

Bogotá, Colombia

Disaster Risk Management Profile

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Disaster Risk Management Profile



1 Introduction

Demographic, economic, social and cultural characteristics

The Republic of Colombia is located in the most north-occidental corner of Latin America; it is the only South American country with coastlines on both Pacific Ocean and Caribbean Sea and also a place with one of the most complex tectonic systems since it is located where the Nazca South American and Caribbean plates meet. Colombia has been subjected to important seismic and volcanic activity in the past, but its complex topography also shows both, landslide and flooding prone zones.

Colombia's economy is based on the agricultural exports (14%), mainly coffee; the industrial sector (32%), textile, oil, clothing, emerald; and provision of services (54%).

Sitting high on top of the Andes mountains (2,640 meters above sea level), Bogotá is Colombia's 465 year-old capital with a population of 6.760.000 people. This city is Colombia's main governmental, financial, cultural, and service center. It is also an urban environment of "extreme" contrasts.

Despite its economic output and growing character as a global city, Bogotá

suffers from social and economic inequalities, lack of affordable housing, and overcrowding. Notwithstanding major improvements in governance, infrastructure, public space, and quality of life, many of them of international renown, Bogotá is still challenged by environmental sustainability, economic inequality, security and administrative matters. El Tiempo newspaper recently published wealth studies that establish that the income of 80% of the homes does not even represent half of the remaining 20% of homes. This means that economic inequality characterizes the city: 40% of the city's income stays in only 7% of the population.

Bogotá has actively embraced an alternative vision of urban development that seeks to attain the social and economic growth of the city through the modernization of its political and administrative structures, the effective enhancement of quality of life indexes (especially in the areas of public health and education), and the adequate provision of public spaces in the form of parks, bicycle paths, sidewalks, etc.

Regarding disaster risk management, the city of Bogotá has also sustained efforts to improve emergency response capacity while progressively incorporating disaster prevention and mitigation policies and bringing them to the attention of the broader community, in an effort often recognized at the regional and international levels.

Governance style

Colombia is a Democratic Republic where the executive branch tends to dominate over the government structure. The president of the Republic is both the chief of the state and head of the government. The legislative branch has a bicameral Congress, members are elected by popular vote and constituents of two dominant parties mainly integrate it. For administrative purposes, the country is divided into 32 departments and one capital District which is Bogotá, where the country's administration is seated.

National hazardscape

During the past century, Colombia suffered the impact of several damaging earthquakes, tsunamis, volcanic eruptions, landslides and floods. Among the most severe we can mention the tsunami and earthquake of Tumaco in 1906

(MW 9.2), the eruption of El Ruiz (Armero-1985), the Pereira earthquake of 1995, the Eje Cafetero earthquake (1999), and a number of landslides and flooding during extreme rainy periods or El Niño events, particularly those in 1997-1998.

These severe impacts that have affected Colombia motivated the authorities to promote a more effective coordination among different actors involved in the whole process of Disaster Risk Management, which major milestones can be summarized as follows:

- Decree 919/1989, Establishment of the National Secretary for Disaster Prevention and Attention.
- 1547 Act, National Calamity Fund is Established
- 60 Act/1993, Pre-assigned resources for Disaster Prevention and Attention from the national budget.
- 99 Act/1993, Safe Environment Law
- Decree 969/1995, National Network of Natural Reserves
- 388 Act/1997, National Land Development Plan
- 400 Act/1998, Seismic Code becomes a national law
- Decree 93/1998, National Plan for Disaster Prevention and Attention
- Decree 332/2004, District Plan for Disaster Prevention and Attention

The City's Present Political Commitment to Risk Management Actions

For more than a decade -since the creation of Bogotá's Fund for the Prevention and Attention of Emergencies FOPAE in 1987- the city has been taking important steps in risk prevention, mitigation and emergency preparedness. As a result, Bogotá has accomplished great advances in institutional, organizational, technical and legal development. Important results have been achieved on risk knowledge, territorial ordering, mitigation works, relocation of families living on high-risk zones, structural reinforcement, education, participation and institutional capacity building for the System for the Prevention and Attention of Emergencies.

The city's Development Plan: Bogotá Without Indifference (2004-2008) in its attempt to build a more inclusive and participative city, has given special relevance to risk reduction and emergency preparedness policies based on the fact that the most vulnerable communities, regarding risk and disasters, are

usually exposed and affected by profound economical, social and cultural dangers as well.

Even though the present administration has kept important programs on risk analysis, risk reduction and emergency preparedness, it has also promoted new macro programs like the Local Risk Management Strategy and the Implementation of the Earthquake Response Plan in Bogotá.

The city has conceived risk reduction actions as essential aspects in the creation of a more modern and humane city. This is why for the period 2004-2008, the District's administration has invested 28 million dollars in the Fund for the Prevention and Attention of Emergencies¹ in order to strengthen the relation between risk management and the development policy within its 20 localities.

Risk Management: A Global Concern

Risk reduction is a global and local challenge. On one hand, it is increasingly important since the loses in case of a major event would postpone social investment and strategies to attack poverty, hunger, basic sanitary programs, alphabetization, as it would also postpone actions for the protection of the environment and employment generation, not only due to the general crisis but also because of the damages in infrastructure and basic living conditions. On the other hand, we must recognize that risk is the result of inappropriate development measures which now call to be revised. The recent development policies and the Objectives for the Millenium are vehicles to reduce vulnerability and promote risk mitigation.

The Declaration of Hyogo was adopted in the frame of the Global Conference for Risk Reduction which took place in January 2005. This declaration recognizes and emphasizes that disasters seriously undermine development investment in short terms lapses and, therefore, they still represent a meaningful impediment for sustainable development and poverty eradication. All nations are called to reduce vulnerability of societies in order to alleviate the

¹ Amount that is superior to the minimum established by the city's council agreement number 11 (1987) which states that the Fund must receive annually 0.5% of Bogota's regular income.

suffering caused by hazards. In this sense a prevention and resilience culture in what regards disasters is considered a sound investment and should be promoted in all levels. Risk reduction policies should be integrated to programs for sustainable development and poverty reduction. In Hyogo's framework (2005-2015) substantial risk reduction is expected in terms of life protection, social, economical and cultural resources in all communities and countries. The recent strategies adopted by the organizations in charge of risk mitigation and emergency attention adhere to the goals established at Hyogo. The majority of the efforts in this matter intend to strengthen Bogotá's resilience capacity in face of disasters and to minimize vulnerability in the SDPAE by enhancing the citizen's capacity of self-protection and by the unification of all possible actors in a spirit of cooperation. It also promotes policies for recuperation and reconstruction in order to integrate risk reduction parameters in the whole city's process.

National Commitment

Since the District and National governments reside in Bogotá, the articulation and harmonization of competences is a great challenge. A major disaster in Bogotá is also a political threat. Consequently, the programs adopted recognize local and national responsibility. The National Plan for Prevention and Attention of Disasters in Colombia (PNPAD) sets decentralization as a fundamental principle. This means that territorial entities become responsible in risk reduction policies leaving the general definition and coordination actions a commitment of the National government. Nevertheless, the PNPAD calls for the harmony, consistency and coherence among all the territorial instances involved.

According to the PNPAD, the District is in charge of the development of risk reduction policies within the city such as institutional preparation and the promotion of citizen awareness. In case of a major event it has to coordinate technical, operative and political actions with the national ones in order to control the crisis and to prosecute recovery and reconstruction processes. The general objective is to standardize processes and procedures in order to articulate all the territorial instances and guarantee an effective response in light of the principles of coincidence, complementariness and subsidization.

The Strengthening of the System for Prevention and Attention of Emergencies

After the disasters in Popayán (1983) and Armero (1985), and in accordance with a World-wide dynamic, the Colombian State is currently developing a process which aims to gradually modify the conception of risk and risk management. The process largely expresses itself in the normative field and institutional organization which now counts with the National System for Prevention and Attention of Disasters (SNPAD) and the National Plan for Prevention and Attention of Disasters (PNPAD). This last one is in charge of giving the general outlines in risk agency within the country.

The SNPAD is conformed by public and private agencies responsible for the prevention, mitigation and attention of disasters, as well as of the rehabilitation of zones affected by natural or non intentional human disasters. Its primordial characteristic is decentralization which makes of local organisms responsible of carrying out risk management actions, and regional and national organisms are responsible of providing subsidiary support.

In Bogotá the organization of risk management is divided in the FOPAE as a fund for resources and DPAE as a coordination entity which reunites and articulates public, private and communitarian actors. This organization already has solid connections with local committees and private organizations in the city. With this program, the DPAE directs to strengthen links with the SNPAD, CREPAD and CLOPAD. At the end, this program should allow an elastic adjustment between all instances in order adopt an appropriate strategy for risk management in the city. The entire process of adjustment is regulated and counts with legal parameters to define the responsibility of all the actors.

National disaster management structure and relevant legislation

The National Disaster Prevention and Attention System was established in 1989 through the 919 executive decree and it operates under the Ministry of the Interior and Justice. The national agency responsible for disaster management is the Dirección Nacional de Prevención y Atención de Desastres (DNPAD, diregen@dgpapad.gov.co).

The country counts with a National Plan for Disaster Prevention and Attention, which has been designed as a major tool to facilitate planning actions within

different economical, social, administrative and political sectors. Additional relevant documents produced under this system are the *Guidelines to Act in Case of a Sudden Natural Disaster with National Impact* and more recently the *Guidelines to Produce Sectorial Emergency Plans* which are being promoted at different levels of the administrative organization, both in departments, municipalities and cities. An organizational chart of the system is depicted on Fig. 1.

The National Committee provides guidance and defines mechanisms to execute and evaluate the National Plan for Disaster Prevention and Attention, it also provides the national government with all the information and recommends actions to be taken in case of a national emergency. The national calamity fund is set aside from the national budget to provide any economic support in case of a disaster, it can also be used to maintain sanitary conditions in the affected communities and finance the installation and operation of equipment and information systems.

National System for Disaster Prevention and

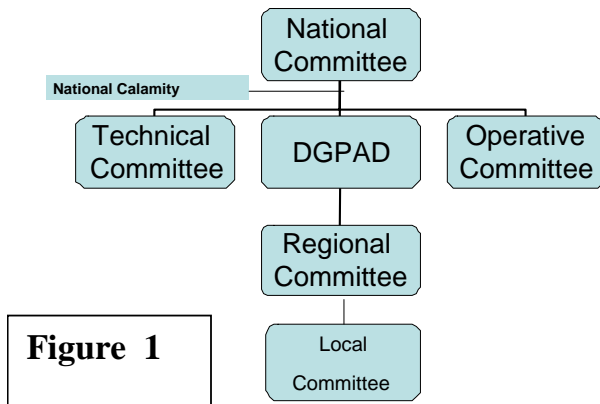


Figure 1

The Technical Committee plays an advisory role and is integrated by 14 different advisory commissions and 6 National Services. The Operative Committee carries out the general coordination of all actions related to disaster situations.

Finally, the Regional and Local Committees advise and coordinate the activities of both public and private organizations in light of a specific disaster; they are in charge of developing specialized studies like hazard vulnerability or risk evaluation with the support of different technical organizations.

National land use management system and relevant legislation

The Ministry of Environment, Housing and Land Development² was created in 2003 via executive decree No. 216. Its main role is to contribute to the sustained development of the nation through the design and implementation of sound policies regarding land use, urban planning, housing and environmental protection.

Under this legislative framework, the National Directorate for Land Planning of this ministry is in charge of providing guidance to the Municipalities and Regional Administrative Corporations (CARs) to develop their own territorial and land use management plans (Planes de Ordenamiento Territorial, POTs), complying with national criteria but taking into considerations local needs. This new frame was adopted by the different municipalities in 1998.

The POT is conceived as a local development strategic plan that should incorporate a sound evaluation of the physical, economic and legislative aspects of the territory it regulates. Exchange with the national and regional levels is welcomed as means of sharing experience, techniques and assuring accomplishment of the national and regional objectives.

The national development plan 2003-2006 counts with the following legislation: Law 388 of 1997, related to revision and approval of POTs; Law 64 of 2000 and the Executive Decree 1729 of 2002 that provide lines for a compatible regional development and grant legal framework for the POTs at the national level.

Significance of the city to the Nation

Bogotá is the most important political, administrative, economic and cultural center of the country. This city has been the seat of all the national administrative institutions for a very long time; therefore almost all the legal, economical and social processes are somehow related to organisms in the capital district. The stability of the whole country largely depends on the stability

² Ministerio de Ambiente, Vivienda y Desarrollo Territorial, www.minambiente.gov.co

of this city.

Bogotá's population was 4,945,448 according to the 1993 census. The National Statistics Department's (DANE, www.dane.gov.co) determined in a recent census that the population of the whole metropolitan area sums up to 7,881,156 in 2005 of which 6,990,000 inhabit Bogotá city's area: the population density is of 4,550 inhabitants per squared meter; the total area of the city is 1776 squared km of which only 385 squared km is considered as urban area. The statistics indicate that there has been a significant growth in the population rate and it also demonstrates the process of urban immigration that the whole country is suffering not only due to industrialization processes, but also due to violence and poverty. Bogotá is a city that provides a large coverage of basic utilities, which is an indicator of development, but it still counts with alarming unemployment, poverty and misery indexes. In 2003, there was an unemployment rate of 17,4%; In 2000, 3,193,170 people lived in poverty conditions and 959,238 in extreme poverty conditions. Paradoxically, the perception of progress in the city is evident, especially in the fields of security, transportation and citizenship. These contradictions are a constant challenge for governors.

The main sectors of the economy in the city are identified as services and utilities (69.3%), manufacturing (15.2%) and primary sector (agriculture and mining) (15.5%). In the year 2003, Bogotá's GDP added up to 50 billion pesos which represents 23% of the national GDP. It may be stated that the whole nation greatly depends on the stability of the city. Furthermore, being the largest commercial, industrial and cultural center in the northern part of South America, the whole region participates in promoting the city's growth, but it also depends on its stability.

Geographical setting of the City

Bogotá is located in a savannah of the high plateau of the eastern Andean mountain range at 2,640 meters above sea level. The city is framed by a mountain system mainly in the east and is crossed by important rivers such as the Tunjuelo, Fucha and Juan Amarillo —located in the southern area of the city— which flow into the highly contaminated Bogotá River. The total area of the city is 1776 squared km and 385 squared km of urban area. The territory

used to be a lake which explains the number of wetlands that may still be found in non urbanized areas.

The city counts with a region that is considered a natural reserve and is protected by environmental laws called Sumapaz which is larger than the city itself. It is considered one of the largest barren plateaus in the world. This area is considered one of the 20 localities that constitute Bogotá.

Adjacent municipalities such as Soacha, Chía, Cota, Mosquera, Funza, Madrid and La Calera form part of the urban area of the city even if they are independent municipalities adscribed to the Cundinamarca Department. They add over nine hundred thousand inhabitants to the urban area of Bogotá.

2 *Inter-City Linkages*

Internal division of the City

The relationship between the national and city government is described as decentralized. Following the 1991 constitution, Colombia has established a decentralized, participative and pluralist model. Through the political acknowledgement of the ethnical and cultural differences in the country, the central government gives autonomy to the local authorities to define their own development plans and budgets, once they cover some basic health and education quotas.

Bogotá, as the capital district, has a special status and has no dependency to the regional government. Regarding the national level, the city must follow the national guidelines disposed in the national development plan, but has the ability to determine its own priorities and action plans.

In addition, there are 20 administrative units or localities that encompass Bogotá city which are shown of Fig. 2. These localities are also in a process of decentralization from the central Mayor's office. Each one counts with an assigned local mayor and an elected town council that have political decision power and a budget to invest according to the local plan.

Figure 2. Bogotá Administrative Division

Bogotá has experienced autonomous processes that have generated profound development gaps between the city and its surroundings. Nevertheless, Bogotá is currently implementing a development plan that acknowledges the need to integrate the city

within the region of Cundinamarca framework as a metropolitan area in order to create an extensive economic growth and social development.

Governance/management style

Given Bogotá's condition as Capital District, it has a very unique political-administrative organization: a Grand Mayor (Alcalde Mayor) and a Council integrated by 42 members, both popularly elected for 4 year tenures. They represent, respectively, the political and administrative authorities of the city. Each one of the localities has its own Local Administrative Body or Junta Administrativa Local (JAL), which is elected also by popular vote. The Local Mayors are designated by the Grand Mayor from a list of three members appointed by the JALs.

This organization aims to improve local participation and strengthen the decentralization process started in 1991. This has proved to be a very good mechanism to integrate the community in all levels of planning and organization. For example, the Land Use and Management Plans, POTs in Spanish, are the result of a long and well-planned process of consultations among different groups of the society and there is a Local Development Plan for each of the twenty localities in the city that determine the investment of the Local Development Funds under a highly participative communitarian consultation scheme.

Relevant legislation/regulations

The 1991 constitution is the main instrument that provides for decentralization and local participation at the decision levels; it was complemented in 1993 with the specific law for Bogotá as capital district. Executive Decrees 425 of 1995 and 739 of 1998 provide incentives and regulate the participatory mechanisms for local planning. On the other hand, specific laws related to urban and land management, both of them having the same tendency to support decentralization, complement this suite of legal instruments; they are Law 9 of 1989 and Law 388 of 1997. In the year 2000, an agreement that (Acuerdo 13, 2000) regulates the community participation in the design of the local development plans is signed. Recently, the city's government issued the Decree 332, 2004 in which the regime and organization for disaster attention and prevention in Bogotá is established.

3 Land Use Management

Relevant legislation

There are specific laws that incorporate disaster planning and management components. For instance, law 99 of 1993 declares high risk zones as protection lands and Decree 619 of 2000 establishes that vital lines from public utilities must develop hazard and risk studies considering both functional and physical vulnerability. The Territorial Ordering Plan (POT) of 2000 has mapped risk areas and regulates processes within those risk zones. The Decree 332 of 2004 establishes that any public or private entity that may generate any kind of public risk must present a risk analysis, contingency plans and prevention and mitigation programs. Other laws that involve risk management in relation to land use may be the following: Bogotá's Construction Code, Decree No. 252 (January 28, 1004) establishes the obligation to hold risk studies in case of rubble clearance in constructions and all the norms relative to the resettlement of families living in high risk areas (see Sound Practice: Resettlement of Families Living in High Risk Areas), among others.

Responsible agents and their relationship

Regarding Land Use several elements ought to be mentioned. In first place,

DPAE emits risk concepts in order to legalize and regulate the use of land, taking into account not only natural but also technological hazards. Secondly, there are district risk mitigation action plans that several entities have agreed and which must be acknowledged in any land study. Thirdly, the 20 localities that integrate Bogotá have included an emergency component in their local development plans that emphasizes on community training, risk knowledge and mitigation works according to the specific qualities of their geography.

In terms of the planning and management component, landslides on high risk zones where no mitigation works are possible are declared protection land. Occupation is restricted in these areas as well as in those considered high risk flood zones. Accordingly, in order to obtain building licenses, building enterprises must develop risk studies and mitigation works for landslides high risk zones as stipulated in the Territorial Ordering Plan (POT). Informal Settlements statistics (2003) estimate that 184.842 people live in informal settlements with 34.230 informal housing units. There are 173 slum or squatter communities that count for 0.14% of the total land area. It should be taken into consideration, however, that the city's administration has developed a massive legalization program since 1995 reducing the number of informal settlements from 1451 to its current number.

There are regulations that consider hazards for land use and planning purposes. Bogotá received the new millennium with a Territorial Ordering Plan - POT that incorporates risk reduction in land use and planning processes. The 2000 POT contains hazards and risk maps that determine land use, special treatment for high-risk areas, building licenses and utilities and services master plans, among others.

The city also counts on an institutional and community based networks, to control illegal land occupation, and develops a massive relocation program for families living in high risk conditions.

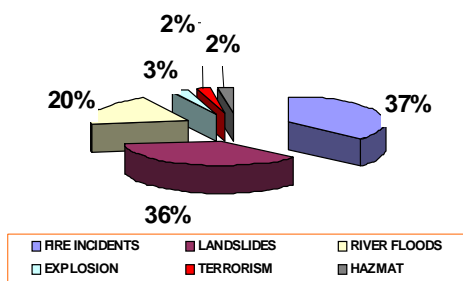
4 Vulnerability Issues

Hazards

The occurrence of a **seismic event** is by far the most critic situation that threatens Bogotá. The high levels of human, goods and economical loses most

probably would destabilize the whole country. Bogotá is located in an intermediate seismic zone and the microzonation study suggests five different types of soils for design purposes ranging from hard soils in the highlands to soft ones in the filled up ravines. Seismic activity is associated to three seismogenic zones: the subduction in the Pacific Coast, the eastern and foot hill faulting system, which is the most dangerous one, and other minor local faults.

On a daily basis the city faces the impact of **flooding** due to the vicinity of three rivers that cross the city: Juan Amarillo River, Tunjuelito River and Bogota River. **Landslides** are very frequent particularly in the hills area due to erosion, flow of mud and debris during heavy rains. **Wild fires** also take place because of drastic temperature swoops.



In fact, between 1999 and 2003, out of the total emergency calls DPAE attended, 37% reported fires, 36% accounted for landslides and 20% had its origins in floods; the remaining 7% are related to explosions, terrorist attacks and technological hazards.

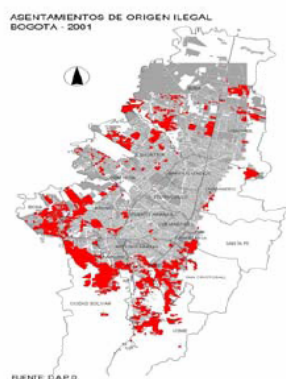
Most recent recorded disasters include: a huge landslide that affected 100 to 150 hectares near the sectors called La Carbonera and El Espino (Phase 1, 2001; Phase 2, 2003) and had an impact on 2965 households who were later relocated under a program established by DPAE. The Tunjuelito River Flood (2002) where 2109 people lost their homes; unfortunately, economic loss assessments have not been done. The Social Club "El Nogal" terrorist attack (2003) which resulted in 38 casualties and around 8.450.000 USD in losses. The Agustiniano Norte Scholar Bus Traffic Accident (2004) resulting in the death of 21 boys and 1 bus assistant. The heavy rainy season on November 17 to 20, 2004, produced 134 landslides in the hilly sides of the city, 4 debris and mud flows and flooding of the Limas and Yomasa ravines, affecting 883 families in three different areas of the city. In May 2006 the state of emergency was decreed (Decree 146, 2006) because of the rainy season and the floodings it caused in the sector known as El Codito. The following is the map of responsibilities set during this state of emergency:

CONTINGENCY PLAN		
OBJETIVE	AREAS OF INTERVENTION	ENTITIES
Landslide and Storm Risk Control	Mitigation works	DPAE
	Stabilization of transportation problems	IDU - SOP
	Resettlement of families	CVP - DABS - DPAE
	Monitoring and inspection of the affected area	DPAE
Flooding and environmental risk control	Basin Management, mantainment and monitoring	E.A.A.B - DPAE
	Transitory relocation of families	IDU - SOP
	Mitigation of environmental damage	CVP - DABS- DPAE
		UESP
Emergency Preparations	Equipment and tools	DPAE - FDL
	Humanitarian Help	DPAE
	Communication and information system	DABS -DPAE
Emergency Preparations	Operative support groups	DPAE
		DAMA
		CVP
	Public Information	DPAE - E.A.A.B. - UESP
Health Prevention and Attention	Epidemic control	DPAE
	Environmental Health	DAMA
	Hospitalary Attention	CVP

At-risk groups

During the last 30 years the city has witnessed an aggressive and disorganized urbanization process that has pushed informal settlers to build their homes in highly unstable zones corresponding to the slopes, filled in ravines or zones that can be subjected to inundations.

ILLEGAL URBAN OCUPATION IN BOGOTA



AREA: 6.400 Ha.
 18 % URBAN AREA
 POPULATION: 1'400.000
 22% POPULATION
 NUMBER OF HOUSES 368.065

Around 10.000 families are currently engaged in the landslide and flooding relocation. 2400 have been already relocated.

Eighteen percent of the urban area has been occupied by informal constructions, housing almost 1,400,000 persons, approximately 22% of the urban population which corresponds approximately to 368.065 dwellings.

The city's built area is 48.000 Hectares, 910 of them correspond to high landslide prone zones. Highly exposed population located in non-mitigable landslides prone zones account for

4200 families (Barbart and Carreno, 2004).

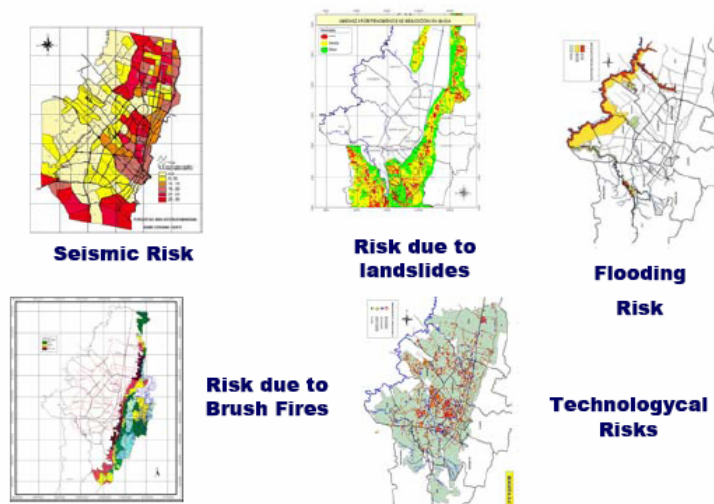
The oriental hills, which are very vulnerable to wild fires, are monitored through several watchmen who are distributed all along the city, there are also two 10-persons brigades engaged by the Civil Defense, under the patronage of DPAE that are working directly with the community of fire prevention and mitigation on the most vulnerable zones of the city. Following a similar initiative, the city has also created a prevention and control brigade that involves public entities, private organizations and the community to avoid illegal urban settlements.

Several risk identification methods have been put in place in the city; they include record of disaster hazard events, hazard maps, studies on physical and social vulnerability, studies on environmental degradation, studies of process linked to disaster occurrence, and technical visits by DPAE's personnel to identify landslides and floods in high risk prone zones.

At-risk locations

Bogotá is one of the cities in the world that counts on detailed information regarding vulnerability and risk identification associated to different hazards, based on GIS platforms. Estimated losses and risky sites have been identified in each one of the 20 administrative units that integrate the city.

RISK AND VULNERABILITY ASSESSMENT IN BOGOTA



City policies on vulnerability alleviation

One of the most significant programs that the city and DPAE have implemented is the relocation of families living in dangerous sites, while at the same time strong mechanisms have been devised to avoid new settlements on flooding

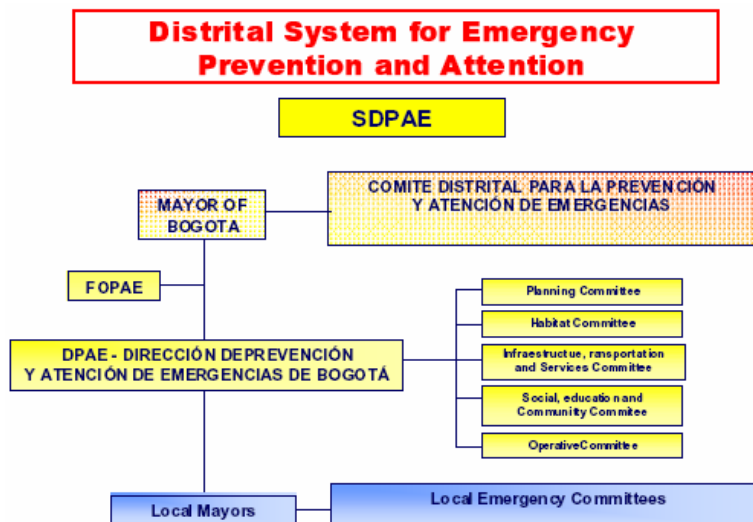
and landslide prone areas. Relevant to this objective is a sustained program of disaster risk awareness through several programs addressed to different groups of the society.

5 Disaster Risk Management Arrangements

Functional arrangements

After suffering the severe impact of different natural disasters, Colombia understood that the best way of dealing with disaster risk management was through a solid institutionalization in the local governments. This process of institutionalization has resulted in the formulation of Decree 332 which clarifies the responsibilities of all the actors in the theme of emergencies and disasters. For instance, the laws and regulations recently forwarded give the possibility to declare a District state of emergency and empower the city Mayor to control, organize and implement recuperation plans in case of a large scale disaster.

Bogotá established the District System for Emergency Prevention and Attention (SDPAE), which does not depend on the regional or national levels. This system provides the institutional mechanisms to pursue common strategies amongst localities in order to strengthen the city's risk and disaster management capacity. Accordingly, land use regulations and development are integrated to the functions of the city government. The emergency system points out that all the public and private organizations must deal with policies, regulations, procedures, methodologies and resources which contribute to reducing human and economic losses in a coordinated manner.



The city body in charge is DPAE, which coordinates the city's Disaster Reduction and Emergency Response System. DPAE has a staff of 130 persons working full-time, out of which 110 are dealing with disaster management. The

whole District Plan is integrated by around 41 governmental, community and private organizations that have specialized personnel in risk prevention and emergency attention within their specific missions (health, social services, city development, city planning, rescue groups, etc).

Economic Resources are provided through the FOPAE, which is the city's Fund for Emergency Prevention and Attention and is nurtured by the 0.5% of all the taxes that the district collects; in addition, it has other specific money transfers that can be allocated based on the political will of the Mayor and the City Council. Specific Budgets are allocated to other institutions members of the System (SDPAE) to execute specific projects and programs related to DRM, which usually respond to a comprehensive planning process.

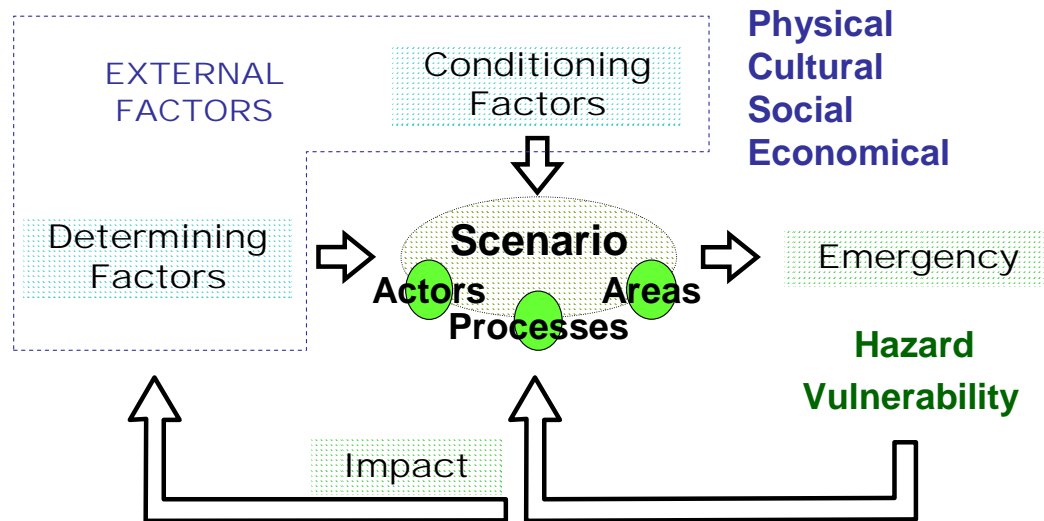
The District Plan for the Attention and Prevention of Emergencies

Experts in risk management have projected a 10-year risk management policy for the city of Bogotá and formulated an Emergency Prevention and Attention Plan (PDPAE). This long term plan is the concerted institutional answer to Decree 332, 2004 which regulates and organizes the District System for the Prevention and Attention of Emergencies. This Master Plan is the first of its kind in the nation and includes 1) risk management policy for the period 2005-2015 2) responsible institutions/agencies 3) strategic areas and sectors 4) objectives, goals and indicators 5) programs and projects.

What is innovative about this approach is the type of planning used in its formulation, in the sense that instead of using the traditional risk planning based on hazards or risk management policies, it is build upon a systemic approach based on risk partial scenarios which include: 1) real people linked to each other by social and economical daily relations 2) developing daily activities that use, occupy and transform 3) a specific territory delimited by those social relations.

The new systemic approach may be sketched as follows:

Architecture Under the Eco-Systemic Approach

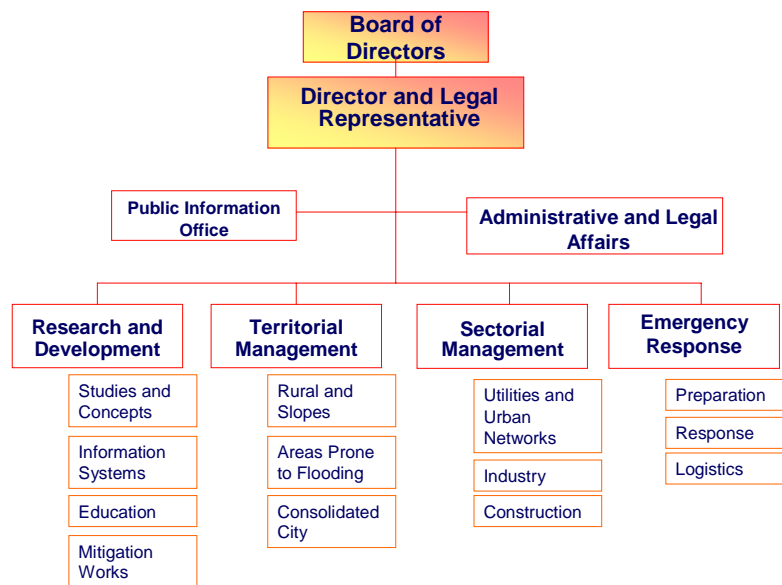


The eco-systemic approach indicates that for risk management actions an integral perception of risk is required: risk management in Bogotá is compelled to consider external factors, internal factors such as actors, processes and areas, the risk and vulnerability in face of the different hazards and the impact that all the processes and risk management actions may actually have over the living conditions in general.

Bogotá has defined territorial (rural and natural areas, slopes, flooding prone areas and consolidated city) and sectoral scenarios (building sector, industry and trade, utilities and urban networks, massive events). This implies a decentralization process and a new perspective of risk management: the starting point is no longer the hazard but each different scenario. In addition, the new systemic approach gives out guidelines to construct risk management agendas which include general objectives, specific objectives, intervention instruments and programs for each scenario. The agendas, therefore, include what wants to be accomplished, steps to attain the general objectives, the tools and techniques required to meet the goals and the formulation of practices that indicate how these instruments need to be applied in order to accomplish the

general objectives. (See Sound Practice: Emergency Prevention and Attention Plan for the city of Bogotá - PDPAE). Agendas are currently being designed and discussed in a largely participative process.

After the formulation process of the Plan the structure had to adjust to the risk management partial scenarios. Therefore, the new organization has a Territorial Management Coordination and a Sectorial Management Coordination as the core structure; the Research and Development Coordination and the Emergency Coordination support the activities of the other two areas as follows:



Risk Assessment

A disaster and loss estimate is not systematically recorded however DESINVENTAR a data base system designed by LA RED is currently being updated not only for the city of Bogotá, but for the whole country and different local government units.

There are instrumentation networks to monitor hazards that include accelographic and pluviometric networks. The local accelographic network is one of the best equipped in Latin America, located not only at ground level but also on different types of structures as to characterize their dynamic characteristics, is part of the national one and is currently operated by the

National Geological Service INGEOMINAS. At the same time, Pluviometers are operated by the Meteorology and Hydrology National Service. A monitoring telemetric system is also being operated by the DPAE in the Río Tunjuelo

Bogotá with the support of local and international organizations has developed detailed studies to identify risk and estimate losses for each different hazard in the city. As a result, there are studies that define a seismic microzonation and which expose vulnerability assessment and retrofitting alternatives for hospitals, schools and other essential buildings. These are some of the products available in the city.

For additional information, SIRE at www.sire.gov.co can be consulted; all sorts of maps and available documents can be downloaded from this site.

Risk Communication

Community participation in mitigation and emergency preparedness is promoted through media, handbooks and community training. Moreover, there are training and education processes regarding risk management that involve: hazard and disaster topics included into formal education, teaching guides for primary and secondary levels, and specialization courses offered at universities.

After the formulation of the PDPAE and the implementation process that has already started, a whole new perception of indicators is adopted. This responds to the fact that the construction of concerted agendas among different risk management actors allows a new approach to goals and results. The objectives are very specific and adapted to partial management scenarios, therefore, results may be followed up periodically in a qualitative and quantitative manner according to each risk scenario and the project is proposes.

DPAE has taken very seriously a continuous process of evaluation and retrofitting to improve its institutional capacity and impact on the five working areas of the program. In self-interest to communicate this evaluation to other stakeholders, but particularly to the lay community as to promote and provide incentives for a participatory process, DPAE has developed the following matrix that refers to the advances they have had and which could be easily understood by the lay community.

The following simple schemes were used to give an overview of other general areas in risk management:

Sectoral Overview

	Habitat	Public Services	Infrastructure and Transportation	Mining	Health	Education
Knowledge						
Planning						
Mitigation						
Emergency						

Important sectors of the economy linked to development, such as housing, public services, health, education, mining, etc. when they are compared with activities such as capacity building or knowledge, use of planning instruments, mitigation efforts or emergency management may indicate the general situation of the city in risk management. The same comparative chart may be done to evaluate the disaster and risk management situation in Bogotá in relation to different hazards.

State of DRM in Bogota

	Knowledge	Prevention and Mitigation	Preparedness and Emergency	Rehabilitation and Reconstruction	Risk Transfer
Landslides					
Flooding					
Bush Fires					
Earthquakes					
Structural Fires					
Technological Risks					

6 Disaster Risk Management Vision

Bogotá's Development Plan 2004-2008, under its section 12, numeral 4, when referring to urban policies and environmental sustainability states: "the main purpose of environmental management is to assure water, air and soil quality control, reduce level of contamination even at the sensorial level, preserve biodiversity, look for climatic stability and reduce risks associated with the impact of natural, technological and biological hazards". This indicates that risk management is necessarily engaged with the protection of the environment. In addition, recent policies refer to the importance of organizing the communities and designing horizontal communication strategies. It is, therefore, important to establish clear social priorities and aim to make of risk management a way to generate a more equal society by improving the living conditions of marginal communities. All in all, risk management in Bogotá overcomes mere technical matters and is understood holistically as a way to promote a democratic society and governance.

DPAE argues that future development and consolidation of the risk management system (SDPAE) should be seen as one of the main objectives of the city. Important steps have already been taken with the formulation and implementation of the PDPAE. The thought behind is to promote and develop practices that have an integral perception of risk management which considers: a) possible damage scenarios b) organizational models, protocols and procedures c) logistics d) interagency, private and community training in operative aspects e) public information and community resilience f) emergency information systems and communication systems g) rehabilitation and sustainable development plans h) legal aspects i) financial aspects j) inter-agency coordination. It is also important to decentralize risk management in order to make it more effective, to procure a solid decision making capacity of the authorities and a strong coordination among the members of the system and the community.

7 Issues

Fernando Ramirez, Director of DPAE, estimates that there have been huge accomplishments in terms of environmental and urban planning, as well as emergency attendance readiness in Bogotá, nevertheless, the city is far from getting to the required levels of preparation.

The city of Bogotá has identified several specific aspects that need to be improved regarding DRM, among them, and maybe one of the most significant, relates to finding appropriate mechanisms to transfer risks. It is clear that there is little culture of ensuring private or public assets, it is important to develop a national strategy, but the capital city can be a very good starting point given its public importance.

The concept that a complex process such as disaster reduction and mitigation makes us all co-responsible has not been fully understood by the private sector and the community at large, most of the effort has come from the public sector only, so additional efforts to incorporate other stakeholders in the process are desired.

Sustained advance on different regulations, standards and codes has been shown in Colombia and the city has embraced them, but enforcement mechanisms are still weak and need to be revised.

On the emergency response, rehabilitation and recovery, the evaluation is very positive particularly when the city has to deal with most frequent events such as landslides and flooding, but there is still a long way to go if the city would like to be reasonably prepared to what they have called the “critical event”, as a severe earthquake in the city, for example.

Another challenge that the city faces is the control of illegal settlements, particularly those in risky places like landslides and flooding prone zones. In addition, a sustained program to avoid environmental degradation as a major cause of risk creation is still to be designed.

8 References

Primary data source:

Results of the questionnaire survey of disaster risk management practices conducted by the EMI-EdM between May and August 2004, and a series of presentations made by Mr. Fernando Ramirez Director of DPAE at the InterAmerican Conference of Disaster Risk Reduction held in Manizales-Colombia on October, 2004 and the Thematic Session organized by EMI for the ISDR-WCDR in Kobe-Japan on January 2005. The update process was followed by Diana González during May and June 2006.

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