



City Outlook

The origin of Hanoi dates back to more than 2,000 years when the capital of the Au Lac dynasty, which lasted for only 50 years, was Co Loa. The ensuing thousand years witnessed the rise and fall of various dynasties (Dinh, Ly, Tran, Ho, Le, Mac, Nguyen) that brought with them changes in the location of the capital as well. In 1883, France's colonization of Vietnam began and the French Indochina Union was born. Hanoi became the capital of French Indochina (consisting of Viet Nam, Lao and Cambodia). Up to the end of the 19th century, France exercised a lake-centered planning and expanded the city area from the Hanoi citadel and the Ancient Quarter toward the southeast.

In 1946, the Vietnamese Democratic Republic was formed and Hanoi was declared as its capital. Since 1976 Hanoi has served as the capital of the Socialist Republic of Vietnam.

Hanoi city population is 3,118,200 with a population density of 3,385 persons per square kilometer.

Working age population comprised between 17 to 64 years-old accounts for 67%.

Hanoi experienced various flood disasters. In 1945 and 1971, it was facing catastrophic floods which resulted in heavy losses (USD 51.5 million and USD 79.9 million respectively). In 1996, another flood disaster led to

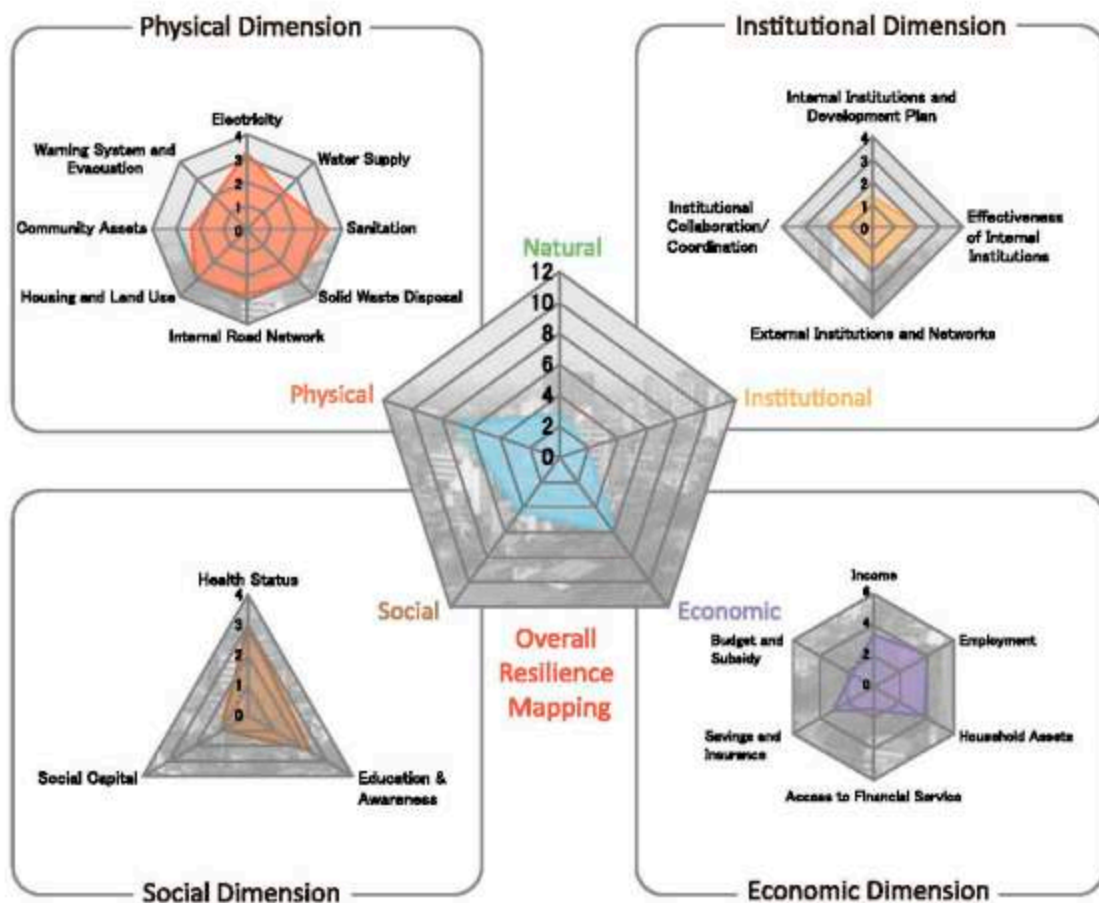
USD 5 million losses for the city.

In 2008, Vietnam experienced its worst rain in 35 years in storms that sparked flooding across large part of the country, hitting Hanoi severely during which 22 people reportedly died.

[Source: Hanoi City Questionnaire Survey ; <http://www.tinquehuong.wordpress.com>]



Analysis Result



Policy Point

Strong focus on flood management and dyke control suggests that disaster concerns always remained priority in Hanoi. However, added attention should be given to improve social and Institutional dimensions of resilience.

Outreach of early warning system to city's relevant institutions as well as communities needs serious attention. Similarly, establishment of evacuation centers should also be considered an equally top priority.

Awareness about 'hazards Hanoi is prone to' can be spread by targeted community based education programs in such a way that it also builds social capital.

Economic resilience can be augmented by two pronged approach. Firstly by improving access to financial services with built-in safety component and secondly by increasing budget and subsidy based incentives to disaster risk reduction.

As a capital city with presence of multiple institutions, external and internal institutional coordination remains a challenge. However, 'Climate disaster Resilience' if given priority, can provide a common link to enhance institutional networking.



City Outlook

In 1998, Saigon-Ho Chi Minh City celebrated its 300th anniversary, but the period of the 75 years between 1623 and 1698 may be regarded as the time in which Saigon was founded. In 1976, after the reunification, the National Assembly unanimously decided to rename Saigon-Cholon-Gia Dinh as Ho Chi Minh City. Bearing the name of Uncle Ho is a big honor for the city and at the same time requires high responsibility for building and protecting the country.

Since liberation, Ho Chi Minh City has contributed a great deal to socialist and national construction and defense. Politburo's Resolution 01 (1982) stipulates that Ho Chi Minh City has a political position just behind Hanoi, the capital. It is endowed with favorable conditions that cannot be found elsewhere. It has great potential for developing industry, exports, tourism and services. In coordination with other localities, Ho Chi Minh City is forming an agro-industrial economic structure for the country's socio-economic development.

The city has a population of 8 million inhabitants and a population growth rate of 10%. Population density is 4,000 persons per square kilometer. Working age population (17 to 64 years old) accounts for 66.4% of

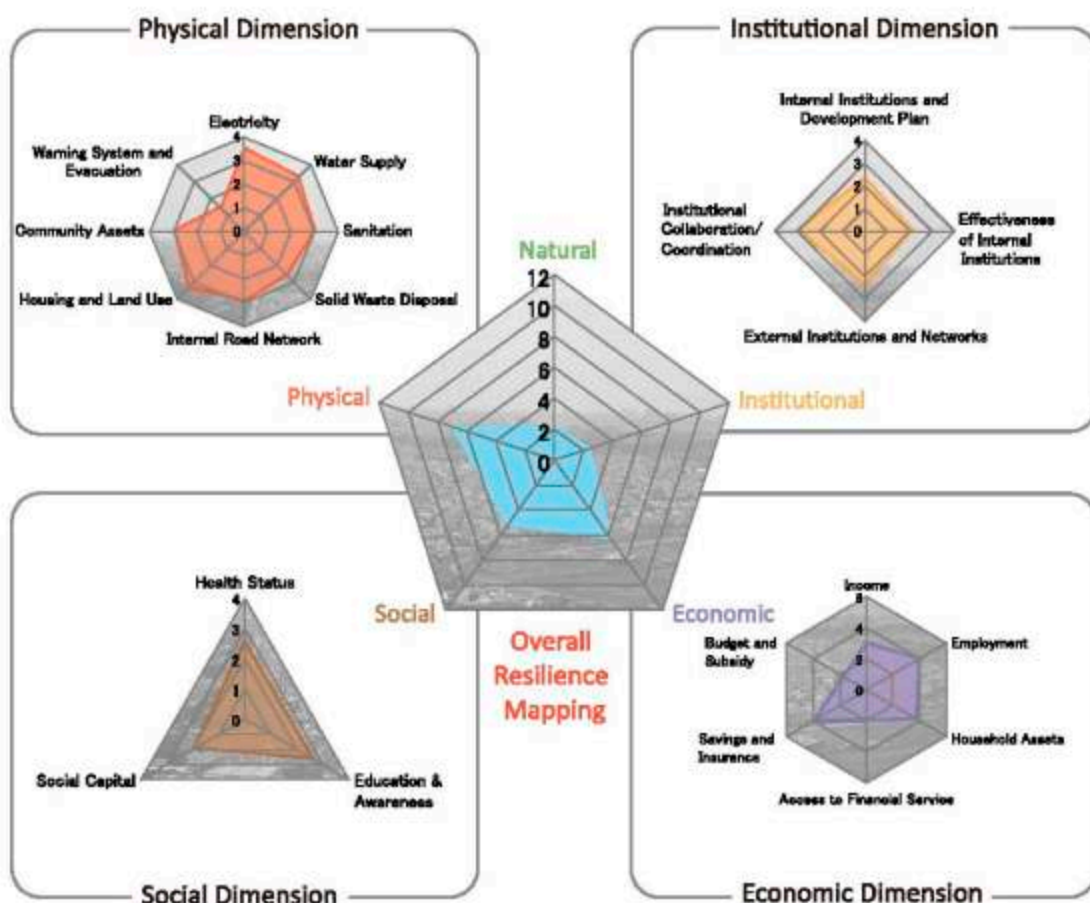
total population.

The city experienced an earthquake in 2006 with minor damages. It regularly faces so-called normal floods on an annual basis. In December 2008, many areas of Ho Chi Minh City remain submerged after the highest flood tide in 49 years swamped the city.

[Source: Ho Chi Minh City Questionnaire Survey ; <http://www.saigon-gpdaily.com.vn>]



Analysis Result



Policy Point

Being the largest city of Vietnam located in Mekong delta, citizens possess better awareness about risks and adopted 'living with flood' approach. Yet, it is crucial to develop systematic and advance levels of warning system to offset possibilities of potential loss of lives in case of unprecedented climate induced disasters.

Development of evacuation centers should also find priority and community perceptions and conveniences may be treated as key parameters while selected hazard resistant structures to be established as evacuation centers.

Solid waste management, sanitation and internal road network improvement will not only improve physical resilience but will also improve quality of everyday life of citizens.

Carefully selected community based approaches to develop social capital of urban community; especially in highly vulnerable pockets of the city will provide great impetus to develop social resilience.

In order to be effective in catalyzing resilience, local institutions of the city need to enhance both internal and external linkages and offer budgetary support and subsidies to promote disaster risk reduction.



City Outlook

Hue is the capital city of Thừa Thiên - Huế province, Vietnam. Between 1802 and 1945, it was the imperial capital of the Nguyễn Dynasty. As such, it is well known for its monuments and architecture.

The city is located in central Vietnam on the banks of the Sông Hương (Hương River), just a few miles inland from the Biển Đông. It is about 700 km (438 mi.) south of the national capital of Hanoi and about 1100 km (690 mi.) north of Hồ Chí Minh City, the country's largest city formerly known as Saigon.

Hue City has a population of 330,836 inhabitants. Population grows at a rate of 1% per year.

About 70% of people depend on primary occupation (agriculture base), 20% on secondary (manufacturing, industry base) while 10% depend on tertiary occupation (service sector base).

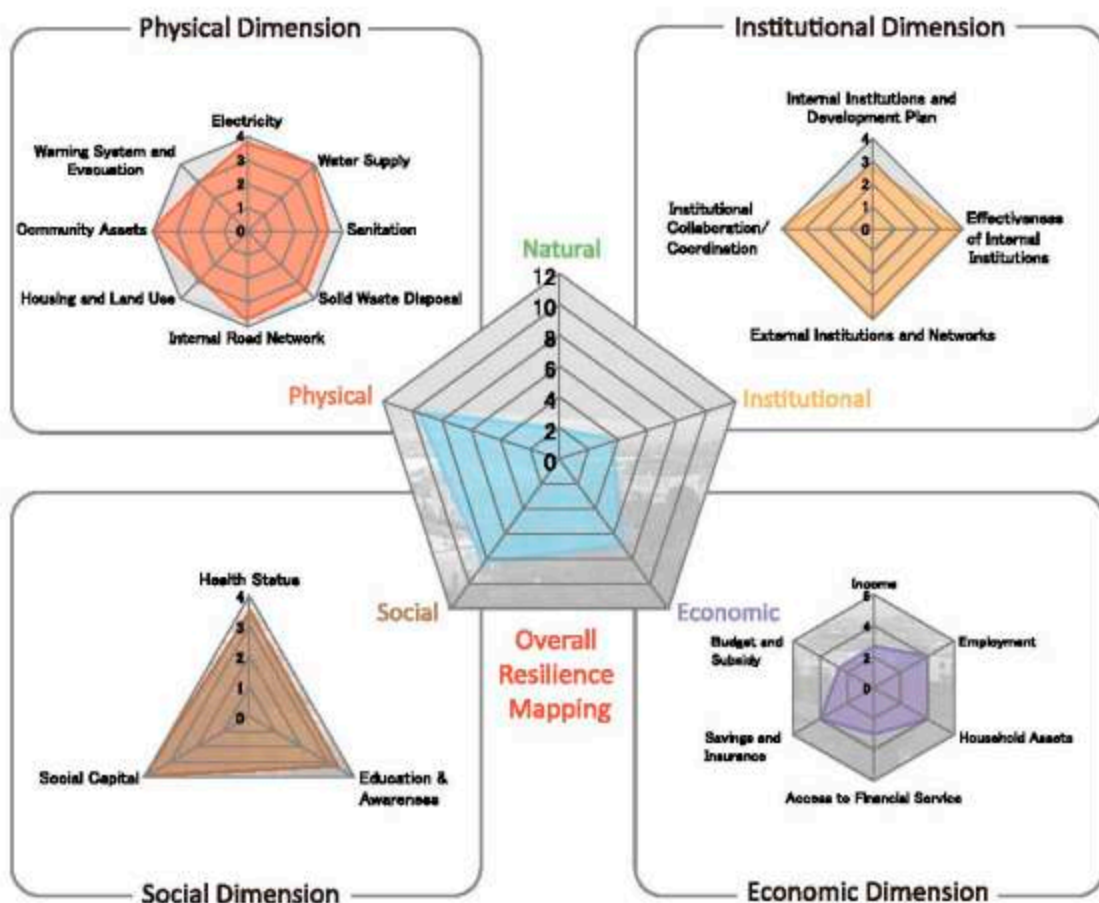
In 1999, Hue city was heavily damaged (90%) by a catastrophic flood. In Thừa Thiên Huế province, this catastrophic flood led to the death of 400 people and

damage to property worth US\$120 million, equivalent to one-half of the province's annual GDP. In 2008, it experienced a normal flood with 20% of loss. Between 1999 and 2002, the city registered an average 3791.5mm of annual rainfall and an average temperature of 24.6 degree Celsius.

[Source: Hue City Questionnaire Survey ; FAO-CIFOR, 2005]



Analysis Result



Policy Point

Risk reduction should receive high priority in education to aware people as social dimension of resilience in Hue is going to alter overall resilience efforts in the city.

Warning systems and evacuation has room for further improvement to address growing climate induced risks. Additionally, improvements in housing conditions and land use planning will certainly boost physical resilience.

Employment rate is high but low income earning opportunities are a cause of concern and can be improved by entrepreneurial development by offering better access to financial services.

Leveraging on high social capital, augmenting education opportunities, improving health status and making aware common people about impending risks can be initiated.

Local institutions in Hue can resolve to mainstream disaster risk reduction into development plans and incentivize DRR activities through dovetailing budget and subsidy.



Iloilo

Philippines

City Outlook

Irong-irong appears in the Maragtas legend of the coming of Ten Bornean Datus (Chieftain) to Panay who bartered gold for the plains and valleys of the island from a local Ati Chieftain. One datu, Paiburong by name, was given the territory of Irong-Irong (now Iloilo). For 300 years before the coming of the Spaniards, the islanders live in comparative prosperity and peace under an organized government and such laws as the Codes of Kalantiaw. Today, Iloilo has rejoined the ranks of the progressive provinces outside of Metro Manila. Iloilo's colorful history has distilled a spirit that possesses the complex nuances of contrasting cultures. It is a culture essentially Oriental, progressively Occidental yet uniquely Ilonggo.

In December 1898, the Americans entered the Iloilo port and took over the reins of the City. Under American tutelage, many Ilonggos became luminaries in the fields of politics and government. The outbreak of the Second World War took a heavy toll on the province. Like the rest of the Country, Iloilo was left with severely shattered economy and deeply demoralized populace. Possessing the resilience and determination of their forebears, the Ilonggos slowly regained their foothold.

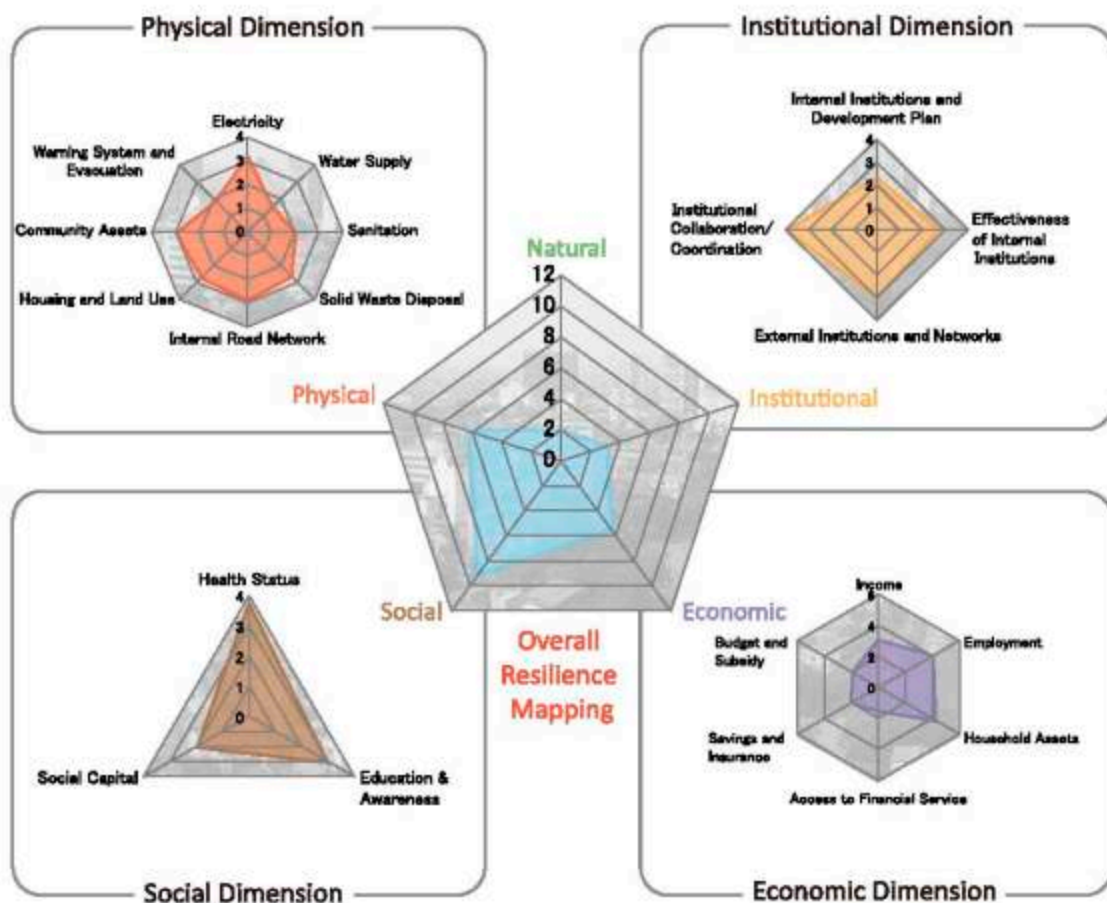
Iloilo city is populated by 403,196 inhabitants, with a population density of 5,209 persons per square kilometer and a population growth rate of 1.93% per year.

The city has experienced several catastrophic floods, such as those in 1994, 2003 and 2006 followed by heavy damage and loss. In 2006, Iloilo City was heavily affected by the catastrophic flood triggered by Typhoon Xangsane that left tremendous damages both human and material to the country (260 dead, 250,000 people displaced, USD 668 million of total damage in the whole country)

[Source: Iloilo City Questionnaire Survey ; <http://www.dartmouth.edu/~floods/Archives/2006sum.htm>]



Analysis Result



Policy Point

Social capital of Iloilo needs specific impetus as it has great potential to influence the other dimensions of resilience.

In general, basic services of the city (especially water supply, sanitation, solid waste management, internal access roads) calls for significant improvement by following participatory community based urban improvement techniques which would also benefit in building social cohesiveness.

Low-income employment prevails in the city and climate-disaster resilient livelihood options can be generated by improving access to financial services and built-in insurance to safeguard development gains.

Institutional collaboration can be more effective if networked well with external institutions by dovetailing risk reduction measures in development planning and implementation.

Updated early warning systems availability with responsible institutions and ensuring effective penetration of warning in vulnerable locations during disasters may be treated as priority.



City Outlook

The City Government of Makati has been in existence for 338 years. It was converted from a municipality into a highly-urbanized city on January 2, 1995 through Republic Act 7854 with the overwhelming approval of the residents in a plebiscite held on February 4, 1995.

The city's total land area is 27.36 square kilometers. Based on land area, excluding roads, the three major land uses in Makati are residential (38%); commercial/mixed use (15%); and institutional (14%). The city has a very compact urban environment with very limited area for expansion. Thus, most of the developments are vertical.

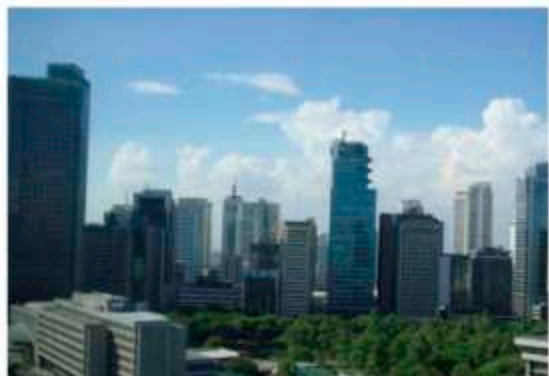
The night time population for 2008 is projected at 550,392 while during daytime is estimated to reach at 3.7 million because of the constant influx of workers, businessmen, tourists, and other transient travelers to the City.

In its effort to develop and maintain a reliable emergency communications, the City Government of Makati set up its Command, Control & Communications Emergency Alert Response System (Makati C3 EARS). The C3 EARS is the city's nerve center for dealing with emergency and disaster situations. For the continuous operation and disaster management, the Makati City allots 5% of its total budget. Following the intensified dredging operations conducted by the city government of Makati since January 2007 through its Department of Engineering and Public Works (DEPW) and Department of Environmental Services (DES), the city's barangays (villages), particularly the low-lying and flood-prone areas, are now experiencing faster flood receding time.

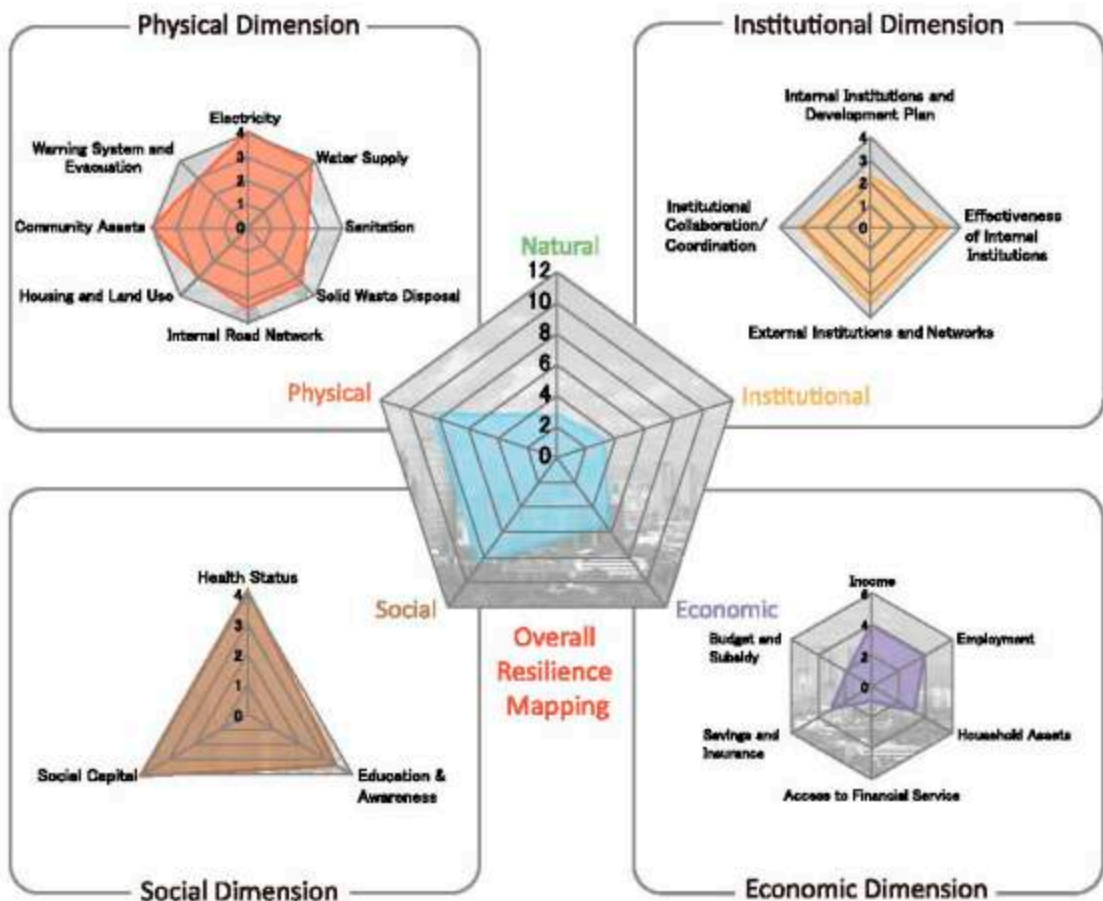
There are two physical characteristics of Makati that could pose danger to its present and future developments. First, a part of the Valley Fault System, a potential generator of a large magnitude earthquake in Metro Manila, is located at the eastern part of Makati City. Second, the western portion of the city is composed of former tidal flats. There are seven low-lying barangays at this portion of the city that are flood-prone. However, maximum receding time of flood water in these areas is only 30 minutes.

In August 2007, Typhoon Egay (Sepat) struck the Philippines, 33 families/165 persons were evacuated in Makati City.

[Source: Makati City Questionnaire Survey ; WHO, 2007 ; <http://www.makati.gov.ph>]



Analysis Result



Policy Point

At the city level, economic and institutional resilience need to keep pace with physical and social dimensions to elevate the overall resilience of the city to climate related disasters.

A number of civic services like sanitation, solid waste management, housing and land use and road network requires considerable improvement to attain better physical resilience.

Climate disaster resilience calls for major overhaul of disaster management systems with particular attention to upgrading warning systems and managing evacuation centers.

In general, employment and income levels are high in Makati. However, budgets and subsidy for disaster risk reduction and better access to financial services for encouraging local citizens to invest in disaster risk reduction need promotion.

Local institutions have high external network which can benefit best if institution-wide coordination is improved.



City Outlook

Mumbai is the commercial, financial and entertainment capital of India. Along with its neighboring suburbs, it forms the world's 6th most populated metropolitan area with home to about 19 million people making it most congested urban conglomerate in the world with an average population density exceeding 21,000 persons per square kilometer. Originated by way of interconnection of group of seven islands, today Mumbai has 24 municipal wards representing contrasting living environments with ultra-modern high-tech skyscrapers for elites' to dilapidated squatters and slums – home to over 50% of its populace.

According to the City Development Plan, behemoth infrastructure shortfall is experienced by the city – 2-6 hours of water supply (with poor condition of transmission and distribution system); 35% households without sanitation, old storm water network that cannot take a rain intensity of more than 25 ml/hour, average travel speed (proxy for road efficiency) of 6-8 km/hour, drainage capacity limited to carrying 50% of the potential sewage – all leading to substantial decline in the quality of life.

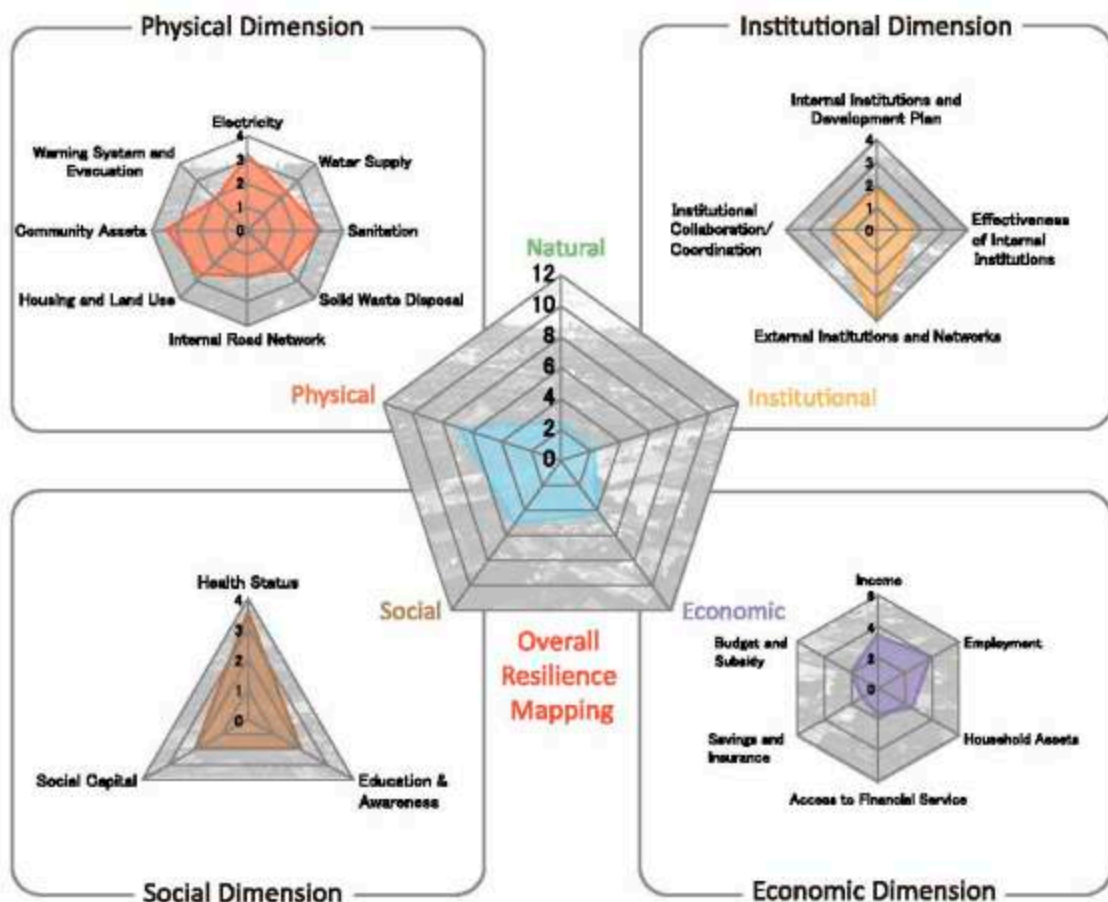
Mumbai is moderately or highly exposed to a plethora of natural and human-made hazards: earthquakes (both on and offshore), landslides, cyclonic storms and possibly storm surge, sea-level rise, rainstorms and local and regional flooding, drought, chemical, industrial and nuclear accidents and civil strife. Flooding is the most frequent and disruptive hazard in

Mumbai. The city has experienced catastrophic flood in July-2005, which was never recorded for over a century or so. In that year, torrential rain disrupted life in the metropolis, caused large number of deaths and according to early estimates (as reported in the media), resulted in the loss of more than Rs 10,000 crores (approx. USD 2 billion). To address those issues, Mumbai's Emergency Response Plan appears to be an efficient tool in enhancing early warning system in the area.

[Sources: Surjan, 2008; City Development Plan, 2006; GoM, 1999; Bohra et al., 2006]



Analysis Result



Policy Point

Overall climate-disaster resilience of Mumbai is relatively low and calls for an urgent attention of stakeholders from and beyond the city. Sustained efforts are specifically needed to strengthen physical, social and institutional dimensions of resilience.

Dismal picture of city-wide basic services is a major stumbling block on the road to physical resilience and solid waste management, water supply, internal roads, sanitation and warning mechanism requires immediate interventions for improvement.

Recurring floods have already helped create awareness among common people. By capitalizing on this, civic societies and local government should focus on building social resilience.

The city needs to leverage on existing reasonable level of income and employment opportunities for crafting savings and insurance mechanism for the urban poor to augment their economic resilience.

Local Institutions responsible for city development have good external network, but need to effectively address climate-disaster issues by wider and broader cooperation with other institutions and also by mainstreaming disaster risk reduction in the development agenda.



City Outlook

San Fernando was originally named "Pindangan" –the place where fish was dried, considerably abundant and the mode of living during this era. Its earliest settlement was believed to have existed before the Ming Dynasty as archeological finding revealed that the early settlers were engaged in trade and commerce with Mainland China and the Middle East having these products of primitive art (i.e. porcelain, beads, spearheads, etc) as the object of trade and commerce, the same form of artifacts unearthed at Barangay Cadaclan. The formal creation of the then municipality coincided with the creation of the Ministerio de San Fernando on May 6, 1786, during the Spanish regime. The name San Fernando was given in honor of King Ferdinand.

On March 20, 1998, the residents of San Fernando declared their resounding approval on a Plebiscite which ratified Republic Act 8509 converting the municipality into a component city.

The City of San Fernando, La Union has a population of 114,813 inhabitants and a population density of 1,091 persons per square kilometer.

Climatological data from two stations (Station: 325-Dagupan City, Pangasinan and Station: 222- Vigan

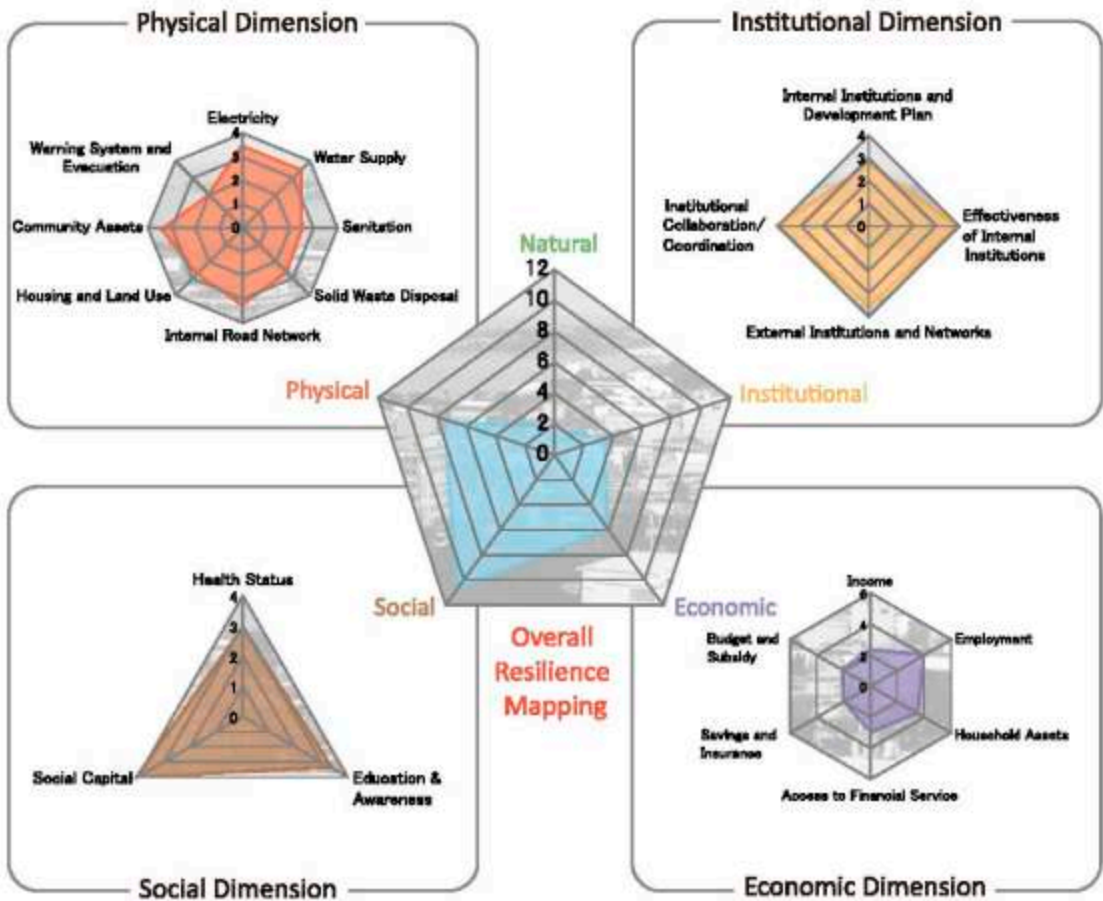
City, Ilocos Sur) show a mean annual rainfall of 2346.3 mm per year and a mean annual temperature of 27.6 degree Celsius between 1971 and 2000.

Supertyphoon "Paeng" (Cimaron) hit the city, leaving 14 dead and a trail of destruction. In 2001, the City of San Fernando and its nearby suburbs experienced heavy flooding as a result of the overflowing of rivers surrounding these areas.

[Sources: City Comprehensive Land Use Plan (CLUP); City of San Fernando, La Union Questionnaire survey; <http://www.reliefweb.int>; PIA, 2006. <http://www.pia.gov.ph>]



Analysis Result



Policy Point

Overall, San Fernando should benefit from its high social capital and institutional capacities to improve physical and economic dimensions of resilience.

Early warning systems, evacuation procedures, sanitation, solid waste management and housing calls for sustained investment for fortifying physical resilience.

Budget and subsidy on risk reduction, income levels of people and savings and insurance patterns - all affects economic resilience and requires improvement.

Leveraging on existing high social capital, education and health status of the populace can be upgraded further.

In order to get most out of present institutional strengths, 'climate-disaster resilience' should be accorded a development planning priority.



City Outlook

The word Sukabumi comes from Sundanese language - suka which means "to like" and bumen which refers to "house or environment". Therefore, the word sukabumi refers to a fresh and comfortable condition, where people like to live in, to take a rest.

From the colonization period, since many people from Netherlands investing in plantations surrounding the city lived in Sukabumi, the government of Netherlands decided to make Sukabumi a Municipality (then called as "Burgerlijk Bestuur" with the status "Gemeenteraad Van Sukabumi").

Sukabumi City has 282,944 inhabitants with a population density of 5,895 persons per square kilometer. The city's population growth rate is 2.39% per year. Working age population (comprised between 17 and 64 years-old) covers 52.94% of total population. Those below 17 years-old represent 41.60%.

Sukabumi city belongs to areas especially at risk for landslides and flooding due to rampant deforestation and West Java's unstable ground that make for a deadly mixture during the rainy season.

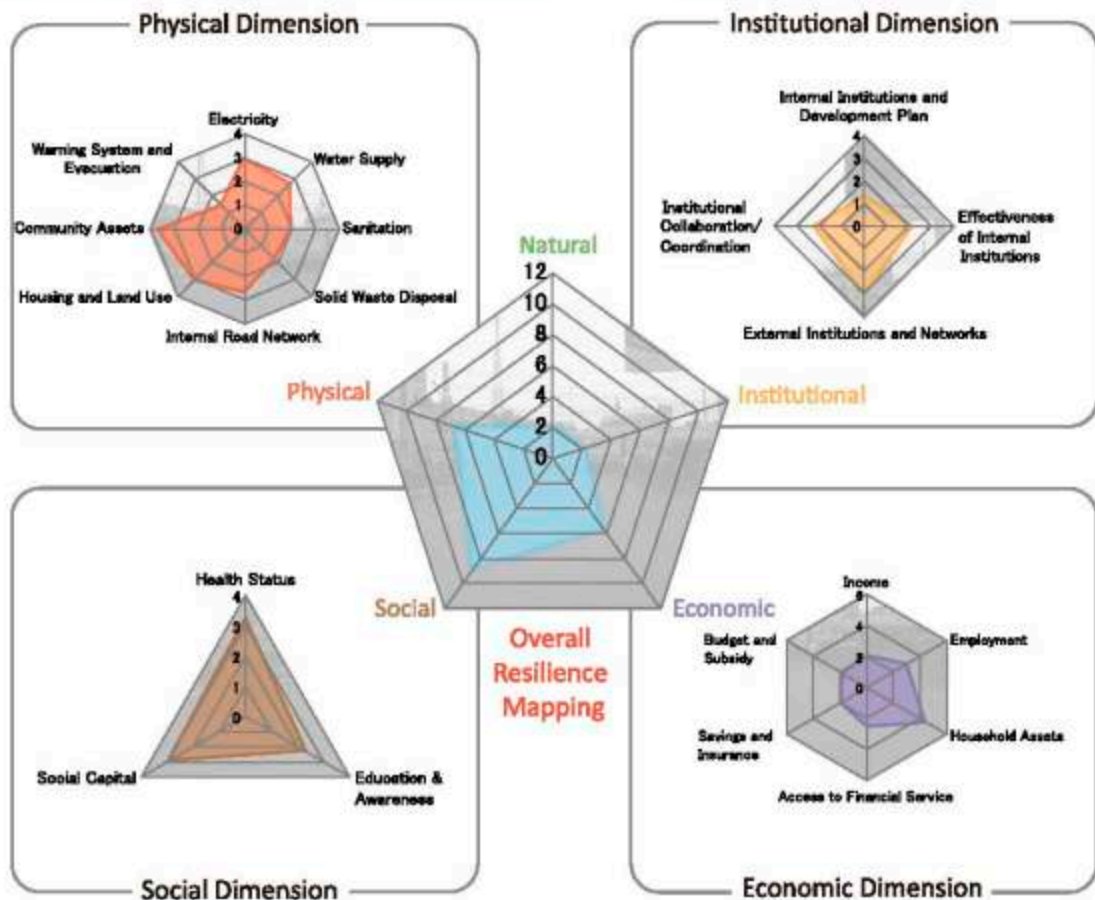
The city experienced flood in 2007 leading to a loss of

Rp. 200 million (approx. USD 17,500). A year later, it was again facing a twister that led to Rp. 300 million (approx. USD 26,000) losses. In April 2008, Heavy torrential rain downpoured West Java areas and caused flash floods in Sukabumi district. The floods has caused one bridge broken and killed 7 people.

[Source: Sukabumi City Questionnaire Survey ; WHO, 2008 ; The Jakarta Post.com; <http://www.kabar-irian.com>]



Analysis Result



Policy Point

Sukabumi's path to attaining climate-disaster resilience calls for adopting an all encompassing approach by strengthening physical, social, economic and institutional dimensions.

Basic infrastructure of the city (especially sanitation, solid waste management and internal road network) and disaster infrastructure of the city (early warning and evacuation), both have room for improvement.

Exploiting existing high social capital, both health status and education and awareness can be reinforced towards better social resilience.

For boosting the economic dimension of the Sukabumi's resilience, initiatives such as economic policy reforms and incentive driven investment may be promoted which will bring more employment opportunities and increase income levels to safeguard against natural threats.

External Institutions and networks help Sukabumi in disaster situations however, the city also needs to build these capacities in its local institutions.



City Outlook

Suwon is the provincial capital of Gyeonggi-do, South Korea. Suwon lies approximately 30 kilometers south of Seoul and is one of the most populous of Seoul's satellite cities. It is traditionally known as "The City of Filial Piety".

The main industrial employer in Suwon is Samsung. Hwaseong Fortress is Suwon's most notable attraction. Built in 1796, the entire city used to be encircled by the walls, but now Suwon has expanded beyond this boundary. Hwaseong is also listed as a UNESCO World Heritage Site. Haenggung Palace is another noteworthy historical attraction. Suwon City Council prides itself on the condition of its public lavatories. It has made efforts in recent years to make new lavatories clean and to improve existing facilities, and now offers visitors guided bus tours of the municipal restrooms.

Suwon city has over a million inhabitants with a population density of 8975.2 persons per square kilometer. Children (below 17 years-old) occupy the majority of population (74%); working age population (between 17 and 64) covers 22% of total population.

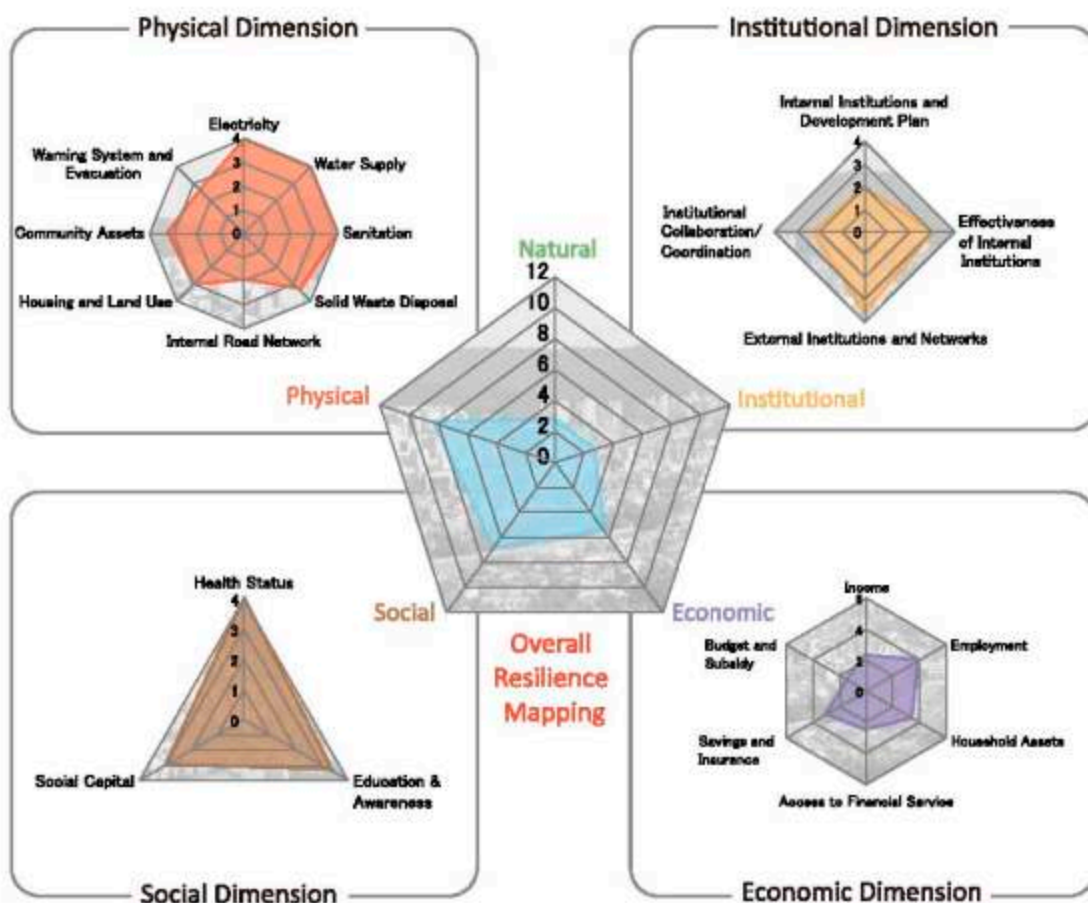
The city average rainfall amount (from 2000 to 2006) is 1307.13 mm; average temperature for the same period is about 12.3 degree Celsius.

A severe flood was occurring in Suwon city in 2000 resulting in heavy casualties (1 dead and thousands of people affected) and financial loss of 14 billion won (USD 10 million).

[Sources: Suwon City Questionnaire Survey;
<http://en.wikipedia.org/wiki/Suwon>]



Analysis Result



Policy Point

Warning and evacuation systems need attention to follow present existing higher levels of city services like electricity, water supply and sanitation to enhance physical resilience effectively. Due to undulating topography, despite good quality roads, accessibility during emergencies remains a challenge which requires more fine-tuning or decentralized planning of emergency infrastructure to ensure quick access.

Carefully carved programs need to be injected through grass-root organizations to improve social cohesion and awareness of communities to abate climate-disaster risks.

High employment rate needs to be translated into better income levels which can be boosted by offering better access to financial services and diversified income opportunities which will help elevating economic resilience.

Development planning and coordination will be an incentive to promote disaster risk reduction if prioritized at institutional level planning for urban development.



City Outlook

Located in the Kantō region of the main island of Honshu, Yokohama serves as the capital of Kanagawa Prefecture with a land area of 437.35 sq. km further subdivided into 19 wards. The city caters to around 3.64 million people making it the second largest city in Japan next to Tokyo.

Once a small village during the feudal Edo period, Yokohama is now known as the major commercial and economic hub of the country since its opening as a Port City in June 1959 wherein the Port of Yokohama serves as base of foreign trade in the country.

During the early 20th century, rapid industrial growth has been very visible within the city as manifested by factories built by entrepreneurs especially along the coastal areas. However, much of Yokohama was destroyed when the Great Kantō Earthquake happened on September 1, 1923 causing the loss of more than 30,000 lives and destruction of infrastructure facilities. As part of its rehabilitation, rubbles from the quake were used to reclaim lands for parks, the most famous of which is the Yamashita Park located in the waterfront which was opened in 1930.

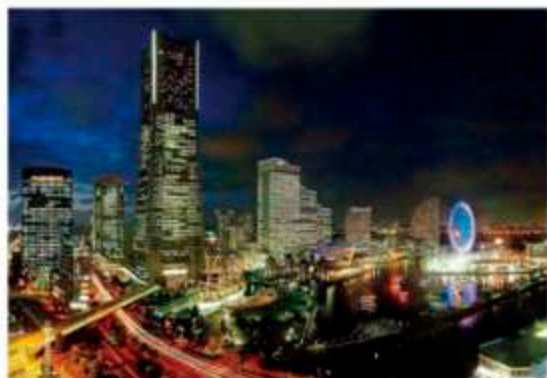
Rebuilding Yokohama after the said incident has been successful however, the city experienced yet another great damage due to thirty-odd US air raids during the second World War which killed an estimated of 8,000 people in a single morning of May 29, 1945.

With the administration being transferred to the city government from the national government on June 1, 1951, major development projects initiated by the city

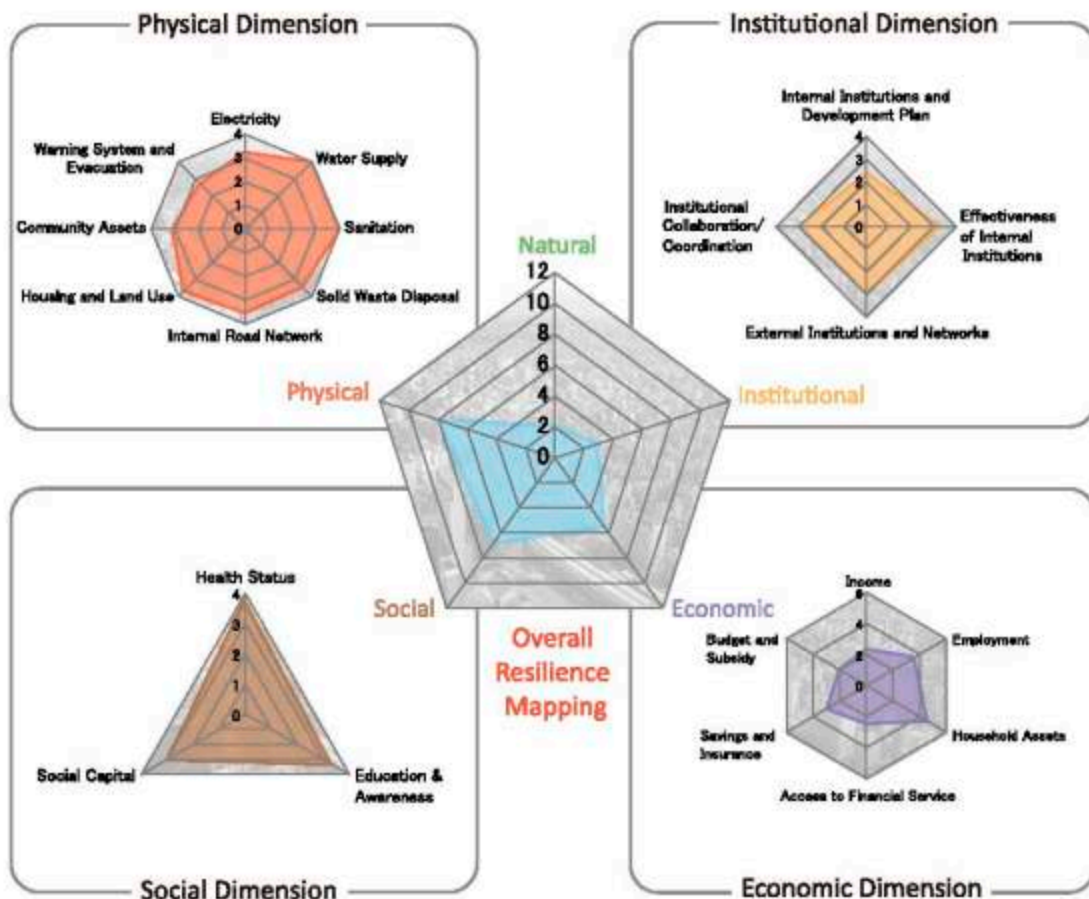
have been taking place enabling Yokohama to regain its prominence as the Port City of the region even up to the present era as manifested by significant landmarks within the city such as the construction of Minato Mirai 21, a major urban development project on reclaimed land which started in 1983.

Being situated on coast, Yokohama's susceptibility to typhoons remains high. Highly developed underground spaces and infrastructure are also prone to flooding which may result in huge economic losses and business disruption.

[Sources: <http://www.city.yokohama.jp/en/>,
<http://en.wikipedia.org/wiki/Yokohama>,
<http://www.channel4.com/history/microsites/H/history/c-d/cities05.html>]



Analysis Result



Policy Point

Being a port city from developed country, Yokohama need to increase financial incentives for insuring lives and assets to climate induced disasters.

Livelihood diversification to widen the employment base and income levels may be considered as probable options to promote economic resilience.

Warning and evacuation system strengthening and community asset building are two prominent areas requires attention to address shortcomings in physical resilience.

Developmental planning organizations of the city are although networked well, also needed better external linkages and placing disaster risk resilience at forefront.

Innovative means of education and awareness tools will help in uplifting and renewing existing social capital and interest of well informed and literate communities of Yokohama.

Way Ahead

CDRI (Climate and Disaster Resilience Initiative) is in its development stage. Through the data collection and questionnaire analysis, city resilience mapping is done, which has different components of physical, social, economic, institutional and natural aspects. Based on these findings, policy suggestions are made.

As mentioned earlier, the data is mainly based on questionnaire survey. Where the questionnaires were incomplete, secondary sources and subjective observations were made. Therefore, needless to say that there are further scopes to improve the methodology and data collection process.

User feedback on the CDRI methodology is of utmost importance. The goal of the whole process of CDRI is to make city managers and practitioners aware of the existing and future city risk for climate related disasters. The policy suggestions should be linked to specific actions at the city and community level. Danang 2009 Training and Action Workshop on "Climate and Disaster Resilience in Coastal Asian Cities" (18-20 February 2009) is the first step in

getting user feedback on the CDRI methodology. There needs to be more future training and action workshops in future to upgrade CDRI methodology.

We see the development of CDRI in two specific ways:

- City based in-depth data collection, organizing small city level workshops to validate the data, and improve the methodology through mutual learning among the city professionals and researchers.
- To use CDRI in ward or neighborhood level. CDRI is non-scale: it can be used for a city, or it can also be used for ward or neighborhood level. Ideally, it is desirable that CDRI be used in the neighborhood level, and through detailed data collection, the city should be able to get a clear resilience map of its own, and identify the vulnerable areas as well as future potential areas.

