



Opportunities for improving disaster management in Chile: a case study

Improving
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management

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Abstract

Purpose – This paper seeks to propose measures to improve management of rainfall-related disasters in Chile.

Design/methodology/approach – This research was carried out as a case study in the semi-arid region of Chile where above-normal rainy events occur once or twice during some rainy seasons. Measures to improve management are suggested based on theory, field data, and community participation. The method was based on a review of both the scientific literature and the local media; and a semi-structured survey that was applied to local parties, including the population affected by past disasters. Also, some participatory activities (i.e. workshops) were organized in order to include the community opinions.

Findings – Results show that there have been significant advances during the last decade in Chile regarding disaster management. Yet, improvements need to be done at the local level in order to achieve a holistic, proactive and integrative management, including community participation and sharing responsibilities. A key element is increased coordination and cooperation.

Practical implications – Benefit the communities and public agencies associated with disaster management, through practical recommendations based on theoretical issues and findings derived from fieldwork.

Originality/value – This is one of the very few scientific research efforts done in Chile based on a case study that includes social aspects (e.g. community participation, social vulnerability) and disaster management.

Keywords Rainful, Disasters, Emergency measures, Integration, Chile

Paper type Case study

Introduction

Scientific research has shown that disaster risk does not only exist because of the presence of a physical hazard, and it is compounded by the presence of vulnerable populations. Researchers suggest that more importance is to be given to the circumstances of the exposed communities that may suffer the damages (Vargas, 2002). Thus, there is a need for shifting from emergency response and recovery toward a sustainable disaster mitigation framework (McEntire, 2004; Pearce, 2003), which includes a more holistic approach and the notion of shared responsibility that involves not only public agencies but the community (Newport and Jawahar, 2003; Trim, 2004). This investigation contributes to an area of knowledge that in Chile is not well developed because only a modest amount of research with a social focus on the subject has been carried out.

This paper first describes the study area in terms of its physical, social and economic characteristics. Next, it gives theoretical and practical recommendations on



measures that would benefit both the community and the public institutions related to disaster management. These recommendations are based on current disaster management procedures collected in the study area, and literature review. Finally, the method included a community and public servants participatory process that “filtered” the research team proposal to allow for a more realistic approach tailored to local conditions.

The study area

The study area located in northern Chile, where the terrain is rugged, and subject to an on-going desertification process due to economic activities such as agriculture, logging and mining. Annual precipitation is highly variable, and frequent droughts occur followed by short periods of intensive rainfall during which few rainy events tend to cause disasters affecting the population and infrastructure. This environment is semiarid and its climate is transitional between a Mediterranean hyper arid desert and a wetter climate to the south (Paskoff, 1993). Three counties[1] were selected according to the differential:

- impacts of past disasters caused by extreme rains;
- population’s geographical distribution within the rural/urban space;
- poverty levels;
- amount of rural population; and
- approaches of county authorities in relation to disaster management.

The counties included were Ovalle, Monte Patria and Punitaqui.

Ovalle is the most populated and urban county in the province (96,976 inhabitants and 75.6 per cent urban population), followed by Monte Patria (30,067; 64.2 per cent) and Punitaqui (9,416; 70.6 per cent). An important country-city migratory process has occurred in these counties (INE, 2002). Regarding the population’s socio-economic characteristics, the counties show 22 per cent, 33 per cent, and 43 per cent of poor, and 6 per cent, 8 per cent, and 14.3 per cent of indigents, respectively (MIDEPLAN, 2000). Economic development in the area is based on agriculture, including forage production, vineyards and table grapes, fruit and vegetables, and goat raising on dry lands. Another activity is mining, based on copper, gold, silver, manganese and lead. Both activities have contributed to environmental deterioration (Schneider, 1982).

The study area has no available systematized information regarding disasters, so local newspapers and the alpha reports were reviewed. The alpha reports are issued by county governments and sent to the provincial government, where a new report with consolidated information is sent to the regional government. This process is repeated in every region from where reports are sent to the central government. These reports are part of the “Civil Protection National Plan (CPNP)” (República de Chile, 2002) and contain data on type and location of damages, and number of affected individuals (details about the CPNP are given in the next section). Also, a structured survey was applied to the affected population, and in-depth interviews were applied to social actors who deal with emergency response and disaster management.

Local sources indicate that the main disasters affecting the study area are storms, rains, flooding and landslides and, less frequently, spate and alluvium (this

classification is based on “Desinventar, Red de estudios sociales en prevención de desastres en América Latina” (La Red, 2003). Disasters are distributed differently along the study area due to spatial differences in precipitation intensities, hydrography, topography and the population’s socio-economic conditions. Thus, in certain urban sites affected by immigration, there is a higher risk of disasters due to inadequate land-use by building houses near riversides or steep hillsides.

The main impacts of these disasters are bridge and road cuts, which result in isolation of people and villages, telephone and electric grids breakage, water systems destruction, flooding of rural areas causing damages on agriculture, and flooding of urban areas resulting in damaged houses, homeless, injured and dead people.

Recommendations for disaster management improvement

These recommendations are based on the study findings, the scientific literature, and the opinions of the surveyed population and public servants.

The need of moving towards disaster management

Researchers suggest that disaster management is shifting from a traditional focus (Pearce, 2003). Salter (Pearce, 2003) summarizes this shift as follows:

- From hazard to vulnerability.
- From reactive to proactive.
- From single agency to partnerships.
- From science driven to multidisciplinary approach.
- From response management to risk management.
- From planning for communities to planning with communities.
- From communicating to communities to communicating with communities.

The discussion that follows highlights both the aspects in which there is progress toward Salter’s proposal, and those which still need additional reinforcement.

The disaster management in the area is structured by the CPNP, which is a Presidential Decree of 2002 that repealed the Emergency National Plan. The CPNP is aimed at decentralizing public administration to allow appropriate planning according to the needs of each hierarchical level in public agencies; enhancing participation of social actors; defining responsibilities of these actors; and systematizing risk assessment and standardizing the basic elements of emergency plans.

The National Bureau for Emergencies (NBE) coordinates the application of the CPNP at the national level and the administration lies on the Civil Protection National Committee, which is integrated by public and private organizations, some of which are conformed by volunteers. This Committee also exists at the regional, provincial and county levels, and they should all work collaboratively. The Committees design plans and prioritize activities given the needs of each jurisdictional area, emphasizing prevention and mitigation. However, our findings show that efforts are concentrated primarily in emergency response.

Management for risk reduction

Disaster risk implies not only the physical dimension but also social vulnerability. This concept needs to be reinforced in the study area because it has not been apprehended by all local actors. When disaster management focuses primarily on the physical phenomena, risk remains high because it does not include the relationship between disasters, development and environmental processes (Haque, 2003; Martin and Taher, 2001; Vargas, 2002).

Vulnerability is conditioned by several factors, one of the most important, but not the only one present in the study area is poverty. Our findings agree with other studies in the sense that poverty forces people to use fragile mountain terrains for housing and other needs to ensure subsistence, and hence adopt unsustainable dependencies on natural resources (Osti, 2004). Another factor is access to information, which is usually not available to the disadvantaged, the poor, the marginalized. They need to have a word in the development of mitigative strategies, especially because the deep relationship between risk management, hazard mitigation and sustainable development (Pearce, 2003).

The following proposals are sorted by topics which were the main issues addressed by our research.

i) Governance Governance in the context of this paper is defined as a process that makes people stronger as they enjoy enough freedom to establish priorities in respect to their development needs, taking into account their specific cultural and socioeconomic circumstances (Antonio, 2001). Freedom of choice includes higher levels of responsibility and, in the case of disaster prevention and management, society requires not only the State's but also the individuals' responsibility (Trim, 2004). This idea of shared responsibility is accepted by most of the interviewees. However, a passive attitude prevails in the community. Thus, a stronger effort is needed in order to sensitize and educate the community, as well as to provide opportunities, which enhance participation. In one of the studied counties the local government does not include or work with the people. This makes it difficult to make decisions regarding the provision of reasonable solutions for disaster-related problems (Pearce, 2003).

ii) Empowerment and capacity building. Paton and Bishop (Paton and Johnston, 2001) indicate that the strategies which are known as empowering the community are usually their participation, and the promotion of their perception of having control, which result in an improvement of the identification of problems by the community and the development of problem-solving strategies. This gives a sense of community, which increases its effectiveness (Paton and Johnston, 2001). On site verification shows that some of these conditions are found in Monte Patria, but not as much in Ovalle and Punitaqui, especially because some authorities lack the necessary political will to promote the creation of Committees. This is especially critical in Punitaqui, a county where poverty is high and community's participation is almost null. These two factors result in increased vulnerability (Pearce, 2003).

On the other hand, interviews with community members reveal that a very precarious community sense exists among many neighbors in all studied counties, and that individualism prevails. However, neighbors are aware that disaster management is a task that requires a sense of community. The sense of belonging and closeness increases access to and utilization of social networks, and facilitates community

involvement in disaster prevention, mitigation, and post-disaster response. Individuals who perceive themselves as not related to their community can feel isolated during disasters, and therefore do not take advantage of networks and may not receive emergency aid, which in turn increases their vulnerability (Bacharach and Zautra, 1985; Bishop *et al.*, 2000, cited by Paton and Johnston, 2001).

Another important aspect is the need of improving professional skills for disaster management in public institutions. Some public servants in the study area have been trained within the CPNP framework in disaster management. However, informants indicate that more employees serving local, provincial and regional governments need to be trained. Training has to be tailored to the local reality. This is a kind of flexibility that is allowed by the CPNP. The plan also provides a common language and terminology, which facilitates communication among individuals of different departments, agencies and the people (McEntire and Myers, 2004). Disaster managers in the study area also need to devote more time to this role, since they currently serve several functions.

Education of the community plays an important role in its empowerment; its goal is to change people's apathy concerning disasters. "Hazards education attempts to increase protective actions by people, groups and institutions by presenting information about hazard and risk" (Nathe, cited by McEntire and Myers, 2004). In the study area almost no community education in disaster management has been done.

iii) Community participation. Disaster management processes must incorporate people's participation at the local decision-making level. Participation of community has been successfully tested in several programs around the world; questions still remain as to whether the level and ways of community participation (Osti, 2004; Pearce, 2003). The CPNP provides the institutional framework for community participation, and it indicates that "...this participation should constitute a process by itself, starting at a local level and led by the county..." (República de Chile, 2002).

This plan is a law, and includes community participation by Committees, which facilitates the decision-making process, an equitable and timely distribution of aid, increasing the population's trust in the authorities (McEntire and Myers, 2004). All of these elements give this law power, authority and legitimacy across all levels of government and the community.

It is important that Committees exist at the community level and that members are free to determine, in conjunction with the local government, their action plan (Newport and Jawahar, 2003). However, a great variability was verified on site regarding the existence, composition and scope of functions of these Committees, since they depend mostly of the willingness of majors, their capacity, and the existence of community leaders. In general, the community showed a great interest in creating and participating in these Committees.

A relationship between experiencing a disaster and positive outcomes during the aftermath has been recognized (Paton *et al.*, 2000; Pearce, 2003). This is the case of Monte Patria county, where two consecutive disasters (extreme rainfalls and an earthquake in June 1997), pushed local authorities to create Committees and the community to participate in them. At the time of this research, more than 80 percent of the villages in Monte Patria had Committees, with a clear definition of roles and work division, which is necessary to achieve effectiveness in case of emergencies (Newport

and Jawahar, 2003; Osti, 2004). One of these roles is first-aid training (Pearce, 2003) that, according to the community, has been offered by the government several times, but has never been done.

Communication and teamwork are key elements of successful disaster and emergency management (Trim, 2004). It is advisable that Committees have well-defined communication channels within the village and with county authorities. It is important that the person in charge of communications to be equipped with adequate radio or telephone devices in order to keep communications with the county authorities (Newport and Jawahar, 2003). This is crucial in the study area because due to its geographical characteristics, a large number of villages suffer isolation due to excess of precipitations. In respect to teamwork, damage evaluation during the emergencies should remain in charge of community members, especially those with experience on how to carry out on-site evaluations. These individuals usually have a better knowledge of the places or families at risk.

To give Committees continuity, it is important that a minimum level of rules developed at the local level exist. Activities, definition of roles, decisions, elections of the board, etc. should be registered in a simple document (Vargas, 2002), what constitutes a pending task especially in villages of Punitaqui and Ovalle counties.

iv) Institutional coordination/cooperation. Coordination and its evolution towards cooperation (Hills, 1994) are key issues for emergency planning and during rescue operations. Cooperation during disasters is relevant and is a way to build relationships, and should help to dispel mistrust and hostility between public organizations (Trim, 2004). In Chile, the CPNP proposes a way of organizing tasks that includes a definition of functions, political, legal, scientific, technical and operative responsibilities. It also proposes inter-institutional coordination in both vertical and horizontal ways, including participation of government's personnel in each hierarchical level, the community, as well as the police, the military and fire departments, among others. The police, for example, is called during the emergency to guard against looting (Trim, 2004). However, interviewed people in rural areas feel safe to leave their houses if needed. Such is not the case in cities, where police is needed more intensively. However, in the study area, the police, the military and fire department not always coordinate during emergencies.

Hence, in spite of the plan more efforts are needed at the local levels that include the community, because in the study area, coordination mostly takes place between public agencies and during the emergency. According to interviewees, periodic coordination meetings are necessary to increase knowledge and hence stimulate the coordination and cooperation. These two concepts allow for advancement toward a preventive view.

v) Contingency planning. A contingency plan for emergency has to be prepared involving all groups (Newport and Jawahar, 2003). Design and implementation of these plans in the study area is an on-going process, that has occurred primarily in the Monte Patria county.

These plans need to improve the inter-organizational coordination and communication, and establish the responsibilities of key members, also help identify resources that a community may need (McEntire and Myers, 2004). More details regarding how to design these plans are not discussed here but are described by, for example, McEntire and Myers, 2004.

One of the most important elements of contingency plans is to warn the population (McEntire and Myers, 2004). In Chile, the NBE has an early warning center, through which information about potential or real destructive events is provided. The interviewees in the study area confirm that the early warning system is used by public organizations. This information is complemented with internet, TV and radio.

vi) Others aspects. Another aspect of disaster management is reconstruction (Osti, 2004). Oliver-Smith (1994) suggests that reconstruction needs to be based on a priority assessment, consulting to and with the participation of the affected parties. In the study area local communities have been involved in the improvement of infrastructure (e.g. roads and bridges) by providing hand labor. Another example is the relocation of the village “Pajaritos de Higuera,” located in an area of high risk of landslides. This initiative combined the effort of the community and relevant public institutions.

Technology is a necessary tool to improve risk management. Several existing computer models are capable of generating maps showing areas of high, intermediates and low risk of disaster (Van Westen *et al.*, 2000; Kovel, 2000). Also, technology can be used to map vulnerable areas and societal groups, and the information can be updated regularly (McEntire and Myers, 2004; Newport and Jawahar, 2003). In the study area, some efforts include maps of “critical points” developed by some counties and public institutions. However, not all of these maps are updated regularly, and they only cover a part of the area. Moreover, in many cases they are not available to other interested parties. Therefore, if these maps were shared, the task of developing sound management practices would be easier. Local development of this type of tools is indispensable, especially in regions of complex geography, as in Chile.

Regarding resource allocation, Anderson (1994) states that not assigning resources for prevention and management is inefficient and uneconomical. In Chile, for emergency responses, the CPNP establishes a “stepwise use of resources” mechanism. This mechanism defines the way in which financial resources are allocated: first, the county uses its own resources. If they are not enough, more funds must be requested to the following level of the government, all the way up to the central government. However, according to the interviewees, financial resources during rainy years are relatively low compared to the needs. Specifically, in the study area the risk management annual budget is very limited and mainly spent in emergencies response.

Another aspect that needs to be considered is the role of the media in prevention, during and after the emergency. In the area, radios and local papers, have been an effective aid, but in some cases inadequate information provided by the media has generated confusion, as it has been reported by Trim (2004) for other communities.

Conclusions

The present case study increased our understanding about the ways in which disaster management is performed in a particular area in Chile. The case study complemented with information provided by the literature, allows to suggest recommendations that would result in an improvement of risk management practices in the country.

A great effort has been conducted by Chile’s government, through the National Bureau for Emergencies, to change the focus from emergency to disaster management in a more holistic view. However, many issues need to be improved, of which the most important relate to community participation, especially that of the poor. Also, more

coordination/cooperation, education, professionalism, prevention, permanent reconstruction, systematization of information, zoning including hazards, the use of technology (e.g. GIS, aerial photographs) and social vulnerability studies are needed.

Note

1. Chile is organized administratively in Regions, Provinces and counties.

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