

Kobe: Developing a Resilient City

PROFILE

City of Kobe, Japan

Population: 1,506,112

Land Area: 550 km²

Municipal Budget: US\$16 billion

STRATEGY

Accelerate the Transition to Sustainable Communities and Cities

CHALLENGE

To repair the physical, social and economic degradation resulting from a major earthquake, and lessen the potential for loss of life and other damage in the future.

GOAL

To realize a safe, active, attractive and collaborative Kobe through cooperation among the municipal government and active and educated community networks.¹ Its original intention is to “revive” Kobe, not just “restore” the city.²

ACTION

Physically restore the city’s infrastructure and revive the city through a plan that addresses physical, social and institutional issues ultimately creating a resilient community better able to withstand natural disasters

ABSTRACT

The City of Kobe suffered a vast disaster as a result of the Great Hanshin-Awaji Earthquake, January 17, 1995. The ten-year long Kobe Revival Plan (the KRP) physically restored the city in the five years after the disaster, focusing on rehabilitating civic life and economy.

Involving all stakeholders of community management, the process has progressed in highly effective manner. In the second half of its implementation, the KRP is now aiming to revive the city in a more sustainable way at the community level. The plan will work within context of multi-reliant disaster management, focusing on physical, social and political improvement.

CASE

The City of Kobe

The City of Kobe is 3.5 hours away from Tokyo by bullet train, and forms the focal point for the western-Japanese economy together with Osaka and Kyoto (see Map 1). Divided by the

Rokko Mountain Range, the south (coast) side of the city is highly urbanized and industrialized, while the other parts are under hybrid (residential and commercial) development or remained rural. The south part, with 30% of the municipal land (approx. 165 km²), is home to 70% of the population (approx. 1 million).³

Map 1: The Location of Kobe



(Source: <http://www.city.kobe.jp/cityoffice/06/033/outline.htm>)

Kobe has been actively attracting business⁴ by committing physical (land) development since the late 1960s.⁵ This urban development method brought significant economic growth to Kobe. However, as business environment was radically changed after the end of the “bubble” economy era, and demand on land declined in earlier 1990s, this method became obsolete.⁶

Daily health service is sufficient. There are 106 hospitals and 1,480 clinics with 20,286 beds (as of April 1, 2001) in Kobe, which provides 1 hospital or clinic per 938 people and 1 bed per 75.

Kobe’s environmental focuses are on water and air quality, and waste control. The former is mainly controlled by ordinances and economic incentives, while the latter is promoted through informal public-private cooperation. Additionally, “Blooming Kobe,” a campaign to fill the city with flowers and greenery, driven by an informal relationship.⁷

The Great Hanshin-Awaji Earthquake

Kobe experienced the immense disaster after the earthquake on January 17, 1995, which is called the Great Hanshin-Awaji Earthquake (see Figure 2 for detailed damage description). A large number of houses, business facilities and transportation infrastructures were collapsed and/or burnt, and most lifelines became inoperative.⁸



Photo 1: Collapsed expressway after the quake.⁹

As is shown in the Figure 2, the majority of the victims were the elderly and people who lived in poorly built structures. About 20% of the disaster victims in the inner city lived in houses built before 1960, which means the district had been out of urban redevelopment activities. Since water and expressways failed, and streets of the district were too narrow for fire trucks to operate, large-scale life-saving activities were not available where they were needed most.¹⁰

Institutional procedure inefficiency made the secondary disaster more serious. Lack of effective information and order flow among national, prefecture and municipal governments slowed down life-saving activities immediately after the quake. Poor medical, food and housing supply for considerable period of time after the quake seriously inconvenienced evacuees. Financial support from the government to restore personal housing was not immediately available after the quake. Thus, emergence survival and restoration ability of private property were dependent on personal financial capability.¹¹

Figure 2: Description of the Disaster (City of Kobe)	
Time and Date of Occurrence:	5:46 am, January 17, 1995
Force:	7.3 on the Richter scale
Depth:	approx. 16km
<u>Human Damage</u>	
Death:	4,571
% of death over 60:	58%
% of crushed or suffocation:	73%
Injured:	14,678
<u>Structural Damage to Buildings</u>	
Fully collapsed:	67,421 structures (approx. 82,000 damaged)
<u>Fire Damage</u>	
Completely burned:	6,965 structures
<u>Damage to Public Utilities</u>	
Power	Citywide Failure
Telephone	25% Failure
Water	Almost Citywide Failure
Gas	80% Failure
Sewage	2 Reduced Capacity and 1 Inoperative of 7
Refuse	All Inoperative
source:	http://www.city.kobe.jp/cityoffice/06/013/report/1-2-j.html http://www.city.kobe.jp/cityoffice/06/033/earthquake.htm

The Need for Disaster-Resistant City

The Great Hanshin-Awaji Earthquake crystallized that Kobe was not disaster-resistant physically, socially, economically and institutionally. Kobe needed to have new development scheme. In June 1995, the city established the ten-year Kobe Revival Plan (the KRP).

The KRP is to revive Kobe by fostering community, economy and culture within a multistakeholder decision-making process. In the short term, quick restoration of urban infrastructure was the focus, while a “disaster-proof” society was the long-term aim.

The short-term outcome was to restore Kobe physically, socially and economically, helping

victims of the quake. Meanwhile, since communities with strong human ties showed great life-saving operation, the process was to highlight improvements to the physical and social durability of communities. As a result, the KRP was a mixture of customary scheme for public infrastructure development¹² and more collaborative and self-determine community management strategies (see Figure 3).

Figure 3: Achievement of the KRP in its First Five Years.

Restoring and Reviving Kobe				
Safety		Activity	Attractiveness	Collaborative
Civic Life Rehabilitation	Durable Community	Economic Restoration	Attractive Town	Joint Town Development
<ul style="list-style-type: none"> • Providing houses, promoting employment and securing sufficient medial service • Rezoning and redevelopment in areas seriously damaged • Lobbying national government to establish a law for individual financial support 	<ul style="list-style-type: none"> • Improving durability of lifelines and infrastructures, and providing information of related issues • Adopting the Safe Community Ordinance to promote collaboration among citizen, business and municipal government 	<ul style="list-style-type: none"> • Supporting existing small-middle class business financially, and arousing new business • Restoring and improving the Kobe Port to revive logistics such as through implementing information networks 	<ul style="list-style-type: none"> • Developing information network facilities • Developing urban amenities for disaster evacuation networking riverbeds, parks and roads 	<ul style="list-style-type: none"> • Promoting communicative community for welfare and disaster resistance recognizing importance of mutual support against disaster

After five years of operation, Kobe evaluated the KRP in 1999, involving the public through 14 workshops and a survey of 10,000 residents.¹³ The achievements of the first five years of the KRP operation were evaluated by following perspectives: rehabilitating civic life, restoring the economy, developing an attractive town, promoting collaboration and establishing a durable community. Researchers in surrounding universities participated in the process as advisors and also did separate assessment of the plan. Both agreed with the considerable achievement of restoration effort in highly efficient manner through collaboration among citizens including volunteers from other cities, experts, business and the municipal government. On the other hand, hastened restoration projects brought problems such as conflict over private land ownership and community degradation. Additionally, the revision of the KRP itself is an achievement as a political improvement, because the concrete evaluation of long-term plans does not happen often in Japanese public management.

Achievements and Problems

Civic Life Rehabilitation

Civic life rehabilitation was the main focus of the first part of the KRP, including such things as providing sufficient medical service, restoring housing facilities and promoting employment. Urban physical restoration was concentrated primarily in three years after the quake. From October 1995 to April 1999, 34,920 residents were built.¹⁴ As the restoration of private property was basically dependent on personal financial capability, not only residence distribution, but job promotion and monetary support were necessary to assure affordability. Holistic support plans for specific sectors of the community were established two years after the quake.

A national act to provide funds to sufferers of natural disaster was established after the quake. To expand governmental financial support, municipalities in Japan lobbied the national government to establish the law. It was effective retroactive to the victims of the Great Hanshin-Awaji Earthquake. Based on the act, Kobe provided personal financial support. The act contributed considerably to improving the affordability of private property restoration.

As the inner city needed overall restoration due to its serious damage, Kobe rezoned the area. Since residents had lived in shelters away from the area for a while,¹⁵ and the area was rezoned, pre-existing communities need to be re-established. This has been a focus of the second part of the KRP, looking at civic life rehabilitation.

The Nishi Municipal Hospital that was severely damaged by the quake is now a primary disaster-resistant health care facility.¹⁶

Economic Restoration

Kobe has been supporting the rehabilitation of existing businesses financially and technically within the given institutional framework. Meanwhile, the physical restoration of public facilities such as port, roads and railways were completed in about two years after the quake. However, the business environment of Kobe had not been the same due to the time of restoration period. Reviving Kobe's economy continues to be a focus of the KRP.

Attractive Kobe

As facilities have been restored, cultural activities are reviving, unified by the disaster experience. In terms of disaster management, expansion and networking open spaces and developing information infrastructures have been achieved. The urban environment sensitivity is being promoted through an ordinance adopted in 1997. Throughout these activities, the physical restoration of an attractive Kobe is addressing the KRP's long-term goal of creating a durable community.

Collaboration

Community-based organizations (CBO) are recognized as major contributor to implementation of the KRP including life-saving activities immediately after the quake. As victims who had to move have had difficulty blending into new communities, CBOs have been helping them settle. Efforts to develop durable, welfare community are being implemented. The movement is no longer a restoration strategy, but already an alternative scheme of public management adopted by the municipality.

Durable Community

Kobe is implementing physical and social durability improvement at the community level. Community-based educational programs¹⁷ about disaster prevention are underway: workshops for fostering 1,357 community leaders (1996-1999), 115 seminars for 2,822 residents in 1999, etc.¹⁸ Meanwhile, administratively, fire department has revised its organization and tactics applying the state-of-art information systems and fire-fighting equipments.

Analysis

The physical restoration of the city has been achieved as planned, or at an even faster pace, and in an efficient manner. However, it was difficult for Kobe to identify appropriate solutions (acute and top-down or long-term and participatory) immediately after the quake because the restoration work was pressed for time. Some policies applied were inappropriate as a result. Taking rezoning and redevelopment for example, a top-down approach was adopted for quickness of restoration, but it has caused severe conflicts in several communities over publicizing private lands and land ownership.¹⁹ Going forward the KRP will need to solve the existing planning problems, implementing social and political improvement.

The municipal government recognizes issues for continued working under the three pillars of civic life rehabilitation, urban activity restoration and durable communities. More concretely, remaining problems related to community re-establishment in rezoned areas, creating alternative shape of business, and integrating physical structures and social, economical and political improvement for disaster prevention.

Going Forward

The desired outcome going forward is to revive Kobe implementing intergenerational and interclass support to citizens, and integrating these activities into the general administrative structure (see Figure 4). Unsolved issues are to be blended in to this framework. As the three main strategies—civic life, urban activities, durable communities—are inter-related, the desired outcomes of the subordinate strategies are closely related. For example, more environmentally-sensitive town development will lead to an alternative community-based economy, resulting improved public health.

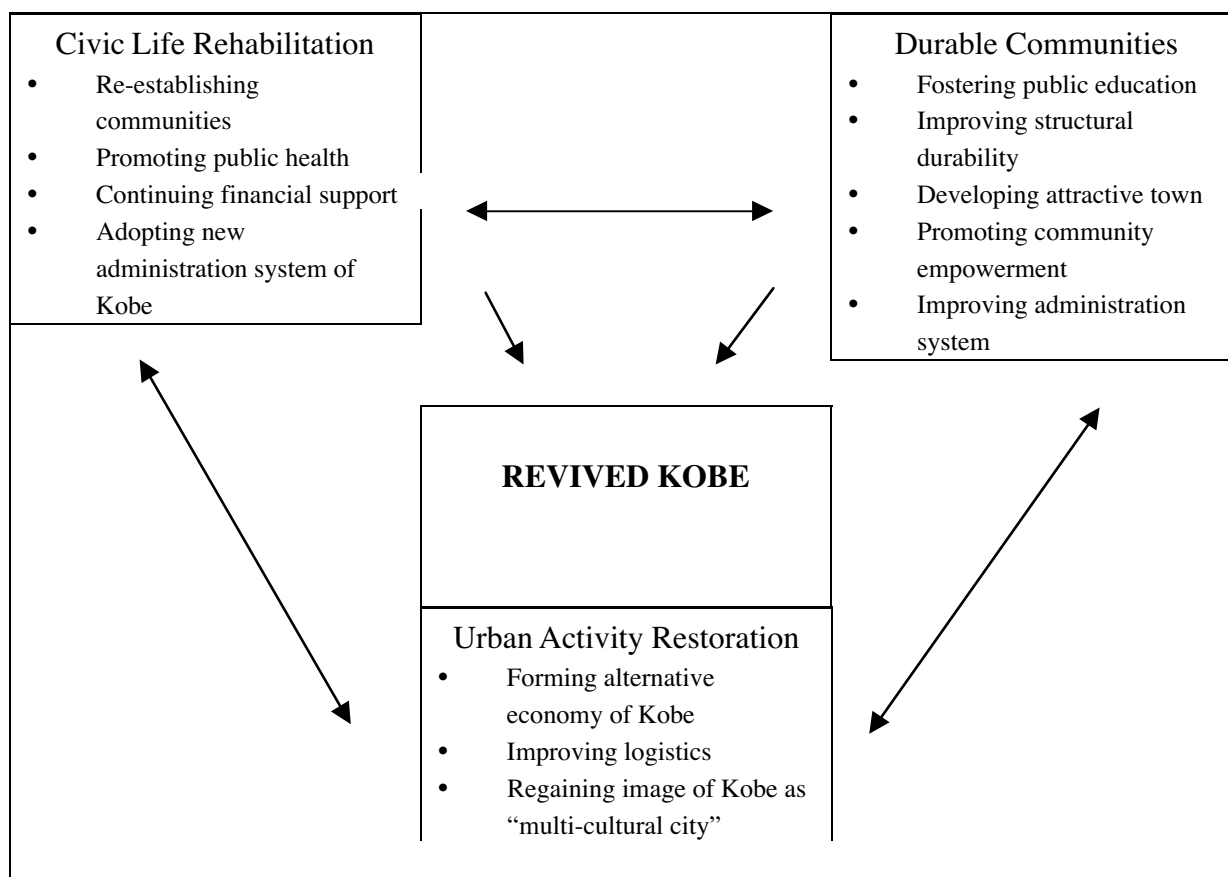
Issues

In 2000, the Kobe municipal government announced after public input that physical restoration had been completed in the first five years of the KRP. Issues still to be addressed include:

- civic life needs to be rehabilitated at daily life basis (intergenerational and interclass communication, medical care improvement, etc.),
- economy, as citizens' income basis, has to be revived,
- urban development for disaster-prevention has to be continued and maintained.²⁰

These issues address tasks to satisfy desired outcome of the long-term plan, which are not directly caused by the quake, but generated and/or identified throughout the restoration process. Therefore, the next phase is to strategically complete the plan's goal while adjusting to the recognized problems.

Figure 4: Conceptual Structure of the KRP to Create a Revived Kobe.



(Source: <http://www.city.kobe.jp/cityoffice/06/013/program/2-2.htm>)

Strategic Unit for Implementation

Kobe strategically adopted the community as driving units of the KRP implementation. Traditionally, communities-- elementary school districts in Kobe--have taken on organizational structures such as those created through community bond practices since late 1960s and town development roundtables (TDR) since early 1980s. The function of the community ties was found to be important in the disaster. Kobe established Disaster-Prevention and Welfare Communities (DWCs) to implement the disaster management approach in the KRP. According to the tradition, the unit is divided by elementary school district, which each hold about 10,000 people. Presently, 178 DWCs have been established, representing almost all of the school districts. The unit is expected to input public comments, check durability of structures, and host disaster simulation event and workshop. Similar activities are sometimes operated by TDRs.²¹

Indicator of Successful Application

Through surveys, workshops and consulting experts, Kobe has established 45 quantitative indicators in 2002 for the progressive management of the 16 programs related to subordinated strategies (see Figure 5). Each indicator has numerical objective to be achieved by 2005 or after. Progressive report will be presented annually to the public. When all the objectives are achieved, the KRP will be considered to be completed.

Figure 5: Indicators for the KRP.

Indicator	Present Point	as of	Goal	Due
Participation of elderly for community	38.10%	March 2000	60%	March 2006
A number of elderly-care support CBOs	93% (161 SDs*)	January 2002	100% (172 SDs)	March 2006
Participation of youth for community	10-12: 80% 13-15: 73% 16-18: 42%	March 2000	10-12: 85% 13-15: 75% 16-18: 45%	March 2005
Business facilities reuse financial support	4 shopping streets	March 2001	10 shopping streets	March 2005
Community business financial support	9 communities	March 2001	30 communities	March 2005
TDR establishment	93% (160 SDs)	March 2000	100% (172 SDs)	March 2005
TDR agenda development	37% (64 SDs)	March 2000	100% (172 SDs)	March 2005
DWU establishment	97% (167 SDs)	January 2002	100% (172 SDs)	March 2005
Housing durability inspection	60% passed	March 2000	75% passed	March 2003
Port processing quantity	40 million tons	March 2000	55 million tons	March 2005

*SD=School District

The list above shows progressive status of activities related to issues specifically recognized. The organizational basis has been established for communities as driving units of disaster prevention, welfare and intergenerational communication. However, business-related activities seem to be struggling. Kobe's gross municipal product has been hovering around 80% of 1994 (before the quake) after quick comeback in the two years after the quake, mainly due to national-level recession.²²

With restored infrastructures and established CBOs, the remaining issues are reviving the economy and dealing with social stratum. Thus, Kobe's next challenge in coming three years will be to integrate them with actual community re-establishment in communicative manner so the newly-developed community can revive existing industries and arouse alternative business opportunities. Meanwhile, public surveys (by mobilizing TDRs and/or DWCs to understand public satisfaction in terms of qualitative progression of the KRP will be needed.

RESULTS

Kobe has achieved quick physical restore of urban structures through both top-down and collaborative approaches. Throughout the process, social improvements have also been implemented. Some communities found that human ties are actual a counter force against vulnerability to disaster. Also, the connection definitely improved the projects' effectiveness for restoration. However, there are severe conflicts in several communities over publicizing private lands for rezoning and redevelopment. Fostering community function where it does

not exist will be a crucial social objective.

Politically, realizing more appropriate identification of policy approaches by issues in more systematic manner when facing great disaster will be Kobe's next challenge, dealing with status-quo that is physical-growth oriented. Having this change happened would also help Kobe's management scheme be more environmentally sustainable.

LESSONS LEARNED

Kobe's experience provides four major lessons. First, an educated and empowered community is practical unit for disaster management. Considering that governmental function would not be very active immediately after the vast disaster, fostering communities with self-helping ability is highly important.

Second, physical durability of structures is the basic requirement to be a disaster-proof city. Since structural demolition is clearly predictable, it is necessary for local authorities to devise countermeasures.

Third, institutional preparedness such as security of information and order flow (among governments, between municipal government and residents, and among residents) and injury logistics are highly important. In order to keep the institutional procedure active, it is important to operate it on a daily basis, not for disaster prevention, but for such things as community events.²³ Neglecting these factors will delay life-saving activities and make disasters unnecessarily bigger.

Fourth, identification of appropriate policy approaches for restoration is greatly favored even under frightened circumstances to reduce conflict after launch restoration programs. The City of Kobe would have preferred to hasten the institutional supply of necessities however rezoning and redevelopment projects could have been implemented more slowly to increase community involvement. Necessities can and should be dealt with quickly while longer-term restoration requires community consultation.

KEY REPLICATION FACTORS

Countermeasures that should be prepared within disaster management are roughly divided into three steps by timescales: emergency, short-term care and long-term restoration. The first two steps should be done by top-down attitude for necessarily quick decisions, while the last one is better implemented with a participatory approach for accountability of the outcome. These steps are needed to prepare emergency logistics flow of the necessities while respecting the basic human rights of victims. The steps progress more effectively and efficiently if cooperative culture exists among residents, experts, business and governments. To establish appropriate countermeasures under imminent situation, it would be useful to prepare a set of guidelines shared by all stakeholders.

Kobe has established a database of the city officials' experience regarding disaster management and restoration. The database is open for public, and other municipalities can obtain specific details of Kobe for disaster management. Also, upon request, Kobe sends their officials to disaster-damaged city.²⁴

Budget and Financing

The City of Kobe has been main provider of staff and facility for restoration activities of the KRP. The national government helped Kobe financially for the first year (1995) with amount of 3.4 trillion yen from the special account in order to rebuild Kobe physically.²⁵ At the very beginning, surrounding cities provided staff to Kobe until the city had become fairly stable. Although the staff support from other local governments is no longer available, financial support from the national government is maintained at the amount of 120 billion yen annually. As the KRP and related projects are estimated to cost 12 trillion yen for ten years to implement,²⁶ instead of national support, Kobe still has to find financial, staff and facility source by itself for long-term program of the KRP.

KEY CONTACT

(for data that was provided by the City of Kobe)

Yuichi Honjo, Section Chief, General Planning Division

Naoya Ando, Section Chief, Planning Division

City of Kobe

Kanoh-cho 6-5-1, Chuoh-ku

Kobe, 650-8570, Japan

Tel: +81-78/322-5029/5030

Fax: +81-78/3232-6009

NOTES

¹ www.city.kobe.jp/cityoffice/06/013/program/1-1.htm

² Kobe has defined “restoration” as “building the city as it was before the quake”, while “revival” means “making it better (more sustainable) than before.”

³ www.city.kobe.jp/cityoffice/06/033/outline.htm

⁴ Port related industries (steel production, shipbuilding, shipping and warehouses) and fashion/lifestyle industries (apparel, shoes and foods).

⁵ The method was issuing long-term municipal bonds to develop and sell lands to companies, then redeeming them with income from the land sales.

⁶ Okuchi, 1999.

⁷ www.city.kobe.jp/cityoffice/06/033/environment.htm

⁸ The development method is adopted not only by Kobe, but by many other Japanese cities, with risks similar disaster to those cities (Miyamoto, 1998).

⁹ www.city.kobe.jp/cityoffice/06/033/earthquake.htm

¹⁰ Miyamoto, 1998.

¹¹ Miyamoto, 1998.

¹² Takada, 1998.

¹³ www.city.kobe.jp/cityoffice/06/013/program/1-1.htm

¹⁴ www.city.kobe.jp/cityoffice/06/013/report/2-2.htm

¹⁵ Due to legal constraints, shelters have to be built on public land. Building shelters on private land is considered to be private property support with revenue, which is currently not acceptable by law (Ando, 2002).

¹⁶ www.city.kobe.jp/cityoffice/06/033/health.htm

¹⁷ Programs are still active presently.

¹⁸ Kobe Fire Department, 2002.

¹⁹ Miyamoto, 1998 and Tsuji, 1998.

²⁰ www.city.kobe.jp/cityoffice/06/013/program/1-1.htm

²¹ Honjo, 2002 and Ando, 2002.

²² Honjo, 2002.

²³ Honjo 2002.

²⁴ Ando, 2002.

²⁵ Miyamoto, 1998.

²⁶ Miyamoto, 1998.

REFERENCES

(Note: Most of references below are written in Japanese.)

Ando, Naoya. Section Chief, Planning and Coordination Division, the City of Kobe. April 15, 2002. *Personal communication with author.*

City of Kobe. March 2002, *City of Kobe Website* [www.city.kobe.jp].

Honjo, Yuichi. Section Chief, General Planning Division, the City of Kobe. April 15, 2002. *Personal communication with author.*

Kobe Fire-Fighting Department. 2002. *Progressive Report on Restoration and Reorganization of Fire-Fighting Department.*

Miyamoto, Kenichi. 1998. "Problems and Scopes of Revival Plan," *The Great Hanshin-Awaji Earthquake Overall Research*. Ritsumeikan University, p. 97-116.

Okuchi, Renichi. 1999. "Reviving the City," *The Great Hanshin-Awaji Earthquake Studies Series 4 –After 5 Years*. Kobe University, p.31-32.

Takada, Noboru. 1998. "Problems and Scopes of Revival Plan," *The Great Hanshin-Awaji Earthquake Overall Research*. Ritsumeikan University, p. 303.

Tsuji, Katsuji. 1998. "Social System Improvement –Proposal for Kobe Revival Plan," *The Great Hanshin-Awaji Earthquake Overall Research*. Ritsumeikan University, p.599.

ACKNOWLEDGEMENTS

Researcher and Author: Yoichi Kumagai

Special thanks to Michie Kishigami.

Local Strategies for Accelerating Sustainability: Case Studies of Local Government Success

This case study is part of [Local Strategies for Accelerating Sustainability: Case Studies of Local Government Success](http://www3.iclei.org/localstrategies). www3.iclei.org/localstrategies

This series of case studies highlights the diverse ways in which local governments and their partners have instituted strategies for action that are accelerating the transition to sustainable, equitable and secure communities. The series was prepared as part of the local government contribution to the [UN World Summit on Sustainable Development](http://www.un.org/summit) (Johannesburg, South

Africa, 2002). www.iclei.org/johannesburg2002

The case studies were researched, written and produced with financial support from the Ministry of Housing, Spatial Planning and the Environment, The Netherlands.

© May 2002, ICLEI-Canada. All Rights Reserved.

*ICLEI World Secretariat
City Hall, West Tower, 16th Floor, Toronto, Ontario, Canada, M5H 2N2
Tel: +1-416-392-1462; Fax: +1-416/392-1478
Email: iclei@iclei.org; Web: www.iclei.org*

Surat, India

Rapid population increases coupled with a poor solid waste management system left the City of Surat, India, open for an outbreak of the plague in 1994. Decentralizing the city into regional management centers and increasing the accountability of the municipal bureaucracy resulted in a remarkably clean and responsive city within 18 months. Citizens became directly involved in monitoring waste management, local authorities were held to rigid evaluations and strict waste management policies were enforced.

*(Sources: World Resources Institute, UN Environment Programme, UN Development Programme, and The World Bank. 1996. "The Black Death Revisited: India's 1994 Plague Epidemic," World Resources 1996-7. Oxford University Press.
and Globe Net. March 2002.*

*Cleanliness campaign in Surat: A case study on administrative initiatives.
[www.globenet.org/preceup/pages/ang/chapitre/capitali/cas/surat_r.htm].)*

Sudbury, Canada

Only 30 years ago, the City of Greater Sudbury, Canada, was a barren "moonscape," the result of 100 years of careless mining and industry. In 1973, Sudbury brought together a multidisciplinary committee, including scientists and community groups, to rebuild and restore the region's plant and animal life. Since then, more than 11 million trees have been planted with over 6 million of these coming through Sudbury's Land Reclamation Program. The city is now regarded as one of the world's finest examples of environmental resiliency in reclaiming damaged landscapes. Although half of the city's land still requires reclamation work, the city is committed to enhancing and sustaining a healthy environment for residents through the restoration and protection of air, land and water resources.

*(Source: City of Greater Sudbury. 2002. Website
[www.city.greatersudbury.on.ca].)*