included a timeline and a description of the products.

Even though the project financing policy is based on cost reimbursement, a decision was made to provide a sufficient cash advance to initiate the work. The "major" projects received an advance of 20-25% of the total amount while the "minor" projects were provided with 100% of the budget. For each project, a Principal Researcher and an Administrator or Legal Representative of the academic institution was identified and charged with the responsibility of submitting periodic technical and financial reports, a final report of the results obtained, and the administrative support required to close out the project.

Follow-up

The FIU/DRR program maintained close communication with those responsible for the projects via e-mail and telephone. Each of the eight universities was visited on at least one occasion, in order to observe project development and interact with key players.

Field evaluations were conducted with the support of various experts. Dialogue with the technical contacts, visits to the local communities, and direct relations with the universities permitted a detailed portrayal of the different CoPs and generated a comparative performance evaluation.

Evaluation

Through organized visits to the various accepted universities, evaluations of the intervening CoPs[3] were conducted.

A set of organizing guidelines were developed to provide coherence to the evaluation and the following methodology was used:

- In the first place, the CoPs were characterized from a structural and operative point of view;
- In relation to the previous characteristics, the indicators for measuring performance, presented in Chapter 2, were applied.

Although FIU had been conducting continuous follow-up evaluations of each CoP, the field evaluations permitted direct contact with each of the different actors and facilitated a better understanding of each experience, which then provided a much broader perspective. Four projects were evaluated by an external observer, Dr. Vincent Gawronski, professor at Birmingham-Southern College, and two projects were evaluated by Specialist Silvia Quiroga, an expert from the Universidad Nacional de Cuyo in Argentina. Specialist Quiroga is familiar with the FIU and USAID/OFDA CoP initiative but was not directly involved with the CoP projects he evaluated. The last two projects were evaluated by Dr. Juan Pablo Sarmiento, Co-Director of the FIU/DRR program and Director of the FIU/Bell program.

The most significant DRR activities evaluated in each of the CoPs are detailed below, and the criteria for analyzing CoP structural characteristics are: (1) the orientation and the areas of action within DRR and (2) the moment of action.

Orientation refers to the nature of the project specific objectives pursued from the outset of CoP formation; while there are four generally recognized areas of action within Disaster Risk Management[4]: (1) identification of risk (analysis of hazards, vulnerabilities, and risk; construction of scenarios; cost-benefit analyses); (2) risk reduction (risk prevention, mitigation, transfer and financing); (3) disaster management (early warning, preparation, and response); and (4) recovery (rehabilitation and reconstruction).

3 The evaluations of the experiences employed as a base the conceptual and methodological aspects developed in Chapters 1 and 2 of this book; as well as other previous documents produced by the group of evaluators: Sarmiento, Juan Pablo. 2009. *Communities of Practice and Disaster Risk Reduction*. FIU/LACC, Miami. Unpublished document. Quiroga, Silvia Graciela. 2009. USAID/OFDA/FIU: *Memorias sobre la Reunión Internacional sobre Reducción de Riesgo a Desastres, Comunidad de Práctica*. Lima, Peru, April 22 to 24. Unpublished document.

4 Sarmiento 2007

Table 4. Orientation and Area of Action with Risk Management

University	Community of practice CoP denomination	Orientation Objective, strategic implications, operational efficiency	Area of action within risk management
Universidad de Costa Rica School of Geology / Master in Disaster Risk Management and Emergency Response	UCR CoP	Train communities in practical knowledge of geological aspects related to risk and in the subject of water resource management in rural communities of Cartago, San José and Alajuela.	Risk identification: Human resources training and work with local communities.
Universidad Tecnológica de Pereira, Colombia School of Health Sciences and Environmental Sciences	UTP CoP	Contribute to the formation of human resources in Risk Management at the postgraduate level, using ten municipalities of the Risaralda Department as the area of study. Activate the functioning of the Risaralda Department Thematic Committee.	Risk identification and reduction: Human resources formation at the postgraduate level, technical preparation, and work in communities.
Universidad de El Salvador Eastern Multi-disciplinary School of San Miguel	UES CoP	Train the trainers of elementary school educators and students of the Eastern Multi-disciplinary School on the management of volcanic risk. Work with local communities on risk scenarios.	Risk identification and disaster management: Preventive work with local communities and preparation for response to volcanic risks. Reconstruction: Some of the selected communities had suffered prior damage from volcanic activity.
Universidad de San Carlos, Guatemala School of Architecture / Master in Risk Reduction Management	USAC CoP	Contribute to the formation of human resources at the postgraduate level, through the USAC Master in Risk Reduction Management. Work in ten local communities through graduate students' thesis project development.	Risk identification and reduction: Formation of human resources at the postgraduate level and work in local communities.
Universidad Católica de San Pablo – Arequipa, Peru School of Professional Industrial Engineering	UCSP CoP	Create the Center for Investigation for the Promotion of Risk Management in Arequipa, in the Universidad Católica de San Pablo: An intermediate technological institution dedicated to the development of projects to identify, reduce, prevent and manage risks.	Risk identification and reduction: Institutional reform. Formation of human resources and investigation.

Universidad Nacional de Educación – Chosica, Peru UNE Committee for Risk Management Education	UNE CoP	Conduct an awareness campaign to generate a culture of risk prevention in the UNE environment. Extend these actions into the local communities related to the university, though the student body.	Risk identification and reduction and disaster management: Formation of human resources and work in local communities.
Universidad de Chile School of Architecture and Urban Planning	UCh CoP	Intervene in the reconstruction process in the Chaitén-affected zone, in the housing, productive, territorial, and natural risk sectors.	Recovery, and risk identification and reduction: Take action for post-disaster recovery and planning.
Metropolitan Urban Planning Institute Caracas Workshop (IMUTC) and Center for Integral Environmental Studies (CENAMB) of the Universidad Central de Venezuela (UCV)	CEN CoP	Contribute to Disaster Risk Reduction in the Caracas Metropolitan District, specifically in Quebrada Agua de Maíz, through the application of the Safe School Guiding Plan and the use of the VIDEO[1] strategy. Development of processes for human resource formation, research, public administration, and work in communities.	Risk identification and reduction: Formation of human resources, land use management, urban planning and risk management, research and work in local communities.

Moment of action refers to the CoPs' disaster-related work interval, which is an analysis of whether the actions were developed in correspondence with the period that preceded the disaster (before), the moment it occurred (during), or following it (after). These parameters, at an introductory level, can be observed in Table 4; while Table 5 places particular emphasis on the type and moment of action within risk management.

1 V.I.D.E.O. stands for the Spanish acronym: Vinculación de la Investigación, la Docencia, la Extensión y las Organizaciones [linkage between research, teaching, extension, and the organizations].

Table 5. Orientation and Moment of Action

Moment of Action	Orientation	Community of Practice							
		UCR CoP	**UTP CoP**	**UES CoP**	**USAC CoP**	**UCSP CoP**	**UNE CoP**	**UCh CoP**	**CEN CoP**
Before	Postgraduate level formation		X		X				X
	Community training	X		X			X		
	Work with communities	X	X	X	X		X		X
	Institutional organization					X	X		
	Investigation		X			X			X
	Public administration								X
	Private administration		X						
	Technical preparation		X			X			
During	Within the framework of the FIU Project, no work has been done with CoPs whose activities have developed during the moment of a disaster.								
After	Planning							X	
	Recovery							X	
	Public administration							X	

After analyzing the orientation of the CoPs, the area of action within risk management, and the moment of action in relation to disasters, it becomes interesting to explore, within the organizational context, another structural characteristic—that is, the process of creation or emergence of the CoP. Table 6 highlights different circumstances that might contribute to the formation of these horizontal organizations, along with the various DRR activities associated with the university's work.

Table 6. Organizational Context and Creation Process

CoP	Creation Process / Emergence
UCR CoP, Costa Rica	The emergence of the CoP is directly related to the formalization of the DRR Project sponsored by FIU, even though important precedents in DRR topics existed in the university postgraduate program practices through the Master in Disaster Risk Management and Emergency Management from the School of Geology.
UTP CoP, Colombia	The CoP emerges within a normative institutional framework in the UTP environment, with the purpose of responding to the DRR Project sponsored by FIU, reactivating the existing Disaster Prevention and Response Management Specialization, and several years later became the second group to complete the graduate program. This reactivation implied a change in the scope of the Specialization as well as the field work modality.

UES CoP, El Salvador	The emergence of the CoP is directly related to the formalization of the DRR Project sponsored by FIU, taking into account that no work on this subject had taken place previously.
USAC CoP, Guatemala	The emergence of the CoP is directly related to the formalization of the DRR Project sponsored by FIU, taking into account the existence of a Master in Risk Reduction Management offered by the School of Architecture. The initiative explored a short training program, without precedent, that focused on the generation of local risk management projects through the distance learning modality, which allowed it to reach a remote region of the country.
UCSP CoP Arequipa, Peru	The emergence of the CoP is directly related to the formalization of the DRR Project sponsored by FIU, taking into account that no work on this subject had taken place previously.
UNE CoP, Chosica, Peru	The Universidad Nacional de Educación had been developing a project with USAID/OFDA in the area of safety of the facilities as well as institutional-level curriculum adaptation to include the subject of Risk Management. Nevertheless, the formation of the CoP occurs when the FIU work project is formalized, as the group consolidates through its work first on an internal level within the university and then projecting outward to the rest of the community.
UCh CoP Chile	During the past ten years, a combination of spontaneous and institutional processes have facilitated the formation of the Universidad de Chile CoP. In the first instance, different university actors gathered to resolve problems common in the Latin American reality pertaining to strategic corridors. In a second phase, with FIU support, facing very concrete institutional requirements of the Universidad de Chile, the functioning of what could be identified as a second CoP was specifically oriented toward work related to the population of El Chaitén; which constituted a completely different experience, given its objective and lifespan.
CEN CoP, Venezuela	Though work on the subject of DRR was underway, the CoP was formed when the Diplomatura de Perfeccionamiento Profesional (DPP) degree was designed, within the framework of an institutional program that linked the CENAMB with the IMUTC in the context of the FIU Program.

After visualizing the creation process of the CoPs, it is useful to analyze another structural characteristic: lifespan. The temporary nature of these horizontal organizations is directly related to their orientation and the circumstances under which they emerge.

Simultaneously, from a more functional point of view, the CoPs are dynamic and experience several phases that, according to Wenger, can be identified and characterized according to the internal processes being developed, independent of age. Table 7 demonstrates how these aspects are correlated.

Table 7. Lifespan, level of maturity and age

CoP	Lifespan	Phase	Age in 2009
UCR CoP Costa Rica	A history of work on the master's degree (Table 6) and with communities out side San José exists. The CoP emerges within the framework of the work project with FIU. Possibilities exist for resuming activities.	Active	One year functioning as a CoP.

UTP CoP Colombia	Activities related to the specialization (Table 6) began nine years ago, with periods of inactivity in this subject.	Coalition	One year functioning as a CoP.
UES CoP El Salvador	A work team is formed that moves to the field to work with the community on extension tasks. The work is inconclusive; there was a lack of field trips due to budget problems.	In case of having formed as a CoP, currently considered in a dispersed stage.	One year functioning as a CoP.
USAC CoP Guatemala	Emergence as a CoP with the aim of completing the USAC course; intentions to continue working exist.	Dispersed	One year functioning as a CoP.
UCSP CoP Arequipa, Peru	Even though the objective of the CoP work project was to create the Center for Investigation for the Promotion of Risk Management at the institutional level, this product seeks to continue the DRR actions in the UCSP with the participation of students, authorities and work within the communities.	Active to dispersed	One year functioning as a CoP.
UNE CoP Chosica, Peru	The internal work history at the UNE began ten years ago. Currently, the developed project provides protocols, roles, and action plans for different times and circumstances.	Continuously active	One year functioning as a CoP.
UCh CoP Chile	Began spontaneously ten years ago, with the treatment of subjects related to risk management in commercial corridors. FIU agreement signed in 2008.	Active with latent periods	Ten years functioning as a CoP.
CEN CoP Venezuela	Activities related to risk management in the UCV environment began ten years ago. The IMUTC was integrated in 2008, coinciding with the FIU work agreement.	Active coalition	Ten years functioning as a CoP.

Table 8 offers a clearer view of the phases and the age of the CoPs, as well as the absence of any particular relationship between these two variables.

Table 8. Correlation between phases and age

Age	**Phases**	**Communities of Practice**							
		UCR	**UTP**	**UES**	**USAC**	**UCSP**	**UNE**	**UCh**	**CEN**
Up to 1 year	Coalition		X						
	Active						X		
	Dispersed				X				
	Memorable	X		X		X			

From 1 to 5 years	Coalition								
	Active								
	Dispersed								
	Memorable								
More than 5 years	Coalition		X						
	Active							X	X
	Dispersed								
	Memorable								

Continuing with the structural characteristics, the degree of interaction was also analyzed—that is, the border crossings between the CoP members and the relations of the CoP with other groups, depending on the evolution and orientation phases of each of them. This important aspect is shown in Table 9 and is complemented with the understanding of the context or circumstance in which the CoP has been functioning, taking into account the possibility that adverse external conditions can affect CoP function or put its continuity at risk.

Table 9. Interaction, border crossings, and context or external circumstances

CoP	Interaction, Border crossings	Context or external circumstances
UCR CoP Costa Rica	CoP is characterized by a multi-disciplinary work team, with emphasis on Natural Sciences, but with inter-sectoral and inter-institutional performance.	The communities around San Isidro de Alajuela experienced an earthquake in 2009 that prompted the rural communities to work on the subject of risk, especially seismic, volcanic, and landslide hazards.
UTP CoP Colombia	The CoP has an emphasis on social sciences even as it maintains a multi-disciplinary, inter-sectoral, and inter-institutional vision.	The country's general situation related to violence and guerrillas, tends to interfere frequently in the university functioning (even more so because it is public) as well as the private lives of citizens.
UES CoP El Salvador	The CoP is characterized by a multi-disciplinary work team, especially related to the sciences of education. It has an inter-institutional vision.	The school (Table 4) is located in the town of San Miguel, far from the main campus. Despite the interest in disaster mitigation and response themes, in addition to having advanced emergency plans for the university and in nearby communities, existing administrative and financial problems have seriously hampered these advances.
USAC CoP Guatemala	The CoP is characterized by a multi-disciplinary work team, with emphasis on the social sciences, with inter-sectoral and inter-institutional performance.	The USAC has been working in the area of DRR through the Master of Risk Reduction Management. However, its actions are de-centralized through Centro Universitario del Norte (CUNOR) and currently promote courses provided in different zones of the country, resulting in an outreach to local communities in their own environment.
UCSP CoP Arequipa, Peru	The CoP begins with its own vision of the exact sciences, but acts in a multi-disciplinary, inter-sectoral, and inter-institutional environment.	The UCSP is working to generate projects targeting the identification, reduction, prevention, and management of risks in the communities of the Arequipa Region.

UNE CoP Chosica, Peru	The CoP originates in the sciences of education, and performs in a multi-disciplinary, inter-sectoral, and inter-institutional environment.	Since 2004, in collaboration with USAID/OFDA, work has focused on raising awareness of the subject of risk and disasters among the educational community.
UCh CoP Chile	The CoP begins in the area of social sciences, with multi-disciplinary participation; and performs at an inter-sectoral and inter-institutional level.	The Universidad de Chile CoP has a track record of working on the subject for several years, but circumstances such as the disaster at Chaitén in 2008 and the earthquake of 2010 effectively created concrete opportunities for DRR work.
CEN CoP Venezuela	The CoP is characterized by a multi-disciplinary work team, with special emphasis on the social sciences. Clear inter-sectoral and inter-institutional approach.	The country's difficult political conditions manifest themselves with particular intensity in the metropolitan area of Caracas, creating an instability that, to one degree or another, affects all levels of society and its institutions.

Focusing now on the operative characteristics of the CoPs, Table 10 analyzes: (1) leadership, identifying who has guided or coordinated the direction of the principle actions developed; (2) formalization of the functioning of the CoP, in reference to the predominant personal or institutional actions; and (3) the financing sources obtained, whether internal to the institutions involved or external, such as the funds granted to the universities by FIU.

Table 10. Operative Aspects: Leadership, Formalization, and Financing

CoP	Leadership	Formalization of the functioning		Financing	
		Personal	Institutional	Internal	External
UCR CoP Costa Rica	UCR Master's degree in Risk Management and Emergency Response Rural community leaders	X	X		X
UTP CoP Colombia	UTP School of Health Sciences School of Environmental Sciences	X	X	X	X
UES CoP El Salvador	UES Multi-disciplinary School of the East	X			X
USAC CoP Guatemala	USAC Postgraduate School of Architecture SEGEPLAN: local coordinator	X	X		X

UCSP CoP Arequipa, Peru	UCSP School of Professional Industrial Engineering	X	X		X
UNE CoP Chosica, Peru	UNE La Cantuta	X	X	X	X
UCh CoP Chile	UCh Risk Reduction Program Assistant Secretary of Regional Development. Ministry of the Interior	X	X	X	X
CEN CoP Venezuela	CENAMB IMUTC	X	X	X	X

It is evident in this table that the projects of the CoPs analyzed have a changing leadership. In fact, the coordinating institutions are not always the ones taking leadership in the direct work at the local levels. In those where only one institution appears, it can be observed that different actors alternate leadership within it. It is interesting to see how, in this approach to a CoP, institutions and individuals horizontally share the need to advance in the analysis of problems, proposed solutions, or solution implementation.

In the formalization, due to the very nature of the CoPs, personal character and members' affinity for institutional commitments or ties prevail. The only CoP that did not attain a minimum level of formalization was the one that had the most difficulty achieving its objectives. It is important to establish formal and institutional relationships, as well as informal relationships, where individuals maintain ties through the exchange of knowledge and experiences, generating new learning from and toward the practice.

Finally, regarding the sources of financing, a relationship can be observed between the permanence in time and the diversity of the sources of financing: internal and external. The dependence on external resources affected in most of the cases, the sustainability of the proposed programs.

CoP membership

Another important aspect in the operative dimension of the CoPs is membership, in other words, the mechanisms by which certain people become part of these horizontal organizations throughout their evolution. Clarifying who are the members of the CoPs, their roles, their permanence in time, the level of cohesion among members, the differentiation of role types, are all elements that allow greater understanding of the internal dynamics of these groups in relation to the objectives sought.

The experience of each CoP in particular offers a universe of details, personal, chronological, cultural, and institutional aspects that demand a complex analysis that, unfortunately, transcends the goal of this documentation work. Nevertheless, in order to conduct a comparison among the cases studied, Table 11 shows an analysis of CoP membership, taking into consideration characteristics such as size, which refers to the number of stable members; geographic distribution, which refers to the group's area of influence; mechanism for member selection; professional profile and technological environment, which refers to technology use and availability.

Table 11. CoP Membership

CoP	CoP size	Geographic distribution	Member selection	Profile	Technological environment
UCR CoP Costa Rica	Four UCR professors and four representatives of institutions and the community of San Isi	Rural communities located in San Isidro de Alajuela.	University professors and students participating in the project. Members of the rural communities.	Professionals specialists students, community leaders, community members in general, women, and children.	Use of Internet, e-mail, PCs, and LCD projectors for community trainings.

UTP CoP Colombia	14 people from different organizations.	The CoP is confined to the Department of Risaralda and its 14 municipalities.	Member selection is directly related to their capacity to advance the proposed project objectives and actions.	The principal profiles are: professors, students, and professionals.	Use of information technologies (Internet, e-mail, PCs, and LCD projectors, GIS) available through UTP and other institutions participating in the project.
UES CoP El Salvador	9 professors and 3 graduate students of UES. School principals.	Students of the FMO Eastern Multidisciplinary School in San Miguel. Rural communities around UES. Vulnerable populations associated with Chaparrastique Volcano.	Members are the FMO university community involved in training: teachers, students, and trainers of elementary school and high school teachers.	Volcanologists, geologists, and risk management experts. Academics Students Teacher trainers.	Use of computers and LCD projectors available in the UES environment.
USAC CoP Guatemala	Composed of 30 participants assisted by USAC personnel.	Alta Verapaz Department	Member selection was left up to the Regional Chief of SEGEPLAN in Alta Verapaz, who used prior knowledge and experience to convene the participants in the initiative.	Teachers Professionals Technicians Government officials Community leaders.	Use of Internet, e-mail, PCs, LCD projectors, and GIS available in Alta Verapaz.
UCSP CoP Arequipa, Peru	3 university professors, 5 members of technical institutions, and 60 undergraduate students of the UCSP Professional Industrial Engineering School.	Arequipa engineering students Local, regional, and national government leaders.	The members of the CoP are connected to the Professional Industrial Engineering School, and participate in the project to create and operate the Center for Investigation for the Promotion of Risk Management.	Academics Investigators Students Members of the community Community leaders Experts from various disciplines.	Use of Internet, e-mail, PCs, LCD projectors, and GIS available in the UCSP environment.

UNE CoP Chosica, Peru	4 members of a central group that was later extended to members of the UNE educational community: directors, administrative staff, teachers, students.	Community members from within and nearby the UNE, La Cantuta.	The members of the CoP are UNE staff members, students, and surrounding community.	Teachers Experts Students Community leaders Community members in general.	Use of Internet, e-mail, PCs, and LCD projectors available in the UNE.
UCh CoP Chile	4 members of the central group, extended to 10 during the Chaitén project. A reduced number of members thanks to a careful selection process.	The current CoP is located in Santiago, Puerto Montt, and different parts of Chile.	Member selection in this CoP has existed according to potential contributions with topics related to DRR.	Teachers Investigators Specialists Technicians Government officials.	Use of Internet, e-mail, GIS technology, and remote sensors.
CEN CoP Venezuela	24 people representing different organizations.	Member origins are confined to the Caracas Metropolitan District.	Member selection directly related to the objectives that have been proposed, and with the capacity to develop the actions planned in each of the modules.	Inter-disciplinary team of teachers, professionals, independents, land use planners, authorities, citizens.	Members are experts in ICT. Internet, e-mail, and GIS technology available through participating institutions.

Knowledge management in the CoPs

A CoP is comprised of people who work to generate new knowledge and apply it; and the CoP is a mechanism for systematizing these experiences. This is no minor function; indeed it is associated with the very essence of these horizontal organizations and it is the intent of the universities' DRR work.

The following analysis is presented next: the area of knowledge generation, whether scientific, arising from university channels or investigation; empirical, as a product of experience and solving daily problems; or knowledge arising from the CoP environment itself, which, without losing scientific rigor, tends to combine the former two types of knowledge, resulting in a wider vision of reality upon which reflections are made.

Table 12 illustrates the types of knowledge, their origins, and the institutions and actors involved in the process of knowledge generation.

Table 12. Knowledge Generation and Related Actors

CoP	Types of knowledge generation that converge in the CoP institutions and actors involved		
	Scientific or formal	*Empirical*	*Community of practice*
UCR CoP Costa Rica	UCR School of Geology Graduate Degree in Central American Geology	Rural communities of San Isidro de Alajuela, affected by an earthquake in 2009.	Teachers, specialists, students. Community leaders
UTP CoP Colombia	UTP Other universities and scientific organizations Scientists, experts University professors	La Virginia educational community La Virginia sand workers Other public and private institutions Local actors Community leaders NGOs and special interest groups	CoP UTP Scientific institutions Professionals, technicians Support teams
UES CoP El Salvador	UES FMO	FMO educational community	UES FMO Community leaders
CoP USAC Guatemala	USAC Master's Degree in Risk Reduction Management	Alta Verapaz community	USAC SEGEPLAN Technicians Government officials Community leaders
UCSP CoP Arequipa, Peru	School of Professional Industrial Engineering Other professional schools. Creation of the Center for Investigation for the Promotion of Risk Management.	Arequipa educational community and the general population	Teachers Students Educational community in general

UNE CoP Chosica, Peru	UNE Academics Experts	Student body School community Community surrounding the UNE. Local communities on a national level.	UNE Education Committee for Risk Management
UCh CoP Chile	UCH Geography Department	Chaitén community	UCH Universidad Católica ONEMI Ministry of the Interior Various institutions of El Chaitén
CEN CoP Venezuela	UCV CENAMB Other universities and scientific organizations Experts University professors	Communities of Quebrada Agua de Maíz NGO Provida Other public and private institutions. Local actors Community leaders NGOs Special interest groups. Varied institutions.	Caracas CoP UCV IMUTC CENAMB DPP Other scientific institutions Professionals, technicians Support teams.

Results obtained by the CoPs in relation to Disaster Risk Reduction

The results or products of the processes initiated by the CoPs (Table 13) have been organized in the following categories: investigation, generally developed in the university settings; teaching, at the undergraduate and especially postgraduate levels; university extension, which has generated direct contact between universities and local communities; and finally, management, developed at the public level (government institutions), private level, and among civil society (especially through businesses and NGOs) that without a doubt has opened space to numerous and varied actors.

Table 13: Results obtained according to work area

CoP	Investigation	Teaching	Extension, work with communities	Management Public, private, and civil society
UCR CoP Costa Rica	Investigation projects associated with the School of Geology, while integrating processes of social science investigation.	UCR: Training for rural communities in practical knowledge about natural and socio-natural hazards; as well as about water resource management.	Creation of risk maps on behalf of the rural communities, with assistance from UCR professors and students. Study field trips and community educational workshops.	No information available.

CoP	Investigation	Teaching	Extension, work with communities	Management Public, private, and civil society
UTP CoP Colombia	Various publications produced at UTP, CARDER3; COLCIENCIAS4, beginning in the year 2000, which constitute a valuable base for the work of the UTP CoP. UTP, Group for Environmental Territorial Management. Project: "Application of public policies in the processes of relocating populations of Ciudadela Tokio, Pereira.	UTP undergraduate level: "Environmental Administration," UTP. UTP Graduate level: "Specialization in Disaster Management, Prevention, and Response." "Specialization in Environmental Management" "Specialization in Local Environmental Management". UTP, Group for Environmental Territorial Management Research. Seminars: "Incorporating Risk Management into Planning," "Incorporating Integral Risk Management into Land Development Plans in Risaralda Department" and "Risk Management and socialization of thesis projects."	UTP. Lines of work to develop: "Environmental problems and conflict associated with Risk Management" "Incorporating risk into territorial development planning" "Communication and education in Risk Management."	Public management: Risaralda Departmental Thematic Committee: development of studies and proposals for Risk Reduction for the municipalities of Risaralda. Private management: Colombian Risk, Emergency, and Disaster Management Professionals Association.
UES CoP El Salvador	No information available.	Training the educational community through workshops, field work.	Production of vulnerability maps. Volcanic hazard simulation exercises. Creation of preparedness, emergency, and evacuation plans.	Public management: Formation of a local Emergency Committee.

CoP	Investigation	Teaching	Extension, work with communities	Management Public, private, and civil society
USAC CoP Guatemala	Student production of graduate theses.	Graduate-level course involving 48 hours of direct teaching and 96 hours of indirect teaching on subjects related to DRR, environmental degradation, and assessment of vulnerability and risk.	Workshops held on Risk Management and natural resource use in Alta Verapaz Department. Community workshops for the preparation of municipal and hazard maps.	No information available.
UCS CoP Arequipa, Peru	School of Professional Industrial Engineering. Creation of the Center for Risk Management Research in Arequipa. Production of a publication on student projects with the assistance of teachers and researchers.	No information available.	Production of student projects, involving the study of hazards and risks, which are transferred to the local government levels of participating communities.	No information available.
UNE CoP Chosica, Peru	Systematization of information about variables in the projects being executed: geographic characteristics of the region, beneficiary populations, community characteristics, hazards, scope of the project work, disaster risk reduction, quantification of the results, risk mapping, simulations, public health issues, development of personal leadership, multiplier effects, changes and solutions to identified problems.	Development of different courses that feature the subject of DRR, for the UNE hard and social sciences curricula. Numerous USAID/ OFDA courses related to school safety, risk management, damage assessment and needs analysis, and pre-hospital care provided. Office of Education for Disaster Risk Management implementation of training, research, and social outreach programs.	Inspections of the university campus buildings; survey of the damages caused by the 2007 earthquake. Production of UNE hazard maps and risk management plans. Student workshops held; simulation and evacuation exercises conducted that included UNE neighboring communities.	Development of standards and security codes, evacuation routes, safe areas, and emergency, disaster response, and fire management plans, among others. Systematization of lessons learned from the experience in order to transfer them to other areas of public and private administration. Development of numerous DRR projects in different segments of the communities.

Uch CoP Chile	ONEMI Practice Project: Study of the territorial – environmental impact caused by the eruption of Chaitén Volcano. Master's thesis projects in geography. Final elective graduate projects.	Universidad de Chile School of Geology. Elective regional analysis program. Universidad de Santiago de Chile: Workshop on Risks and Geography Application: territorial evaluation of vulnerability.	Work with the community of El Chaitén.	No information available.
CEN CoP Venezuela	Safe School Master Plan: Determination of the Analyzed Vulnerability Unit. Information compilation and processing.	Undergraduate level: Professorship Essay on Environmental Hazards and Urban Vulnerability. Graduate level: Course on Environmental Management, Land Use Management and Socio-natural Risk Reduction. Workshop on Urban Planning. Critical Analysis of Urban Vulnerability. Land Use Planning in Areas of Risk. Establishment of proposals for Sustainable Urban Development.	Vulnerability appraisal of a school building. Vulnerability appraisal of ordinary and essential buildings. Identification of hazards, opportunities, and local community resources for Risk Management. Vulnerability appraisal of Urban Structure and Infrastructure. Identification of hazards, opportunities, and institutional resources for Risk Management.	IMUTC: bases for land use planning in Quebrada Seca and other similar zones in the Caracas Metropolitan District.

As mentioned in the beginning of this chapter, information about the project carried out by the Universidad Nacional de Río Cuarto in Argentina is included on the next page. Even though this project was not directly supported by FIU, it did share the fundamental experience of a CoP.

Some reflections

The follow-up interviews and overall evaluation of the CoPs that have been working on DRR through the FIU-supported Disaster Risk Reduction Program have generated the findings presented throughout this Chapter. These findings stem from the particularities of each work group and are associated with each one's internal and external circumstances.

The information about the characteristics, structures, processes, and results of the DRR CoPs enriches the original, existing CoP focus. Indeed the exploration of new areas of reflection though inductive analysis confirms the utility of this approach. New experiences, when managed in an intentional and direct way from the outset, should increase the returns of this modality, strengthening potential benefits and mitigating foreseen and unforeseen negative circumstances.

Institution
Universidad Nacional de Río Cuarto - (Argentina)

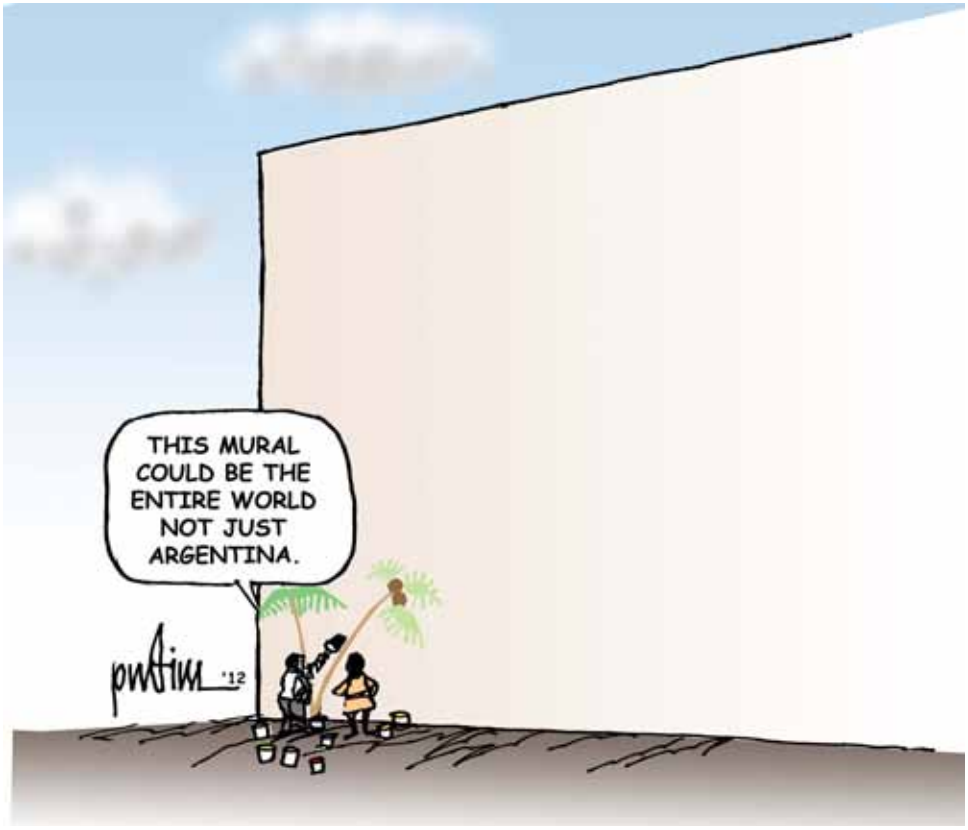
Project
"Fishermen prosper in troubled waters. A proposal to learn while playing," was carried out in the Municipality of La Carlota (Córdoba). Municipal authorities gathered all the neighborhood leaders of the area who in turn gathered 53 children ages 6 to 12 years.

Duration
15 months.

Objectives
- Develop potential actions in reaction to danger, acquire and strengthen children's identity and autonomy to act in the face of flooding risks.
- Recognize risk through play and other creative activities involving age-appropriate skills and abilities.
- Encourage children's capacity for observation, analysis, and deduction, as well as awaken their self-confidence, optimism, communication and socialization skills, empathy, and proactivity.
- Promote attitudes and values of solidarity and community responsibility to face emergency situations.

Resources
Submitted to the FIU Program but in the end financed by the Argentina Ministry of Education. Coordination: Prof. Elina del Carmen Sosa, with professors María C. Valenzuela, Gabriela Inés Maldonado and Gabriel Villalba of the Geography Department (Sosa and Valenzuela participated in the USAID-supported CoP). Nineteen volunteer students of Geography, Elementary Education, Special Education, and Communication Sciences from the School of Human Sciences worked on the project.

Results
On weekends, parents and children worked with professors and students in recreational and informational sessions and workshops, producing artifacts such as pamphlets related to natural risks and their management. The material was widely distributed throughout the general population. With support from the La Carlota School of Art, a mural was painted depicting flood prevention and self-protection as another form of community socialization.



Chapter IV

Enrichment of the Community of Practice (CoP) Concept Based on Experiences in Latin America

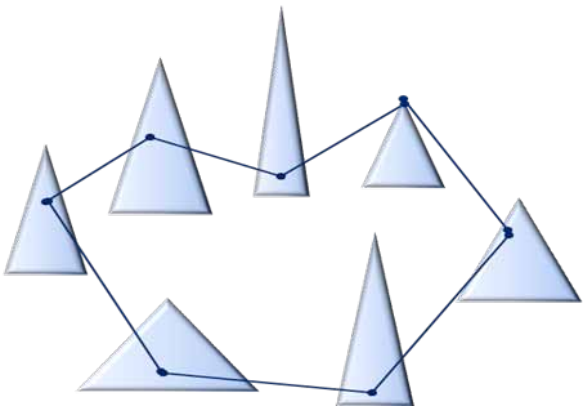
By Juan Pablo Sarmiento P. and Silvia Graciela Quiroga

After a detailed analysis of the aspects evaluated in each of the CoPs, this chapter presents: (1) a review of the concept of CoPs in light of the documented experiences; (2) the philosophy used in the external evaluations of the CoPs involved in the project; (3) aspects relevant to the self-perception of CoP leaders; and (4) some reflections on the analyzed experiences.

Envisioning the CoP concept

As was indicated at the beginning of Chapter III, the FIU call for proposals included principles that would help universities focus their proposals and move them forward. In complementary form and for communication purposes, it became necessary to support the explanations with a graphic that illustrated the CoP concept outlined in Chapter I:

> A community of practice is a temporary horizontal organization with varying levels of formality whose primary mission is to identify and solve complex, institutionally cross-cutting problems and whose major characteristics are: (1) a task-focused existence; (2) flexible and evolvingmembership; (3) openness to a wide input array; (4) shifting loci of leadership; (5) democratic decision-making; and (6) autonomous funding, within a continuous learning environment.



Graph 1. Community of Practice

In Graph 1, the different institutions, organizations, and agencies that in one way or another are involved in risk management are represented by triangles, given that their hierarchical structures are generally pyramid-shaped. Some of their members (represented by the dots) may be part of the CoP, which, in turn, is represented by the polygon that interconnects the members of the different institutions.

The lines and their intersections with the triangular shapes represent the channels of communication between institutions, both from and toward different levels in the interior of each. As was previously mentioned, this horizontal mechanism facilitates the treatment of complex and interrelated problems such as poverty, environmental issues, vulnerability, development, and risk, this last being of particular concern to the Florida International University Disaster Risk Reduction (FIU/DRR) Program.

This graphic was first introduced during the meeting in Lima, Peru, on April 23 and 24, 2009, attended by the Principal Investigators of the projects supported by FIU and members of the CoP who had been interacting with FIU/USAID and with the program implemented by International Resources Group (IRG).

The horizontal structure of CoPs facilitates, among other things, the production and exchange of different artifacts[1], which can be grouped according to the following categories:

1. Knowledge management, which refers to knowledge transfer, the exchange of knowledge and experiences, identification of problems and solutions, reutilization of inputs, coordination of efforts and search for synergies, documentation and systematization of experiences, knowledge mapping, research, identification of gaps and new challenges, advances in the exploration of new horizons.

2. Risk management, beginning with risk identification (evaluation of hazards, vulnerability studies, construction of scenarios, cost-benefit evaluations), then moving on to actions aimed at risk intervention (risk prevention, mitigation, transfer, and financing), continuing with actions to manage disasters (early warning, preparation and response), and finally, recovery from adverse events through temporary actions (rehabilitation) and permanent actions (reconstruction, building resiliency).

3. Member interaction, through cooperative agreements, information exchange, co-financing of activities, participatory planning processes and implementation of plans, projects and activities with the participation of government agencies, academic and technical-scientific institutions, the private sector, and civil society, among others.

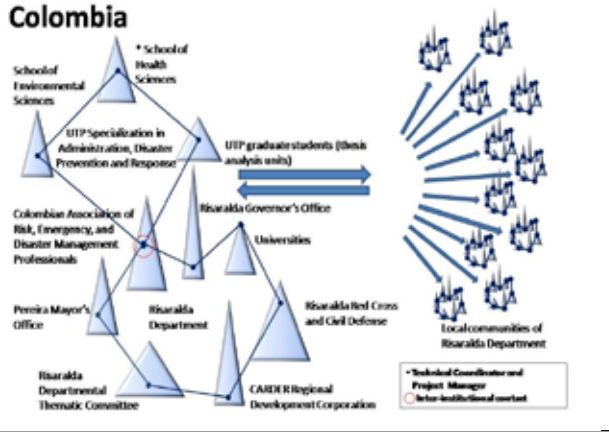
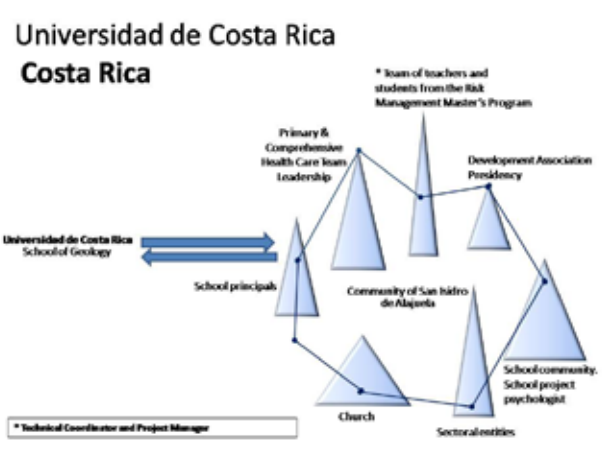
Diversity and visualization of CoPs in Latin America

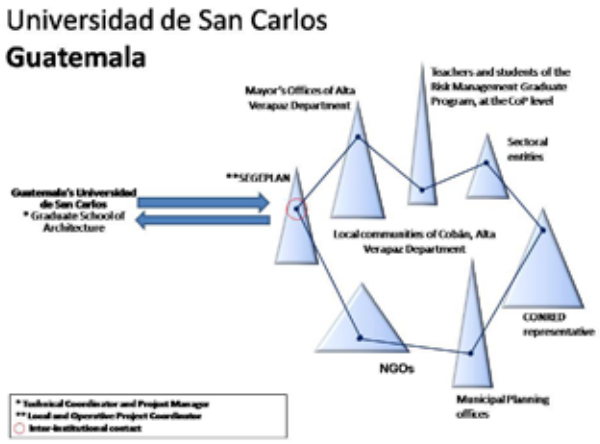
Having reviewed the conceptual reference point for CoPs, on which FIU based its call for proposals and subsequent communication with participating universities, the process of project development allowed for an enrichment of these bases. During the follow up, a set of specific variables that showed the different applications of the original CoP concept was seen in each of the universities.

With the results of the field evaluations complete, an interpretation and schematic representation (Table 1) of the respective visualization of each CoP was made, including the form of organization and management, as well as paying special attention to the role performed by the universities, the project coordinators, and other members involved.

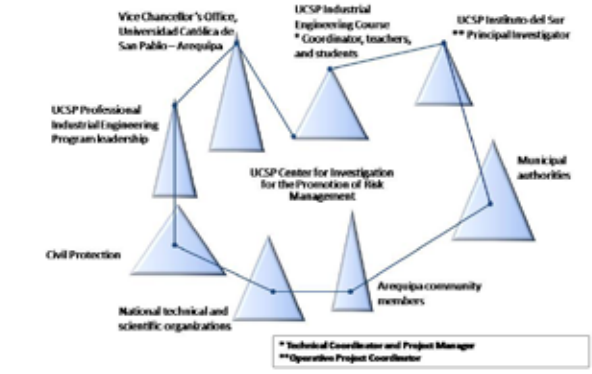
1 Refers to articles, sketches, diagrams, organization charts, books and other works that demonstrate the experiences of a community of practice in a very concrete and tangible way, based on the development of capabilities and the generation of desired products or services, as well as on the development of new tools and processes or new uses for existing tools and processes.

Table 1. Visualization of the communities of practice participating in the Bell and DRR Programs

CoP Visualization	Comments
	The U.T.P. builds its proposal on a solid base: regional and local advancement in the subject of risk management, an association of professionals in the subject, and an existing graduate program. The careful selection of participants for the Specialization program and the requirement of a degree project related to a concrete risk management problem at local levels allow participants to quickly position themselves. The challenge of U.T.P. rests in its capacity to systematize experiences, provide feedback to participating stakeholders, pose new challenges, and attain self-financing.
	The U.C.R. has a master's degree in the subject of risks that is recognized in Central America. The CoP project represents an interactive experience between the graduate studies team and base communities, and this provides not only awareness of the risks present in a particular territory but also strengthens the social component of the graduate program and advances the processes of investigation-action that result in the definition of new challenges for the university.
	The U.E.S. School of Multidisciplinary Studies, based in San Miguel, has serious administrative difficulties in approaching and reaching the proposed accomplishments. Employing the undergraduate and graduate student internships the project was able to establish a link to local schools, advancing in aspects related to the safety of these establishments. There is a long road ahead to systematize the experience and consolidate the sustainability of the initiative. The verticality of the relations in the interior of the U.E.S. continues to be the greatest difficulty.

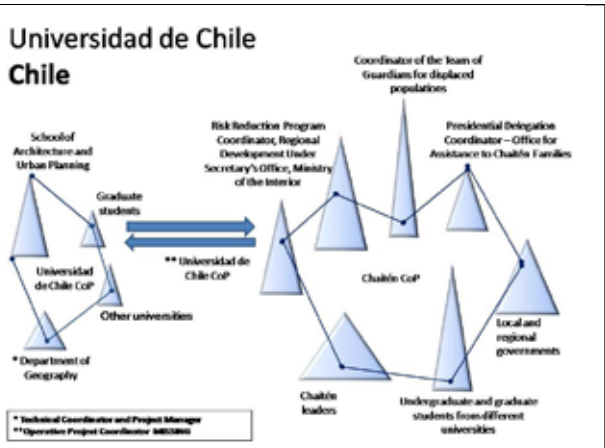
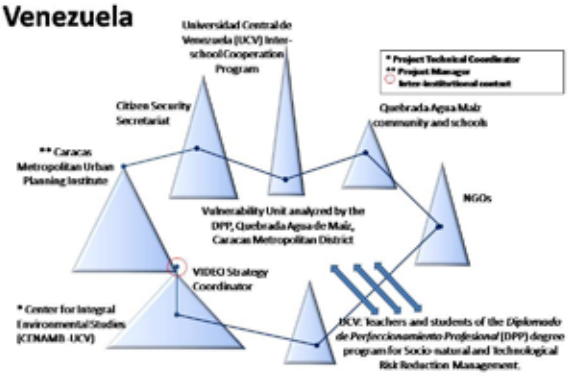


The U.S A.C. offers a master's degree in the subject of risk that is imparted from the country's capital. An attempt was made to decentralize it, but this was discontinued. This CoP project created a space for educational innovation, interaction with public, private, and civil society institutions around specific geographic areas located far from the academic centers, containing a concentration of hazards and vulnerabilities with a relevant historical background. The CoP experience evaluation and feedback processes suggest a positive outcome for the beneficiary region, for the participants in the experience, the institutions involved and the very university. Significant difficulties persist, within the great public academic centers of Latin America, to adapt to the new challenges of decentralization, dispersal, and development of capacities at the local level.

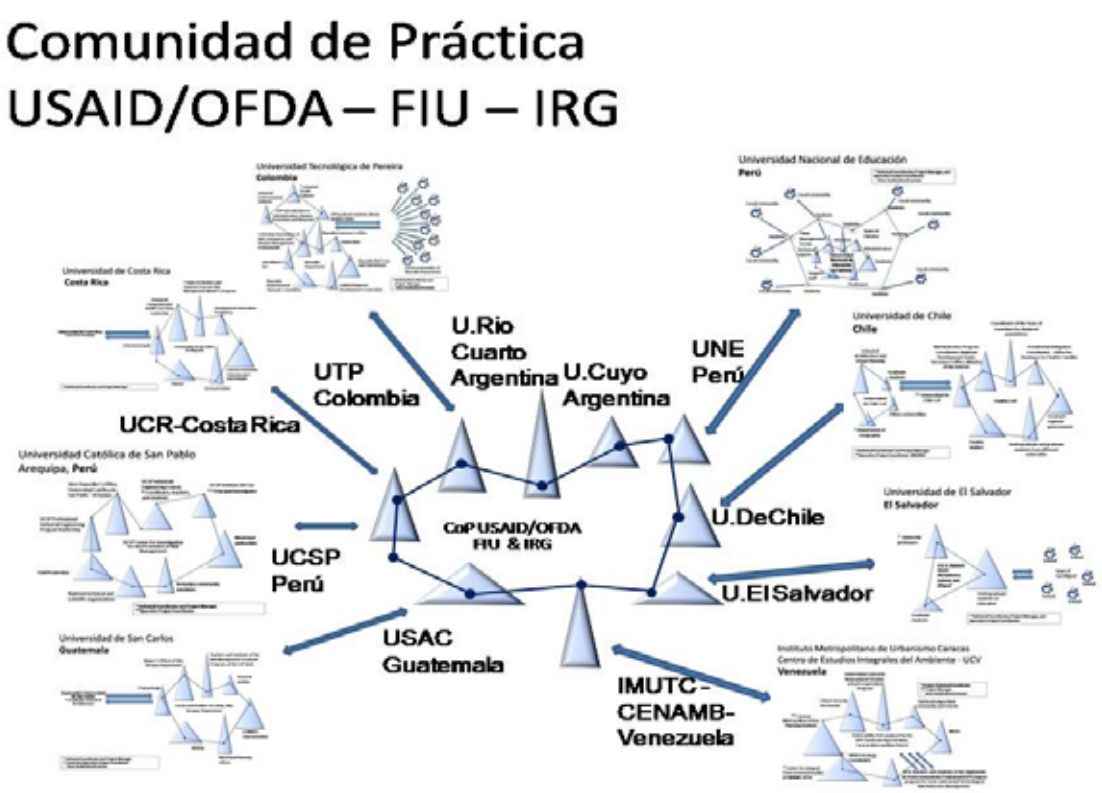


The U.C.S.P. in Arequipa gained recognition with the subject of risk management and the approach of the CoP, positioning the university at both local and regional levels. The horizontal structure allows it to achieve relations among key actors, address diverse local problems and reach the goal of creating a Center for Investigation. The university has made a great effort to systematize the experience and must now faces the challenge of putting into action a permanent risk management mechanism.

The U.N.E. employs the CoP project as a strategy to consolidate an initiative of many years encouraged by IRG-USAID/OFDA. Few other universities have an approach that comprehensively contemplates: the security of the installations, the inclusion of risk management as a cross-cutting issue in the curriculum, and the students' field internships. The latter provides the greatest geographic dispersal of any of the projects financed by FIU. The U.N.E. has made a significant effort to evaluate at a national level the internships done in local communities. This serious and conscientious work contributes to the project assessment and the definition (or reaffirmation) of policies on the subject.

	The UCh has a history of work that is similar to today's CoP work. This experience provides stability to a small number of members who maintain active ties and propose rising to meet new challenges. In this process, the group establishes ties, assimilates conditions and relations, achieves results, and returns to the original state. The CoP is strengthened by the addition of new members, the experiences obtained as well as by new positioning in a specific arena and the areas and projects it takes on.
	The alliance between the IMUTC and the CENAMB of the UCV strengthened the V.I.D.E.O.* initiative, gathering a valuable group of graduates that combines and empowers the roles and contributions of students, teachers, technicians, institutional directors, community leaders, and citizens to reach the proposed objectives, within a complex political and social environment. With this project, the CoP acquires a particular dimension, unequivocally coinciding with the concept and the principles proposed by FIU. This project has a novel intervention model for land development planning, supported by a solid environmental and Risk Management approach. **Vinculación Investigación, Docencia, Extensión y Organizaciones* (Link for Investigation, Teaching, Extension, and Organizations)

The information in Table 1 corresponds to an image of the moment of analysis, and will be modified according to the changes in the evolution of the CoP, its particular characteristics, its actions, and the actions taken within the environment in which it develops. The CoP was initiated by the USAID/OFDA Regional Disaster Assistance Program and continued by FIU.



Graph 2: CoP initiated by the USAID/OFDA RDAP and continued by FIU.

In order to provide feedback on the entire process, it is important to revisit the visualization of the CoP begun by the USAID/OFDA Regional Disaster Assistance Program and continued by FIU. The first chapters of this publication contained a careful review of its evolution and products, including the observation of the notable openings and enrichment attained through the interrelation of the eight CoPs supported by the FIU project. The analysis will now proceed to describe the current visualization and foresee its immediate future development.

The image of the CoP promoted by USAID/OFDA through the FIU and IRG programs corresponds to the period of time in which this chapter was being prepared. It is interesting to observe that a predominant characteristic of the geographically dispersed CoP is its permanently evolving and changing character. Any transformation in the condition of its members, its surroundings, or interactions with other CoPs, has influenced and will influence the results and other components of the CoP.

In the visualization of the different CoPs, the existing nodes, geographic dispersion, leadership modalities, and circumstances that influence interpersonal ties, all demonstrate the diversity and complexities of the relationships. One circumstance that afforded great versatility to the proposal was the simultaneous membership of the same actor in different groups, without this causing any conflict whatsoever.

Turning now to the interior processes of CoPs, Graph 3 illustrates the engagement of the traditional functions of the university, faculty, research, and extension, with the approach toward and from the CoP.

Adapted from the chart created by Silvia Quiroga to describe the CoP of the IMUTC-CENAMB of Venezuela.

The graphic demonstrates how the interaction of the new actors modifies the structure of relations and processes. This transcends the academic environment and enters the area of field work through a two-way process that both contributes to the experience and learns from it, while allowing each participant to remain within his/her area of competence.

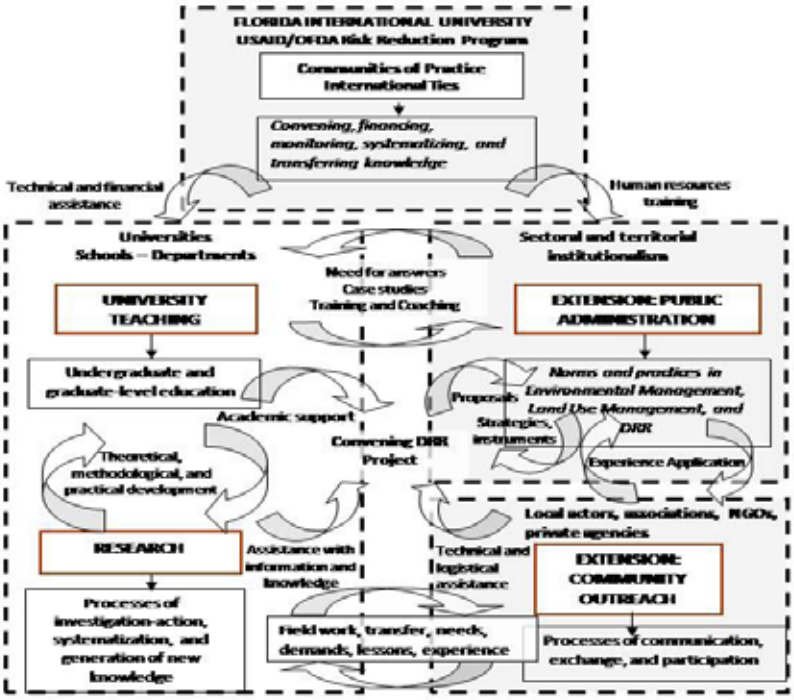
Perceptions of the CoP members

The members of the CoP conducted a self-evaluation. The parameters utilized are not included in this chapter for reasons of confidentiality; knowing them would affect the manner in which the external evaluators visualized the composition and relations within the studied communities.

The evaluators were, in some cases, the operative coordinators of the projects; in others, the principal researchers, and, at times, other key actors depending on the internal circumstances of each CoP. Following are the questions raised and a summary of the responses obtained.

(1) Did the CoP experience supported by FIU change the way that the academic institutions deal with the issue of disaster risk reduction?

The response was affirmative and unanimous. Though, while recognizing the CoP approach made a difference and contributed to change, only some universities were able to institutionalize the experi-



Graph 3: Standard organization of a CoP

ence (see related question 5).

Those responsible for the projects agree that the project facilitated: (1) an approach to address specific local problems; (2) field experience; (3) interaction with authorities and other organizations; and (4) a learning opportunity for the university.

Regarding the last point, several comments and complementary additions were made. For the universities, the journey from theory to practice resulted in invaluable experience with the social perception of risk; a sharper awareness of the difference between academic time and the time required to resolve real-life problems in the community; and a real-life way to experience the problems posed by impermanence in political posts.

(2) What was the greatest difficulty in executing the project?

Two themes were recurrent as far as the difficulties encountered in the project implementation: meeting deadlines and complying with the administrative and accounting requirements. The former refers to an initial estimation of deadlines that were too short in relation to the real time required, and the latter is related to the complex internal administrative processes of the universities and the time necessary to carry out these processes. In a couple of cases, the geographic distance between the site of the project execution and the university campus created a true challenge.

(3) If you were to repeat the project, what would you do differently?

It is interesting to note that if these experiences were to be repeated, in every case those interviewed would maintain the CoP approach as well as the scientific-technical aspects of the proposals.

The experience obtained in the interaction with other institutions, in the search for solutions to complex problems, would facilitate the establishment of timelines that more closely resemble those required to reach the objectives and produce the deliverables proposed. Four of the eight project representatives indicated that they would seek part-time administrative support to achieve a more expeditious project execution.

(4) Will this experience be continued in the university?

With the exception of one university, all the others will continue to deal with the issue – some in a way similar to that of the project, others incorporating the experience into academic activities or programs already underway. The university that will not continue this endeavor, a public institution with national coverage, cites a lack of economic resources to advance these efforts.

(5) Would this experience have been different if those involved in the projects had received an induction/training in the subject of the CoP approach?

The subject of CoPs was completely new. Even though there was recognition of the contribution of the Lima meeting in April 2009, where the university proposals and CoP principles were presented and discussed, these were not really understood until the experience was lived through the implementation of the projects. The universities of Chile and Venezuela are the exception, given their previous involvement with CoPs. Once the projects were completed, there was particular interest in sharing the experiences regarding: (1) risk management;

(2) academic and research innovation; and (3) the promotion and maintenance of the communities of practice.

(6) Should productivity be considered the primary factor in a CoP, even when the community is temporary as a result, or should sustainability be the essential characteristic?

The tendency is evident, both productivity and sustainability are important and should be encouraged simultaneously since they are interdependent. The identification of specific subjects of mutual interest and agreement on desired results or products facilitates convergence, empowers, and gives meaning to the convened group. At the same time, the interaction among members, the discussions, agreements, divergences, collective conceptual creation, all contribute to strengthen the ties among the members of a CoP, offering optimal conditions for the sustainability of this endeavor.

The difficulty that some of those interviewed had in delimiting their CoP deserves mention. The interaction among teachers, students, authorities, professionals, institutional representatives, and local leaders challenges the classic perception of the relationship between professor/student, investigator/object of study, theory/practice. Even though the benefit of this approach modality is recognized, it would seem that the boundaries of the CoP are still perceived as being within the academic community, such that what transcends is more of an extension of the academic community toward the world, than a result of effective participation from the field experience toward the university. It is probable that if these types of projects continue, this perception would change and evolve into more mature and inclusive ways of thinking, such as those observed in the Chile and Venezuela projects.

Some reflections on the chapter

From the lessons identified following the implementation of CoPs in Latin America, new questions arise:

- Could proactive, inter-institutional ways of thinking such as CoPs enrich the traditional approaches to Risk Management, based on conferences, videos, discussions, and seminars?

- How willing are the academic institutions and professionals involved in the subject of DRR to delve into local realities; to confront existing theoretical frameworks, to apply technical and scientific knowledge about hazards; and explore new methods and techniques to gauge vulnerabilities?

- Is it possible to create methodologies and risk modeling processes, in order to construct probable scenarios of risk that contribute not only to their (academic institutions and professionals involved in DRR) understanding and dimensioning, but also especially to decision making on a personal, community, and institutional level?

The results of the evaluations show important advancements in comprehending the structural and functional characteristics of the CoPs, their identitities their relations, characteristics, and potential, in addition to their connections with individuals, communities, and institutions, which, in addition to benefitting from the artifacts produced, also nourish the CoP with concrete problems and demands for solutions.

These questions now remain. The search for answers through the experiences offered by the continuity of the work is another challenge for these temporary horizontal organizations.

Chapter V

Developing Complex Capabilities: The Case of Disaster Risk Reduction

By Etienne Wenger-Trayner

Disaster risk reduction is typical of most significant challenges we face today. It requires coordinated learning across a number of stakeholder groups because focusing on one discipline or on one institution simply will not do. Addressing most current challenges involves a large number of different practices, which work at multiple levels of scale in different institutional settings. In this sense, improving the capability for disaster risk reduction has all the characteristics of a complex "social learning challenge."

In this chapter, I will explore the implications of seeing a concern such as disaster risk reduction as a social learning challenge. I will start by using the concept of community of practice as a lens through which to make observations about complex learning challenges from a social perspective. Then I will apply this perspective to explore the use of communities of practice as an intervention

aimed at enhancing the learning capability of a social system. I will end with a list of key factors requiring attention as the project moves into new phases. I will also add some comments on the potential significance of the project.

Complex learning challenges: the perspective of practice

I will start with a few basic observations and principles derived from applying the concept of community of practice to clarify the nature of social learning challenges such as DRR. This perspective from social learning theory will help articulate why the type of project described in this book is important.

The first principle is very simple, but it has important practical implications for the development of capabilities to address complex challenges.

Commensurability: Developing the capability to address a complex learning challenge requires a commensurate social system. Indeed, the diversity, scale, and power structure of the social learning system needs to match the complexity, structure, dynamism, and scope of the challenge with which the social system is expected to deal.

Landscapes of practice

The challenge of reducing disaster risk requires a multiplicity of capabilities in different domains. The ones mentioned in this book include land development and city planning, finances, risk management, first-responders, environmental science, regional development, rural community development, neighborhood leadership, education, research in the natural and social sciences, architecture, government agencies, territorial management, industrial engineering, health sciences, policy-making, and the list goes on to include many sub-domains. Some of the practices involved are quite specialized and technical while some are more at the civic level. Some are central to DRR while others are more marginal. The relevant domains of competence do not merely refer to established disciplines, but to all the areas and subareas, officially recognized or not, where there is a need to develop a relevant practice.

Each community of practice holds a piece of the knowledge required for the overall capability, and each community has its own history of learning in which it has established a framework of competence, both formal and informal. This creates a regime to which members are held accountable. These definitions of competence are not necessarily congruent. Sometimes the different practices even produce different views of what counts as knowledge, as can be the case between practitioners and academics. When the learning imperatives are contested, this results in a landscape of practice with a multiplicity of perspectives.

A complex capability lives within this dynamic and varied landscape of practice. What matters most about communities of practice is that they constitute a living capability. People are directly involved in defining what matters, what counts as competence, and who qualifies for membership. A practice is therefore a very dynamic, self-organizing process of sustaining a capability. It is a history of learning, with its own momentum and inertia, and with its own dynamics of contestability, agreement, conflict, divergence, and convergence. Whether the resulting capability is called knowledge is mostly a political issue. At any rate, membership in these communities of practice, and the knowledgeability that is derived from such membership, can give rise to very strong identities for participants.

The diversity of the landscape of practice is a key feature for fulfilling the requirement of commensurability, both because of the multiplicity of communities of practice, and their ability to reconfigure dynamically. Yet the locality of practice means that it does not scale very easily. The potential fragmentation resulting from a multiplicity of local practices can make it difficult to take stewardship of complex challenges.

Institutions

The practices in this landscape live in the context of a series of institutions. Some practices are within an institution or are even largely defined by that institution; some live across institutions; and some are not directly affiliated with any given institution. But in all cases, the impact of the institutional context on practice is substantial. Disaster risk reduction involves a variety of institutions in the public and private sectors, including universities, local governments, municipal services, national governments, development agencies, and land developers, though not all approach DDR in the same way or with the same focus.

Institutions structure the social space in ways that simplify participation and render complex alignment more manageable on a large scale. Indeed, institutionalization enables participation to be local yet aligned, even with minimal communication. Institutions structure scale by dividing responsibilities among practices, formalizing the relationships among them, and codifying the processes and activity systems through which members of various practice get things done (Engestrom 1999). Institutions define roles, responsibilities, and processes around explicit objectives (those that matter to the communities of practice that have the power to decide). This creates formal systems of accountability with hierarchies of reporting relationships that concentrate decisional power and control over resources. In theory at least, such institutionalization formalizes alignment to facilitate contribution to large-scale enterprises while focusing on local goals and practices.

Design by reification

One way to understand the upsides and downsides of institutions is to see them as reified designs that project intentions across the landscape of practice. In communities of practice, reification is a process by which practice is congealed into "things"—tools, documents, words, concepts. These objects carry meaning because they are embedded in practice and reinterpreted over time by participants. If they "travel" to other practices, they may or may not be interpreted in similar ways (Wenger 1998). As reifications, institutions cannot exist without a multiplicity of living practices to sustain them (e.g., legal, managerial, technical, and non-technical practices). Yet institutions have a complex relation with practice. They depend on the living logic of practice, provide a context for it, but never fully control or define it. Like practices, institutions reflect

social histories of learning, but they are one step removed from the histories of the practices involved. As reification, institutions embody learning, but in a way that is detached from the source of this learning.

Institutions inherit the strengths and weaknesses of reification. The strengths they inherit include: visibility, explicitness (and therefore contestability), persistence through time and space, and as a result, ability to "travel," that is, to project a demand for attention and interpretation across the landscape of practice. The weaknesses of reification that institutions inherit include: rigidity, hidden interpretations, dependence on practice but potential detachment from practice, and because of the need for reinterpretation across time and space, potential meaninglessness. The multiple communities involved in interpreting this reification into practice have potentially diverging views of the institution and its objectives so that being in the same institution does not guarantee convergence, even when it provides some level of coordination. And because institutions create formal hierarchies that have a tendency to become removed from the practices where work gets done, they can easily become prey to their own politics. Institutions can therefore become detached from (and sometimes work against) the intentions and objectives that gave them birth.

Oversimplification by design

The reified nature of institutions has significant implications for the principle of commensurability. Reification is by necessity an oversimplification. Formal reification, which is a costly process that requires maintenance, power, and attention, can only be applied to a few dimensions of complexity. For instance, an organization will be structured around product lines, or by country offices, or by departments defined by disciplines. As a result, institutional structuring inevitably oversimplifies the match between social structure and problem. It can achieve scale, but at the cost of oversimplification. The fact that institutional structuring can be counterproductive does not mean that it is inherently bad: institutions are "convenient" oversimplifications. This is both its strength and its weakness. It means, however, that achieving full commensurability still depends on practice and the "inconvenience" of its living complexity.

Scale and locality

The practices and institutions involved in a complex challenge like disaster risk reduction are associated with multiple levels of scale. They take different scope as their purview. Some are very local, in one municipality or even one neighborhood, while some have national or even international scope. Academics may even claim that their attempt to produce universal knowledge in their domain is in a sense scale-free.

Yet it is important to remember that all practices are in the end local, no matter the scope of their domain. Of course, different practices take different aspects of the system as their purview and the scope can differ. Management, for instance, often takes a whole organization as its purview. Administrators' hierarchical position gives them influence over large segments of practice. But that does not mean that their practice is not local as a practice. Similarly researchers have developed methods to draw conclusions that transcend locality, but their practice as researchers is still a practice. There is always a trade-off between scale and texture. As a consequence, there is no privileged view that encompasses the whole system from a practice perspective.

No subsumption: All practices are local as practices, no matter their purview. In particular, practices at broader levels of scale do not subsume practice at narrower levels of scale, even if politically they have more power to affect the system.

Obviously from a political standpoint, some practices have more power than others to influence the system, but that ability does not mean that the knowledgeability of powerful practices subsumes the knowledgeability of less powerful practices. Knowledgeability, improvisation, and meaning making exist and coexist in each practice. They all have their own locality as aspects of practices.

This impossibility of subsumption of one practice by another is a key principle for understanding scale and commensurability from a practice perspective. Viewed through this principle scale is always problematic and is only partially addressed by institutionalization. Indeed, scale does not imply moving from the local to the global, but having the two coexist in relationships between different forms of locality. Therefore dealing with scale is not subsuming some practices under the knowledge of others, but negotiating the boundaries between practices that have their own forms of knowledgeability. Large-scale learning capability depends on the degree to which practices at various levels of scale interact so they include each other's perspectives as they seek to incorporate more of the system in their own view.

Dynamics of learning capability

Given these observations about the nature of complex social systems, I now turn to the issue of learning capability as a characteristic of social systems. Learning capability is a paradoxical aspiration because learning by itself does not guarantee learning capability. Sometimes, success in learning is precisely what prevents further learning (see, for instance, Christensen 1997 for a study of this paradox in business). Learning capability thus cannot be found in the knowledge accumulated in existing structures, but in the dynamic potential of the system. The following section describes three tensions that are fundamental to enhancing social learning capability.

Tension one: cores and boundaries as learning assets

All three dimensions of complexity introduced so far (practices, institutions, and scale) create boundaries which reflect the different perspectives and accountabilities that come from being located in various places in the landscape. These boundaries are interrelated, but are of distinct types:

- Boundaries of practice: differences in competence, perspectives, what matters, and what counts as knowledge;

- Boundaries of institutions: differences in affiliation, accountability, role, and power; and,

- Boundaries of scale: differences in scope of purview, in access to resources, and influence

Sometimes these boundaries overlap and sometimes they don't, but they are crucial to the goal of enhancing of learning capability. To start with, the boundaries are unavoidable if any depth of learning and knowledge is required. Even if one creates a single overarching institutional structure to address a complex learning challenge, there is still a need to negotiate multiple boundaries to achieve the required learning capability.

The effects of boundaries cut two ways. On the one hand, they are places where communication can be difficult, where misunderstandings and disagreement occur, and where competing priorities disrupt collaboration. On the other hand, and for the same reasons, boundaries present important learning opportunities because radical innovation often takes place at those boundaries. Negotiating and renegotiating boundaries is a very important capability for learning and coordination. Any practice has to develop the ability to interact with adjacent practices in order to address concrete challenges.

Core-boundary interplay

The learning capability of a social system depends on the coexistence of deep elements and active boundaries.

If the core elements of a learning system (practices, institutional units, and levels of scale) are deep but isolated, the social system's learning capability is fragmented. Similarly, if there is a lot of activity at the boundaries, but elements are shallow, not much learning capability results. Core and boundaries must be developed at the same time. The potential of boundary encounters to generate new insights suggests the following questions:

- What kind of boundary activity, joint project, visit, joint or mutual storytelling can serve as a productive encounter for negotiating and exploring a boundary?

- How can boundaries be used to systematically trigger a reflection process?

- What kind of boundary objects and activities can support this boundary-oriented learning and create points of focus for engaging multiple practices and institutions at various levels of scale?

- Who can act as brokers to articulate knowledgeability across boundaries?

Tension two: vertical and horizontal accountability

Practices and institutions tend to operate under different systems of accountability. Institutional structures tend to be based on what can be called vertical accountability through hierarchies that give some practices and some people the legitimacy to extract accountability from others. By contrast, the regime of accountability of a community of practice could be defined as horizontal in that it exists in mutual relationships among participants. Power works along these two axes of accountability:

- Vertical accountability is associated with traditional hierarchies, decisional authority, the management of resources, bureaucracies, policies and regulations, accounting, prescriptions, and audit inspections.

- Horizontal accountability is associated with engagement in joint activities, negotiation of mutual relevance, standards of practice, peer recognition, identity and reputation, and commitment to collective learning.

A common mistake that organizations make is to assume that horizontal relationships lack accountability—and therefore that the only way to create accountability is to overlay vertical structures on a social system: the accountability inherent in horizontal relationships is strong and sometimes more effective than vertical accountability. Another common mistake is to demonize vertical accountability and romanticize community and local engagement in practice: horizontal accountability in communities of practice can be narrow-minded, parochial, mean-spirited, and counterproductive.

Vertical accountability works well for what is known and certain. It is appropriate when there is a need for one-way alignment, compatibility through homogeneity, and pre-defined coordination. It becomes something externalized that is no longer negotiable. It increases learning capability by fixing what is known, and thus freeing the energy of participants to focus on more important issues. But because verticalization tends to create homogeneity and predictability, it tends to decrease learning capability by preventing local experimentation.

Horizontal accountability works for what is unknown and uncertain. It is appropriate when there is a need for improvisation, negotiated alignment, and dynamic coordination. This type of accountability increases learning capability by enabling dynamic change, adaptation, and focuses on personally meaningful things. But because horizontal accountability generally does not scale very well, it renders learning from success and failure local and ephemeral. As a result, it tends to decrease learning capability.

Interplay of vertical and horizontal: Enhancing learning capability entails both vertical and horizontal accountability in interplay.

Both vertical and horizontal forms of accountability have always existed in organizations and social systems, but traditionally they have been quite segregated, operating in different realms as it were. But since their complementary strengths and weaknesses can make up for each other, one way of enhancing learning capability more systematically is to promote closer interactions and integration between these two systems of accountability.

Tension three: social structures and people as carriers of knowledgeability

Over time, practices and institutions represent social histories of learning. They are carriers of past learning—albeit in different ways, as I have argued. And as such, both are part of the "social body" of knowledge. In the middle of all that, people also act as "carriers of knowledgeability." They do so by participating in practices or institutions, yet they are not bound to a given practice or institution. Like practices and institutions, people have histories of learning, but these different types of histories do not necessarily coincide, even if they shape each other. Social structures and people evolve and shape the landscape in interaction, yet in their own ways.

People become carriers of knowledgeability by traversing the landscape. On their journey they encounter various practices and institutions. Some they go deep into; some they only touch; some they leave behind; some they reject or are rejected by. All in some big and small ways become part of a person's identity. As people form their own trajectories, they develop their own, unique form of knowledgeability, combining their experiences and accountabilities in the various communities of practice and institutions with which they have become involved. This ability to incorporate the perspectives of multiple practices, multiple institutions, and multiple levels of scale into a dynamic experience of life is a key component of learning capability.

Social capability in social systems is therefore constituted by different types of carriers of knowledgeability: the communities that have developed specific practices over time, the reified design of institutions, and the people whose identities are formed within and across practices and institutions.

Interplay of carriers of knowledgeability: Learning capability depends on the interplay of multiple types of carriers of knowledgeability

All types of carriers of knowledgeability have the potential to contribute to learning capability and enhance it; yet all of them also have the potential to work against it, lessen it, or even block it. The ways people can do so are both complementary and in tension. Therefore, social learning capability ultimately depends on the dynamics of the interplay among them.

Communities of practice as interventions

With the perspective I have developed so far, it becomes easier to appreciate how the DRR project addresses the challenge of developing DRR capability when the body of this capability is a complex landscape of practices, institutions, and people. The approach is to reconfigure the landscape by opening new social learning spaces that have the potential to enhance the learning capability of the overall system.

Learning by reconfiguring: opening new social learning spaces

Traditionally, intentional reconfigurations would have been done through formal institutionalization, for instance, reorganization initiatives, the creation of new units, roles, and metrics, or through the delivery of formal courses. And for some issues, it is important to create a new institution, especially if significant resources are going to be channeled to it. But one has to be very cautious about reconfiguring formal systems because it is a disruptive process that requires a lot of work, alignment, and attention. Reconfiguring affiliation and relationships of power is likely to generate conflicts and to require either a lot of consensus building or a lot of top-down authority. Because of such investment in formal structuring, once the process begins and gains momentum, it tends to produce permanent structures that can later outlive their usefulness.

To address dynamic issues of learning capability it is better to reconfigure the social system with new spaces without too much institutionalization. Communities of practice are social structures that allow just that. Because these communities are institutionally "light," they require little investment in formal structure; therefore they can last precisely as long as they are needed. The usefulness of communities of practice arises out of their self-governed character, which allows the goals and accountability to reflect the perspectives, needs, and aspirations of the participants. Participation itself is a matter of personal relevance rather than formal affiliation or level in the hierarchy. This allows people from different sectors and levels to contribute to the same topic or issue. The goal of a community of practice does not have the formal urgency of regular work, though it enables regular work: it opens a space for exploration and reflection anchored in practice.

The DRR project exemplifies the growing trend of using communities of practice as interventions in complex learning systems in order to open new spaces for actors to collaborate and learn together. The collective learning may or may not result in a new practice that will endure in its own right. But even if the result is only the modification or coordination of existing practices, the language of communities of practice provides a useful framework to become more systematic about opening new social learning spaces as a way to enhance the learning capability of social systems. Indeed, communities of practice accommodate the three dynamics of learning capability introduced the last section. They allow the exploration and crossing of boundaries:

- They combine vertical and horizontal accountability in new ways; and,
- They enable people to expand their experience as carriers of knowledgeability across institutions and practices

I now explore the potential of each of these dynamics in more detail.

Exploring boundaries: beyond disciplines or institutions

A purely disciplinary or institution-centric approach does not work with complex challenges such as DRR. What is required is a multivocal development of capability that involves interactions across disciplines (both academic and applied), institutions (government, education, and the private sector), and levels of scale (national, regional, and local). Communities of practice allow heterogeneous

membership independently of affiliation. They can function with fairly loose integration that does not exclude the expression of other affiliations. These new spaces do not overtake the agendas of the different stakeholders; rather, they work to serve them. The point is not to renounce other affiliations, but to express them in a new context of boundary crossing.

The idea in communities of practice is to define objectives loosely enough so that everyone can achieve what they want or need, express the accountabilities they work under, and explore new ones around shared projects; and yet define objectives precisely enough so that participants can strive for something concrete that forces them to engage across boundaries in their time together.

Boundary crossing is not easy because it forces participants to engage with other perspectives and with people who may not appreciate what each person knows or understands. For universities, such collective learning can be quite an experience—going beyond the walls of the university and interacting with concrete problems and learning. Similarly for practitioners, trusting that academics have something valuable to contribute that will be applicable to practical solutions may take considerable negotiation and shared experience. The experience of boundary engagement can be both frightening and exhilarating.

Exploring boundaries suggests the following principles:

• **Acknowledgment of boundaries.** It is a good idea to acknowledge and discuss boundaries explicitly, both to prevent misunderstandings proactively and to seek learning opportunities.

• **Boundary interactions and projects.** One should define goals that force participants to combine existing perspectives in new ways, expanding both their own capabilities in their domain as well as their ability to interact across boundaries.

Representing all relevant voices: One needs to ensure that all the relevant perspectives are represented at the table, and that they all have a voice. No single perspective, institution, or practice can own the space. Avoiding domination by one perspective require a particular type of humility, especially when leadership involves prestigious institutions such as universities, or powerful ones such as national governments.

Combining vertical and horizontal accountability

Crossing boundaries of practice, institution, and scale requires people to engage with each other in new ways while remaining true to the perspectives of their practices and to the obligations of their institutions. This complex goal requires a special kind of social space, where horizontal accountability invites full participation in the following manner:

- The goal of the community is negotiated among members so that it reflects their perspectives;
- The community is focused on negotiated usefulness rather than merely trying to affect formal measures;
- Individual contributions represent a person's relationship to the topic rather than one's role or affiliation;
- Leadership is defined by the energy one puts into, and the wisdom one contributes to the community rather than position in a formal hierarchy.

These points all represent key characteristics of successful communities of practice. They suggest the following principles:

• **Local accountability integrates existing vertical commitments.** While this local, horizontal definition of accountability is crucial for the success of the learning process, it does not displace vertical accountability. The community does not replace existing structures and the accountability that comes with them. On the contrary it needs to integrate such existing accountability through the participation of members who are renegotiating who they are in this new context without abandoning their own contexts. The community provides a new context to improve on what they need to do anyway. It complements what they are doing. Academics can write better papers, policy-makers can produce better regulatory systems, and practitioners can do their work better. In other words, part of the community's accountability is helping members be accountable to their own contexts and do the work they have to do there.

• **Learning trumps power.** This combination of vertical and horizontal accountability requires a subtle dance. At the core of the combination of vertical and horizontal accountability is the imperative of social learning. Terms like community and horizontality have the downside of connoting for many people the absence of power relations. But relations and issues of power are inherent in communities, both internally as members negotiate the nature of their relationships, and externally as relationships from the contexts are imported into the community. The point is not to deny these relationships of power, but to channel them toward collective learning. What characterizes a good social learning space is not the absence of power, but rather that in the end the imperative of learning trumps power. This is a very important principle, which requires and reflects a real commitment to a spirit of inquiry on the part of all members.

• **Institutions can expect but not control outcomes.** The value of social learning spaces like communities of practice is that they create a capability that is inherently not predictable. If institutions play any role in the process, this role is one of enablement, not control. If institutions were able to control these communities and their outcomes, their learning would not be needed. This does not imply that institutions should leave these communities alone: ignoring them has the risk of marginalizing them and lessening the impact of their work. It suggests that institutions should expect the unexpectable and pay attention.

Engaging people as unique carriers of knowledgeability

A key distinction between a community of practice and a task force is that members serve on a task force, but

a community exists to serves its members. As a new, cross-boundary, self-governed social learning space, a community of practice acts as a kind of "neutral" or "open" space on the trajectories of participants. It frees the members from their own practices and institutional affiliations, while at the same time allowing—even expecting—them to manifest their other connections in productive ways. Participants bring what they have to the table in order to find new contexts for contributing and learning. It is a chance to engage their connections with specific practices and institutions, but at the same time to take distance from them and focus on building up their own identities.

Furthermore, in cases where institutions themselves are too unstable or politically volatile to be the locus of sustained learning, less formal social learning spaces such as communities of practice can offer an alternative way to identify, support, engage, and connect talented and committed people. It is also a way to give them a voice.

Creating new social learning spaces is an opportunity to change the dynamics of the landscape so that people can really explore who they are as carriers of knowledgeability. They discover this by engaging their full being directly in the solution of problems. It is an important function of a community of practice to let people discover new aspects of themselves as carriers of knowledgeability. It allows them to discover how they care about an issue directly and to express this identity of care both individually and collectively. This type of new learning space can be quite liberating, and many participants in the DDR project have reported being quite inspired and sometimes transformed by their participation. In this sense, new social learning spaces are an important source of inspiration and creativity.

The importance of engagement suggests the following principles:

• **Personal meaningfulness.** The development of learning capabilities depends on identity and personal engagement as much as on process. Often, in day-to-day work, process dominates as the source of productivity, and personal meaning follows, if at all. In the new social learning spaces I am describing here, process has to be in the service of personal meaning, which is the source of productivity and creativity.

• **Expressibility of identity:** As much as possible, participants should be able (and encouraged) to engage their full identity in the work of the community—that is, not just a narrow slice of expertise as defined by their role, but the variety of contexts from which they draw inspiration. In other words, boundary crossing is not only a social process of connecting practices, institutions, and levels of scale, but also a personal process of engaging multiple aspects of one's identity.

• **New ways to engage:** A social learning space, like a community of practice, provides a good context to explore new ways to engage with a challenge like DRR. In other words, personal meaningfulness and identity are not simply pre-existing histories; they are also a work in progress. What people can discover in a new social learning space is not only what they want or aspire to, but also what they did not know they wanted or aspired to. Exploring new ways for people to care and developing new avenues for them to engage with a problem is a key function of communities of practice in contributing to learning capability.

There is a possible misconception here which is important to dispel up front. Note that the notions of identity and personal meaningfulness used here are not presented as inherently individual. On the contrary, the notion of social learning space places meaningfulness and identity squarely in their social context, with its mixture of resources as well as constraints, struggles as well as inspiration, reconfiguration of relationships as well as personal quest. The point is not to focus on the individual as opposed to the social, but on the contrary to recognize their mutual constitution and seek the kind of interplay between them that is likely to be conducive to an increase in learning capability.

Some key ingredients

When using communities of practice as interventions to enhance the learning capability of a social system, we should highlight a number of key ingredients. Paying explicit attention to these ingredients will be helpful when moving projects like DRR forward. This section looks at some of these ingredients as things to recognize, encourage, appreciate, and reward:

- Learning citizenship;
- Social artists;
- Conveners;
- Sponsors; and
- Transversality

Learning citizenship

Engaging with a cross-boundary community of practice is a personal risk that demands delicate choices about use of time and investment of effort. The domain of a boundary community usually does not fully overlap with one's areas of interest. Interactions with people who are not familiar with one's discipline may require a lot of negotiation and end up being a waste of time. Accomplishing what one needs to do while contributing to such a community often requires reconciling conflicting accountabilities and juggling priorities. Doing all this in the service of enhancing learning capability is what I have started to call an act of "learning citizenship" (Wenger 2009).

Learning citizenship is a particular ethical stance by which one assumes some responsibility for enhancing learning capability—one's own, that of a community, that of an organization, or that of a broader social system. It can take different forms, such as taking leadership in pushing a collective inquiry on a topic of personal relevance; bridging a boundary by brokering elements of one practice into another; seeing the need for a new community of practice and using one's authority and legitimacy to bring it into being; or connecting people to a community they did not know about, membership in which will enhance their (and the community's) learning capability.

The ethics of learning citizenship is anchored in the experience of identity: it uses one's location to take actions that reshape the landscape in order to open new spaces for learning. The ability to do this depends on an image of the

surrounding landscape of practice and of the potential for learning that inherent in that landscape of practice. It also depends on awareness of one's position in that landscape, which affords a unique perspective on this potential. And finally it requires the will and the legitimacy to act on one's awareness. This is one reason why the ability to express of complex identities is a key success factor for innovative learning spaces.

If it is true that reconfiguring the landscape is an important learning move, then the identities of all those involved will be affected. They must renegotiate their own trajectories and use their own position as a resource to make these new spaces work. Encouraging learning citizenship is therefore essential to the success of projects such as DRR.

Social artists

Some people excel at opening new social learning spaces and inspiring learning citizenship. They have the interpersonal skills to encourage active participation; they have the social intuitions to help people find meaning in the interactions they facilitate; and they have the personal and intellectual depth to create the condition for making learning productive. These people help others experience learning spaces as part of their own trajectories so that collective and individual learning blend. I call these people "social artists" (Wenger 2009).

Like artists who embellish the world with paintings, sculptures, spectacles, music, and poetry, social artists enrich the social landscape with new spaces for learning. They are skilled, but they are not technocrats. Above all, social artists live what they seek to bring about. Like all artists, they use themselves, their own experience and identity, as a source of inspiration. They are themselves learning citizens of great intensity, which is how they can embrace the complexity of their work and inspire others. Whether they do what they do because of professional responsibilities or just as extraordinary learning citizens, their role is of utmost importance when learning depends on reconfiguring the social landscape. The success of socially complex projects like DRR will increasingly depend on the contribution of social artists.

We can all be learning citizens in our own ways and to various degrees, but we are not all social artists. Social artists are extraordinary people, and yet their work often goes unrecognized because it does not fit within standard institutional expectations. We lack adequate frameworks and language to appreciate their contributions. We need to learn to recognize, enable, and celebrate their work. It will be a key success factor of projects like DRR to learn to make the work of social artists more visible and to provide them with a context in which their artistry is valued and supported.

Conveners

The DRR project proposes a new way to work across organizational contexts, starting with a university that invites others to join. This convening function is a new role for universities in many countries. Convening, however, is a complex role (Trayner, in press) that requires legitimacy, which is double-edged for universities:

On the one hand, their traditional role in organizing learning and fostering knowledge is likely to make them natural leaders in pushing the development of capabilities and in opening new social learning spaces. This traditional role may also make them seem less political, at least in the eyes of some stakeholders.

On the other hand, convening also requires the ability to recognize the validity of other perspectives. In particular it requires recognition of the knowledgeability of practitioners. The university is usually removed from challenges of practice, which is its strength, but it's also its weakness. Convening learning spaces is very different from being a provider of disembodied knowledge in a vertical mode of transmission, which is the traditional role of universities. This "vertical" knowledge is an important type of knowledge but is not the only one. So universities have to recognize other types of knowledge without renouncing their strengths, which gives them legitimacy as a convener in the first place. They have to see that they can learn from practitioners and other communities and institutions, while also contributing programs, research, and teaching.

Still engaging actively with their surroundings and taking a convening role rather than solely having a knowledge-provider role is likely to create some identity issues for universities. The role of convener will depend on the creation of new identities that will help participants see the value of what they are doing across boundaries. This may inspire participants to do more together. Unless they do, their ability to convene broader learning processes and to collaborate in knowledge creation is likely to be fragile and short-lived.

The role of sponsor

It is essential to manage the institutional context carefully because social learning spaces often do not fit very easily in organizational structures. This is the role of sponsor. It includes providing resources such as funding and support, but it also implies taking the learning of communities into institutional settings where implementation requires the types of power that communities and stakeholders do not have. So the role of the sponsor is really a two-way role that connects communities and institutional hierarchies. It is quite different from traditional management roles that mostly act within a hierarchy.

Sponsors also have to take a broad social learning system into consideration and ensure that it functions at multiple levels of scale. In the DRR project, universities act as conveners of subcommunities—local face-to-face chapters for regional collaboration. But it is important to connect these communities into a broader learning system that operates at multiple levels of scale so that the learning of the whole system is maximized.

It is the role of sponsors to provide appropriate legitimacy to the process by recognizing the value of learning spaces when they do not necessarily fit well in existing systems of vertical accountability. The goal is to create institutional arrangements that avoid some of the conflicts that make emergent learning spaces unrecognizable in existing systems of vertical accountability, where they may seem counterproductive.

Transversality

The sponsor's role is crucial in creating legitimacy and making sure the process is visible to hierarchies. Vertical and horizontal accountability structures are very different in nature. Vertical accountability works across levels of scale. It tends to favor tools that travel easily across different practices. Numbers are a good example because six is greater than five everywhere in the landscape, even if it is less than obvious what each number means or how they were reached. Horizontal accountability tends to favor processes that focus on substance in the context of mutual negotiation. Conversations are a good example because they often enable interactive meaning making. The price of horizontal accountability is that these processes do not "travel" easily into different practices.

I have stated that in many organizations, vertical and horizontal accountability function almost completely separately. To foster learning capability at a system level, they need to be brought together and inform each other, even though they unavoidably remain in tension. One of the difficult issues is that the two forms of accountability are not easily visible to each other since they value different "currencies."

This lack of mutual visibility decreases the potential of the system and even carries a risk of conflict and disconnection. This could be illustrated with the metaphor of a vertical and a horizontal plane: the intersection between them is just a thin line. The two systems can become more visible to each other, but only if they recognize the limitations of their own currency—the value and price of contextualization and de-contextualization. It takes some humility to see the limitations of each system and organize their interplay in ways that recognize these limitations and build on their complementarity.

The role of leaders in a social learning systems includes the need to "tell the story" in forms that are understandable across contexts, as a way to both provide legitimacy and spread the learning. This ability is typical of what I call transversality: the ability to increase the visibility and integration between vertical and horizontal structures. Transversality usually involves hybrid accounts that combine de-contextualized measures and contextualized narratives. It also depends on the brokering of people who have a foot in both worlds. One of the challenges of projects like DRR is to understand and develop transversal processes and roles that integrate horizontal and vertical accountability. This is true of the project itself as well as of the processes of evaluation.

An urgent learning imperative

The DRR project is very significant because enhancing the learning capability of complex social system has become an urgent imperative. Indeed we are faced with many challenges like DRR, which need accelerated learning on a large scale. In this chapter, I have tried to outline some principles that will allow the project to move from an experimental stage to a more proactive phase. The need to convene learning processes across practices, institutions, and levels of scale will require a substantial rethinking of the role of various players, particularly in institutions of learning. Making this a systematic approach is an especially critical contribution at a time when humankind faces unprecedented challenges that will place increasing demands on our ability to learn together.

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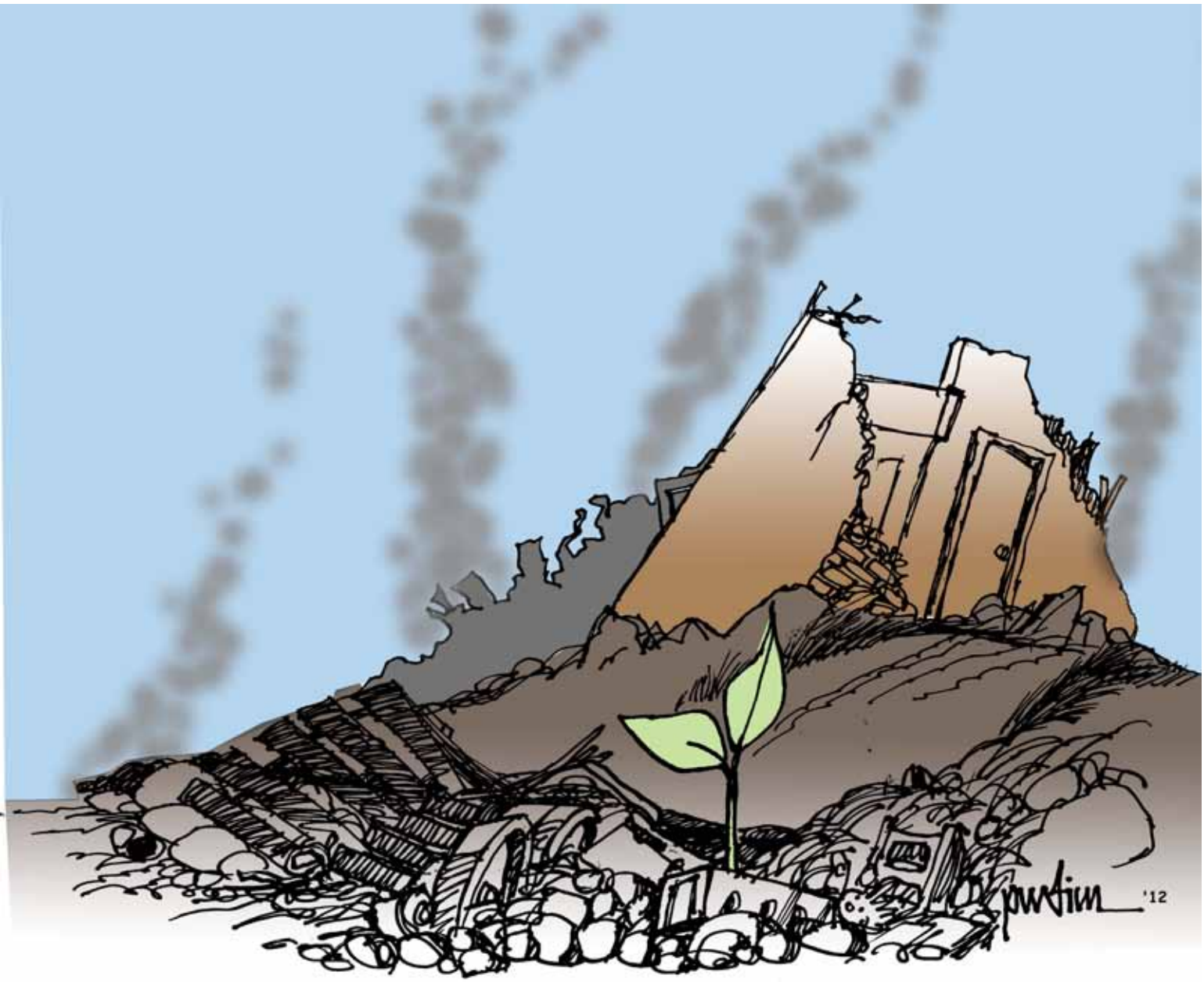
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Epilogue

By Juan Pablo Sarmiento P.

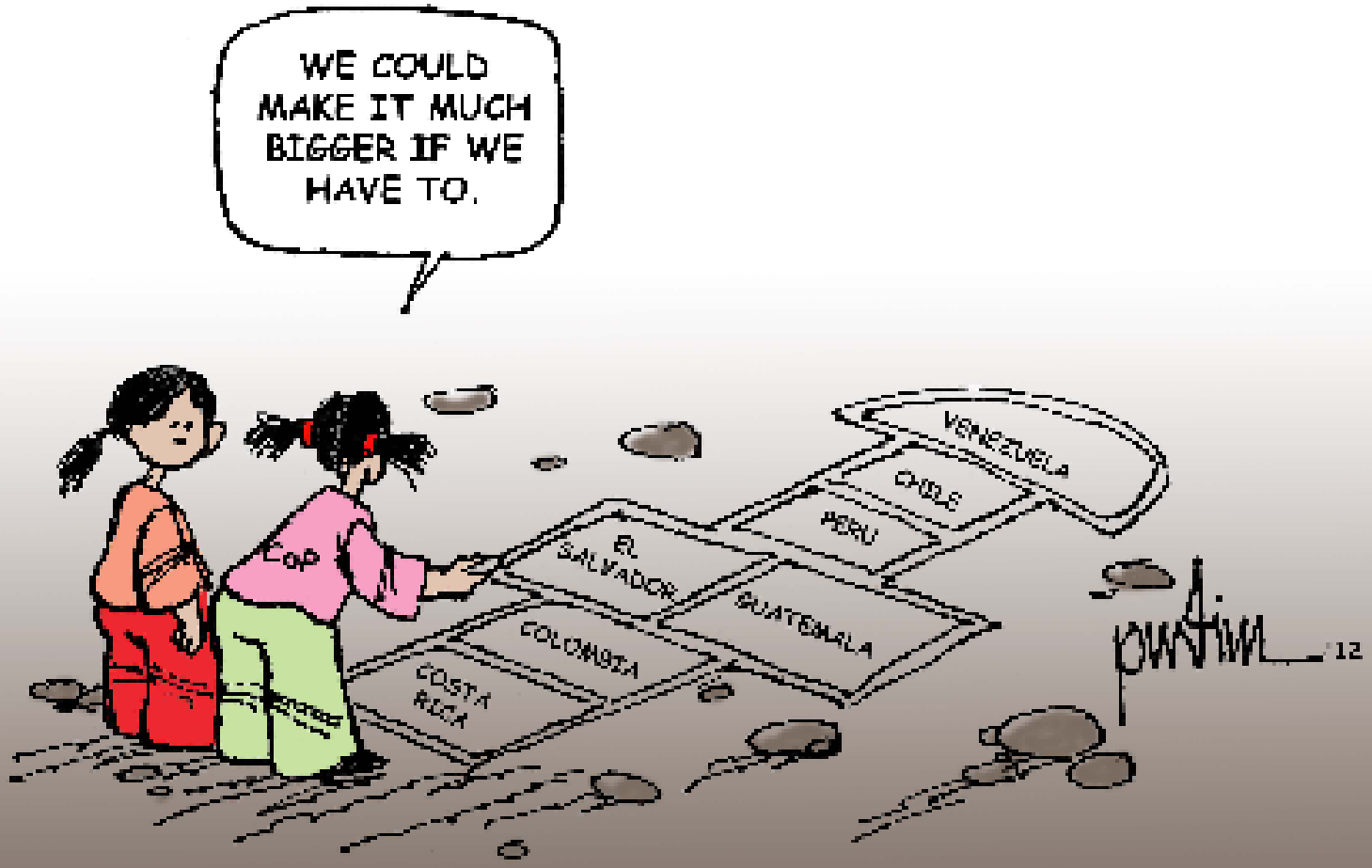
The communities of practice approach offers clear advantages to the understanding and practice of disaster risk management (DRM) in general and to disaster risk reduction (DRR) in particular. The CoP approach also positively contributes to the institutions from which CoP members come and to those institutions that promote DRM and DRR.

It seems, however, that CoPs and DRM share a common problem: sustainability over time. The pressure to develop measurable management processes and expected outcomes in specific time periods results in a short-term project drivers, which is directly contrary to the notion of a long-term perspective emphasizing final impact measurements in a society.

Donors and development agencies have sought to reconcile these visions, but they have failed in two ways: (1) by requiring long-term impact measurements in short term project implementation, they have proven incapable of dealing constructively with the obvious time asymmetries; in this way, they have met bureaucratic requirements but have failed address the real target problem, and (2) by including the definition of an expected M&E process within the project terms, assuming that by self-management a results driven follow-up process would ensue; but often, the sponsor agency has not included this monitoring process in its own project management after completion.

One wonders if in the case of CoPs and risk management, innovative development processes could be designed that would avoid incurring the above-mentioned failures, stimulating instead "sustainable" practices such as networking, addressing complex issues, suggesting collective processes of knowledge production and management, and supporting the implementation of initiatives for experience systematization, among many other options. Indeed, it is important to devise strategies to develop DRM and DRR capabilities that go beyond isolated activities so that CoPs respond to those so coveted long-term goals. No doubt these strategic planning processes will require greater efforts for both donors and agencies promoting DRM and DRR as well as for CoPs and institutions directly involved in their own capacity development.

The next phase of the CoP program sponsored by FIU will focus on this new strategy, promoting creative and sustainable initiatives, while developing close monitoring and evaluation of results.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