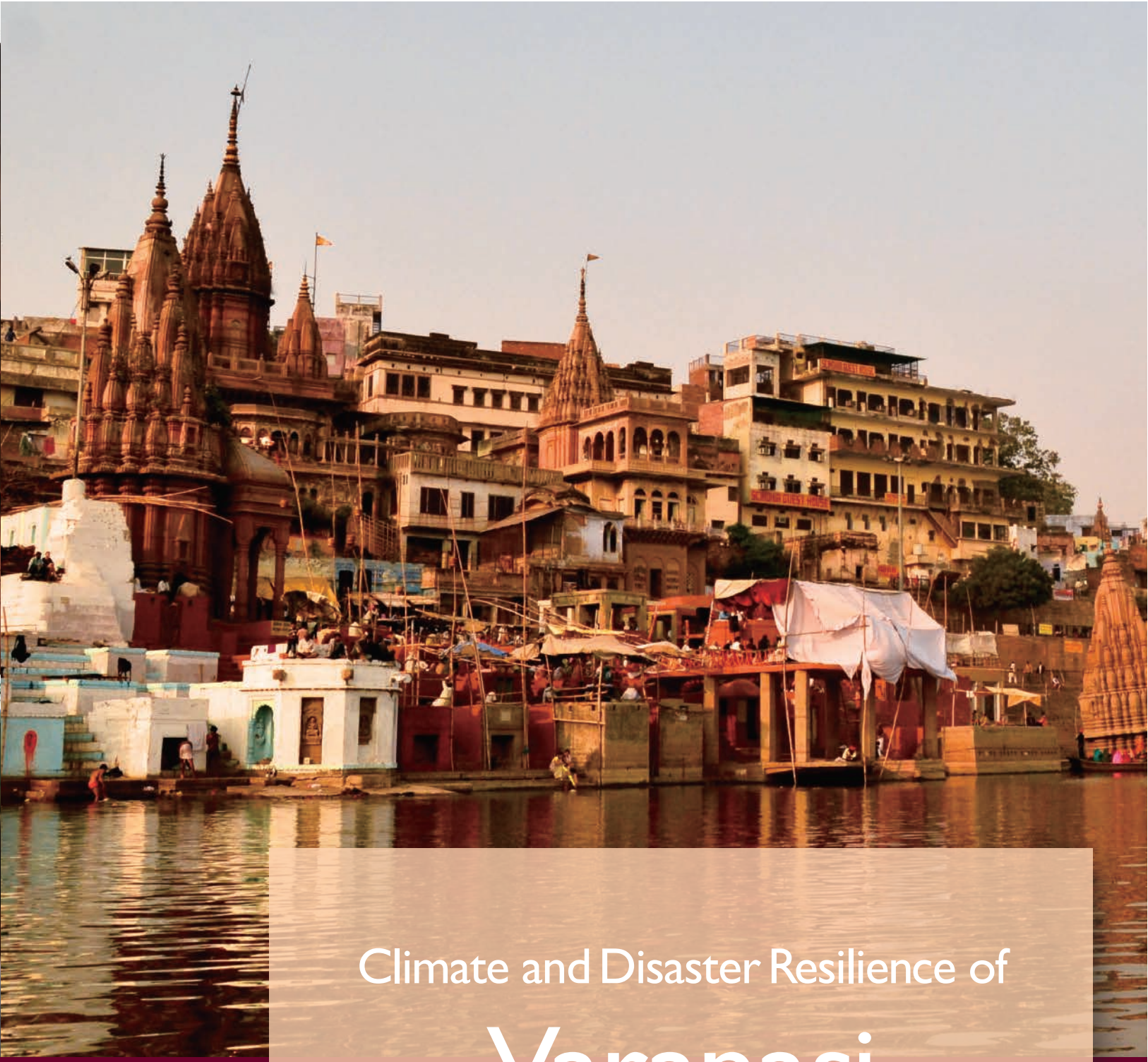

Climate and Disaster Resilience of

Varanasi

City, Zone and Ward Profile

About the Initiative

The Climate and Disaster Resilience Initiative (CDRI) study of Varanasi was undertaken as a part of academic collaboration under the Kyoto Varanasi Partnership with involvement of Kyoto University, Banaras Hindu University and Varanasi Nagar Nigam. Various City, Zone and ward level data was collected through questionnaire surveys involving the city government officials. The cooperation and inputs from all the officers of Varanasi Nagar Nigam are highly appreciated.

Team Members

Kyoto University

Rajib Shaw
Ranit Chatterjee

Banaras Hindu University

Akhilesh S. Raghubanshi
Pramit Verma

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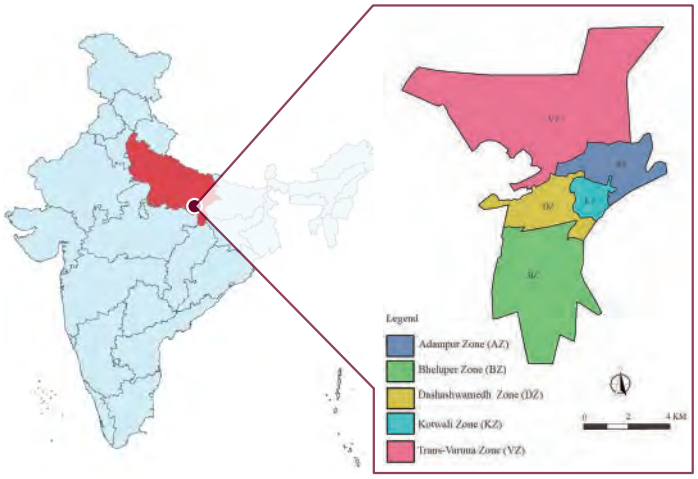

Key map of Varanasi

Zones	Populations in 2011*
Adampur zone (AZ)	249,671
Bhelupur zone (BZ)	281,562
Dashashwamedh Zone (DZ)	229,119
Kotwali Zone (KZ)	139,146
Trans Varuna Zone (VZ)	298,058
Total Varanasi city population	**1,197,629**

*Provisional population data of Varanasi city

Citataion Chatterjee R., Verma P., Shaw R., Raghubanshi A.S. (2015): Climate and Disaster Resilience of Varanasi, Kyoto University, Banaras Hindu University, Varanasi Nagar Nigam study, 76 pages, Kyoto, Japan.

Printed in March 2015

Message

Ram Gopal Mohley
Mayor, Varanasi Nagar Nigam

राम गोपाल मोहले
महापौर

अ.शा.पा.सं. .....
नगर निगम, वाराणसी
निवास : D.58/12-M2/2,
गाँधी नगर, सिगरा, वाराणसी
दूरभाष : (कार्या.) 0542-2222600
(आवास) 0542-2222068, 2
फैक्स : 0542-2221702

पत्रांक 0258/Mayor/2014-15 दिनांक 23-01-20

Message

India is urbanizing at a rapid rate with the urban population increasing rapidly in the last decades leading to migration, change in land use and exerting pressure on the urban services. Varanasi, one of oldest cities in the world, considered the spiritual and cultural capital of India is also no exception to this phenomenon. The impacts are clearly visible across physical infrastructure, socio- economic, cultural, institutional and natural environment aspects of our city. The Municipal Corporation acknowledging the impacts of climate change and natural disasters globally and locally in conjunction with the city's development envisions for a "***Resilient Varanasi***".

I am happy that Kyoto University in collaboration with the Banaras Hindu University is conducting the study for analyzing and also addressing the Climate related disaster risks faced by the city. The comprehensive nature of this effort should be beneficial to our city to strengthen our services and infrastructure for serving the citizens effectively and making their life safe.

The study is a good initiative for taking forward the Varanasi Kyoto partner city agreement signed in the presence of Hon'ble Prime Minister of India Sri Narendra Modi and Hon'ble Prime Minister of Japan Mr. Shinzo Abe. In this connection I also express my appreciation to the joint research team of Kyoto University, Japan and Banaras Hindu University, India functioning under the leadership of Prof. Rajib Shaw and Prof. Akhilesh Raghubansi respectively. I wish them all success in their endeavor.

(Ram Gopal Mohley)

Message

Prof. Girish Chandra Tripathi
Vice Chancellor
Banaras Hindu University

काशी हिन्दू विश्वविद्यालय
BANARAS HINDU UNIVERSITY
An Institution of National Importance established by an Act of Parliament

प्रो. गिरीश चन्द्र त्रिपाठी
कुलपति
Prof. Girish Chandra Tripathi
Vice-Chancellor

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January 23, 2015

Message

Indian cities are acting as magnets attracting people from the rural areas. The rapid speed of urbanization not only poses an unprecedented managerial and policy challenge but also increases the risk of urban disasters as more and more hazard prone areas get inhabited. Global experiences indicate that adequate level of preparedness and increased city resilience has lead to sidestepping various disasters and saving precious lives.

The Climate Disaster Resilience Index study of Varanasi is an appreciated effort to fathom the city's resilience to climate related hazards such as riverine floods, urban floods, heat wave, cold wave and water scarcity. The five dimensions namely physical, social, economic, institutional and natural are considered for developing the resilience index of Varanasi. The study is taken up the ward level, which are the lowest administrative node in the city for developing micro-level understanding of resilience issues.

As the head of India's leading institution of higher learning committed to advance and diffuse scientific, technical and professional knowledge for human life betterment, it gives me immense pleasure acknowledging contributions of BHU faculty and students in preparation of this report. Institute of Environment and Sustainable Development, Banaras Hindu University partnered in the preparation of this report. Efforts done by Prof. Akhilesh Raghubansi and Mr. Pramit Verma in this regard are commendable. I also express my appreciation to Prof. Rajib Shaw and Mr. Ranit Chatterjee from Graduate School of Global Environment Studies, Kyoto University for choosing BHU as a partner institution and making all sincere efforts to prepare this report.

I am confident that present study will assist various stakeholders who are actively engaged in development of Varanasi to prioritize their actions and making decisions in emergencies. I hope that the Varanasi city administration will make best use of this report to make Varanasi a disaster resilient city.

(Girish Chandra Tripathi)

Message

Prof. Shigeo Fujii
Dean, GSGES, Kyoto University

Kyoto University
Graduate School of Global Environmental Studies

京都大学
大学院地球環境学堂

Message

Asia is urbanizing rapidly and this will lead to increasing development challenges in the near future. The urban centers in the developing nations face a greater threat from the climatic hazards. India, will be one of the major contributors to this urban population growth with fifty three million plus cities. Varanasi is one of them. The city has been expanded its boundaries to accomodate this influx in population. The city services have not been able to match upto this rapid growth. Taking this into consideration it becomes imperative to draw up a coherent strategy for sustainble development of the city.

The present Study was initiated as part of the Kyoto Varanasi Partnership to understand the Varanasi resilience to climate related disasters. In the past the Environment and Education Laboratory (EEL), Graduate School of Global Environmental Studies (GSGES) of Kyoto University had conducted Climate Disaster Resilience Initiative (CDRI) studies for various Asian cities successfully. The study is conducted based on field based action research in participation of the local government, academic institutions and other stakeholders. The CDRI developed and tested a multi-disciplinary planning tool to asses Varanasi's resilience to climatic disasters through five dimensions namely, physical, social, economic, institutional and natural. Through an exhaustive questionnaire survey data are collected at the city, zone and ward levels. The results will support local officials in prioritizing actions to reduce the city's risk.

I am very happy to present the findings of the analysis of the city, zone and ward level, which has been done in close collaboration with Varanasi Nagar Nigam and Banaras Hindu University. I am thankful to the Mayor of Varanasi and the Vice Chancellor of Banaras Hindu University for their support in taking this study to its logical end. I strongly believe that this study will be useful in formulating future policies and guidelines to tackle development challenges and mitigate disaster risks in Varanasi. On behalf of the Graduate School of Global Environmental Studies, I would extend all possible technical support in future to make this collaboration fruitful. Last but not the least I congratulate the team from Kyoto University and Banaras Hindu University for their hard work and making this happen.

藤井滋穂

Professor Shigeo Fujii
Dean
GSGES, Kyoto University

View of Dashashwamedh Ghat with sewage pumping station

Manikarnika Ghat, the cremation Ghat of Varanasi

Preface

Cities are increasingly playing a leading role in the world economy as centers of both production and consumption. At presnet there are approximatly 400 million plus cities across the world with a majority of them in the developing world. Varanasi city is one of them. Varanasi is one of the oldest living cities in the world and has evolved organically with time to become an important center of art and education. Located on the banks of river Ganges, Varanasi has been witness to flooding issues in the past. The organic growth has lead to uneven distribution of service across the city. The high urbanization trends in the recnt times coupled with ad-hoc planning and rise in frequency of climate related disasters calls for a systematic approach to tackle the future climatic hazard risks.

This study is an attempt to provide base information for building city's resilience by identifying the root cause of vulnerabilites with a multi stakeholder approach. The study is based on questionnaire surveys at city, zone and ward level covering the five resilience-based dimensions (Physical, Social, Economic, Institutional and Natural) in which every dimension has five linked parameters. These five parameters are again connected to five sets of variables. All 125 variables are used to assess the city's resilience using weighted mean scores for variables, parameters and dimensions. The results of the study can be used in developing policies and future planning startegies for Varanasi. Kyoto University along with other partners had conducted a city level survey in 2011. The changes for 2011 and 2015 at city level are also presented.

We are happy to present the analysis of the Varanasi City for five zones and 90 wards conducted in close cooperation with the Varanasi Nagar Nigam. We express our sincere appreciation to the Hon. Mayor of Varanasi Nagar Nigam, Hon. Commissioner, Varanasi Nagar Nigam and his office, who were instrumental in conducting the study. We are thankful to Prof. Girish Chandra Tripathi, Vice Chancellor, Banaras Hindu University and Prof. Shigeo Fuji, Dean, Graduate School of Global Environmental Studies, Kyoto University for their support through out the period of study.

This publication is the result of the first collaborative academic research between Kyoto University and Banaras Hindu University under the Kyoto Varanasi Partnership. Although, this is a modest initiative but one the first one to have a holistic approach in identifying the priority areas of action for strengthening Varanasi city's resilience to climate related disasters.

Rajib Shaw
Professor
Graduate School of Global Environmental Studies
Kyoto University

Akhilesh S. Raghubanshi
Director
Institute of Environment and Sustainable Development
Banaras Hindu University

Introduction

The cities across the world are increasingly getting more exposed to frequent and severe natural hazards and climate change risk (IPCC, 2012). These risks get amplified due to lack of adequate infrastructure, overcrowding, unsafe housing, poor health and inept basic services. Realizing that urban resilience goes beyond measuring city's vulnerability to disaster, a comprehensive tool which measure urban resilience factoring in responsive capacities of the communities and institutions will be crucial for making cities resilient to climate related disasters. The Climate Disaster Risk Index (CDRI) is a planning tool, which addresses the vulnerable parts of the city's functional system, and its responsive capacity to cope with a potential disaster to strengthen the city's resilience (Joerin and Shaw, 2011).

The city of Varanasi is known for being a hotspot of heritage, education and biodiversity. The city has evolved over the years organically along the bank of river Ganges. The city has been known by various names, which includes Kashi, Kasi, Varanasi, Banares and Banaras. Varanasi, which literally means land between river Varuna and Assi although in recent times the city, has expanded beyond this limit. The population growth coupled with migration, increase in frequency of natural hazards has been adding pressure to the existing city infrastructure. Varanasi city is divided into five administrative zones namely, Adampur Bhelupur, Dashashwamedh, Kotwali and Trans Varuna. These five zones are further divided into 90 electoral wards. The overall management and service delivery lies with the City government (Varanasi Nigar Nigam).

Climate Disaster Resilient Index

Since disaster resilience is a function of a diverse set of indicators, CDRI measures climate disaster resilience by considering five dimensions: physical, social, economic, institutional, and natural. Each dimension has five parameters (see Table 1) and each parameter in turn has five variables. Therefore, all in all, the CDRI questionnaire has 125 questions. At the end of each parameter and dimension, survey respondents are requested to assign weights to the variables and parameters in order to reflect the priorities of the cities and the relevance of the indicators to the local situation. Using data collected from the questionnaire surveys, we used Weighted Mean Index (WMI) method and Aggregate Weighted Mean Index (AWMI) to compute the scores for each parameter and dimension, respectively. The CDRI of the city is the simple average of the indexes of the five dimensions. The index value ranges from 1 to 5. Higher CDRI values are equivalent to higher preparedness to cope with climate change and disasters. Needless to say, these results are not absolute values, but serve mainly as broad policy guidance. The quality of the results is very much dependent on the quality of the input data from the survey respondents.

Based on the results, the strengths and weaknesses of the cities in each of the five dimensions are highlighted. Then policy points and recommendations are suggested to provide encouragement of city governments' engagements in specific institution and capacity building. Not only are outputs from this study useful for city governments, but they also provide valuable knowledge and information to other local and national stakeholders having a similar target: the enhancement of community resilience. Graphs are provided to help in visualizing the analysis results and to facilitate comparison between dimensions and between cities. One graph shows the city's overall resilience and five other graphs demonstrate the city's resilience in terms of the physical, social, economic, institutional, and natural aspects.

Methodology

In this study, CDRI is used to evaluate the current level of climate disaster resilience of the Varanasi city and its five zones and 90 wards. The survey respondents were department heads, zonal officers and other officers of the Varanasi Nagar Nigam in charge of various services in the city. Varanasi Nagar Nigam facilitated the distribution of the questionnaire for the survey. Table 1 explains various dimensions, parameters and variables of CDRI used in the study.

Table 1: Dimensions, Parameters and Variables of CDRI

Physical	**1. Electricity** (access, availability, supply, dependence on external supply, alternative capacity) **2. Water** (access, availability, supply, dependence on external supply, alternative capacity) **3. Sanitation and solid wastedisposal** (access to sanitation, toilets, collection of wastes, wastetreatment, recycling) **4. Accessibility of roads** (transportation network, paved roads, accessibility during normal and catastrophic flooding, roadside covered drains) **5. Housing and land-use** (building codes, non-permanent structures, houses above water logging, house ownership, population living in proximity to polluted industries)
Social	**1. Population** (annual growth rate, population under 14 and above 65, population of informal settlers, population density) **2. Health** (population suffering from waterborne/vector-borne diseases, access to health facilities, functionality and capacity of health facilities, preparedness for disasters) **3. Education and awareness** (literacy rate, awareness of disasters, availability of public awareness programs/disaster drills, access to the Internet, functionality of schools after disasters) **4. Social Capital** (participation in community activities and clubs, ability of communities to build consensus and to participate in city's decision-making process, mixing and interlinking of social classes) **5. Community preparedness during a disaster** (preparedness in terms of logistics, materials, and management; participation in relief works; provision of shelter for affected people; support from NGOs/CBOs; population evacuating voluntarily)
Economic	**1. Income** (population below poverty line, number of income sources, households dependent on only one income source, income disparity, income derived from informal sector) **2. Employment** (unemployment in formal sector, youth unemployment, women employment, workers coming from outside the city; employment in the informal sector) **3. Household assets** (households with television or radio, phone, motorized vehicle, non-motorized vehicle, basic furniture) **4. Finance and savings** (availability of credit facility to prevent disasters, accessibility of credit facility to urban poor, savings of households, household's insured properties, existence of disaster risk financing instruments) **5. Budget and subsidy** (city' annual budget for DRR and CCA, availability of subsidies to rebuild houses,alternative livelihood, health care after a disaster)
Institutional	**1. Mainstreaming of DRR and CCA** (mainstreaming in city's land-use plans, housing policies, school education curriculum, transport policies, environmental plans) **2. Effectiveness of city's crisis management framework** (existence of disaster management plan, incorporation of climate change uncertainties, effectiveness of emergency team during and after a disaster, readiness of alternate decision-making personnel) **3. Effectiveness of city'sinstitutions to respond to a disaster** (formal and informal institutions, trained emergency workers, disaster training programs, learning from previous disasters) **4. Institutional collaboration with other organisations and stakeholders** (dependence on external institutions; collaboration with neighbor cities, national government, NGOs, private organizations) **5. Good governance** (implementation of DRR plans, accountability and transparency of city government, implementation of building codes, effectiveness of early warning systems, frequency of disaster drills
Natural	**1. Intensity/severity of natural hazards** (floods, typhoons, rainfall-induced landslides, heat waves, droughts) **2. Frequency of natural hazards** (floods, typhoons, rainfall-induced landslides, heat waves, droughts) **3. Ecosystem services** (quality of urban biodiversity, soil, air, and water; urban salinity) **4. Land-use in natural terms** (area vulnerable to climate-related hazards, urban morphology, settlements in hazard-prone areas, available urban green space, loss of urban green space in last 50 years) **5. Environmental policies and food security** (compliance to environmental policies, existence of environmental preservation policies, waste management system, reduction of air pollution, food supply during disasters)

Key findings

Varanasi, like most of other cities, has spatial variation of its resilience score. The city has its ***strength in social capital, household assets, education and awareness, water supply system and institutional collaboration.*** These collectively can enhance city's physical, social, economic and institutional resilience. Even at the zone level, ***social capital*** becomes an asset for all the zones, on which the community preparedness activities and social resilience can be built on. Water supply in most zones as well as in the city level is another strength, on which the physical resilience can be built on. ***Household assets*** are relatively higher in most zones, and people have relatively higher level of ***education and awareness.***

The city needs to take specific actions on the following issues, which can be divided into three aspects under the GET [**G**overnance **E**ducation **T**echnology] framework.

— **Governance:** The city needs to improve its ***governance capacity on disaster risk reduction.*** There needs to be a specific unit or department for disaster risk reduction, at the city and zone level with appropriate ***personnel and budget provisions.*** The personnel needs training and capacity building and will require basic understanding on risk reduction approaches, tools and policies. One of the key urgent issues is to put specific budget for disaster risk reduction, and enable the responsible department [s] to take decisive actions in a positive way.

— **Education:** Knowledge dissemination is one of the key emphasis areas, which needs to be improved. The city usually faces small-scale frequent disasters. To cope with these types of disasters, redundancy of the system is of utmost importance. To enhance redundancy, it is important ***to share the knowledge and experiences*** widely across the city and conduct regular emergency drills. This information sharing can also be done ***using social media and other smart media*** appropriately. Involving and monitoring youth group to participate in innovative risk reduction activities is considered to be important.

— **Technology:** A few immediate focus areas would be: ***improvement of road conditions, better sanitation and solid waste management system, and health facilities.*** Road conditions need not only physical improvements, but to introduce a proper traffic management system. Varanasi city has relatively lower ratio of length of road compared to its area and population. This may be difficult to improve drastically, but a better management system can be put into practice. Sanitation and solid waste management are well known challenges in the city and different zones, which need technical improvements, as well as policy and system improvements. The city also lacks good health facilities, and is not well equipped to tackle the regular small-scale disasters and health related issues like water, vector borne diseases or health problems due to heat waves.

The zone analysis suggests zone specific approaches and priorities. Comparative analysis of five zones indicates highest resilience for Admapur Zone, and lowest resilience for Dashashwamedh zone. The zone analysis provides two specific patterns:

- In Bhelupur and Trans Varuna Zones, ***sanitation and solid waste management*** is the key issue, which needs urgent attention. There is very little segregation of solid waste at the source of generation, and most of the solid waste goes untreated before dumping. Sanitation infrastructures need to be improved properly. The other key issue is environmental policy implementation. Lack of appropriate ***environmental policy*** has different impacts, which are linked to land use change, lack of green spaces etc. These issues need to be improved on urgent basis. These two zones have s***trength in social capital as well as water supply system,*** which needs to be sustained over time.
- In case of Dashashwamedh, Adampur and Kotwali Zones, the key strength lies in ***health, water and social capital.*** Relatively better health system, less interruption in water supply system and strong social bonding will increase the physical as well as social resilience of these communities. However, the zones need improvements in ***good governance and budget*** related issues. All these three zones have no budget provisions for disaster risk reduction, and therefore, specific activities are rather limited. Lack of appropriate governance system is also linked to non-implementation of policy as well as limited number of trained personnel at both city and zone level.

In summary, the issues, which need to be developed, are:

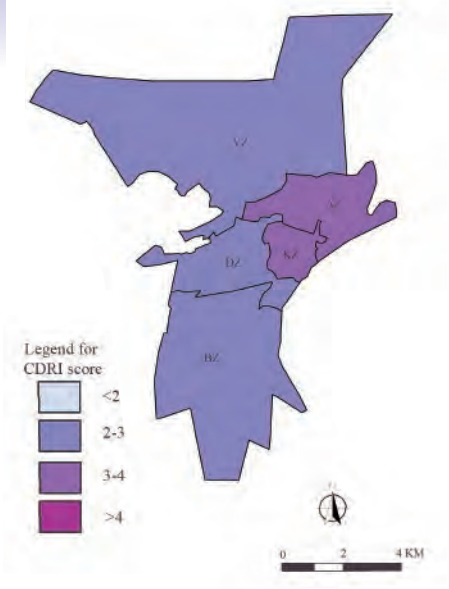
- Governance capacity, allocation of budget and personnel
- Social media and smart media system to share lessons and learning
- Better technology for sanitation, solid waste management, road & traffic management and
- health system

The issues, which need to be sustained, are:

- Social capital and community cohesion and relationship
- Water supply system
- Household assets

Based on this analysis, an action plan comprising of short, medium and long-term priorities needs to be developed for the city as well as the zones. The plan needs to be updated and the progress of its implementation needs to be monitored, keeping in mind that city resilience is a dynamic factor, which changes over time.

Physical Resilience of Varanasi



The Physical Resilience of Varanasi is measured in terms of its electricity, water, sanitation and solid waste disposal, road conditions and housing and land use planning. The study suggests that out of the five zones the highest physical resilience is of Adampur zone and the lowest is of Dashashwamedh zone. In terms of parameters, water supply has the highest resilience where as accessibility of roads has the lowest resilience at the city level. The average CDRI score of the five parameters suggest sanitation and solid waste disposal has the lowest CDRI score. This variation can be attributed to the ground level implementation gaps. Purvanchal Vidyut Vitaran Nigam Limited (PVVNL) meets 51 to 75% of Varanasi's electricity demand through a centralized system. The study shows 51 to 75 % of the households have legal access to electricity for an average of 9 to 15 hours per day. In case of a disaster, the city's supply has less than 10% dependency on external sources to run emergency services. At the zone level Dashashwamedh and Bhelupur zones show a lower resilience for electricity services parameter in comparison to the other zones due to lesser households having access to electricity services and longer periods of power interruptions. In Varanasi, 26 to 50% of the electricity demand is meet by alternative arrangements such as generator and invertors.

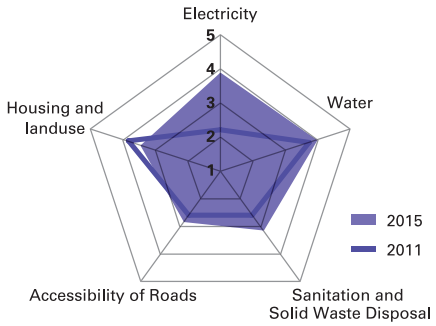
Varanasi Jal Sansthan meets 51 to 75% of the city's water supply demand through a centralized water supply system. On an average, 51 to 75 % of the city dweller has access to potable water supply for 6 to 10 hours per day. At zone level, Dashashwamedh and Bhelupur zones show a lower resilience for the water service as these zones have availability of water for shorter periods (3 to 5 hours per day) in comparison to other zones. As an alternative arrangement, overhead tank are used for storing water in most of the households across the city.

In Varanasi, 51 to 75 % of the population has hygienic access to sanitation. Further, 76 to 100 % of the city's solid waste gets collected everyday but 100% of it goes untreated before dumping and only 11 to 25 % of it is recycled. At the zone level, Dashashwamedh zone has the lowest resilience for the sanitation and solid waste disposal parameter as only up to 50% of the solid waste generated is collected the same day.

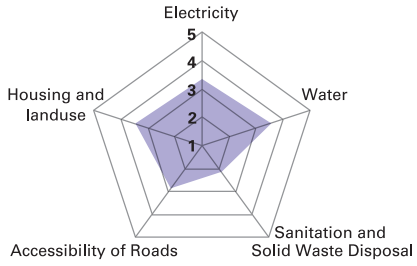
Varanasi has road network on 11 to 15% of its land and less than 50% of the city is accessible by paved roads. In addition to this, organic city growth, low awareness level of the citizens and non-functional traffic signals has added to the traffic woes of Varanasi. Incase of severe flooding only 16 to 30% of the city's roads remain accessible. The study shows a need for bettering the road network and conditions across all the zones.

Varanasi's 90% of the buildings are permanent structures but only a few of them conform to the building codes. In addition to this less than 50% of the houses in the city are built with plinth level higher than normal flood level. Further, less than 12.4% of the total population lives in close proximity to polluted industries or dumping ground but Adampur zone is an exception where more than 50% of the population lives in close proximity to such hazardous locations. Among the five zones, Dashashwamedh zone has the least resilience in this parameter owing to its high number of non-permanent structures.

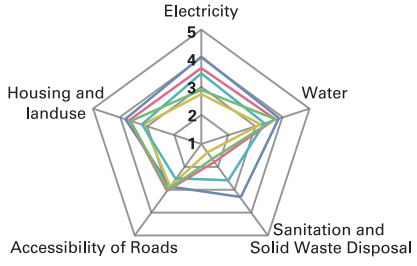
Physical Resilience of Varanasi



Average Physical Resilience of Zones



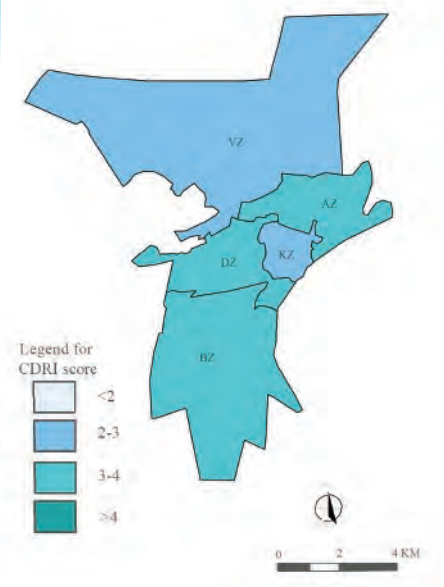
All Zone Composite



Legend

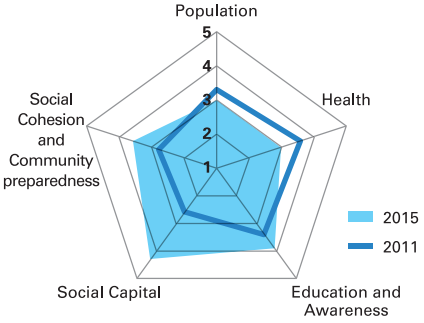
Physical Resilience Parameters	Electricity	Water	Sanitation and Waste Disposal	Accessibility of Roads	Housing and land use
City Level 2015	3.70	3.80	3.00	2.73	3.33
City Level 2011	2.20	3.75	2.60	2.60	3.80
Zonal Average 2015	3.35	3.57	2.16	2.86	3.47

Social Resilience of Varanasi



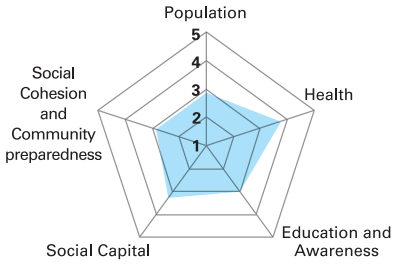
Varanasi has strong social capital, education and awareness and community cohesion and preparedness as a result has highest resilience in the social dimension among other dimensions. Among the zones, Bhelupur has the highest while Trans Varuna has the lowest social resilience. The parameter considered to measure the social dimensions are population, health, education and awareness, social capital and social cohesion and community preparedness. The social capital has the highest resilience and population has the lowest resilience at the city level. This is due to higher level of participation of the communities in community activities and ability to build consensus and deliver shared interests. While the overall population density in Varanasi is 14,605 people per square kilometer but certain pockets especially the ones containing older parts of Varanasi has very high population density in of range of 30,000 to 48,000 persons per square kilometer. The city has more than 50% its population living in slum areas or informal settlement, which puts additional pressure on the services of the city government.

Average Social Resilience of Varanasi



The zonal average suggests health is most resilient parameter while social cohesion and community preparedness is the least. The variation in health is due to the fact that the present health service though is apparently effective in managing small-scale disasters at zonal level but will need strengthening to handle complex large-scale future disasters. The health service in Varanasi managed by the district health department is accessed by 76 to 90% of the citizens. The water borne and vector- borne diseases impact less than 11% of the population in a year but such cases increases in certain pockets during flooding but in such times effectiveness of the health services gets reduced.

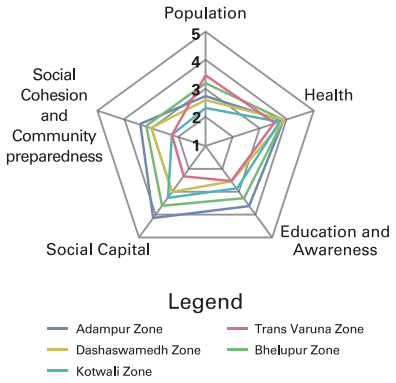
Average Social Resilience of Zones



The communities are not well prepared for disasters though there had been severe flooding incidences in the past. Further, at the zone level it is seen that most of the evacuation process is not voluntary. The NGOs and CBOs collaborate with the city government during disasters but such collaborations do not exist at the zonal level. The zonal data reveals that communities in the zones that have faced disasters in the past are better prepared.

The social capital varies across the zones with Adampur having the highest and Dashashwamedh lowest score due to variation in the level of democracy, community participation and consensus building.

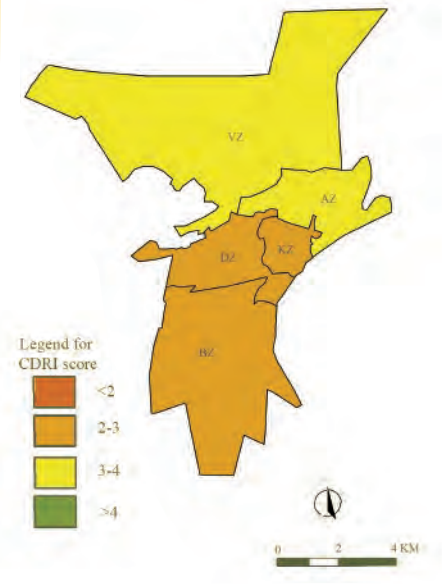
All Zone Composite



The city has strong resilience in the education and awareness parameter with higher overall literacy rate than the national average (74.04 %) and majority of the population have access to Internet. The city government conducts awareness programmes and disaster drills more than once in a year but communities have poor awareness and understanding of city's disaster threats. At the zone level training programmes are seldom conducted resulting in a variation in the resilience. The schools functions as evacuation and relief shelters in the city.

Physical Resilience Parameters	Population	Health	Education and Awareness	Social capital	Social cohesion and Community preparedness
City Level 2015	3.00	3.00	3.93	4.30	3.60
City Level 2011	3.33	3.60	3.40	2.60	2.80
Zonal Average 2015	2.86	3.77	2.95	3.26	2.82

Economic Resilience of Varanasi



The Economic Resilience of Varanasi has the lowest resilience among the five dimensions and is measured by considering five parameters namely income levels, employment, house assets, finance and savings and budget and subsidy. At the city level the resilience is highest for the household assets while it is lowest for budgets and subsidies. The average of resilience of the five zones suggests resilience is highest for income while the lowest is for finance and saving. This is be due to the fact that, at the city level there is no dedicated budget available for disaster management but at the zone level other budget heads are utilized for carrying out disaster management related work. Further, at the city level the credit facilities are available but the lower resilience score at the zone level suggests that such facilities are not commonly sought for disaster management related works. The variation in income parameter at city and zone level suggests higher income disparities between the lowest and highest income levels. Among the five zones, Adampur has the highest score while Kotwali has the lowest score in economic resilience.

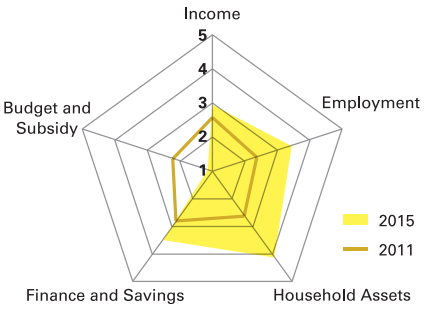
A considerable number of people (15 to 24%) in Varanasi live below the poverty line. In addition to this at the city level, more than 25 % of the youth are unemployed in the formal sector and almost 20 to 39 % of the employees in the formal sector are from outside the city as a result brings down the income level of the city. Individual households are particularly less resilient as dependency on a single source of income is high (75-99%). The percentage of women employed in formal sector is low, ranging between 21 to 35% of total employed population in formal sector. Adampur, Dashashwamedh and Trans Varuna have the highest income level, which is due to a developed tourism sector and commercial activities in these zones.

The household assets in the city have the highest resilience with majority of the households having access to television and mobile phones, which can be used for issuing early warnings and conducting awareness generation drives. More than 61% of the population in Varanasi owns a motorized vehicle which one way strengthens the city's economic resilience but impacts the physical resilience inversely due to rise in traffic congestions and air pollution levels.

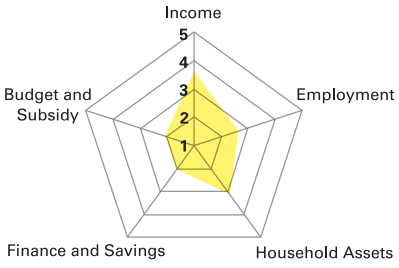
The financing and saving has a lower score at the city level due to limited availability of credit facilities to prevent or mitigate disasters. Further the study suggests that capacity of the existing credit facilities get reduced in the aftermath of a disaster. Overall in Varanasi people have a habit of saving but such practice varies across the zones from less than 10% in Adampur and Trans Varuna to more than 50% in Dashashwamedh zone. Further, Varanasi has less than 10% of its household under at least one insurance scheme, which are either life insurance or health insurance schemes that do not cover catastrophic disaster risks.

The city government has no budget head or subsidies for managing disaster risk at present. The city is dependent on the State or the District funds for disaster management related works. Limited funds are available for the health services specially for buying medicines during the monsoon season to control water borne and vector borne diseases.

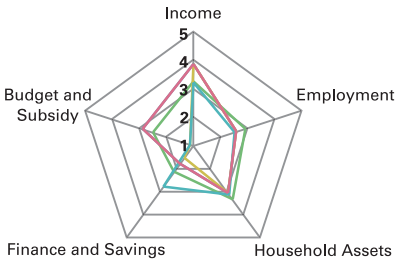
Physical Resilience of Varanasi



Average Physical Resilience of Zones



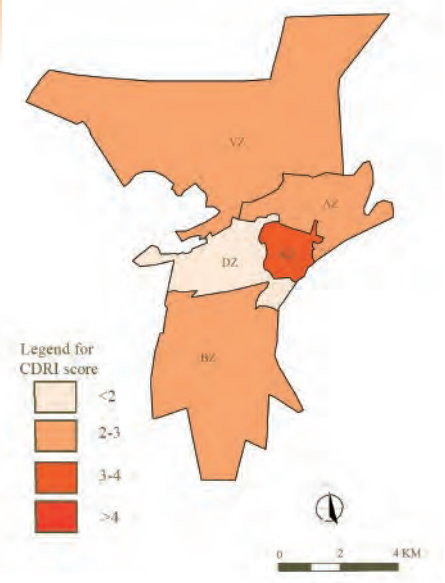
All Zone Composite



Legend

Economic Resilience Parameters	Income	Employment	Household assets	Finance ad savings	Budget and subsidy
City Level 2015	2.93	3.46	4.13	3.46	1.13
City Level 2011	2.60	2.40	2.60	2.80	2.20
Zonal Average 2015	3.61	2.65	3.13	2.01	2.09

Institutional Resilience of Varanasi



The Institutional Resilience of Varanasi is measured in terms of mainstreaming of Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), effectiveness of city's crisis management framework, effectiveness of city's institutions to respond to a disaster, institutional collaboration with other organisations and stakeholders and good governance. At the city level, the highest score among these five parameters is that of institutional collaboration and good governance while the lowest score is that of mainstreaming Non Governmental Organizations (NGO) and Community Based Organizations (CBO). While the average of zonal resilience suggest institutional collaboration as the highest and knowledge dissemination as the lowest. Among the zones, Kotwali has the highest institutional resilience while Dashashwamedh has the lowest.

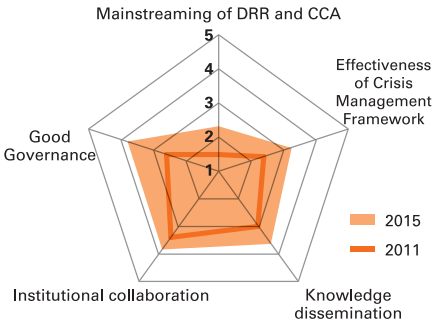
At the city level the mainstreaming of Disaster risk reduction has obtained the least resilience score, as disaster risk reduction is not integrated into land use, housing, transportation, environmental plans and policies. Both at the city and zonal level disaster management plans do not exist. Further, at present disaster education is not part of the school curriculum.

The crisis management framework is not very effective at the city level due to lack of emergency teams and poor incorporation of uncertainties of climate change in disaster management plan. At zone level, lack of evacuation centers is a major challenge considering the high population density of the city.

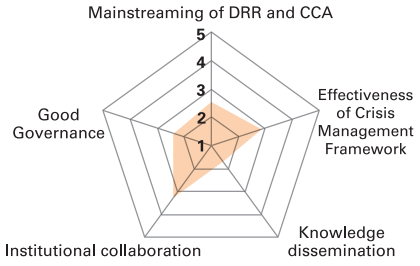
The knowledge dissemination and management needs to be strengthened with frequent training and awareness programs at the city, zone and ward levels. Along with this, it is necessary to transform the learning form the past disasters into effective planning and policy decisions to mitigate future disasters.

The institutional collaboration is high at the city as well as zonal level. The city is slightly dependent on the other sources for support during disasters especially on the district authorities. While the zonal authority rely heavily on the city services and the neighbouring zones for support during disasters. The city government has strong collaborations with private organizations but has limited collaboration with the non governmental organizations and community based organizations. Varanasi has strong good governance parameter at the city level with effective implementation of building codes and enforcement of disaster risk management. However, the city lacks an efficient early warning system to timely warn the communities before disasters. City level disaster drills are conducted more than twice a year with the fire brigade department of the State government but such drills seldom involve the zonal officers or communities.

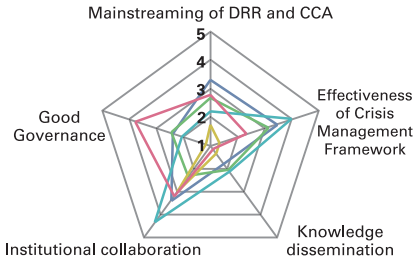
Average Social Resilience of Varanasi



Average Social Resilience of Zones

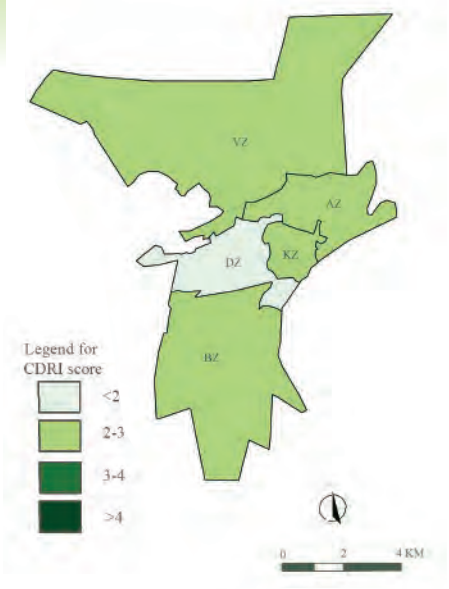


All Zone Composite



Institutional Resilience Parameters	Mainstreaming of DRR and CCA	Effectiveness of crisis management framework	Knowledge dissemination	Institutional collaboration	Good governance
City Level 2015	2.33	3.26	3.60	3.80	3.80
City Level 2011	1.50	2.40	3.00	3.40	2.60
Zonal Average 2015	2.54	2.85	1.69	3.25	2.39

Natural Resilience of Varanasi



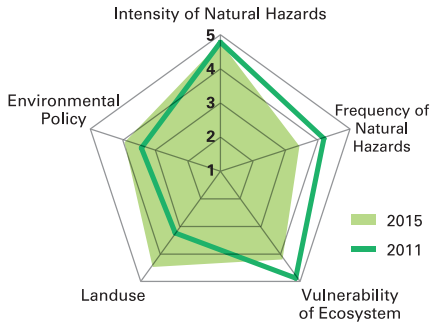
Varanasi is prone to climate related natural hazards like flooding, heat wave, cold wave and water scarcity. The Resilience to Natural Conditions is measured in terms of intensity and frequency of natural hazards, ecosystem services, land use and environmental policies. Both at the city and zone level, lower intensity and higher frequencies of natural disasters suggest predominance of localized, less severe disasters for shorter spells. Dashashawmedh zone is an exception to this, which shows exposure to severe climate related natural hazards mainly riverine and urban floods. Highest concern at the city level is towards the increase in frequency of the natural hazards in the recent years. At the zone level, environmental policy has the lowest resilience due poor compliance to waste management, pollution level and issues related to food security. Dashashwamedh has the lowest resilience and Kotwali has the highest resilience.

The frequency of natural disaster is moderate except for Dashashawmedh, Adampur and Bhelupur zones, which face annual flooding incidences of both riverine and urban types. Although heat and cold waves are annual events but their impacts are not severe as compared to flooding. The peripheral areas of the city mainly in Trans Varuna zone face water scarcity in the summer season due to extensive use of tube wells resulting in lowering of the water table.

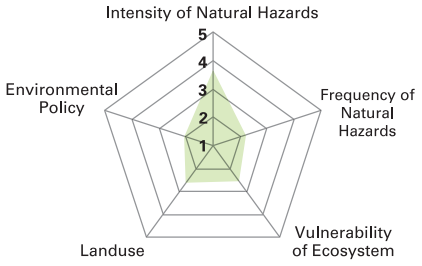
The ecosystem services in the city are degrading with poor urban biodiversity and soil condition and high levels of water contamination inspite of improvement in waste management policies. Poor mitigation policy of the city government to reduce air pollution and reduced compliance to environmental policies is leading to higher levels of air pollution and water contamination. The interlinked water bodies locally called kunds, which use to act as natural holding ponds to tackle urban flooding, are slowly depleting in number. Further, disposal of solid waste in the drains and poor solid waste collection system, urban flooding is becoming more frequent in certain pockets of Varanasi.

Almost one fourth of the city is exposed to impact of climate related natural hazards. Taking into account the high intensity of land use –urban morphology in Varanasi the urban green spaces are decreasing over the years. At the present more than 16% of the total city area comprises of urban green spaces but at the same time in the last 50 years more than 40% of these have been transformed to manage the infrastructure needs. The effect is more pronounced in densely populated Adampur and Dashashwamedh zones where the green spaces are reduced to 1 to 5% of the total zonal area. In contrast to this, newly developed Trans Varuna zone has more than 16% of the green cover. This reflects on the need to strengthen the environmental conservation regulations and its implementation in Varanasi.

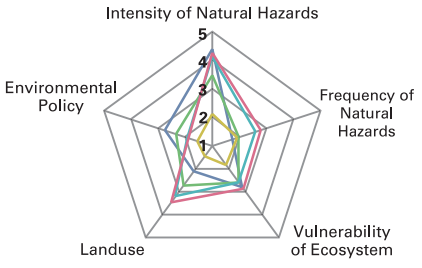
Average Social Resilience of Varanasi



Average Social Resilience of Zones



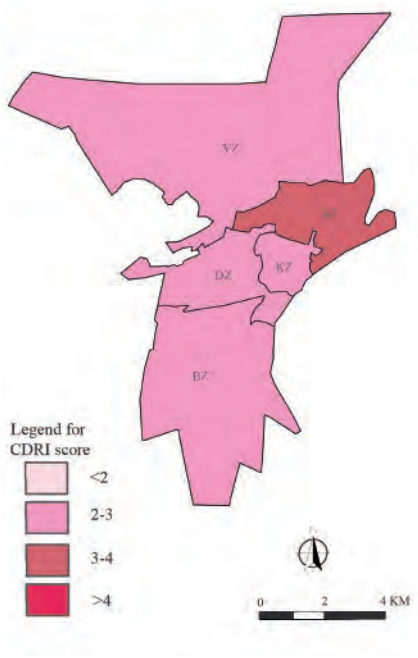
All Zone Composite



Legend

Natural Resilience Parameters	Intensity /severity of natural hazards	Frequency of natural hazards	Vulnerability of ecosystem services	Landuse in natural terms	Environmental policies and food security
City Level 2015	3.80	2.46	3.13	3.40	2.93
City Level 2011	3.80	3.20	3.80	2.20	2.40
Zonal Average 2015	3.67	2.21	2.54	2.59	2.07

Overall Resilience of Varanasi



The Overall CDRI value of Varanasi is 3.20 with social dimension having the highest resilience while economic dimension has the lowest resilience. Looking at the various parameters, the highest resilience is that of social capital, household assets, education and awareness, water services and institutional collaboration. The lowest resilience is for budget and subsidy, mainstreaming of disaster risk reduction and climate change adaptation, frequency of natural hazards, accessibility of roads and environment policy. A relatively higher CDRI score of intensity and lower score for frequency of natural hazards suggest Varanasi is more exposed to the risk of low intensity high frequency disaster events. The lower CDRI scores for budget and subsidy, environmental policy and mainstreaming of disaster risk reduction and climate change adaptation points towards a need for a strong institutional base for disaster management in Varanasi. The health, roads and sanitation services need to improve for strengthening physical resilience of the city.

The CDRI score for the zonal average is lower than the CDRI score at the city level for all dimensions. This shows the importance of micro level information and zone and city linkages. Further it also signifies the need to focus on the zonal issues for strengthening overall city's resilience.

The average of zonal resilience score suggest physical dimension to be having the highest resilience and economic conditions have the lowest resilience. The economic resilience at the zone is lower due to high rates of unemployment, limited financing facilities and lower savings. The variation in institutional resilience score for the city and zonal average points out towards weak governance at the zone level and further down.

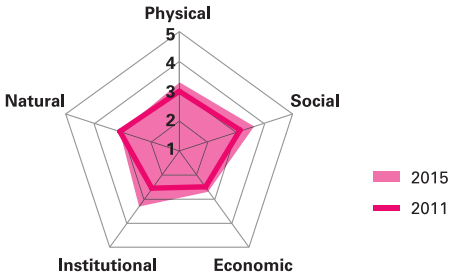
Scores for Various Parametersat City Level	
Social Capital	4.30
Household Assets	4.13
Education and Awareness	3.93
Water	3.80
Institutional collaboration	3.80
Good Governance	3.80
Intensity	3.80
Electricity	3.70
Community preparation	3.60
Knowledge dissemination	3.60
Employment	3.46
Finance and savings	3.46
Landuse	3.40
Housing and landuse	3.33
Crisis Management Framework Effectiveness	3.26
Ecosystem	3.13
Sanitation	3.00
Population	3.00
Health	3.00
Income	2.93
Environmental Policy	2.93
Accesbility of Roads	2.73
Frequency	2.46
DRR and CCA Mainstreaming	2.33
Budget	1.13

CDRI Scores

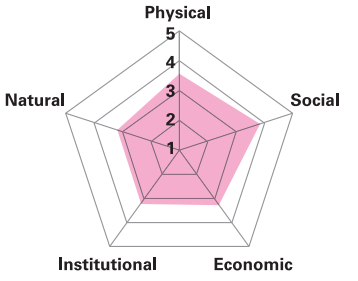
	Overall	Physical	Social	Econom	Institutional	Natural
City 2015	3.20	3.29	3.65	2.66	3.30	3.08
City 2011	2.86	2.99	3.14	2.52	2.58	3.08
Zonal Average	2.90	3.12	2.74	2.54	2.56	2.77

CDRI Mapping

Overall City Resilience



Average of All Zone Resilience



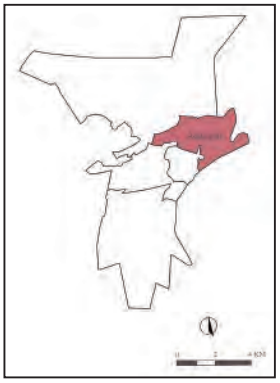
CDRI Values						
Name	Overall Score	Physical	Social	Economic	Institutional	Natural
Varanasi City 2015	3.20	3.29	3.65	2.66	3.30	3.08
Varanasi City 2011	2.86	2.99	3.14	2.52	2.58	3.08
Adampur Zone (AZ)						
Adampur Zone	3.08	3.46	3.38	3.01	2.86	2.70
Rajghat	3.10	3.89	3.51	3.03	2.35	2.72
Alaipura	2.65	2.90	3.09	2.54	2.22	2.49
Prahladghat	2.96	3.48	3.28	3.03	2.35	2.66
Navapura	2.98	3.71	3.36	2.82	2.40	2.62
Omkaleshwar	2.84	2.87	3.26	3.03	2.40	2.67
Pathani Tola	2.88	2.92	3.30	3.13	2.39	2.66
Dhoopchandi	2.80	2.88	3.17	2.83	2.21	2.91
Kamal gadha	2.39	2.16	2.80	2.50	2.42	2.08
Katehra	2.85	2.97	3.23	2.84	2.22	3.01
Basniya	2.68	2.85	3.06	2.66	2.16	2.64
Jamaluddinpura	2.77	2.97	3.23	2.84	2.09	2.72
Kaji sadullapura	2.89	3.12	3.28	2.80	2.22	3.02
Bandhookachchibagh	2.64	2.87	2.94	2.62	2.21	2.55
Saraiya	2.74	3.49	3.08	2.21	2.53	2.37
Agaganj	2.68	2.88	3.17	2.49	2.22	2.65
Koniya	2.62	2.95	3.13	2.21	2.45	2.38
Kamalpura	2.72	2.89	3.25	2.53	2.13	2.81
Chhittanpura	2.85	2.84	3.16	2.78	2.46	3.03
Jalalipura	2.76	3.54	3.00	2.27	2.50	2.47
Rasulpura	2.74	2.97	3.13	2.57	2.20	2.83
Bhelupur Zone (BZ)						
Bhelupur Zone	2.80	2.76	3.48	2.82	2.45	2.53
Ranipur	2.97	2.76	3.73	2.77	2.86	2.72
Bajardiha	2.72	2.76	2.25	3.05	3.26	2.29
Revadi Talab	2.43	2.63	3.02	2.53	1.78	2.20
Shiwala	2.84	2.60	3.00	2.34	3.42	2.84
Jolha	2.78	2.72	3.29	3.01	2.22	2.64
Nawabganj	2.54	2.55	2.58	2.80	2.23	2.56
Nariya	2.76	2.76	3.00	3.01	2.21	2.81
Tulsipur	2.66	2.76	3.00	3.00	2.21	2.32
Bhadaini	2.76	2.49	2.40	2.15	4.06	2.68
Sunderpur	2.62	2.78	2.87	2.60	1.93	2.93
Nagwa	2.77	2.67	3.23	2.65	2.59	2.70
Virodpur	2.82	2.57	2.98	2.60	2.79	3.17
Bhelupur	2.69	2.71	3.03	2.60	2.14	2.95
Newada	2.68	2.71	3.20	2.48	2.40	2.62
Vinayaka	2.65	2.84	2.78	2.60	2.40	2.66
Baghada	2.46	2.64	2.25	2.60	2.17	2.64
Khojwa	2.98	2.72	2.84	2.61	3.66	3.04
Pandey Haveli	2.48	2.64	2.31	2.80	2.21	2.45
Sarai Surjan	2.55	2.66	2.80	2.55	1.90	2.84

Name	Overall Score	Physical	Social	Economic	Institutional	Natural
Dashashwamedh Zone (DZ)						
Dashashwamedh Zone	2.40	2.40	3.40	2.53	1.76	1.75
Lahartara	2.92	2.68	3.35	2.60	3.30	2.66
Chhittupur	2.67	2.68	2.86	2.11	3.08	2.61
Luxa	2.86	2.82	3.08	2.41	3.22	2.76
Kajipura	2.80	2.77	3.03	2.36	3.10	2.74
Lallapura Kala	2.51	2.39	2.76	2.10	2.85	2.47
Shivpurva	2.68	2.92	3.15	2.11	2.93	2.31
Pandariba	2.64	2.75	3.28	1.95	2.82	2.42
Bangali Tola	2.87	2.85	3.36	2.16	3.26	2.71
Dashashwamedha	2.87	2.89	3.24	2.42	3.23	2.57
Jangambaadi	2.78	2.79	2.88	2.45	3.08	2.69
Madanpura	2.69	2.58	2.93	2.25	3.02	2.68
Rampura	2.77	2.81	2.89	2.39	3.24	2.54
Chetganj	2.78	2.43	3.14	2.49	3.38	2.44
Lallapur	2.81	2.94	3.27	2.04	3.28	2.52
Jagatganj	2.76	3.01	3.28	1.89	3.16	2.46
Habibpura	2.77	3.08	3.05	2.11	3.25	2.36
Sarai Govardhan	2.82	3.11	3.08	2.32	3.10	2.51
Lahangpura	2.82	2.80	3.04	2.20	3.17	2.90
Sigra	2.34	2.73	2.63	1.80	2.56	1.99
Kotwali Zone (KZ)						
Kotwali Zone	2.91	3.00	2.91	2.34	3.35	2.93
Kameshwar Mahadeva	2.64	2.66	3.09	2.16	2.76	2.52
Katuapura	2.58	2.88	2.98	2.05	2.55	2.41
Benia	3.00	3.20	3.11	2.57	3.09	3.04
Piyari Kala	2.86	2.88	3.65	2.16	2.99	2.60
Madhyameshwara	2.86	3.49	3.60	2.10	2.75	2.34
Baluabeer	2.81	3.09	3.61	2.16	2.75	2.44
Goladinanath	2.60	2.63	3.02	2.14	2.72	2.51
Gadwasi Tola	2.63	3.12	2.87	2.18	2.45	2.54
IshwarGangi	2.98	3.68	3.66	2.14	2.80	2.60
Rajmandir	2.74	2.76	3.38	2.22	2.86	2.46
Hadha	2.94	3.00	3.65	2.47	2.96	2.59
KaalBhairav	2.73	2.76	3.36	2.12	2.82	2.58
Daranagar	2.93	3.83	3.57	2.09	2.79	2.40
Trans Varuna Zone (VZ)						
Trans Varuna Zone	2.77	2.89	2.79	3.01	2.27	2.90
Dithori Mahal	2.64	2.72	2.77	2.58	2.20	2.94
Narayanpur	2.62	2.76	2.62	2.30	2.41	3.03
Shivpur	2.75	2.91	2.97	2.28	2.58	3.01
Chaukaghat	2.58	3.13	2.89	2.89	2.10	1.92
Mavaiya	2.66	2.59	2.96	2.55	2.25	2.97
Dindayalpur	2.85	2.89	3.41	2.68	2.24	3.04
Pahariya	2.71	2.85	2.87	2.67	2.15	3.00
Ramrepur	2.66	2.89	2.89	2.00	2.44	3.08
Sarsauli	2.68	2.73	2.85	2.46	2.28	3.08
Hukulganj	2.74	2.86	2.79	2.50	2.55	3.01
Rajabazar	2.56	2.76	2.64	2.30	2.24	2.87
Sikraul	2.70	2.76	2.84	2.59	2.30	3.00
Khajuri	2.65	2.89	2.70	2.43	2.32	2.93
Tarna	2.71	2.75	2.80	2.30	2.52	3.16
Indrapur	2.71	2.91	3.01	2.29	2.34	3.01
Pandeypur	2.71	2.84	2.84	2.89	2.10	2.86
Sarnath	2.77	3.13	2.90	2.89	2.27	2.67
Nayi Basti	2.59	2.68	2.75	2.34	2.39	2.79
Nadesar	2.51	2.66	2.56	2.34	2.33	2.63

Climate Disaster Resilience Index of Adampur Zone

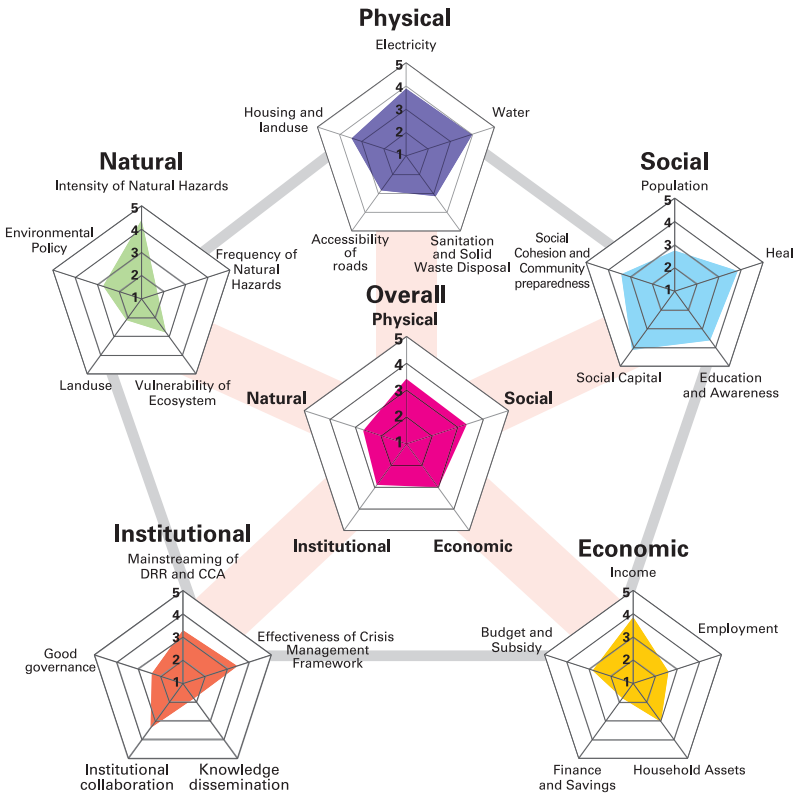
Introduction

Adampur zone is located in the northeastern part of the city on the banks of river Ganges and Varuna. The zone is divided into 20 wards with a population of 249,671 as per 2011 provisional population data. The zone has small- and medium scale industries, which are involved in sari making, carpet weaving among others. The zone has mixed land use with a mosaic of the older city and newly developed pockets. The older part due to organic growth is characterized by narrow streets while the newly developed pockets have wider roads but encroachment is common. Adampur is affected by riverine and urban flooding due its location in the flood plains of Ganges.



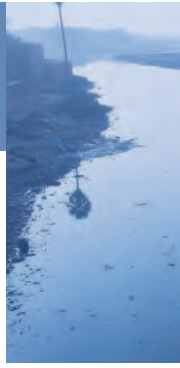
Score of Indiviual Parameters	
Intensity of natural hazards	4.40
Social Capital	4.13
Household Assets	4.13
Electricity	4.07
Water	3.87
Health	3.86
Housing and landuse	3.80
Education and Awareness	3.60
Employment	3.46
Finance and savings	3.46
Effectiveness of Crisis Management Framework	3.46
Community preparation	3.42
Institutional collaboration	3.40
Sanitation and Solid waste disposal	3.33
Mainstreaming of DRR and CCA	3.30
Income	2.93
Accessibility of Roads	2.87
Ecosystem services	2.80
Population	2.73
Environmental Policy	2.73
Good Governance	2.40
Landuse in natural terms	2.13
Knowledge dissemination	1.80
Frequency of natural hazards	1.73
Budget and Subsidy	1.13

CDRI Scores					
Overall	Physical	Social	Economic	Institutional	Natural
3.08	3.46	3.38	3.01	2.86	2.70



CDRI Analysis

The CDRI score for Adampur zone shows Physical resilience is highest and resilience to natural condition is the lowest. The area is exposed to low intensity frequent disasters for shorter periods mainly due to its location between the flood plains of river Ganges and Varuna. The strength of the area is its social capital, household assets and water, health and electricity services. While it needs improvement in good governance, knowledge dissemination by means of training and awareness, environmental policy compliance and investment for flood mitigation measures.



Physical

Adampur has better water, health and electricity services. 81 to 95% of the household in the area has electricity available for more than 16 hours per day and more than 96% of the household has access to water for less than 10 hours a day. On an average, 61 to 75% of the population in the zone has access to sanitation and less than 5% of the solid waste generated is not collected on the same day. However, almost all the solid goes untreated before dumping and only 10% of the solid waste is recycled. During floods up to 10% of the solid waste gets collected within 48 hours after the water recedes. More than 70% of the roads remain accessible during flooding although less than 15% of them have covered drains. The zone has less than 10% of the buildings built following the buildings codes and 51 to 60% of houses are above normal flood level. More than 50% of the population lives close to polluted industries and dumping sites.

Social

The Adampur zone has very high social capital with more than 41% population participating in community activities and acceptability of the community leader in the zone is good. 25 to 37 % of its population lives in slums or informal settlements. The literacy rate is between 75 to 87 %, which is higher than the national average. People are affected more by waterborne disease (6-11%) in comparison to vector borne diseases (0-5%) and only 50 to 75% of the population has access to primary health care. Public awareness and disaster drills are though done once in a year but has limited effect. During a disaster, the schools function as relief shelters but only a few people evacuate voluntarily after a disaster. The communities are poorly prepared to face disasters and there are very less support from the non governmental organizations and community based organizations. The community provides relief materials and shelter incase of disasters to the affected people.

Economic

Adampur zone has less than 11% of its population below poverty line and 50 to 74% of the household has one sources of income with 11 to 20% engaged in informal sector. In case of a disaster, 11 to 20% of the households have reduced income levels. Less than 25% of the population is employed in formal sector and more than 25% of the youth population is unemployed. Most of the population has access to mobile phones; television and 41 to 50% have motorized vehicles. Approximately 10% of the population has savings but only less than 10% of the households have registered under some insurance schemes. The zone has no dedicated budget head for disaster management but channelizes more than 3% of its annual budget from other budget heads for disaster management and climate change related activities. The zone has limited subsidy for health care but lacks subsidies for livelihood and rebuilding houses in the aftermath of a disaster.

Institutional

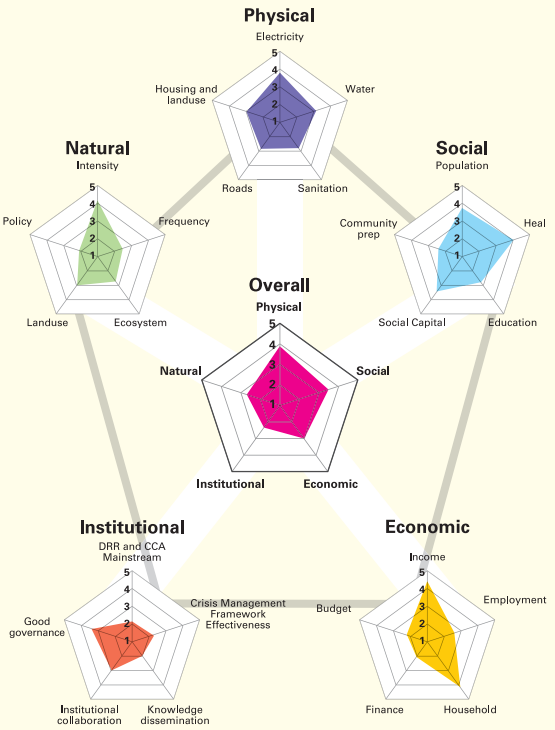
The institutional resilience of Adampur is higher than rest of the zones due to its high institutional collaborations. There is an effective crisis management framework and sufficient evacuation center in the zone but the zone needs to strengthen mainstreaming of disaster risk reduction and climate change adaptation. Further, trainings and disaster drills are not conducted for the disaster management team and community. The learning from the past disasters seldom gets reflected in planning and mitigation strategies of the zone. The zone is dependent on external support of city head office and district disaster management authority in handling disaster. The zone has strong networking with neighbouring zones but at the same time there is a need to increase the non governmental organization and private organization collaboration. There is no established early warning mechanism in the zone.

Natural

Adampur faces riverine flooding once every year and urban flooding more than once annually. The zone experiences cold waves in winter season once every year of medium severity. The zone has overall poor ecosystem services due to rise in air pollution and water contamination. The built up area lies between 71 to 90% in the zone with less 1% green cover due to transformation of green spaces for supporting infrastructure development in the last 50 years. 10 to 25% of the settlements are in hazardous locations mainly closer to flooding areas. There is a need for better compliance to the environmental conservation policies and waste management systems in the zone.

Adampur Zone

Ward Name- Raj Ghat
Ward Number- 4
Population - 8,889



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
3.10	3.89	3.51	3.03	2.35	2.72

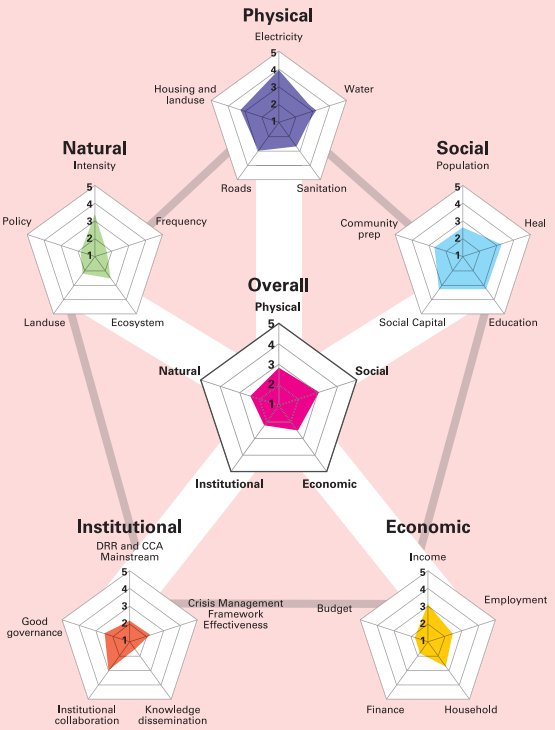
Strengths

- Low intensity of disaster.
- Developed housing and land use, water and electricity services.
- Strong institutional collaboration and education level.

Scope for Improving Resilience

- Strengthen Good governance mainstreaming of DRR and knowledge dissemination.
- Improve road and sanitary conditions of the ward.
- Generate employment and Create budget head for DRR.
- Revitalize Eco-system and strengthen DRR policy.
- Strengthen social capital and community preparedness.

Ward Name- Alaipura
Ward Number- 23
Population - 18,777



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.65	2.90	3.09	2.54	2.22	2.49

Strengths

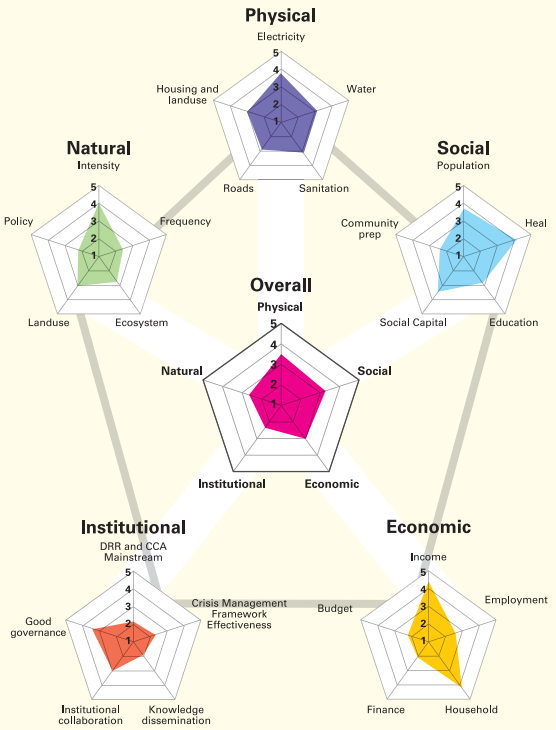
- Low intensity of disaster.
- High-income levels and household assets.
- Good governance and developed health services.

Scope for Improving Resilience

- Strengthen education levels and knowledge dissemination.
- Improve road, sanitary conditions of the ward.
- Generate employment and Create budget head for DRR.
- Revitalize Eco-system and strengthen DRR policy.
- Strengthen social capital and community preparedness.

Adampur Zone

Ward Name-Prahlad Ghat
Ward Number- 66
Population – 13,413



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.96	3.48	3.28	3.03	2.35	2.66

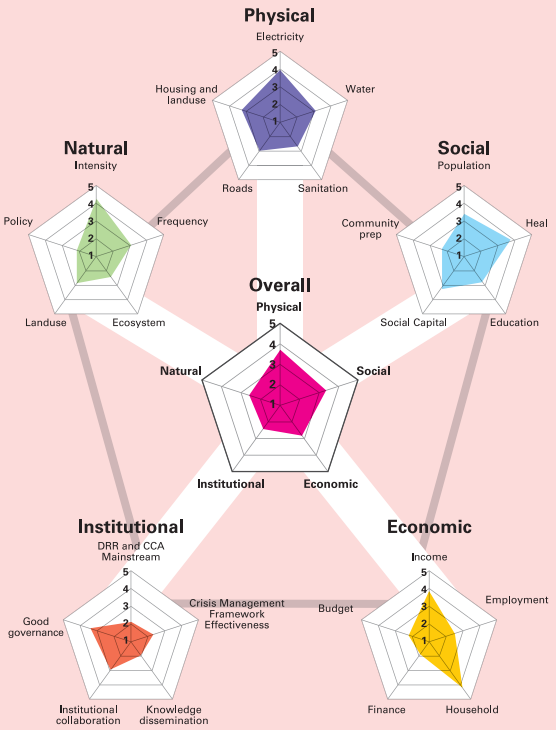
Strengths

- High-income levels and household assets
- Low intensity of disasters
- Developed health and electricity services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen environmental policy

Ward Name- Navpura
Ward Number- 58
Population – 14,150



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.98	3.71	3.36	2.82	2.40	2.62

Strengths

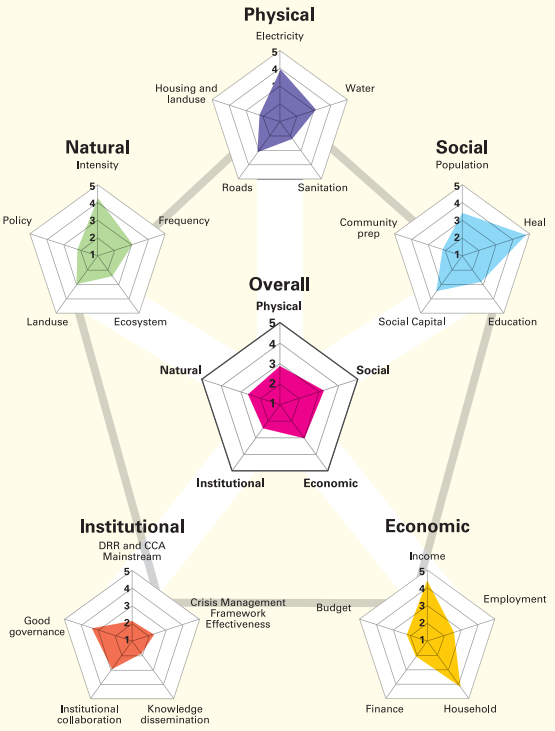
- Low intensity of disasters
- Developed health, and electricity services
- High-income levels and household assets

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen environmental policy

Adampur Zone

Ward Name- Omkaleshwar
Ward Number- 47
Population – 12,547



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.84	2.87	3.26	3.03	2.40	2.67

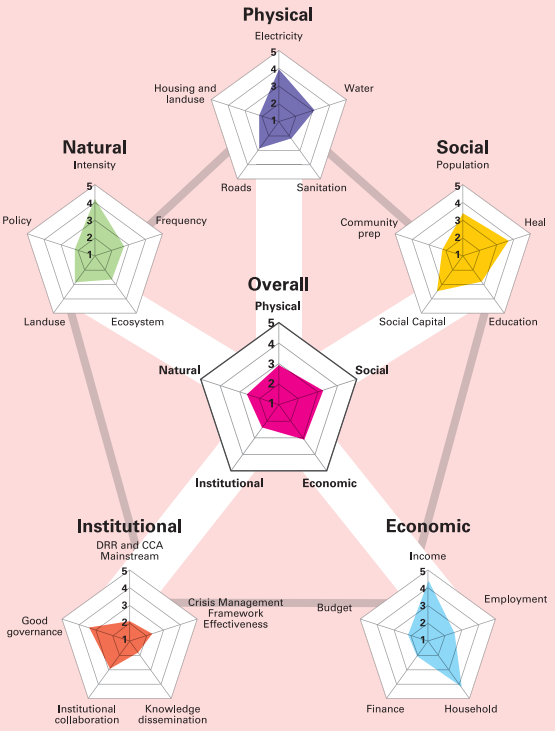
Strengths

- High-income levels and household assets
- High Social capital
- Developed health and electricity services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen environmental policy

Ward Name- Pathani Tola
Ward Number- 71
Population – 15,491



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.88	2.92	3.30	3.13	2.39	2.66

Strengths

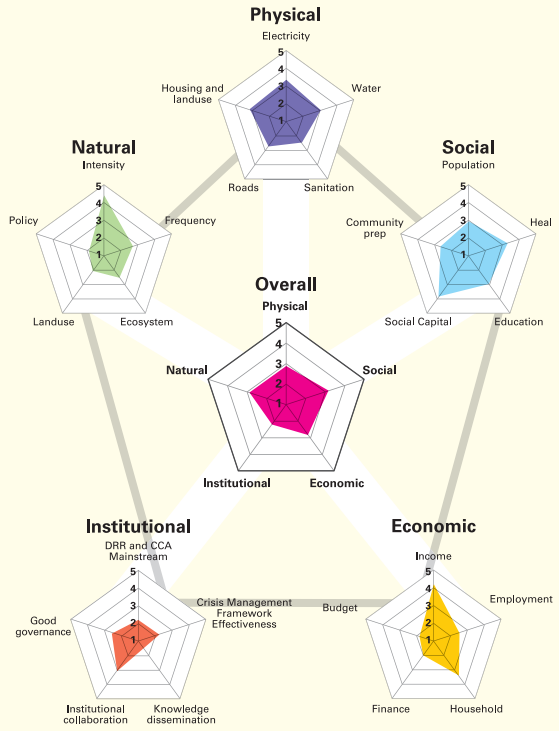
- Low intensity of disasters
- Developed health, and electricity services
- High-income levels and household assets

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen environmental policy

Adampur Zone

Ward Name- Dhoopchandi
Ward Number- 75
Population – 13,993



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.80	2.88	3.17	2.83	2.21	2.91

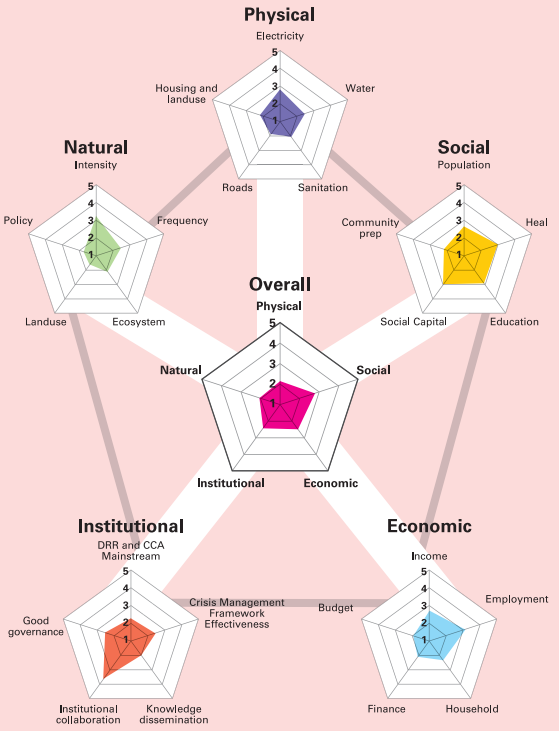
Strengths

- Low intensity of disaster
- Developed health and electricity services
- High Social capital
- High household assets

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy

Ward Name- Kamalgadha
Ward Number- 46
Population – 14,301



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.39	2.16	2.80	2.50	2.42	2.08

Strengths

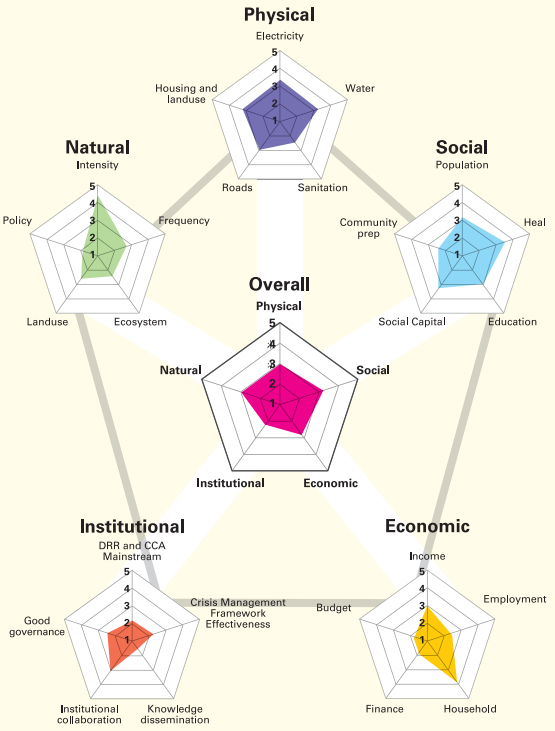
- High institutional collaboration
- Low intensity of disaster
- Presence of employment opportunities.
- High social capital
- Developed health services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Improve road conditions in the ward

Adampur Zone

Ward Name- Katehra
Ward Number- 80
Population – 9,812



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.85	2.97	3.23	2.84	2.22	3.01

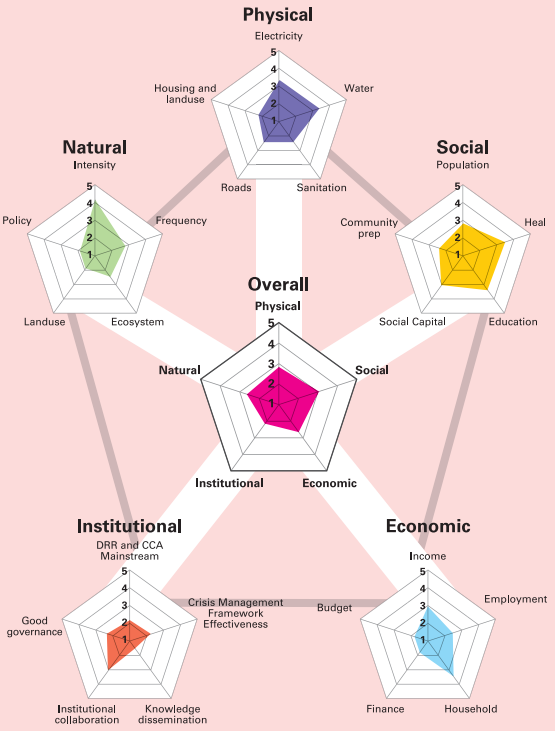
Strengths

- Low intensity of disaster.
- Developed health and electricity and water services.
- High Social capital
- High household assets.

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen environmental policy

Ward Name- Basaniya
Ward Number- 85
Population – 12,311



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.68	2.85	3.06	2.66	2.16	2.64

Strengths

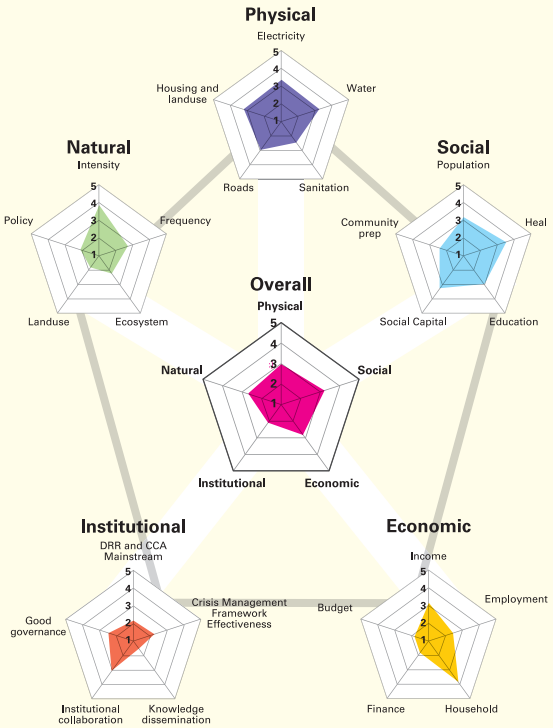
- Low intensity of disaster
- Developed water and electricity services
- Developed health services
- High household assets
- High education and awareness level

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Strengthen economic condition by supporting financing and savings
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy

Adampur Zone

Ward Name- Jamaluddinpura
Ward Number- 81
Population – 9,324



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	2.97	3.23	2.84	2.09	2.72

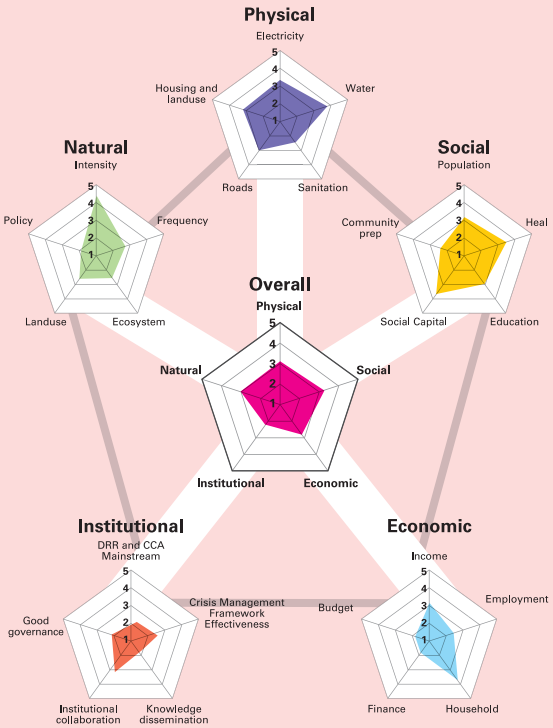
Strengths

- High Household assets
- Low intensity of disaster
- High social capital
- Developed health, water and electricity services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Improve road conditions in the ward

Ward Name- Kaji sadullapura
Ward Number- 86
Population – 11,737



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.89	3.12	3.28	2.80	2.22	3.02

Strengths

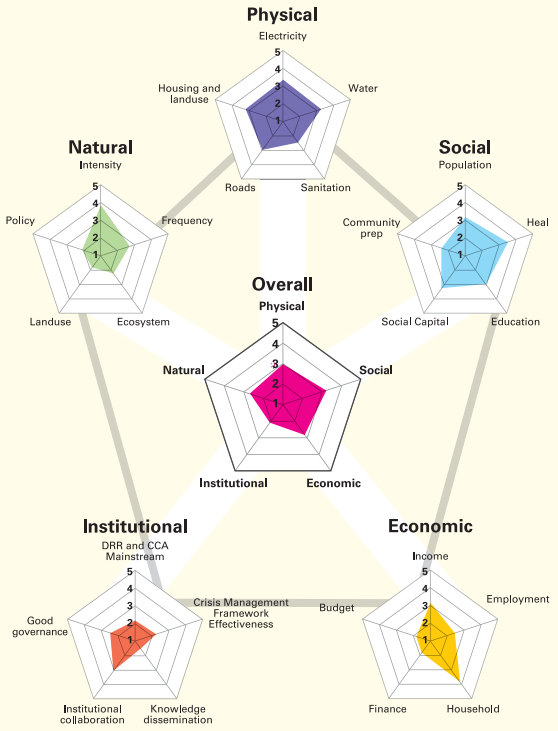
- Low intensity of disaster
- High household assets
- High social capital
- Developed health water and electricity services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen mainstreaming of disaster risk reduction
- Strengthen environmental policy
- Improve road conditions in the ward

Adampur Zone

Ward Name- Bandhookachchi bagh
Ward Number- 82
Population – 9,697



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	2.97	3.23	2.84	2.09	2.72

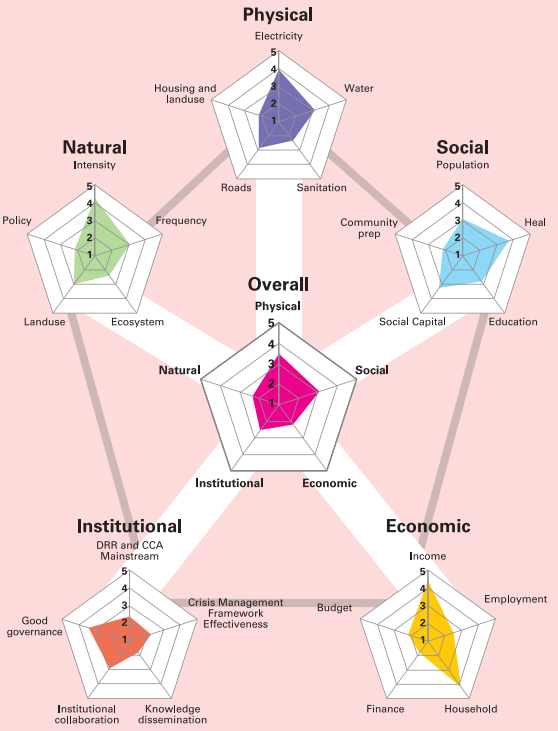
Strengths

- Low intensity of disaster
- High household assets
- High social capital
- Developed electricity, water and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Improve road conditions in the ward

Ward Name-Saraiya
Ward Number- 50
Population – 16,586



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.74	3.49	3.08	2.21	2.53	2.37

Strengths

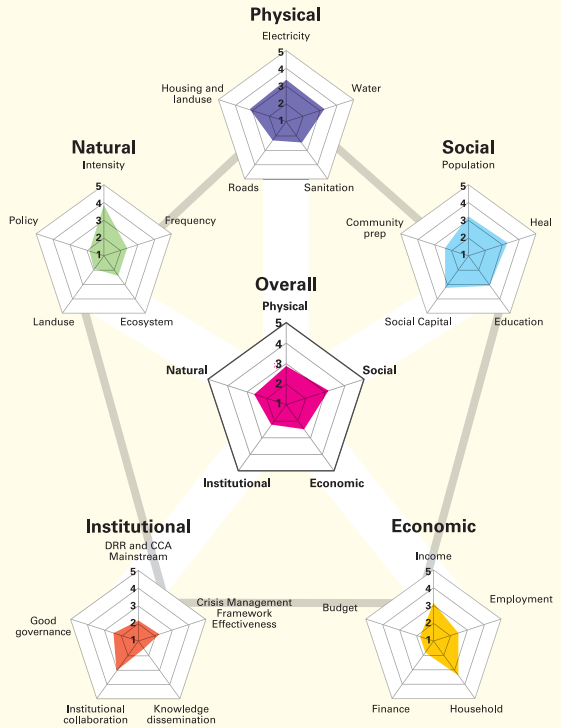
- High income levels and household assets
- Low intensity of disaster
- Presence of employment opportunities.
- Good governance
- Developed health and electricity services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen community preparedness for disasters
- Strengthen environmental policy

Adampur Zone

Ward Name- Aga Ganj
Ward Number- 87
Population – 8,084



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.68	2.88	3.17	2.49	2.22	2.65

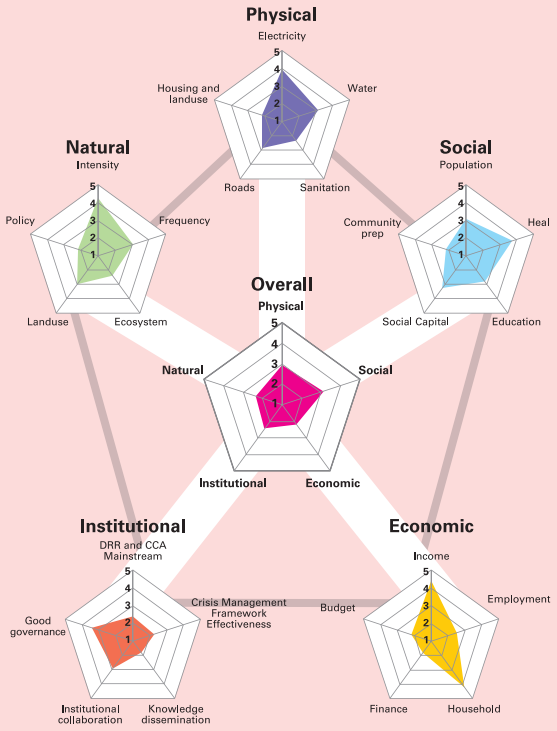
Strengths

- Low intensity of disaster
- High social capital
- Developed health, water and electricity services

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen economic condition by supporting financing and savings

Ward Name- Koniya
Ward Number- 34
Population – 18,032



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.62	2.95	3.13	2.21	2.45	2.38

Strengths

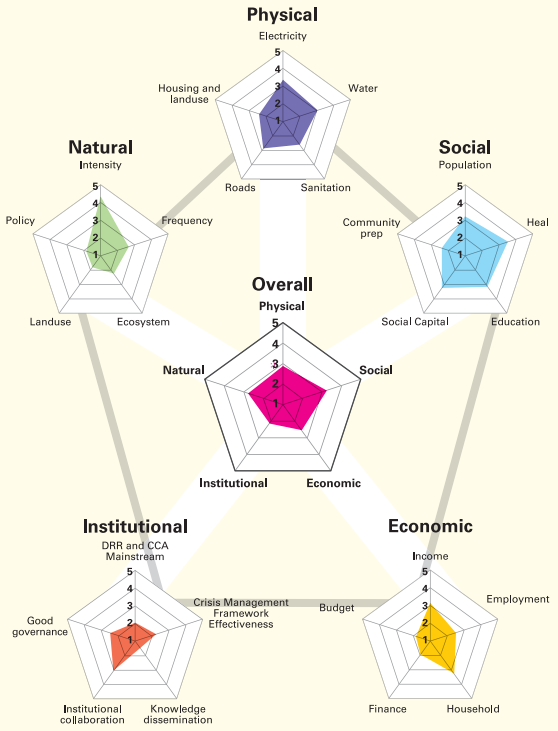
- High income and household assets
- Low intensity of disaster
- Developed health and electricity services
- Good governance

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen community preparedness for disasters

Adampur Zone

Ward Name- Kamalpura
Ward Number- 84
Population – 7,904



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.72	2.89	3.25	2.53	2.13	2.81

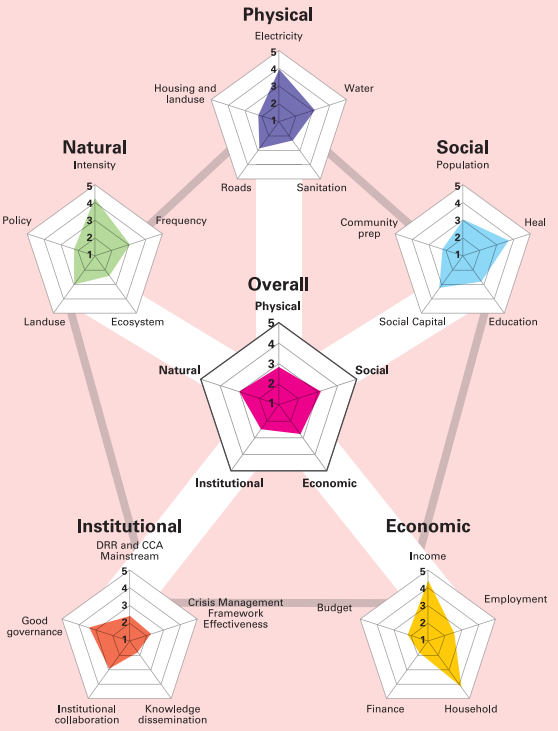
Strengths

- Low intensity of disaster
- High social capital
- Developed health and electricity services
- High household assets

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen economic condition by supporting financing and savings

Ward Name- Chinttanpura
Ward Number- 89
Population – 10,222



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.85	2.84	3.16	2.78	2.46	3.03

Strengths

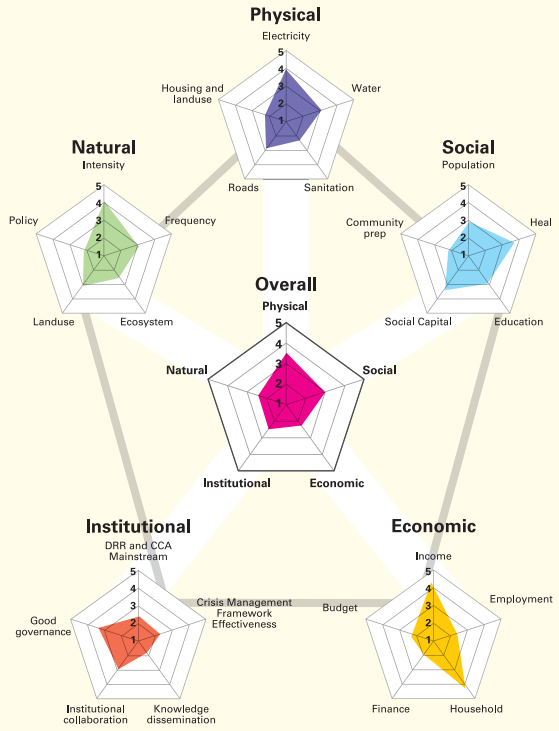
- High income levels
- Low intensity of disaster
- High social capital
- Developed health and electricity services
- Good governance

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen environmental policy
- Strengthen community preparedness for disasters
- Strengthen economic resilience by supporting financing and savings

Adampur Zone

Ward Name-Jalalipura
Ward Number- 56
Population – 16,554



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.76	3.54	3.00	2.27	2.50	2.47

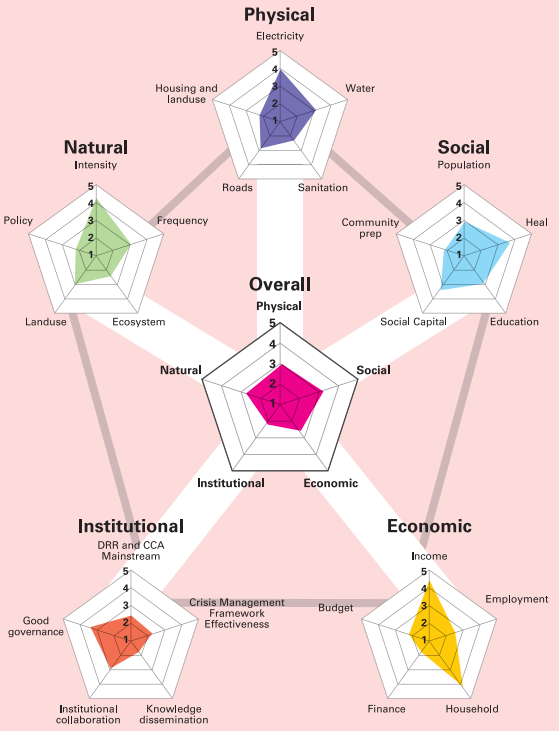
Strengths

- High income and household assets
- Low intensity of disaster
- Developed health and electricity services
- Good governance

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen community preparedness for disasters

Ward Name-Rasulpura
Ward Number- 88
Population – 7,847



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.74	2.97	3.13	2.57	2.20	2.83

Strengths

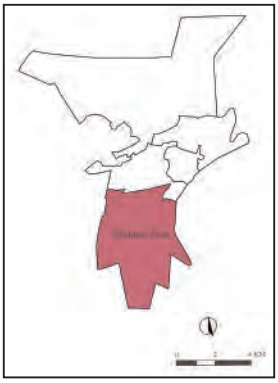
- High income and household assets
- Low intensity of disaster
- Developed health and electricity services
- Good governance

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Create budget head for disaster risk reduction
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen community preparedness for disasters

Climate Disaster Resilience Index of Bhelupur Zone

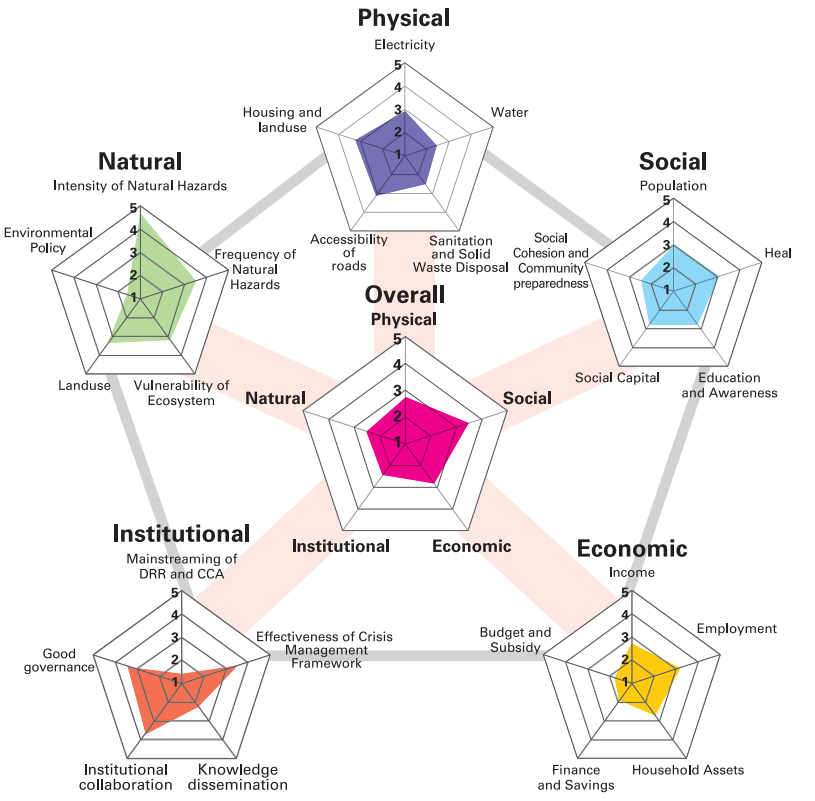
Introduction



Bhelupur zone is located in the southern part of the city on the banks of river Ganges. The zone is divided into 19 wards with a population of 281,562 as per 2011 provisional population data. The zone has mixed land use and has a mixture of old city and newly developed pockets. The water supply system for Varanasi is based out of Bhelupur and serves 50% of the population of the city. Riverine flooding, Sanitation and Solid waste disposal are serious concerns for the area. There are few low-lying pockets that raise concern for urban flooding issues during monsoon season. Sankat Mochan, Durga Kund and Assi Ghat are famous tourist destinations in this zone. Banaras Hindu University, the largest residential university in Asia in located in the Bhelupur zone.

Score of Indiviual Parameters	
Health	3.87
Water	3.73
Housing and Landuse	3.60
Social Capital	3.60
Intensity of natural hazards	3.47
Household assets	3.33
Education and Awareness	3.27
Income	3.27
Population	3.20
Community preparation	3.20
Effectiveness of Crisis Management Framework	3.13
Accessibility of Roads	3.00
Employment	2.93
Electricity	2.87
Landuse in natural terms	2.73
Mainstreaming of DRR and CCA	2.67
Ecosystem services	2.60
Budget and Subsidy	2.47
Good governance	2.47
Institutional collaboration	2.33
Environmental policy	2.33
Finance and Savings	2.13
Knowledge dissemination	2.07
Frequency natural hazards	2.00
Sanitation and Solidwaste disposal	1.67

CDRI Scores					
Overall	Physical	Social	Economic	Institutional	Natural
2.80	2.76	3.48	2.82	2.45	2.53



CDRI Analysis

The CDRI score for Bhelupur zone shows social resilience is highest and institutional resilience as the lowest score. The zone is exposed to low intensity frequent disasters. The strength of the zone is its high social capital, housing and land use planning, water and health services. While it needs strengthening in sanitation and solid waste disposal, knowledge dissemination, environmental policy compliance and investment for flood mitigation measures.

Physical

In Bhelupur, health, water services and housing and land use planning are its strength. 66 to 80% of the households have to access to electricity for 9 to 12 hours per day and more than 96% of the households have access to water for less than 10 hours a day. Sanitation is a concern for the zone with an average of 21% of the population having access to sanitation. 66 to 80% of the solid waste generated is collected on the same day. However, almost all the solid waste goes untreated before dumping and only 10% of the solid waste is recycled. During floods, 26 to 50% of the solid waste gets collected within 48 hours after the water recedes. More than 70% of the zone's roads remain accessible during flooding though less than 31 to 45% of these have covered drains. The zone has 21 to 30% of the buildings built following the buildings codes and less than 50% of houses are above normal flood level. 25 to 37% of the population lives in close proximity to the polluted industries and dumping sites.

Social

The Bhelupur zone has strong social resilience with high social capital with 41% of its population participating in community activities. The acceptability of the community leader in the zone is good. On an average, 25 to 37 % of the population live in slums or informal settlements. The literacy rate is between 50 to 62 %, which is lower than the national average. People are affected equally by waterborne and vector borne diseases (0-5%) and 90 to 95% of the population has access to primary health care. Public awareness and disaster drills are done more than once in a year but has limited effect. During disasters the schools function as relief shelters but only a few people evacuate voluntarily during a disaster. The communities are ill prepared to face any disaster but provide relief and shelter incase of disasters to the affected people. The non governmental organizations and community based organizations actively support disaster management activities in the zone.

Economic

In Bhelupur zone, less than 11% population are below poverty line and 50 to 74% of the households have one sources of income with 11 to 20% of the population engaged in informal sector. After disaster, 11 to 20% of the population have reduced income levels. 13 to 18% of the population is employed in formal sector and 19 to 24% of the youth population is unemployed. More than 81% of the population has access to mobile phones, television and 41 to 50% have motorized vehicles. More than 50% of the population in the zone has savings but only less than 10% of the households have registered under some insurance schemes. The zone has no budget head for disaster management but utilizes 1.1 to 2% of its annual budget from other budget heads for disaster management or climate change related works. The zone has limited subsidy for health care but lacks subsidies for livelihood and rebuilding houses in the aftermath of a disaster.

Institutional

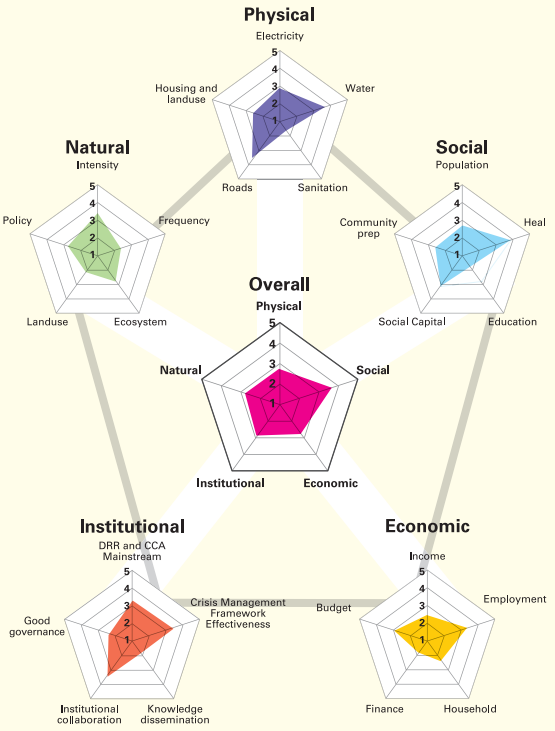
The zone has the lowest resilience in the institutional parameter due to limited mainstreaming of disaster risk reduction and climate change adaptation and community participation in development planning. Bhelupur has an effective crisis management framework and sufficient numbers of evacuation centers. There are no trainings and disaster drills conducted for the disaster management team and community in the zone. The learning from the past disasters seldom gets translated in planning and mitigation strategies of the zone. The zone is self sufficient in handling disasters but it has weak network with neighbouring zones. The institutional collaboration with non governmental organization and private organization is not established. The zone has no established early warning mechanism.

Natural

Bhelupur experiences riverine flooding annually and urban flooding more than once in a year of medium intensity. Incidences of Cold waves are experienced once in year every year of medium severity. The zone has degrading ecosystem services due to lowering of soil quality, higher air pollution and water contamination. The zones built up area lies between 71 to 90% with 6-to10% green cover. In the last 50 years, 21 to 40% of the green cover has been lost. Less than 10% of the settlements in the zone are in hazardous locations mainly in the flood plains. There is poor implementation of environmental conservation policies and waste management system. Currently, there is no mechanism to mitigate and reduce air pollutions levels.

Bhelupur Zone

Ward Name- Ranipur
Ward Number- 77
Population – 15,687



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.97	2.76	3.73	2.77	2.86	2.72

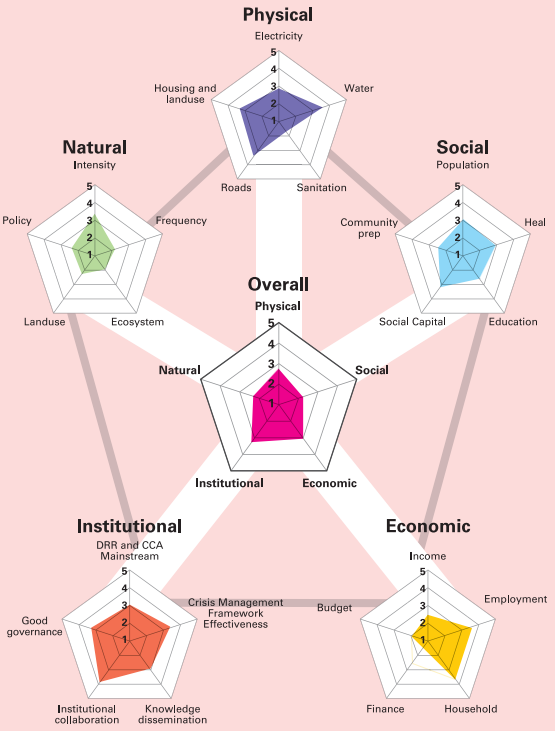
Strengths

- Effective crisis management framework
- Low intensity of disaster
- Developed health, water and road services
- Opportunities for employment generation
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen community preparedness for high frequency low severity disaster
- Strengthen economic resilience by supporting financing and savings

Ward Name- Bajardiha
Ward Number- 38
Population – 15,355



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.72	2.76	2.25	3.05	3.26	2.29

Strengths

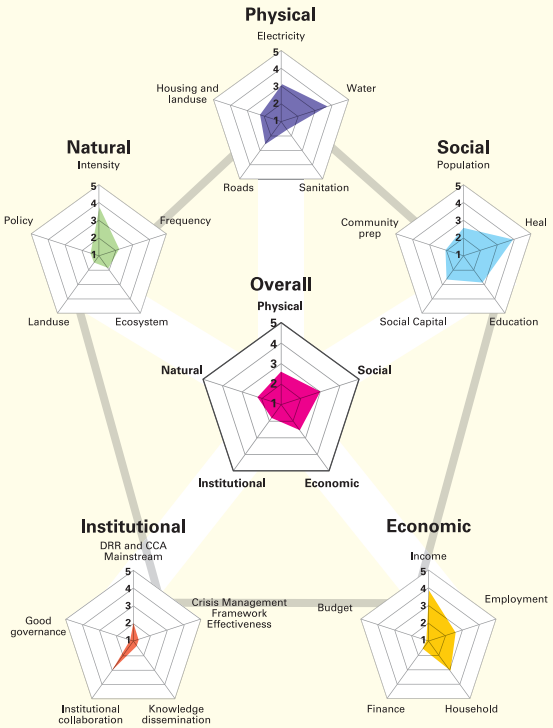
- Effective crisis management framework
- Developed road and water services
- Opportunities for employment generation
- Strong institutional collaboration

Scope for Improving Resilience

- Improve sanitation and solid waste disposal services
- Revitalize eco system services
- Strengthen land use planning
- Strengthen environmental policy
- Strengthen community preparedness for high frequency low severity disaster
- Create budget head for disaster risk reduction

Bhelupur Zone

Ward Name- Revadi Talab
Ward Number 72
Population – 11,685



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.43	2.63	3.02	2.53	1.78	2.20

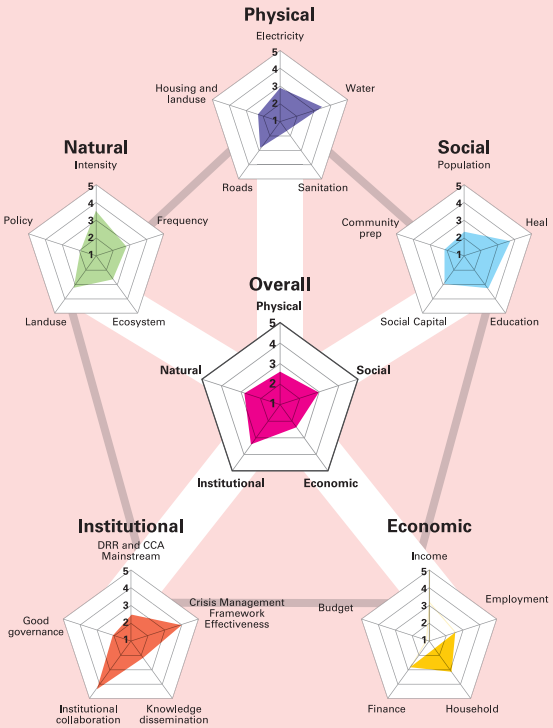
Strengths

- High income levels and household assets
- Low intensity of disaster
- Developed health, electricity and water services
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen land use planning
- Strengthen good governance
- Restructure crisis management framework for better effectiveness
- Strengthen environmental policy
- Create budget head for disaster risk reduction

Ward Name- Shiwala
Ward Number- 39
Population – 10,125



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.84	2.60	3.00	2.34	3.42	2.84

Strengths

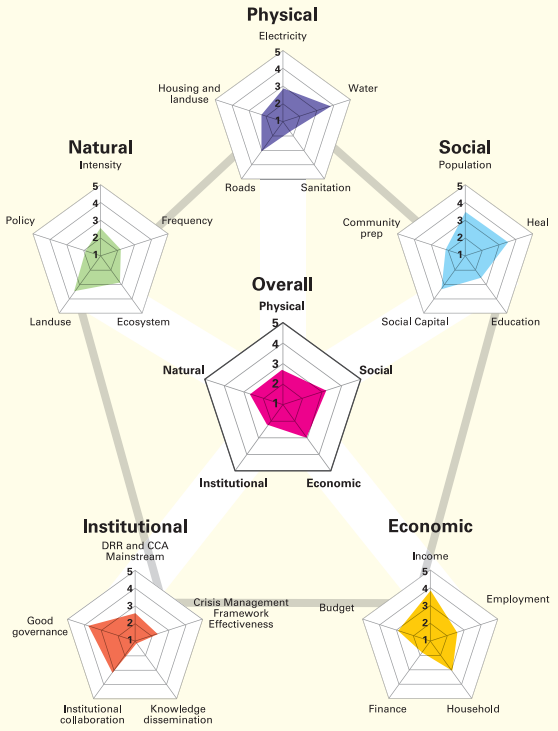
- Strong institutional collaboration
- Effective crisis management framework
- Low intensity of disasters
- Developed health and water services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen good governance
- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Improve sanitation and solid waste disposal services

Bhelupur Zone

Ward Name- Jolha
Ward Number 25
Population – 28,705



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.43	2.63	3.02	2.53	1.78	2.20

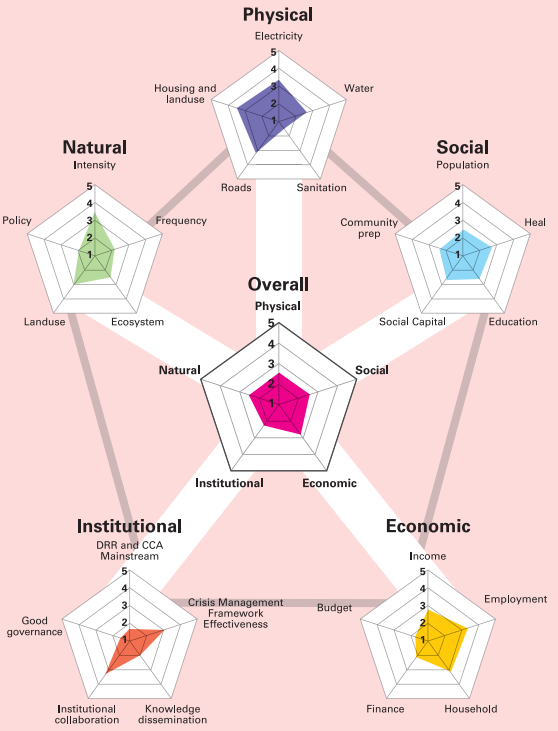
Strengths

- High income levels
- High population resilience
- Low intensity of disaster
- Good governance
- Developed health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Improve sanitation and solid waste disposal services
- Strengthen economic resilience by supporting financing and savings
- Strengthen community preparedness for high frequency low severity disaster

Ward Name- Nawabganj
Ward Number- 14
Population – 8,442



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.84	2.60	3.00	2.34	3.42	2.84

Strengths

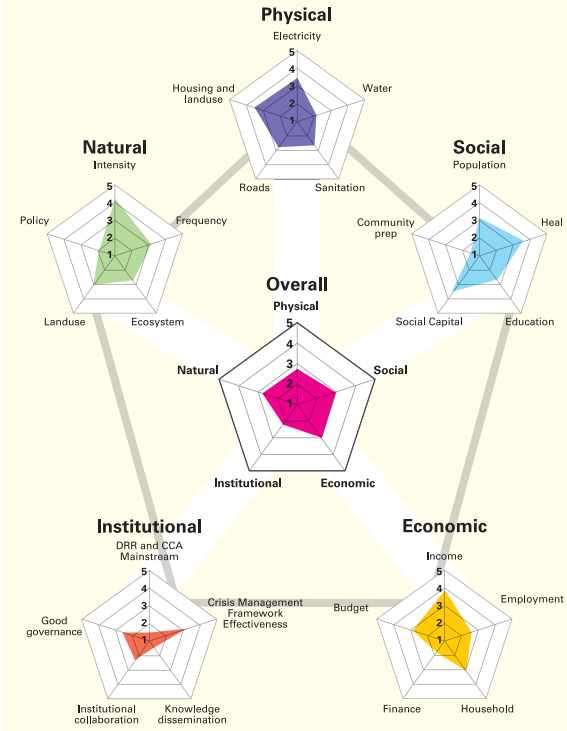
- Strong housing and land use planning
- Developed electricity and road services
- Opportunities for employment generation
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen good governance
- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Improve sanitation and solid waste disposal services

Bhelupur Zone

Ward Name- Nariya
Ward Number-32
Population – 23,353



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.76	2.76	3.00	3.01	2.21	2.81

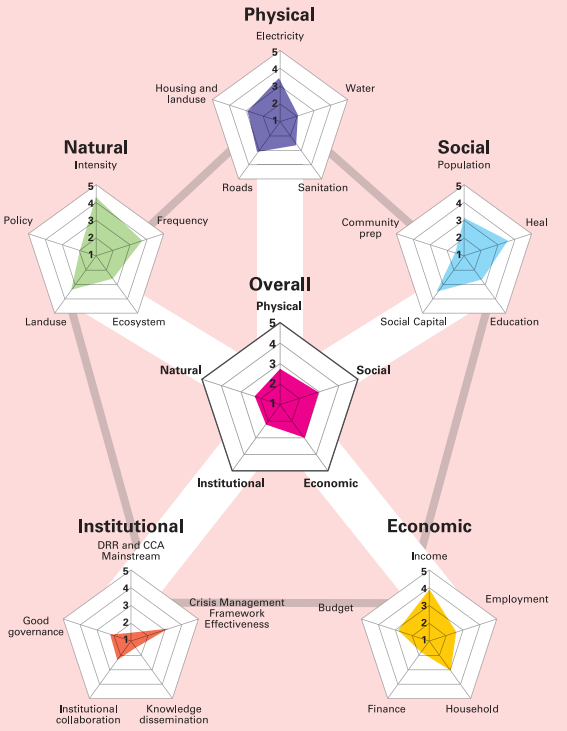
Strengths

- High income levels
- High social capital
- Low intensity of disaster
- Strong housing and land use planning
- Developed health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen community preparedness

Ward Name- Tulsipur
Ward Number- 12
Population – 19,990



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.66	2.76	3.00	3.00	2.21	2.32

Strengths

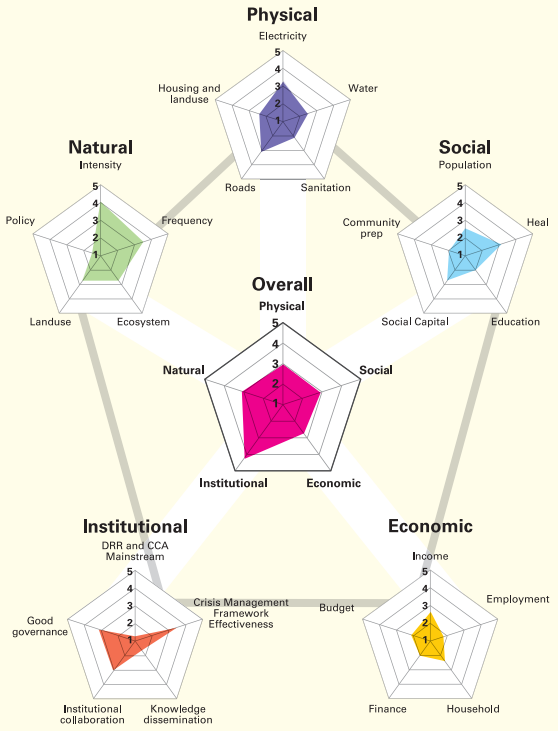
- Low intensity of disaster and low frequency of disasters
- High income levels
- High social capital
- Developed electricity and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen community preparedness

Bhelupur Zone

Ward Name- Bhadaini
Ward Number-54
Population – 8,398



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.76	2.49	2.40	2.15	4.06	2.68

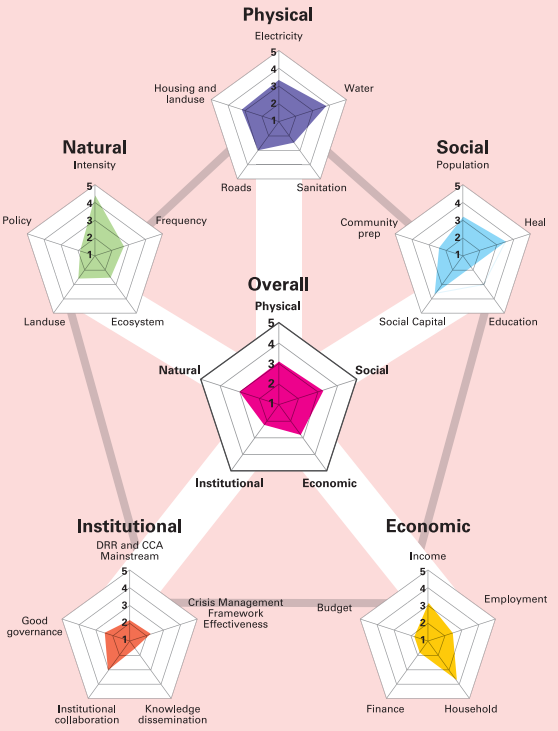
Strengths

- Low intensity of disaster and low frequency of disasters
- Effective crisis management framework
- Developed roads, electricity and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen community preparedness

Ward Name- Sunderpur
Ward Number- 10
Population – 13,605



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.62	2.78	2.87	2.60	1.93	2.93

Strengths

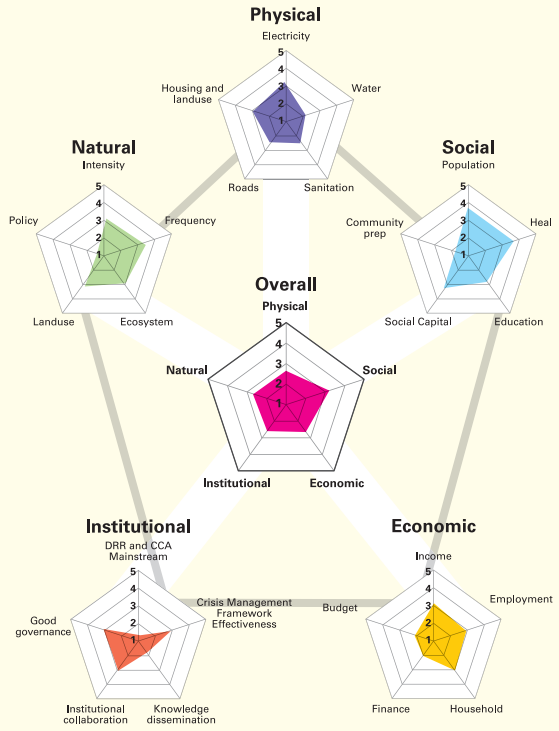
- Low intensity of disaster and low frequency of disasters
- High income levels
- High social capital
- Developed electricity and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen good governance mechanism

Bhelupur Zone

Ward Name- Nagwa
Ward Number- 8
Population – 13,288



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	2.67	3.23	2.65	2.59	2.70

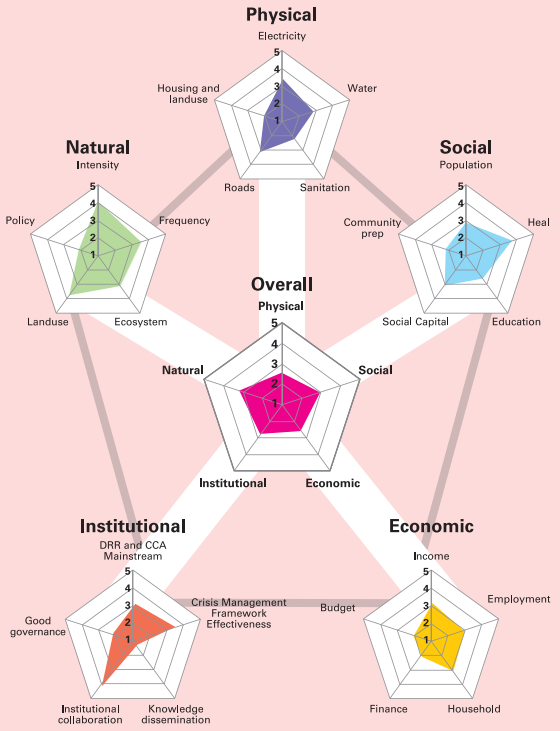
Strengths

- High population resilience
- Developed health and electricity services
- High Social capital
- Low frequency of disasters
- High income levels

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen community preparedness

Ward Name- Virodpur
Ward Number- 53
Population – 9,116



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.82	2.57	2.98	2.60	2.79	3.17

Strengths

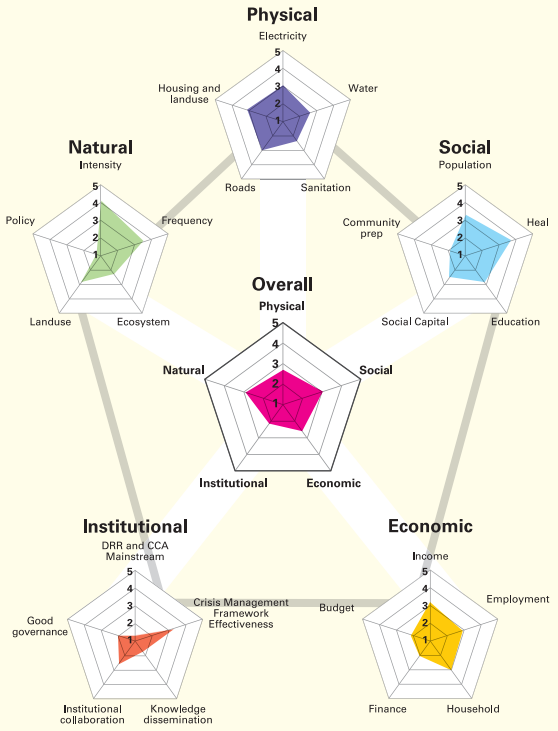
- Strong institutional collaboration
- Developed health and electricity services
- High Social capital
- Low intensity and frequency of disasters
- Less land use vulnerable to climate induced disasters

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen community preparedness
- Create budget head for disaster risk reduction
- Strengthen housing and land use planning

Bhelupur Zone

Ward Name- Bhelupur
Ward Number- 44
Population – 10,746



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.69	2.71	3.03	2.60	2.14	2.95

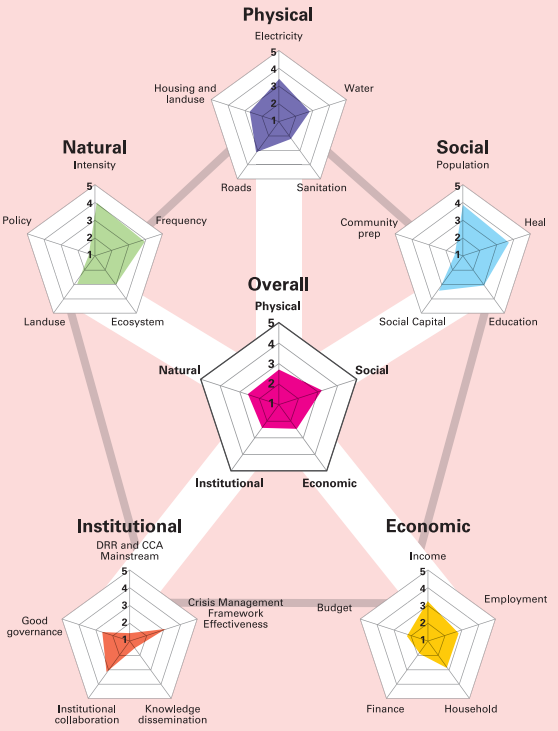
Strengths

- Low intensity of disaster and low frequency of disasters
- Effective crisis management framework
- Developed roads, electricity and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen community preparedness

Ward Name- Newada
Ward Number- 28
Population – 21,152



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.68	2.71	3.20	2.48	2.40	2.62

Strengths

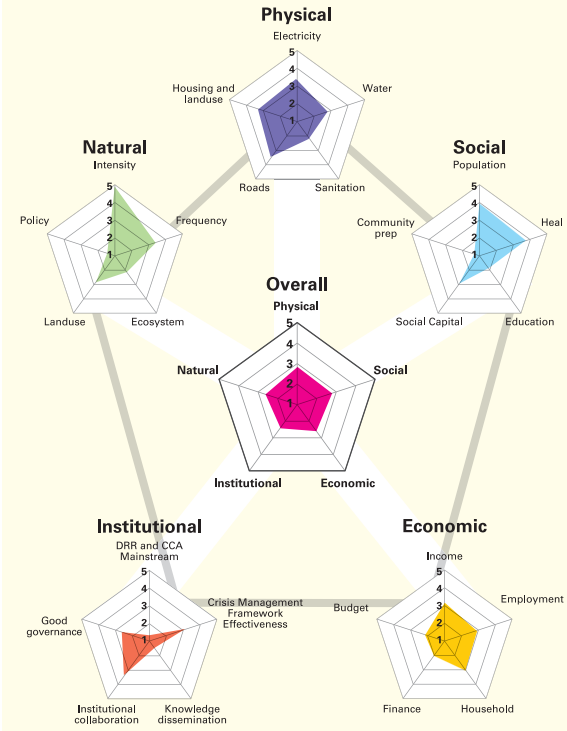
- Low intensity of disaster and low frequency of disasters
- High income levels
- High social capital
- Developed electricity and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen good governance mechanism

Bhelupur Zone

Ward Name- Vinayaka
Ward Number- 2
Population – 15,974



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.65	2.84	2.78	2.60	2.40	2.66

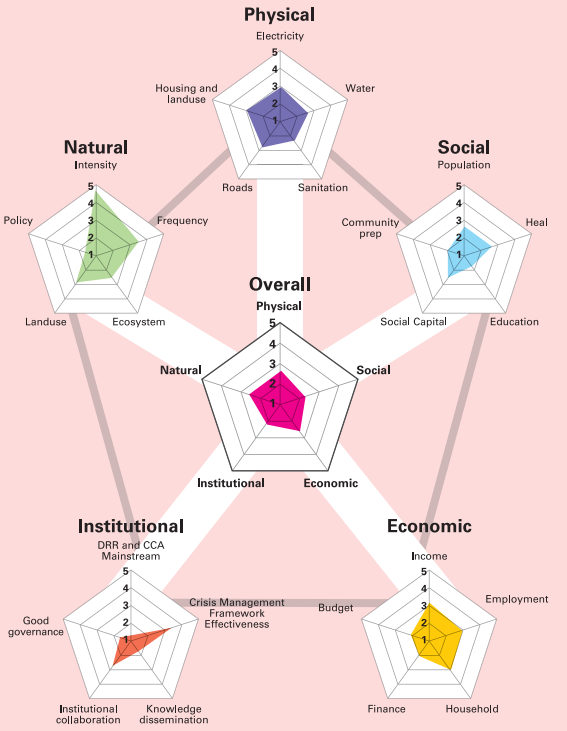
Strengths

- High population resilience
- Developed health and electricity services
- High Social capital
- Low frequency of disasters
- High income levels
- Scope for Improving Resilience

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen community preparedness

Ward Name- Baghada
Ward Number- 65
Population – 11,986



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.46	2.64	2.25	2.60	2.17	2.64

Strengths

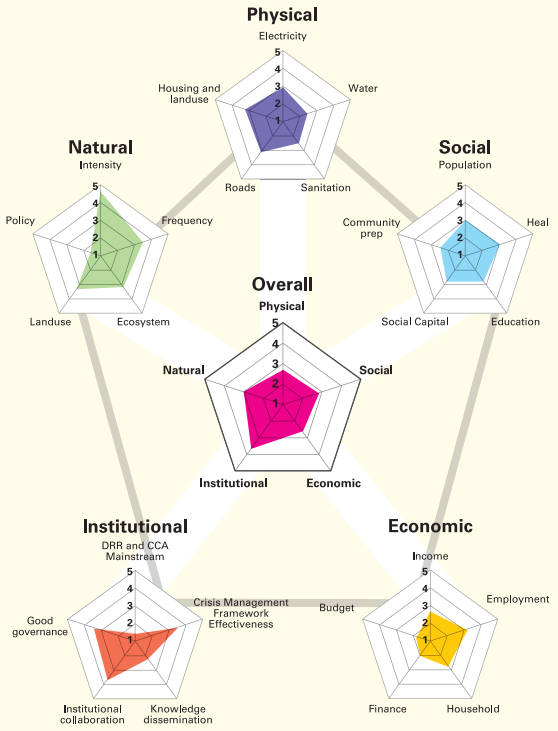
- Strong institutional collaboration
- Developed health and electricity services
- High Social capital
- Low intensity and frequency of disasters
- Less land use vulnerable to climate induced disasters

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and savings
- Strengthen community preparedness
- Create budget head for disaster risk reduction
- Strengthen housing and land use planning

Bhelupur Zone

Ward Name- Khojwa
Ward Number- 43
Population – 11,734



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.98	2.48	2.64	2.31	2.80	2.21

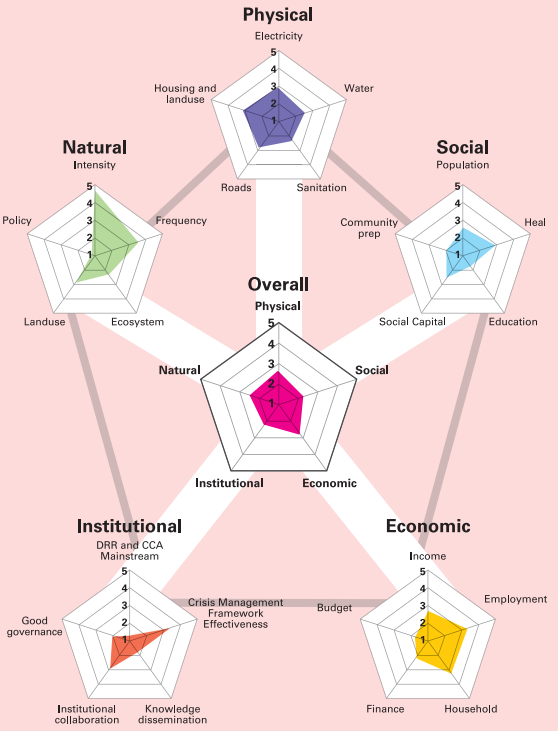
Strengths

- Low intensity and frequency of disaster
- Developed housing and land use planning
- High institutional collaboration
- Good governance
- Effective crisis management framework

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and savings

Ward Name- Pandeypur Haveli
Ward Number- 70
Population – 7,449



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.45	2.64	2.25	2.60	2.17	2.64

Strengths

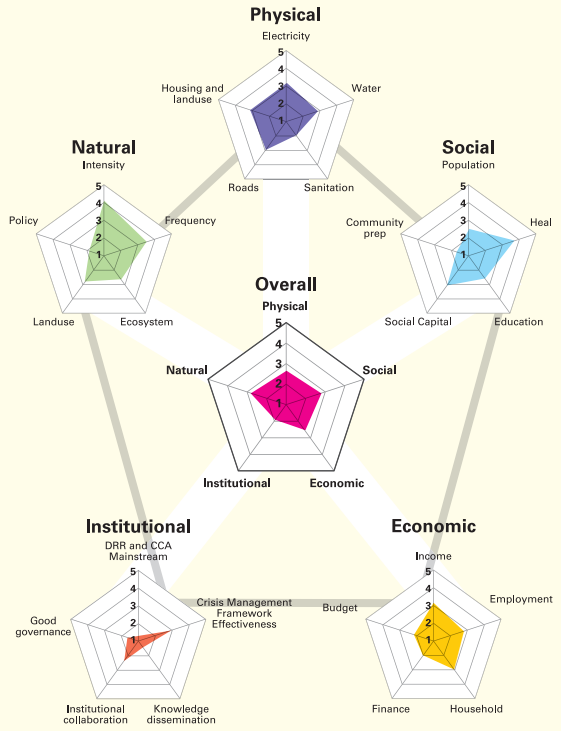
- Low intensity and frequency of disasters
- Effective crisis management framework
- High household assets
- Opportunities for generating employment

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen education and disaster awareness levels
- Create budget head for disaster risk reduction

Bhelupur Zone

Ward Name- Sarai Surjan
Ward Number- 13
Population – 24,772



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.55	2.66	2.80	2.55	1.90	2.84

Strengths

- Low intensity of disaster
- Developed housing and land use planning
- High income levels
- Good governance
- Developed electricity and health services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Strengthen education and disaster awareness levels
- Strengthen good governance

Streetscapes of Varanasi

Narrow Streets in the older city of Varanasi


Streets with commercial activities in Dashashwamedh


Streets in the newly developed pockets in Adampur

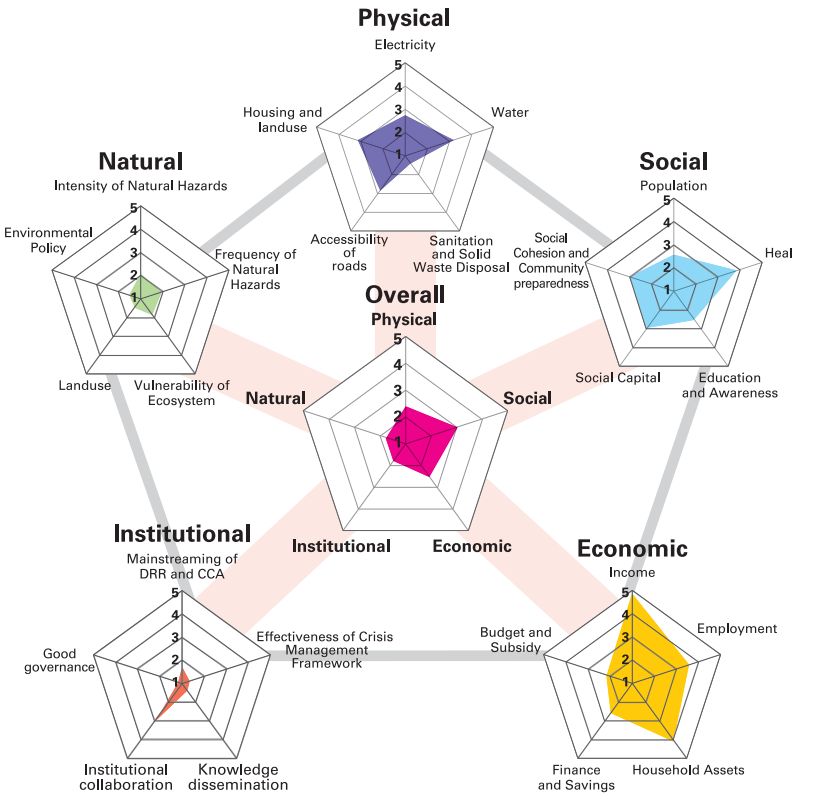
Climate Disaster Resilience Index of Dashashwamedh Zone

Introduction

Dashashawmedh zone is located in the eastern part of the city on the banks of river Ganges. The zone is divided into 19 wards with a population of 229,199 as per 2011 provisional population data. The zone mainly consists of older city of Varanasi with presence of important pilgrimage areas like Kashi Vishwanath temple, Manikarnika and Dashashawmedh Ghat. The zone has developed organically with time and has high-density core area with narrow and inorganic street patterns. The areas closer to the Ghats, act as commercial centers with rampant encroachment by commercial and informal sector on the roads. The main arterial roads cross this bazar area and cause huge traffic congestions. Riverine flooding, open defecation and sanitation and solid waste disposal are serious concerns for the area. The area has faced riverine flooding in 1978, 1984, 2009 and 2013 of which 1978 was the most severe.

Score of Indiviual Parameters	
Health	3.90
Income	3.86
Water	3.20
Housing and Landuse	3.13
Household assets	3.06
Social Capital	3.00
Community preparation	3.00
Institutional collaboration	3.00
Accessibility of roads	2.87
Electricity	2.73
Population	2.60
Employment	2.60
Education and Awareness	2.53
Intensity of natural hazards	2.13
Frequency of natural hazards	1.93
Ecosystem services	1.86
Mainstreaming of DRR and CCA	1.73
Finance and Savings	1.53
Environmental Policy	1.53
Landuse in natural terms	1.46
Sanitation and Solid waste disposal	1.40
Effectiveness of Crisis Management Framework	1.33
Knowledge dissemination	1.33
Good governance	1.20
Budget and Subsidy	1.13

CDRI Scores					
Overall	Physical	Social	Economic	Institutional	Natural
2.30	2.40	3.04	2.53	1.76	1.75



CDRI Analysis

The analysis of Dashashwamedh zone suggests social resilience has the highest value and natural conditions has the lowest value. The zone is exposed to high intensity disasters with return period of 10 years or more. The strength of the zone is its developed water and health services, strong housing and land use planning and higher income levels. While there is a need to strengthen sanitation and solid waste disposal, good governance, knowledge dissemination and crisis management framework.

Physical

In Dashashwamedh zone, 81 to 95% of the households in the area have access to electricity for more than 16 hours per day and more than 96% of the households have access to water for less than 10 hours a day. On an average 61 to 75% of the population in the zone has access to sanitation and up to 50% of the solid waste generated is collected on the same day. In addition to this, almost all the solid waste goes untreated before dumping and only 10% of the solid waste is recycled. During floods, only up to 10% of the solid waste gets collected within 48 hours after the water recedes. More than 70% of the zone's roads remain accessible during flooding and more than 60% of these have covered drains. The zone has less than 10% of the buildings built following the buildings codes and 61 to 70% of houses are above normal flood level. Around 12% of the population lives close to polluted industries and dumping sites.

Social

The high social resilience of the zone is its strength. The zone has less than 12 % of its population living in slums or informal settlements. The literacy rate is between 50 to 62.5 %, which is lower than the national average. People are affected equally by waterborne and vector borne diseases (0-5%) but incase of floods an increase of 6% in reported cases is noticed. The access to primary health care is medium with 50 to 75% of the population having access. Public awareness and disaster drills are though done once in a year but has limited effect. During any disaster the schools acts as relief shelters but functionality is poor and only a few people evacuate voluntarily during a disaster. The level of community participation is high with more than 41% population participating in community activities and acceptability of the community leader in the zone is medium. The communities are poorly prepared to face any disaster but have good support of non governmental organizations and community based Organizations. The community provide limited relief and shelter incase of disasters to the affected.

Economic

The zone has very high income and household assets and has presence of commercial and retail markets. In Dashashwamedh, less than 11% of the population are below poverty line and 50 to 74% of the households have single sources of income with 11 to 20% of the population are engaged in informal sector. In case of a disaster, 11 to 20% of the households experience reduced income levels. Less than 25% of the population is employed in formal sector and more than 25% of the youth population is unemployed. Most of the population has access to mobile phones, television and 41 to 50% of them have motorized vehicles. More than 50% of the zonal population has savings but only less than 10% of the houses are insured under some insurance scheme. The zone has no budget for disaster management or climate change in particular. There are limited subsidies for health care after a disaster but lacks subsidies for livelihood and rebuilding houses in the aftermath of a disaster.

Institutional

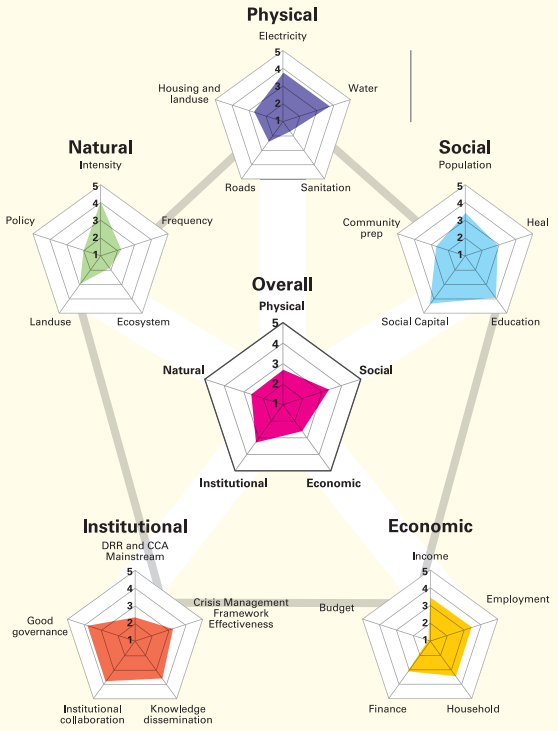
The institutional resilience of Dashashwamedh is the lowest than among the other dimensions due to poor capacity in the zone to develop development plans with community participation and weak mainstreaming of disaster risk reduction and climate change adaptation and crisis management framework. The learning from the past disasters seldom gets translated into planning and mitigation strategies of the zone. Considering the zone has severe riverine flooding concerns and high population density, the evacuation centers at present are not sufficient. Further, there are no trainings and drills conducted for disaster management team and community. The zone is heavily dependent on external support of specially the city authority and district disaster management authority in handling disasters. The zone has strong networking with neighbouring zones but at the same time there is a need to increase the non governmental organization and private organization collaborations. The zone has no established early warning mechanism.

Natural

Dashashwamedh faces severe riverine flooding and has 10 to 25% of the settlements in hazardous locations mainly closer to flood plains. The frequency of such severe flooding varies from 5 to 10 years. The zone has low-lying areas, which face urban flooding problems during heavy rainfall. Heat and Cold waves in summer and winter seasons affect the zone annually. The population with non permanent shelters are the most vulnerable these events. The zone has overall good ecosystem services but the soil condition is constantly degrading and increase in air pollution and water contamination is posing a major challenge to the authority. The zone is densely populated with more than 90% as the built up area and only 2 to 5% green cover left. The loss of green cover is in the range of 21 to 40% in the last 50 years. The zone has poor compliance to environmental conservation policies and waste management systems.

Dashashwamedh Zone

Ward Name- Lahartara
Ward Number- 9
Population – 15,990



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.92	2.68	3.35	2.60	3.30	2.66

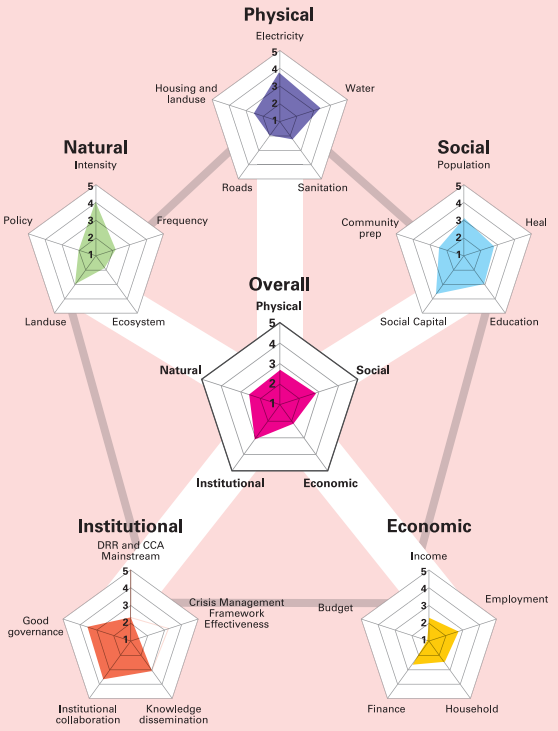
Strengths

- High social capital
- Low intensity of disaster
- Good governance
- High education and awareness level
- Developed water services

Scope for Improving Resilience

- Strengthen knowledge dissemination
- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Strengthen community preparedness for high frequency low intensity disasters

Ward Name- Chhittupur
Ward Number-31
Population – 17,490



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.67	2.68	2.86	2.11	3.08	2.61

Strengths

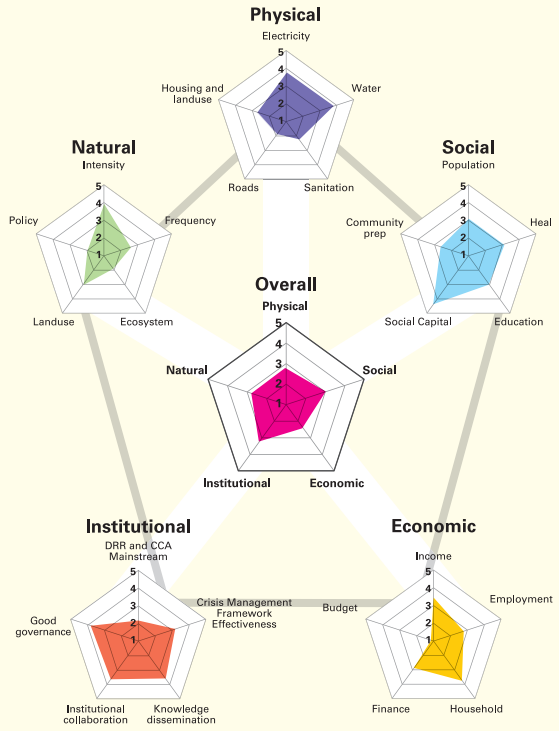
- High social capital
- Low intensity of disaster
- Good governance
- High institutional collaboration
- Developed water services

Scope for Improving Resilience

- mprove sanitation and solid waste disposal services
- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Strengthen community preparedness for high frequency low intensity disasters

Dashashwamedh Zone

Ward Name- Luxa
Ward Number- 60
Population – 10,016



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.86	2.82	3.08	2.41	3.22	2.76

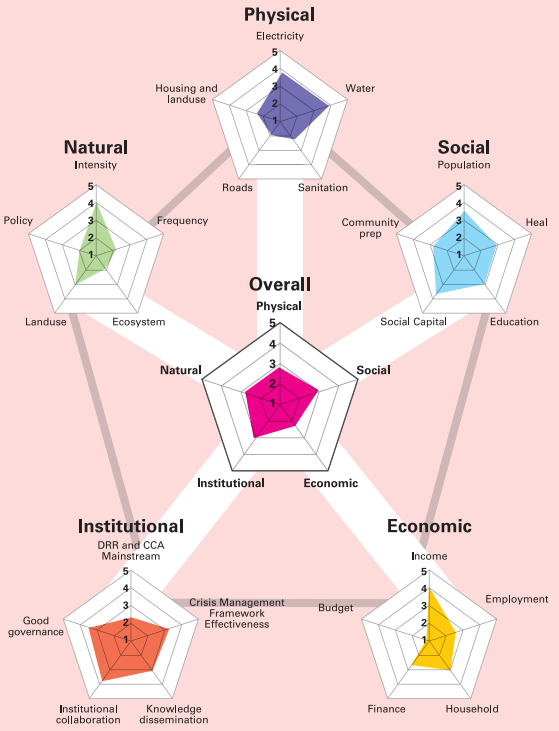
Strengths

- High social capital
- Low intensity of disaster
- Good governance
- High household assets
- Developed electricity and water services

Scope for Improving Resilience

- Improve sanitation and solid waste disposal services
- Strengthen environmental policy
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Improve road conditions for the ward
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services

Ward Name- Kajipura
Ward Number- 35
Population – 11,204



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.80	2.77	3.03	2.36	3.10	2.74

Strengths

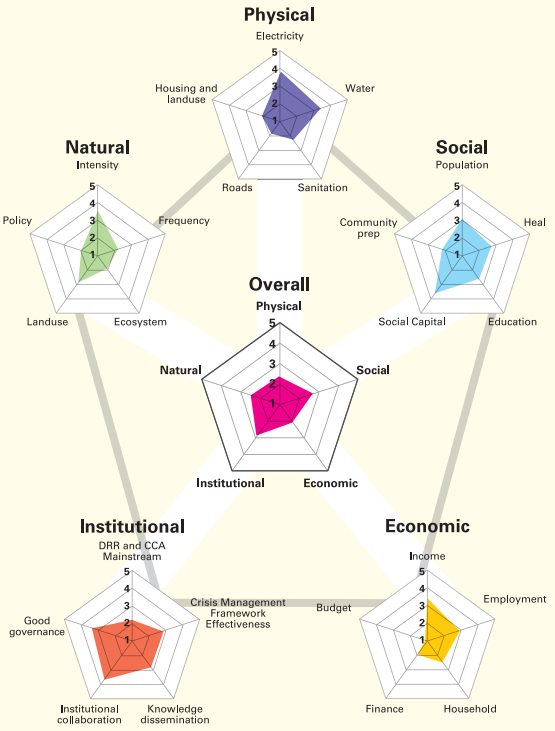
- High Income levels
- High social capital
- Low intensity of disaster
- Developed electricity and water services

Scope for Improving Resilience

- Strengthen environmental policy
- Strengthen community preparedness for high frequency low intensity disasters
- Improve road conditions for the ward
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services

Dashashwamedh Zone

Ward Name- Lallapura Kala
Ward Number-37
Population – 16,939



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.51	2.39	2.76	2.10	2.85	2.47

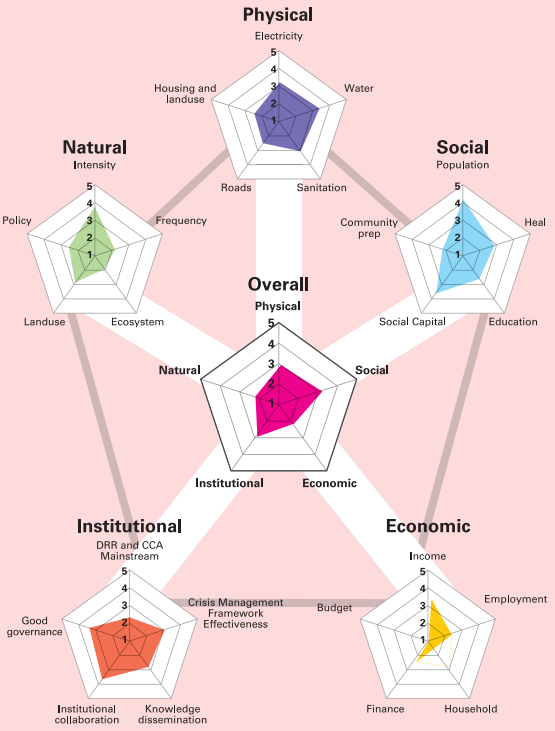
Strengths

- High social capital
- Low intensity of disaster
- High income levels
- High institutional collaboration
- Developed electricity and water services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen economic resilience by supporting financing and saving
- Strengthen housing and land use planning

Ward Name- Shivpurva
Ward Number- 17
Population – 25,896



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.68	2.92	3.15	2.1	2.93	2.31

Strengths

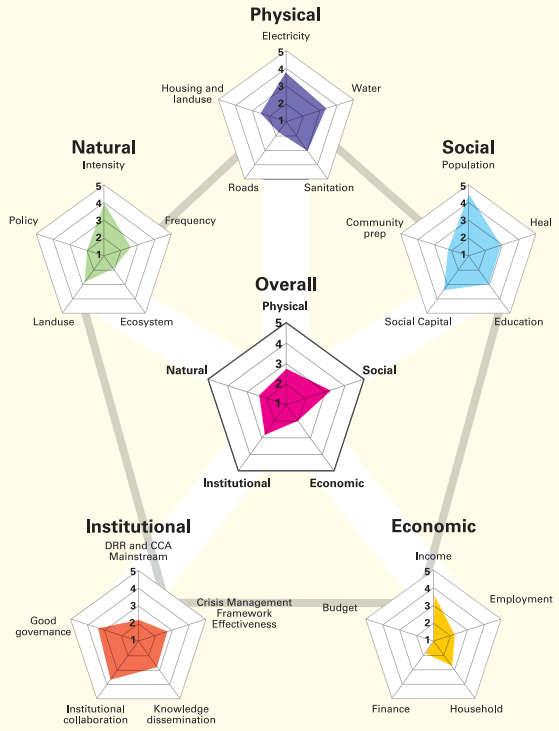
- High population resilience
- High Income levels
- High social capital
- Low intensity of disaster
- Developed water services

Scope for Improving Resilience

- Create opportunities for employment generation
- Strengthen environmental policy
- Strengthen and revitalize eco system services
- Create budget head for disaster risk reduction

Dashashwamedh Zone

Ward Name- Pandariba
Ward Number-61
Population – 12,603



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.64	2.75	3.28	1.95	2.82	2.42

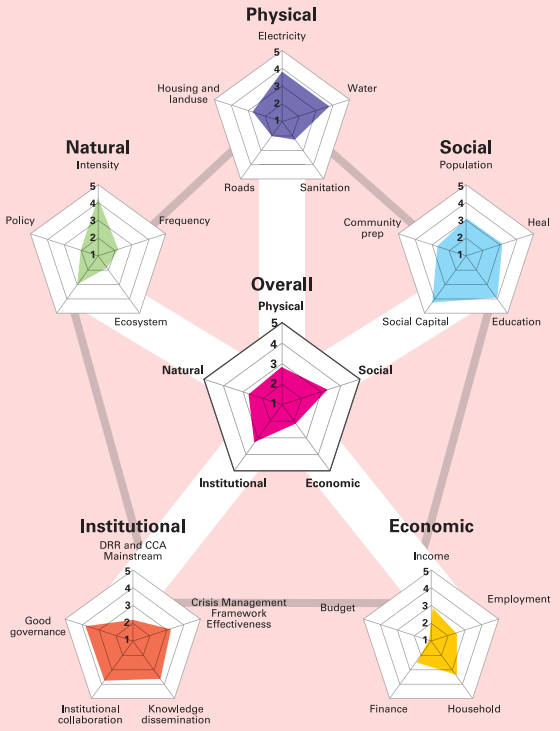
Strengths

- High population resilience
- Low intensity of disaster
- High income levels
- High institutional collaboration
- Developed water services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen economic resilience by supporting financing and saving

Ward Name- Bangali Tola
Ward Number- 78
Population – 9,187



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.87	2.85	3.36	2.16	3.26	2.71

Strengths

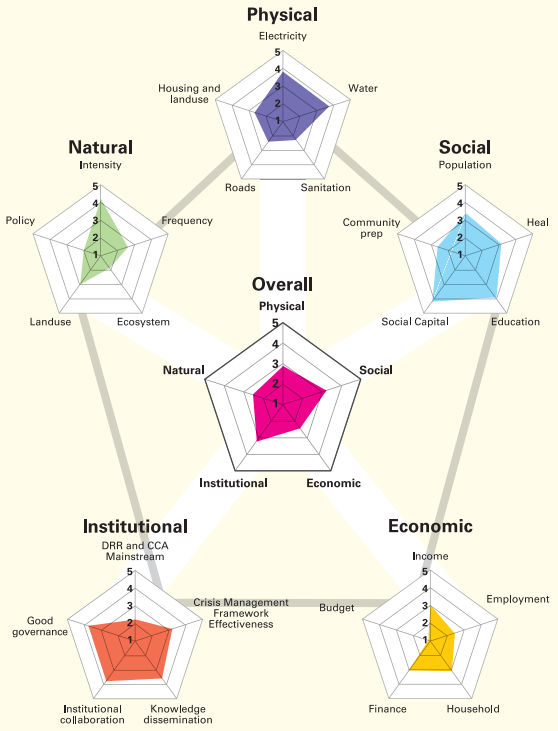
- High Income levels
- High social capital
- Good governance
- Low intensity of disaster
- Developed water and electricity services
- High level education and awareness

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Strengthen community preparedness for high frequency low intensity disasters
- Improve sanitation and solid waste disposal services
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation

Dashashwamedh Zone

Ward Name- Dashashwamedh
Ward Number-74
Population – 9,266



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.87	2.89	3.24	2.42	3.23	2.57

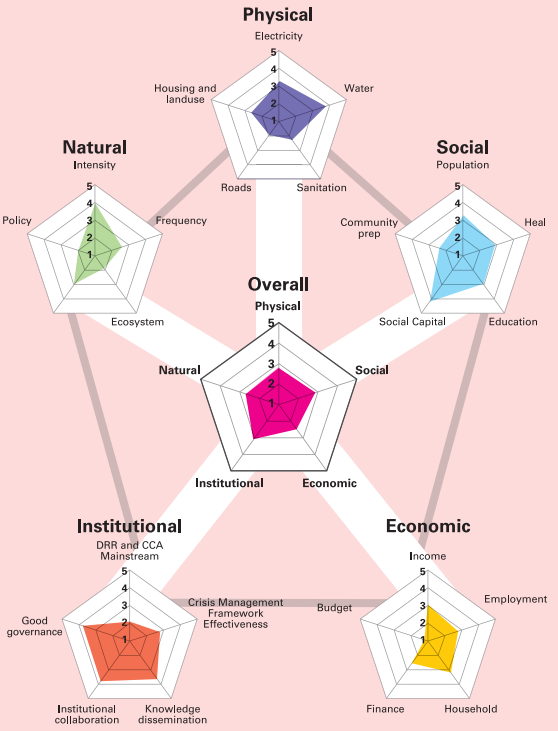
Strengths

- High social capital
- Good governance
- Low intensity of disaster
- Developed water and electricity services
- High level education and awareness

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation

Ward Name- Jangambaadi
Ward Number- 49
Population – 6,429



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.78	2.79	2.88	2.45	3.08	2.69

Strengths

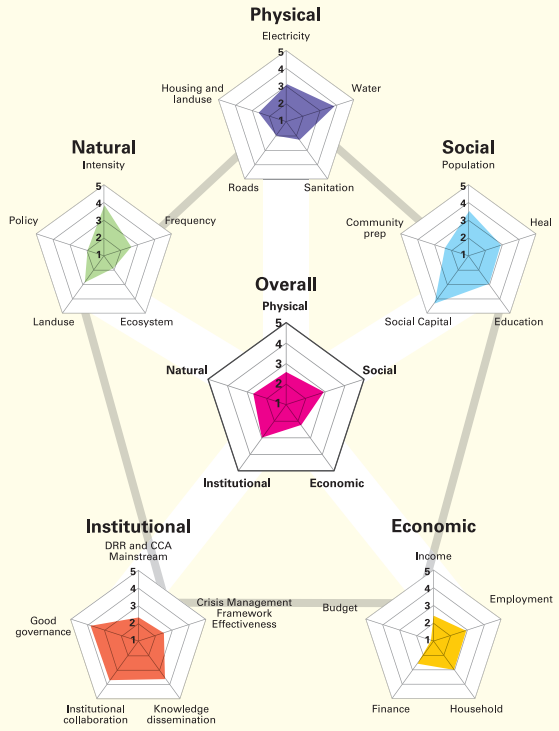
- High social capital
- Good governance
- Low intensity of disaster
- Developed water and electricity services
- Strong knowledge dissemination

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services
- Strengthen mainstreaming of Disaster risk reduction and climate change adaptation
- Improve road conditions for the ward

Dashashwamedh Zone

Ward Name- Madanpura
Ward Number-90
Population – 8,809



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.69	2.58	2.93	2.25	3.02	2.68

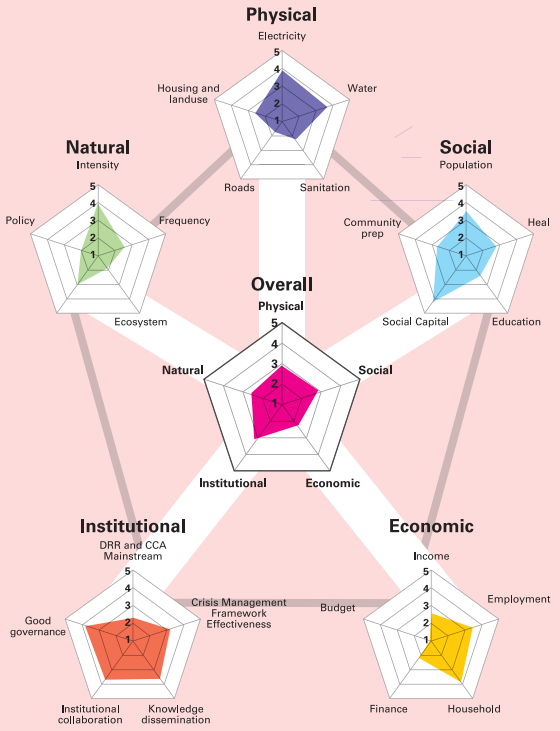
Strengths

- High social capital
- Good governance
- Strong institutional collaboration
- Developed water services
- Strong knowledge dissemination mechanism

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services
- Improve road conditions for the ward

Ward Name- Rampura
Ward Number- 64
Population – 9,968



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	2.81	2.89	2.39	3.24	2.54

Strengths

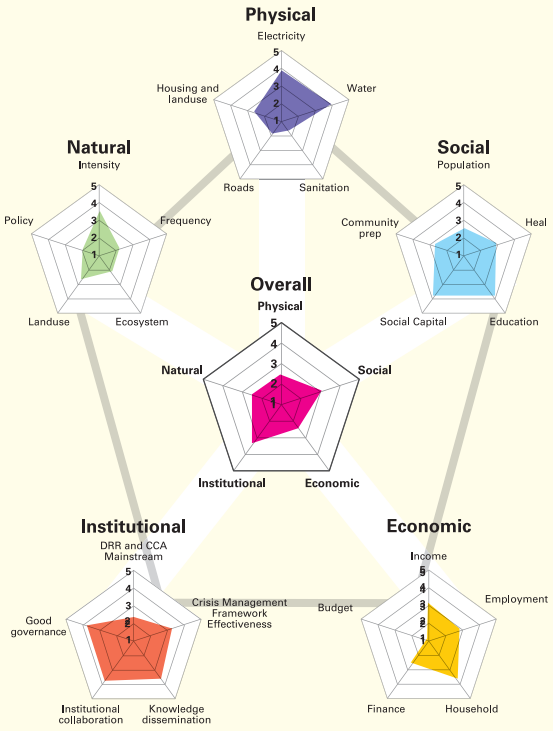
- High social capital
- Good governance
- High household assets
- Developed water and electricity services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services
- Strengthen economic resilience by supporting financing and saving

Dashashwamedh Zone

Ward Name- Chetgunj
Ward Number-45
Population – 11,122



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.78	2.43	3.14	2.49	3.38	2.44

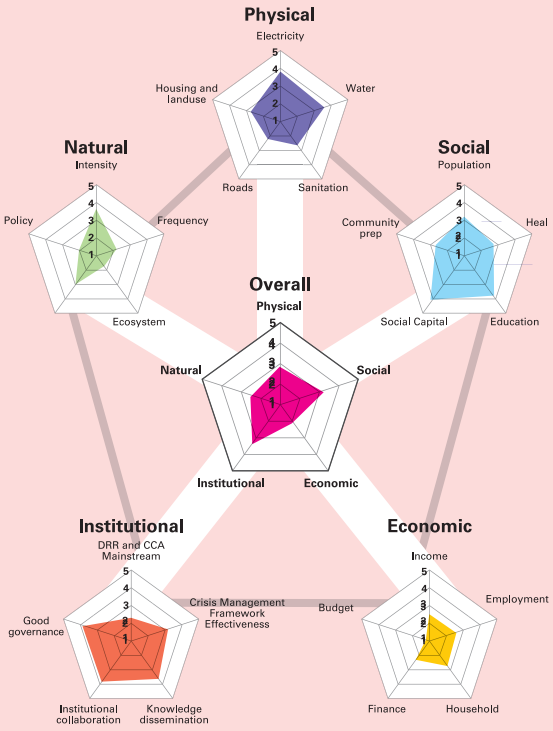
Strengths

- High social capital
- High education and awareness levels
- Strong institutional collaboration
- Developed water and electricity services
- High household assets

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services
- Improve road conditions for the ward
- Strengthen community preparedness for high frequency low intensity disasters

Ward Name- Lallapur
Ward Number- 73
Population – 9,721



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.81	2.94	3.27	2.04	3.28	2.52

Strengths

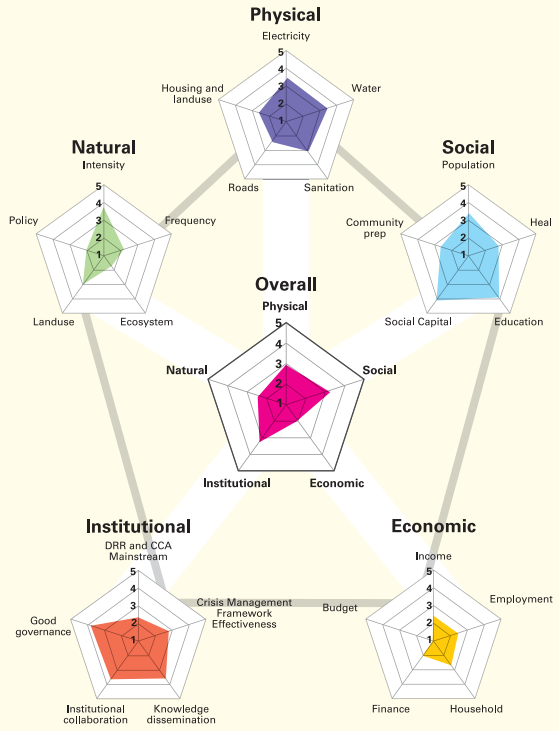
- High social capital
- Good governance
- High education and awareness levels
- Developed water and electricity services
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve sanitation and solid waste disposal services
- Improve road conditions for the ward

Dashashwamedh Zone

Ward Name- Jagatganj
Ward Number-24
Population – 8,552



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.76	3.01	3.28	1.89	3.16	2.46

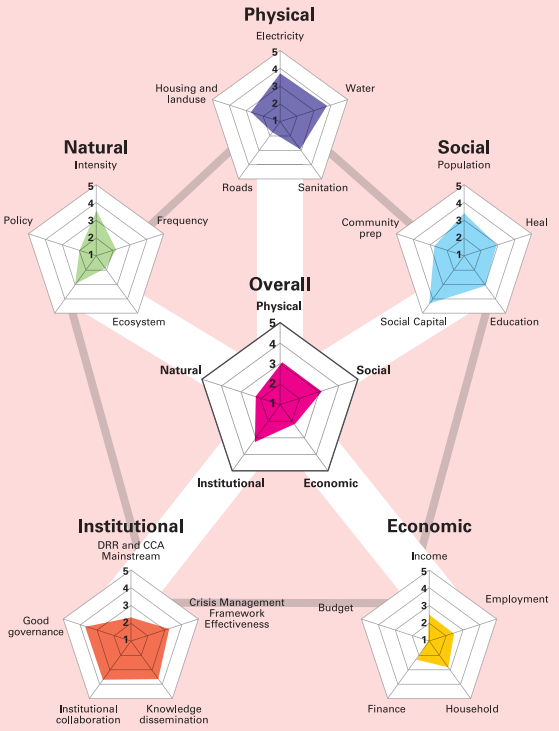
Strengths

- High social capital
- Good governance
- Low intensity of disasters
- Strong institutional collaboration
- High education and awareness levels
- Strong knowledge dissemination mechanism

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen community preparedness for high frequency low intensity disasters
- Strengthen economic resilience by supporting financing and saving

Ward Name- Habibpura
Ward Number- 21
Population – 9,785



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	3.08	3.05	2.11	3.25	2.36

Strengths

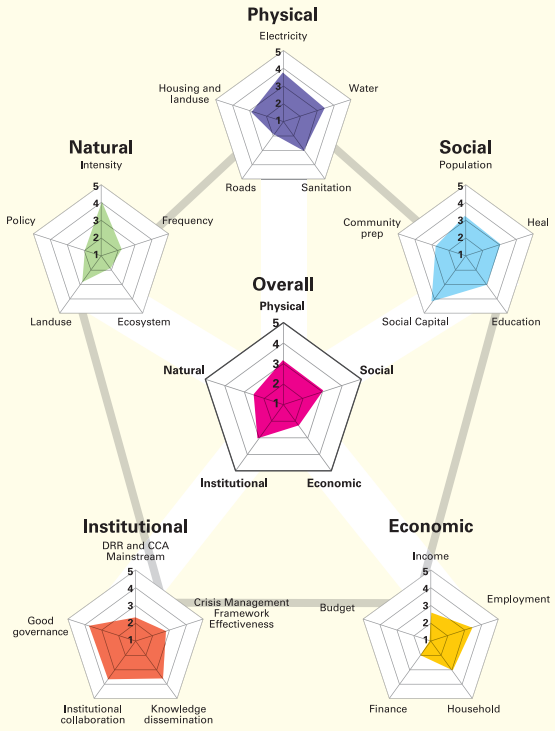
- High social capital
- Good governance
- Developed water and electricity services
- Strong institutional collaboration
- Low intensity of disasters

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen community preparedness for high frequency low intensity disasters

Dashashwamedh Zone

Ward Name- Sarai Govardhan
Ward Number-69
Population – 11,283



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.82	3.11	3.08	2.32	3.10	2.51

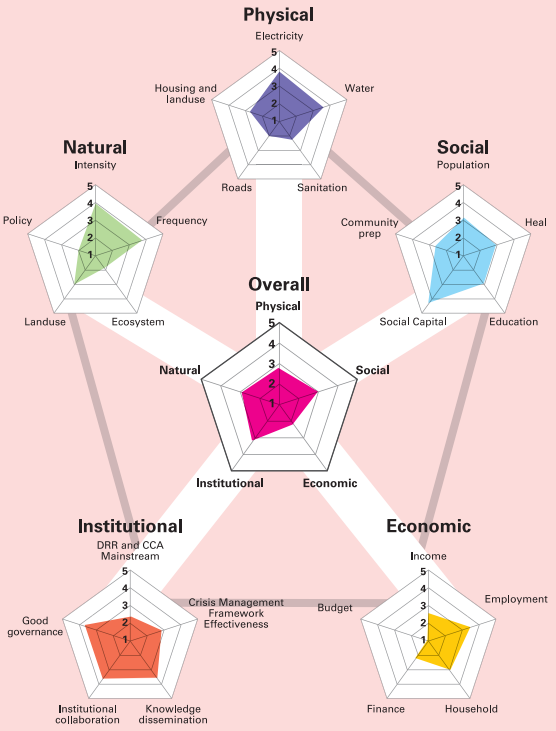
Strengths

- High social capital
- Good governance
- Low intensity of disasters
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen community preparedness for high frequency low intensity disasters
- Strengthen economic resilience by supporting financing and saving

Ward Name- Lahangpura
Ward Number- 59
Population – 10,098



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.82	2.80	3.04	2.20	3.17	2.90

Strengths

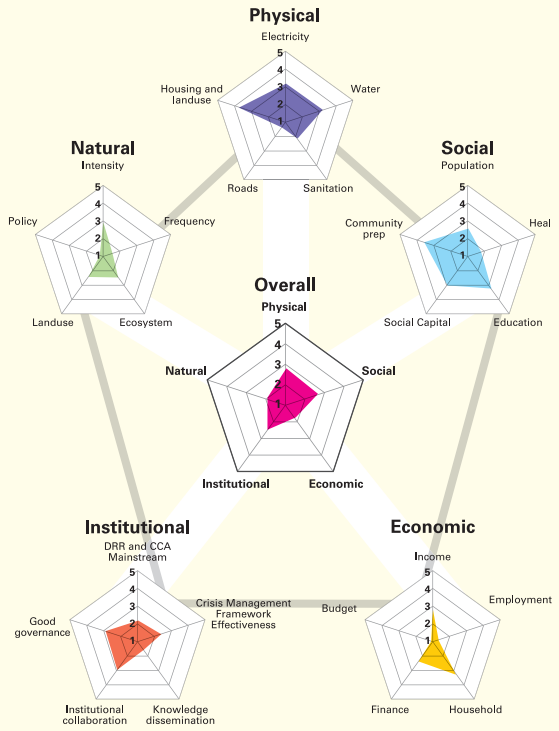
- High social capital
- Good governance
- Developed water services
- Low intensity and frequency of disasters

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen community preparedness for high frequency low intensity disasters
- Strengthen economic resilience by supporting financing and saving

Dashashwamedh Zone

Ward Name- Sigra
Ward Number-40
Population – 14,301



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.34	2.73	2.63	1.80	2.56	1.99

Strengths

- Strong housing and land use planning
- High community preparedness
- Developed water and electricity services
- High household assets
- High education and awareness levels

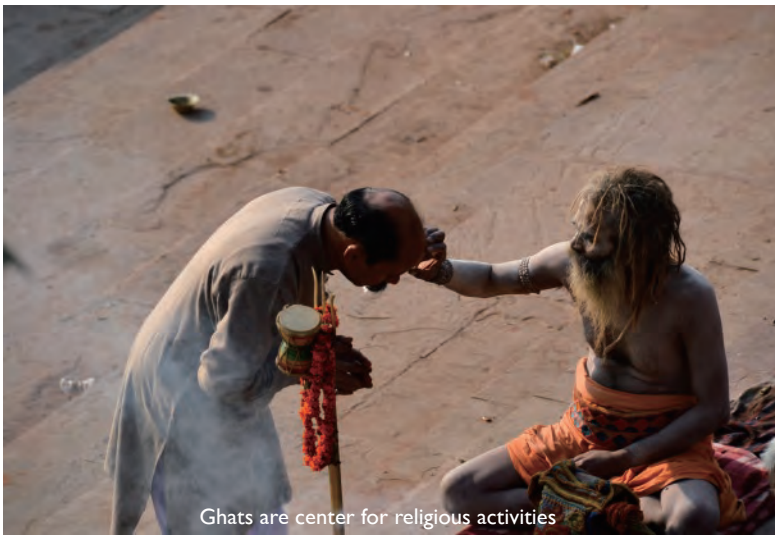
Scope for Improving Resilience

- Strengthen environmental policy
- Strengthen and revitalize eco system services
- Improve road conditions for the ward
- Strengthen community preparedness for high frequency low intensity disasters
- Strengthen knowledge dissemination mechanism

Ghats as multi-functional hub of Varanasi

Bathing in the Ghats by locals and tourists

Washing of clothes in the Ghats by washer men



Ghats are center for religious activities

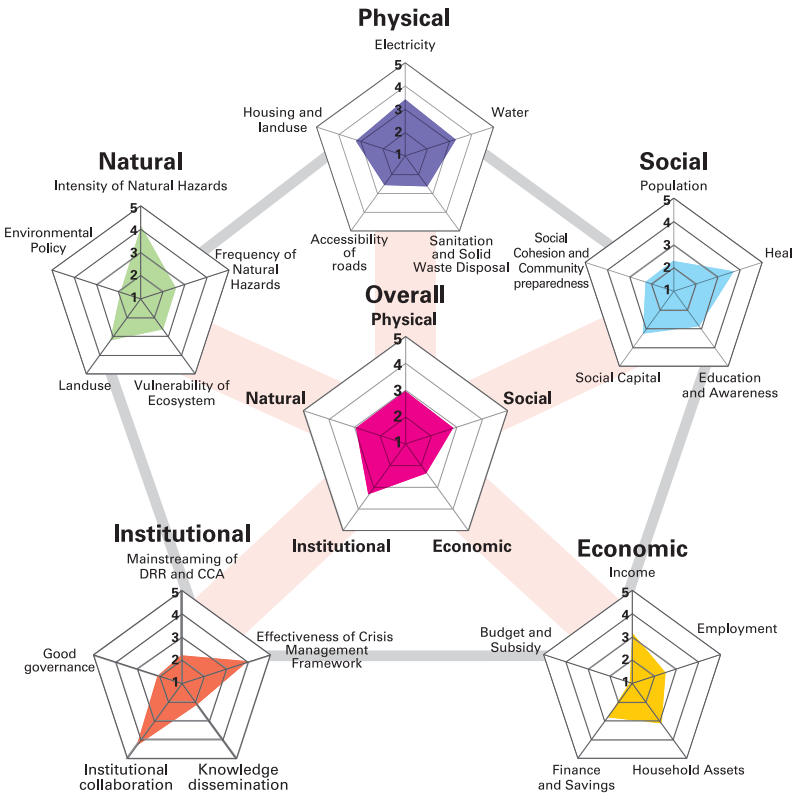
Climate Disaster Resilience Index of Kotwali Zone

Introduction

Kotwali zone is located in the western part of the city comprising mainly parts of the older city of Varanasi. The zone is divided into 13 wards with a total population of 139,146 as per 2011 provisional population data. The zone has mixed land use with majority of area coming under residential type but has presence of a few small scale industries. The Kalbhairav temple is an important destination for religious pilgrimage. Similar to Dashashwamedh zone, Kotwali has high-density core area with narrow and inorganic street patterns and dilapidated buildings. The zone has problem of urban flooding during the monsoon season. Traffic congestion and sanitation and solid waste disposal are concern for the zone.

Score of Indiviual Parameters	
Institutional collaboration	4.33
Intensity	4.13
Effectiveness of Crisis Management Framework	4.00
Health	3.73
Electricity	3.46
Water	3.33
Social Capital	3.26
Housing and Landuse	3.20
Income	3.20
Land use	3.20
Household assets	3.13
Education and Awareness	2.86
Finance and Savings	2.80
Sanitation and Solid waste disposal	2.60
Frequency of natural hazards	2.60
Ecosystem services	2.60
Accessibility of oadsr	2.53
Employment	2.53
Population	2.33
Community preparation	2.26
Mainstreaming of DRR and CCA	2.20
Knowledge dissemination	2.13
Good governance	2.06
Environmental Policy	1.93
Budget and Subsidy	1.13

CDRI Scores					
Overall	Physical	Social	Economic	Institutional	Natural
2.91	3.00	2.91	2.34	3.35	2.93



CDRI Analysis

The analysis of Kotwali zone suggests institutional resilience has the highest resilience and low economic resilience. The strength of the zone is its strong institutional collaboration, crisis management framework and health, water and electricity services. While there is a need to strengthen mainstreaming of Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), good governance, knowledge dissemination and budget for disaster management. The zone is exposed to low intensity disasters with return periods varying from 2 to 10 years.

Physical

The physical resilience in Kotwali is higher due to developed health, water and electricity and strong housing and land use planning. More than 96% of the household in the zone area has electricity available for more than 16 hours per day and water for less than 10 hours a day. More than 81% of the population in the zone has access to sanitation and 96% of the solid waste generated is collected on the same day. However, almost all the solid goes untreated before dumping and only 10% of the solid waste is recycled. During floods more than 76% of the solid waste gets collected within 48 hours after the water recedes. The 70% of the zone's road remain accessible during flooding though less than 30% of these have covered drains. The zone has less than 20% of the buildings built following the buildings codes and less than 50% of houses are above normal flood level.

Social

The Kotwali zone has less than 12% of its population living in slums or informal settlements. The literacy rate is between 75 to 87 %, which is higher than the national average. People are affected more by waterborne disease (18-23%) in comparison to vector borne diseases (0-5%) and more than 96% of the population has access to primary health care center. During a disaster the schools function as relief shelters but only few people evacuate voluntarily during a disaster. The level of community participation is lower than 20% and acceptability of the community leader in the zone is medium. The zone lacks in public awareness and disaster drills are not taken up in the zone as a result communities are poorly prepared to face any disaster and there is very less support of non governmental organizations and community based organizations during a disaster.

Economic

In Kotwali, less than 20% population are below poverty line and more than 50 % of the households have two sources of income with less than 30% of the population engaged in informal sector. In case of a disaster, more than 31% population have reduced income levels. Less than 25% of the population is employed in formal sector and 18% of the youth population is unemployed. Most of the population has access to mobile phones, television and 50% or more have motorized vehicles. More than 30% of the zonal population has savings but only less than 10% of the households are insured under some insurance scheme. There is an existence of credit facility in the zone. The zone has no annual disaster management or climate change budget head. There are limited subsidies for health care after a disaster but lacks subsidies for livelihood and rebuilding houses in the aftermath of a disaster.

Institutional

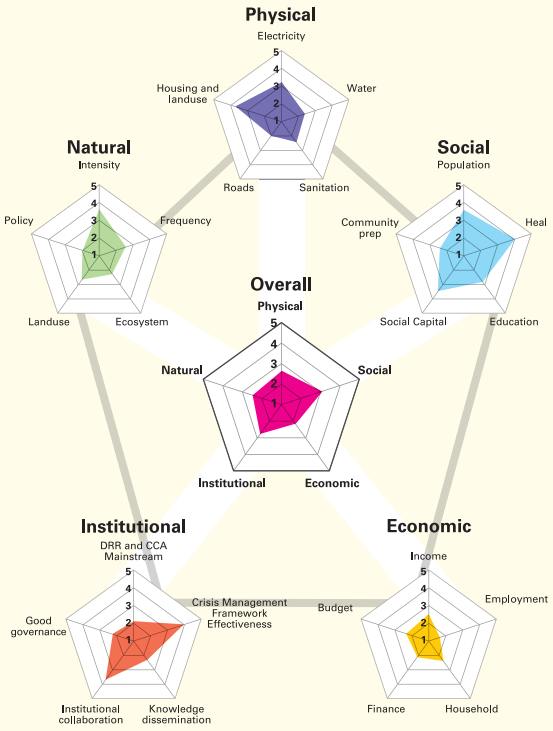
The institutional parameter has the highest resilience in Kotwali due to institutional collaboration and good governance mechanism. Despite this, the zone has weak mainstreaming of disaster risk reduction and climate change adaptation and community participation in development planning. There is an effective crisis management framework and sufficient evacuation centers in the zone. The learning from the past disasters seldom gets translated into planning and mitigation strategies of the zone. The zone is capable of handling disaster independently due to its strong networking with neighbouring zones but at the same time there is a need to increase the Non Governmental Organization and private organization collaborations. There is no established early warning mechanism in the zone.

Natural

Kotwali has not faced any major disasters in the recent times. The zone has water scarcity problem and heat waves in summer and cold waves in the winter season. The zone has overall poor ecosystem services due to poor soil quality and constant increase in air pollution and water contamination. The built up area lies in between 51 to 70% in the zone with only 6 to 10% green cover. In the last 50 years more than 40% of the green spaces in the zone have been transformed into built up spaces. Less than 10% of the settlements are in hazardous locations closer to flooding area and dumping sites. The zone has poor compliance to environmental conservation policies and waste management systems.

Kotwali Zone

Ward Name- Kameshwar Mahadeva
Ward Number- 41
Population – 9,452



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.64	2.66	3.09	2.16	2.76	2.52

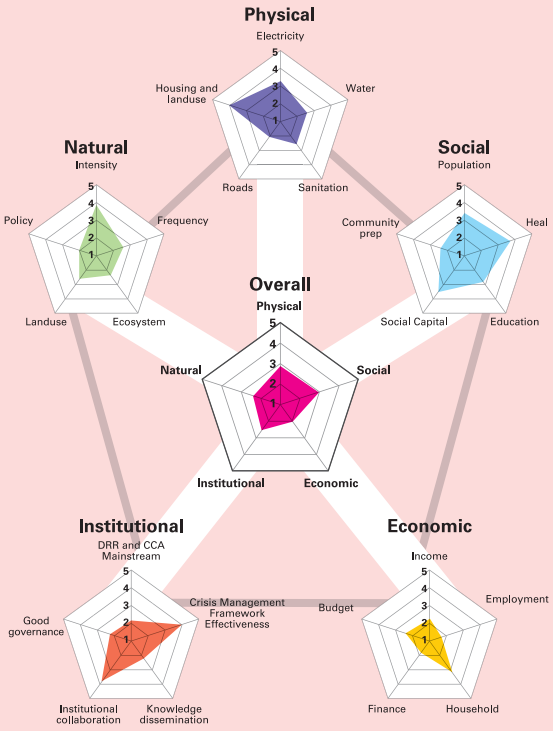
Strengths

- Developed health systems
- Strong Housing and landuse planning
- High institutional collaboration
- Strong crisis management framework

Scope for Improving Resilience

- Improve the road conditions
- Strengthen environmental policies
- Strengthen economic condition by generating employment
- Strengthen Disaster risk reduction and climate change adaption
- Strengthen finance and savings

Ward Name- Katuapur
Ward Number- 42
Population – 11,688



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.58	2.88	2.98	2.05	2.55	2.41

Strengths

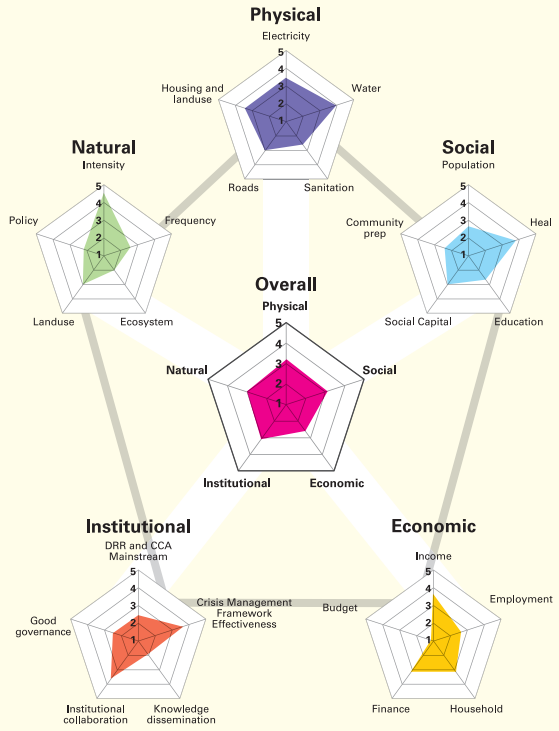
- High household income level
- Developed housing and land use planning.
- Low intensity of disasters.
- Strong crisis management framework

Scope for Improving Resilience

- Improve the road conditions
- Strengthen environmental policies
- Strengthen economic condition by generating employment
- Strengthen Disaster risk reduction and climate change adaption
- Strengthen finance and savings

Kotwali Zone

Ward Name- Benia
Ward Number- 68
Population – 10,029



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
3.00	3.20	3.11	2.57	3.09	3.04

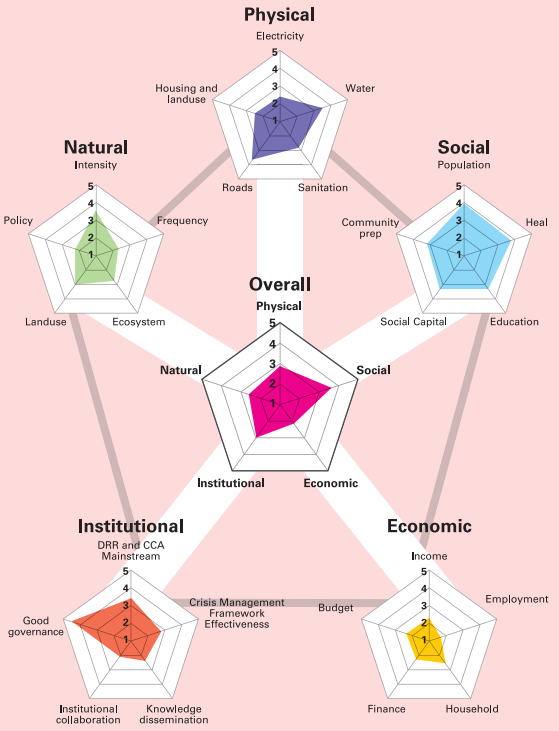
Strengths

- Developed health systems and high- income level
- Developed water services
- Low intensity of disasters

Scope for Improving Resilience

- Strengthen good governance, education levels and knowledge dissemination
- Improve the road conditions of the ward
- Strengthen economic condition by employment and budget head creation for DRR
- Eco-system revitalization and strengthen DRR policy
- Strengthen social capital and community preparedness

Ward Name- Piyari Kala
Ward Number- 52
Population – 13,648



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.86	2.88	3.65	2.16	2.99	2.60

Strengths

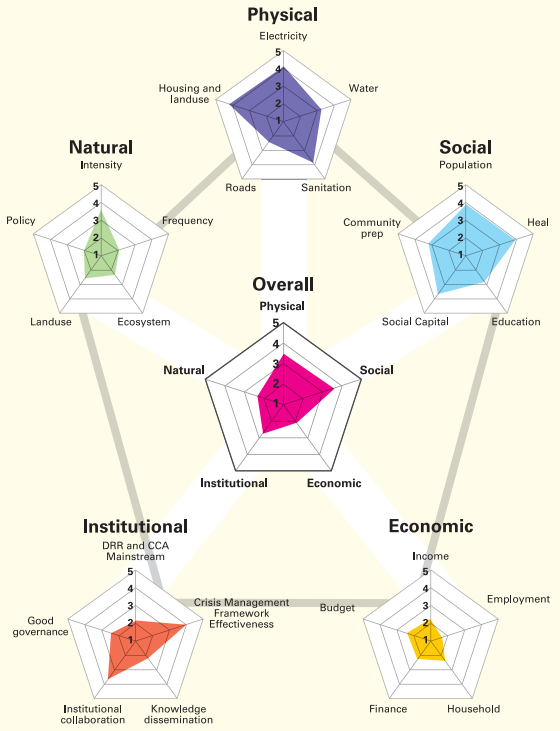
- Developed health systems
- Strong population resileince
- Strong Housing and landuse planning
- High institutional collaboration
- Strong crisis management framework

Scope for Improving Resilience

- Better the road conditions of the ward
- Strengthen economic condition by generating employment
- Strengthen environment policy
- Strengthen finance and savings
- Strengthen community preparedness for low severity localized disasters

Kotwali Zone

Ward Name-Madhyameshwara
Ward Number- 48
Population – 11,269



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.86	3.49	3.60	2.10	2.75	2.34

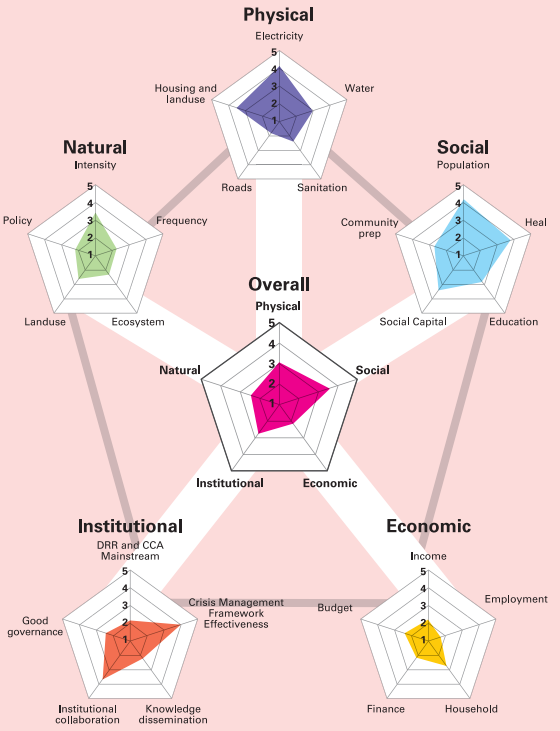
Strengths

- Developed sanitary, health, electricity conditions
- Strong housing and landuse planning.
- Low intensity of disaters
- High institutional collaboration and Crisis management implementation.

Scope for Improving Resilience

- Better the road conditions of the ward
- Strengthen economic condition by generating employment
- Strengthen environment policy
- Strengthen finance and savings

Ward Name-Baluabeer
Ward Number- 76
Population – 12,198



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.81	3.09	3.61	2.16	2.75	2.44

Strengths

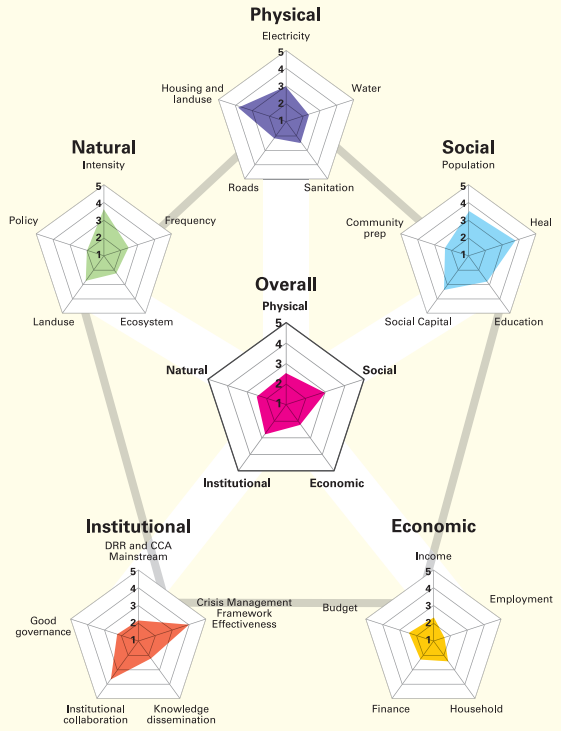
- High population resillence
- Developed health systems
- Strong Housing and landuse planning
- High institutional collaboration and Crisis management implementation

Scope for Improving Resilience

- Better the road conditions of the ward
- Strengthen economic condition by generating employment
- Strengthen environment policy
- Strengthen finance and savings.

Kotwali Zone

Ward Name-Goladinanath
Ward Number- 67
Population – 9,481



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.60	2.63	3.02	2.14	2.72	2.51

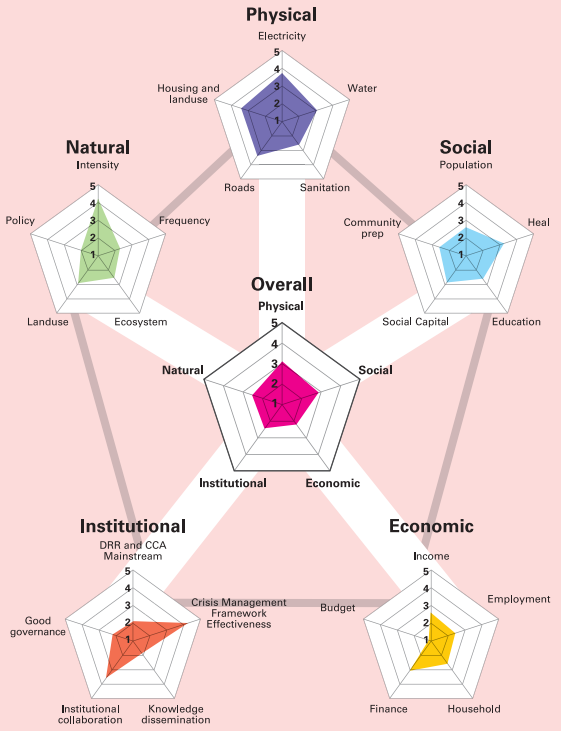
Strengths

- Developed health systems
- Strong Housing and land use planning
- High institutional collaboration and Crisis management implementation
- Low intensity of disasters

Scope for Improving Resilience

- Better the road conditions of the ward
- Strengthen economic condition by generating employment
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Revitalize ecosystem services

Ward Name- Gadwasi Tola
Ward Number- 63
Population – 9,405



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.63	3.12	2.87	2.18	2.45	2.54

Strengths

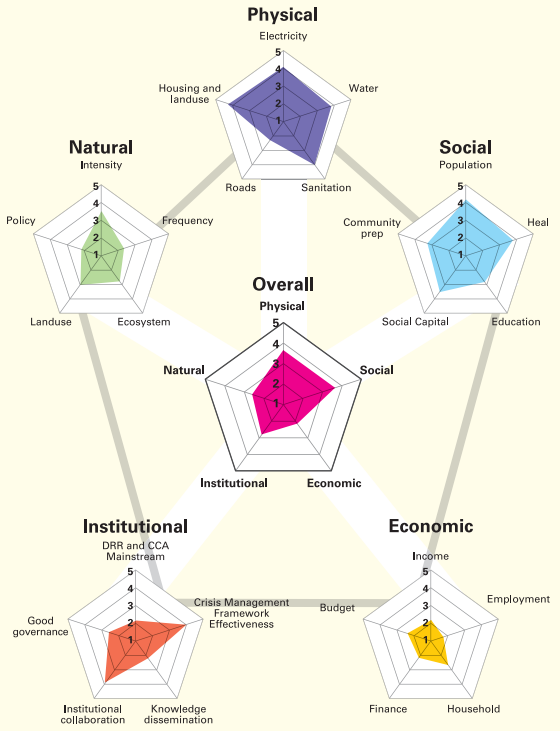
- Developed road conditions, electricity services
- Low intensity of disasters
- Developed crisis management framework

Scope for Improving Resilience

- Strengthen good governance and DRR mainstreaming
- Better the water and sanitary conditions of the ward
- Strengthen economic condition by employment and budget head creation for DRR
- Eco-system revitalization and strengthen DRR and land use policy
- Strengthen community preparedness and social capital

Kotwali Zone

Ward Name- IshwarGangi
Ward Number- 55
Population – 12,530



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.98	3.68	3.66	2.14	2.80	2.60

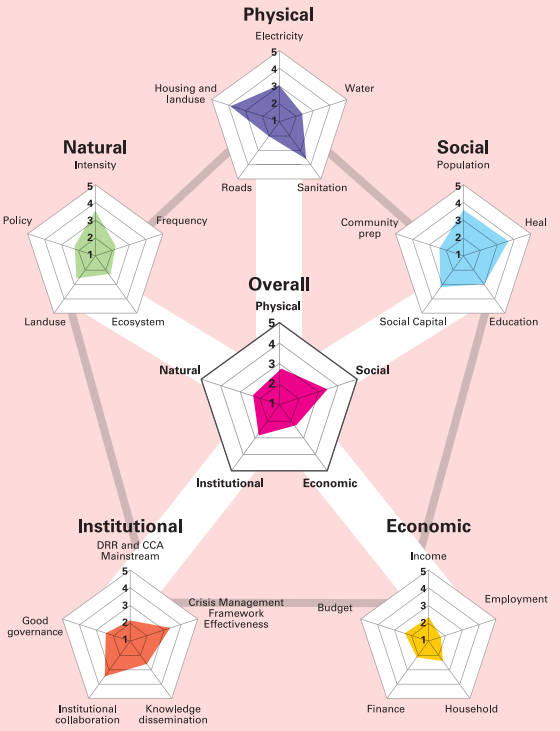
Strengths

- Developed health systems.
- Developed Sanitary, electricity services.
- Strong Housing and land use planning.
- High population resilience.

Scope for Improving Resilience

- Strengthen knowledge dissemination.
- Better the road, conditions of the war
- Strengthen economic condition by generating employment
- Eco-system revitalization and strengthen DRR policy
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation

Ward Name-Raj Mandir
Ward Number- 62
Population – 8,688



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.74	2.76	3.38	2.22	2.86	2.46

Strengths

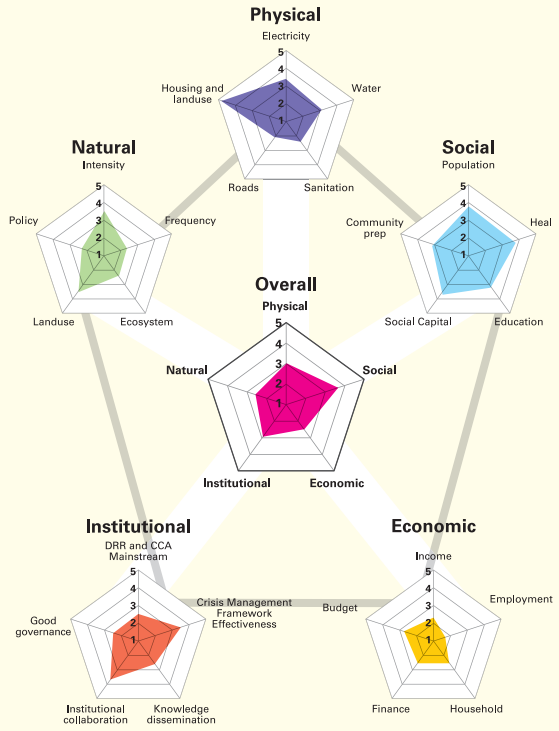
- Strong Housing and land use planning.
- Developed health systems.
- Developed sanitary conditions.
- High population resilience

Scope for Improving Resilience

- Better the road conditions of the ward
- Strengthen economic condition by generating employment
- Strengthen environment policy
- Strengthen finance and savings
- Strengthen community preparedness for low severity localized disasters

Kotwali Zone

Ward Name- Hadha
Ward Number- 79
Population – 8,090



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.94	2.94	3.65	2.47	2.96	2.59

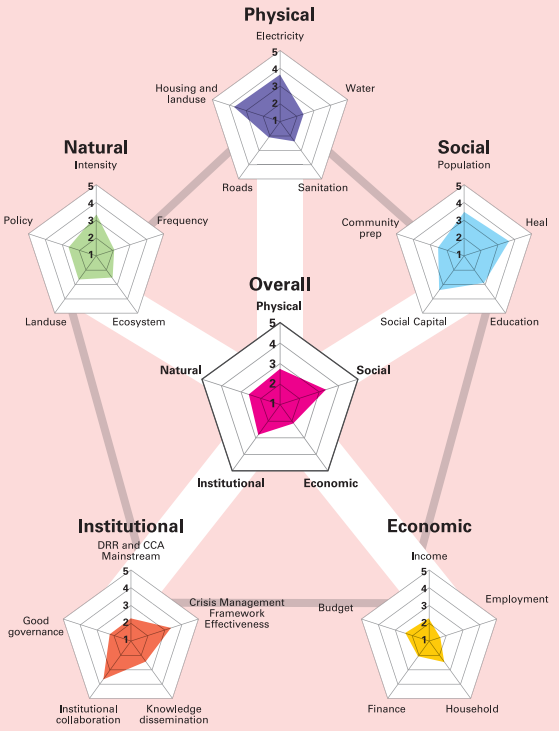
Strengths

- Developed health systems
- High Social capital
- Strong Housing and land use planning
- Strong institutional collaboration
- High population resilience

Scope for Improving Resilience

- Improve the road conditions of the ward
- Strengthen disaster preparedness as ward is prone frequent low severity disasters
- Strengthen economic condition by supporting higher income levels and generate employment
- Strengthen environmental policy

Ward Name- KaalBhairav
Ward Number- 83
Population – 10,765



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.73	2.76	3.36	2.12	2.82	2.58

Strengths

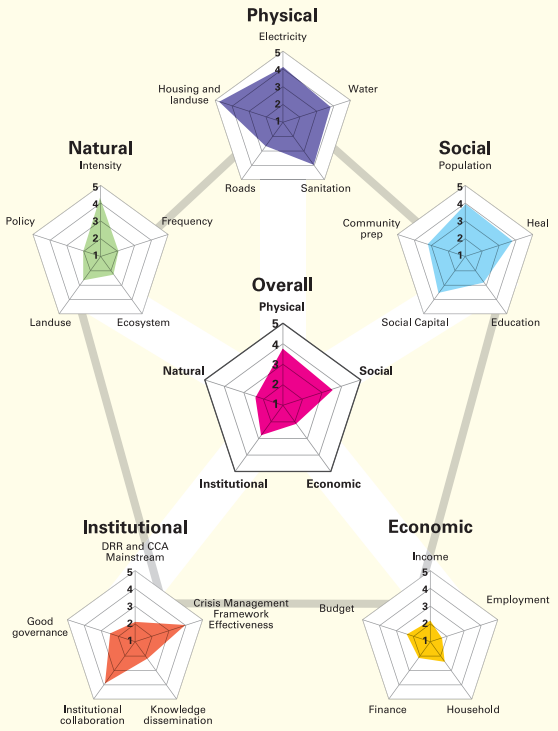
- Developed health systems
- Developed electricity services
- Strong Housing and land use planning
- High population resilience
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen good governance
- Improve the road conditions of the ward.
- Strengthen economic condition by generating employment and supporting finance and savings
- Strengthen disaster preparedness as ward is prone frequent low severity disasters

Kotwali Zone

Ward Name-Daranagar
Ward Number- 51
Population – 11,903



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.93	3.83	3.57	2.09	2.79	2.40

Strengths

- Developed health, electricity and sanitation and solid waste disposal systems.
- Low intensity of disasters
- Strong Housing and land use planning
- Strong Crisis management framework

Scope for Improving Resilience

- Strengthen economic condition by generating employment and supporting finance and savings
- Strengthen disaster preparedness as ward is prone frequent low severity disasters
- Strengthen environmental policy
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation

Roads and traffic conditions in Varanasi


Arterial Road connecting the Ghats of Varanasi


Road connecting Dashashwamedh Ghat in the morning


Road connecting Dashashwamedh Ghat in the evening

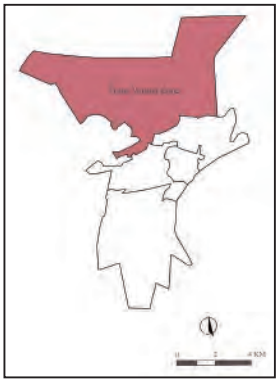
Building along Bhonsale Ghat with Highest Flood level of 1978 marked Inset – Highest flood marking of 1978

Damage caused to the Ghats by flooding and riverine erosion

Climate Disaster Resilience Index of Trans Varuna Zone

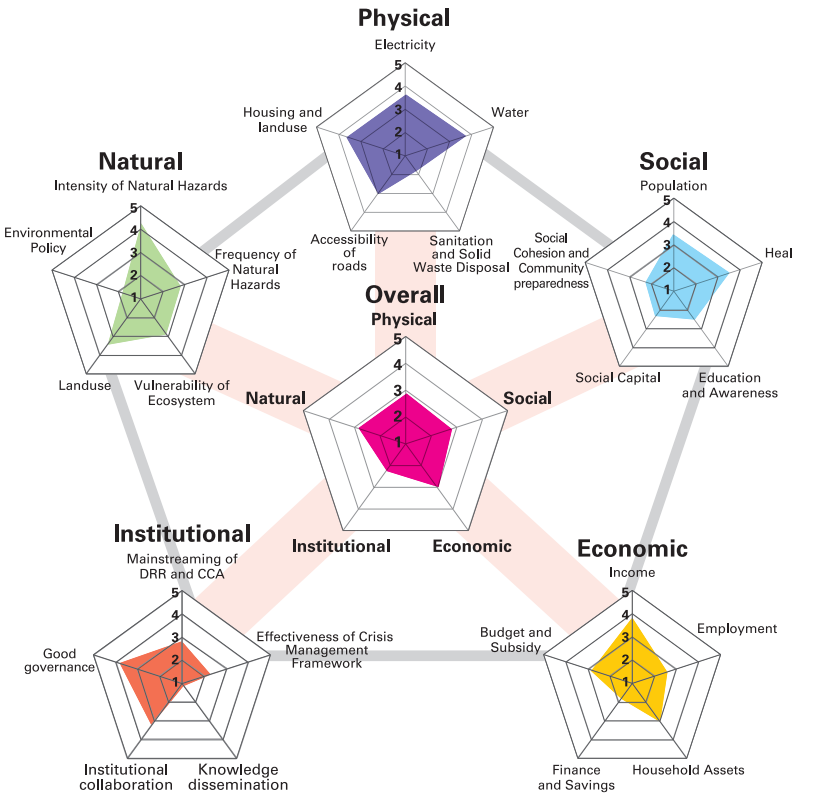
Introduction

Trans-Varun zone is relatively a newly developed zone located in the northern part of Varanasi extending beyond river Varuna. The zone consists of 19 wards with a total population of 298,051 as per 2011 provisional population data. The zone has Sarnath and its precinct, which is a demarcated national heritage site. The trans varuna sewage plant is located in this zone. The Trans-Varuna zone gets its water supply mainly from the ground water and during summer face water scarcity problems.



Score of Indiviual Parameters	
Intensityof natural disasters	4.13
Income	3.86
Good governance	3.80
Water	3.73
Electricity	3.66
Housing and Landuse	3.66
Health	3.53
Population	3.46
Institutional collaboration	3.20
Landuse in natural terms	3.20
Accessibility of roads	3.06
Household assets	3.06
Budget and Subsidy	2.86
Mainstreaming of DRR and CCA	2.80
Employment	2.60
Frequency of natural hazards	2.60
Ecosystemservices	2.60
Education and Awareness	2.53
Social Capital	2.33
Effectiveness of Crisis Management Framework	2.33
Community preparation	2.26
Environmental policy	1.93
Sanitation and Solid waste disposal	1.80
Finance and Savings	1.80
Knowledge dissemination	1.13

CDRI Scores					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	2.88	2.78	3.01	2.27	2.90



CDRI Analysis

The CDRI score across various dimensions in Trans Varuna show no major variations. The economic resilience is the highest while institutional resilience is the lowest in the zone. The zone's strength is its high-income levels, good governance and strong housing and land use planning while it needs improvements in Sanitation and solid waste disposal, knowledge dissemination, environmental policy compliance, and community preparedness.

Physical

In Trans Varuna zone high physical resilience is due to strong health, water and electricity services and housing and land use planning. More than 96% of the households have access to electricity for more than 16 hours in a day and water is available for less than 10 hours in a day. On an average, 61 to 75% of the population in the zone has access to hygienic sanitation and 66 to 80% of the solid waste generated is collected on the same day. However, like other zones almost all the solid waste goes untreated before dumping and only up to 10% of the solid waste is recycled. During floods upto 10% of the solid waste gets collected within 48 hours after the water recedes. More than 70% of the zone's roads remain accessible during flooding though 16 to 30% of these have covered drains. The zone has less than 10% of the buildings built following the buildings codes and more than 71% of houses are above normal flood level. Less than 12% of the population lives in proximity to polluted industries and dumping sites.

Social

The social resilience of the zone is the weakest among all the other zones with low level of community participation, only 11 to 20% of the population participate in community activities. In Trans Varuna, less than 12.4 % of its population lives in slums or informal settlements. The literacy rate is between 75 to 87 %, which is higher than the national average. People are affected equally by waterborne disease and vector borne diseases (0-5%) and only 50 to 75% of the population have access to primary health care. Public awareness and disaster drills are not conducted in the zone as a result of which communities have limited understanding of the disaster threat and mitigation measures. During disaster, only a few people evacuate voluntarily and the schools function as the relief shelters. The acceptability of the community leaders in the zone is medium. The communities are poorly prepared to face any disaster and there is very less support of Non Governmental Organizations and Community Based Organizations.

Economic

The economic resilience of Trans Varuna zone is highest among other dimensions with 11to 20% of its population below poverty line and 50 to 74% of the households have single sources of income with 11 to 20% engaged in informal sector. In case of a disaster 11 to 20% of the population have reduced income levels. Less than 25% of the population is employed in formal sector and more than 25% of the youth population is unemployed. Majority of the population has access to mobile phones, television and 41 to 50% have motorized vehicles. Approximately 10% of the population has savings but only less than 10% of the population invests in some insurance scheme. The credit facility in normal times and during disasters does not exist. At present, the zone has no budget for implementing disaster management or climate change related works. The zone has limited subsidy for health care but lacks the subsidies for livelihood and rebuilding houses in the aftermath of a disaster.

Institutional

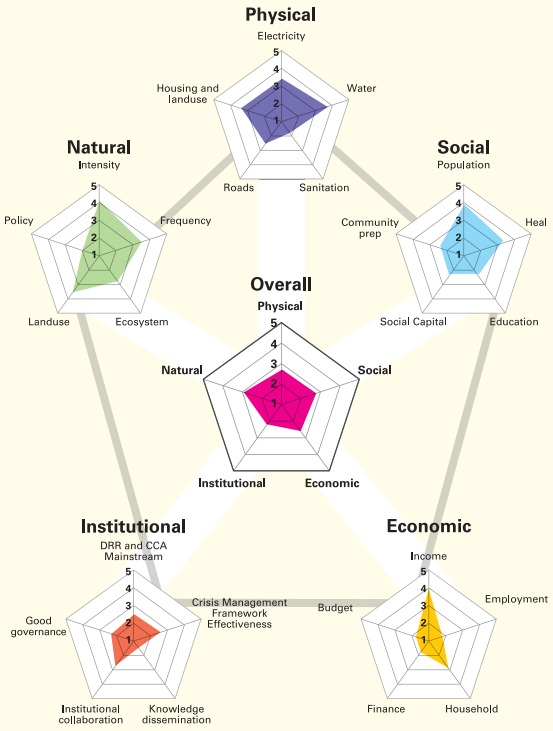
The institutional resilience of Trans Varuna has the lowest resilience due to weak governance and mainstreaming of Disaster Risk Reduction and Climate Change Adaptation and limited community participation in development planning. The zone has an effective crisis management framework and sufficient evacuation centers but lacks trained workers for carrying out emergency services. Further, there are no trainings and drills conducted for the disaster management team and communities. The zonal authority is heavily dependent on external support of city head authority and district disaster management authority in handling disaster. The learning from the past disasters seldom gets translated into planning and mitigation strategies of the zone. The zone has limited networking with neighbouring zones and there is a need to increase the Non Governmental Organization and private organization collaborations. There is no established early warning mechanism in the zone.

Natural

Trans Varuna faces flooding of both riverine and urban in nature in certain pockets of low intensity but are not frequent. The zone faces cold wave in winter season once every year of normal severity. The zone has overall poor ecosystem services due to degrading soil quality and increase in air pollution and water contamination. The built up area lies between 51 to 70% in the zone with more than 16% green cover. In the last 50 years more than 40% loss of green spaces have been transformed into built up areas. In this zone, less than 10% of the settlements are located in hazardous locations closer to the flood plains. The zone has poor compliance to environmental conservation policies and waste management systems.

Trans Varuna Zone

Ward Name- Dithori Mahal
Ward Number- 57
Population – 15,335



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.64	2.72	2.77	2.58	2.20	2.94

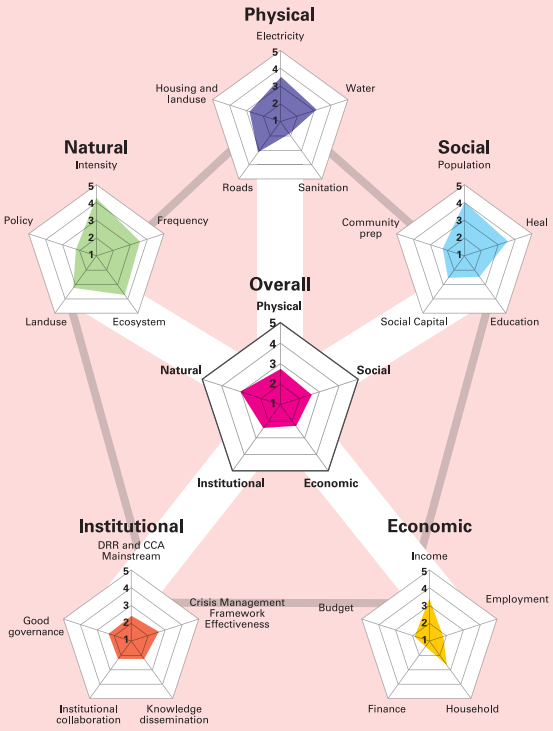
Strengths

- High income level
- Low intensity and frequency of disasters
- High population resilience
- Land use less vulnerable to climate induced disasters

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Create opportunities for employment generation
- Improve sanitation and waste disposal services

Ward Name- Narayanpur
Ward Number-5
Population – 16,795



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.62	2.76	2.62	2.30	2.41	3.03

Strengths

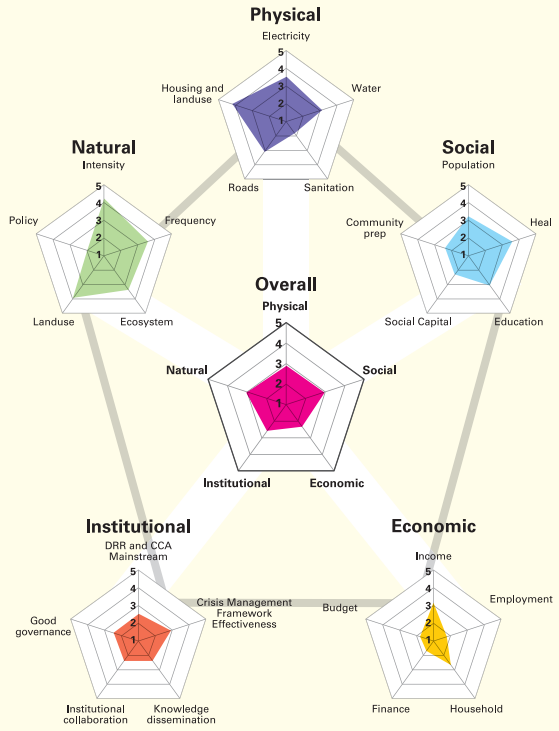
- Low intensity and frequency of natural hazards
- Developed health services
- Strong ecosystem services
- High population resilience

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Shivpur
Ward Number-19
Population – 19,185



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.75	2.91	2.97	2.28	2.58	3.01

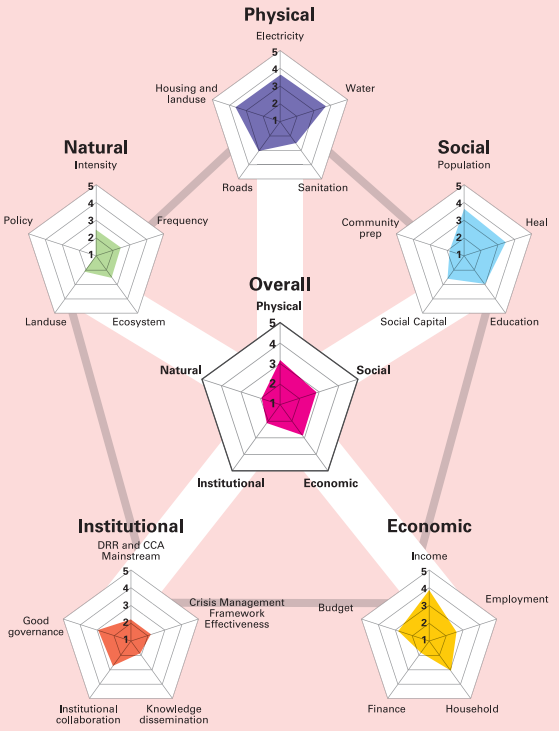
Strengths

- High income level
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Restructure crisis management framework

Ward Name- Chaukaghat
Ward Number-11
Population – 12,692



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.58	3.13	2.89	2.89	2.10	1.92

Strengths

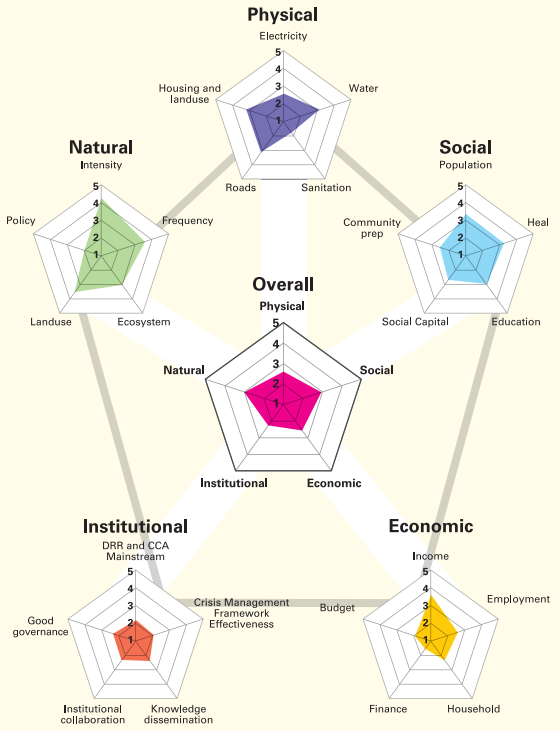
- High income levels
- Low intensity and frequency of natural hazards
- Developed electricity and water services

Scope for Improving Resilience

- Strengthen environmental policy
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen economic resilience by supporting financing and saving
- Strengthen knowledge dissemination mechanism
- Strengthen community preparedness

Trans Varuna Zone

Ward Name- Maviya
Ward Number- 27
Population – 17,617



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.66	2.59	2.96	2.55	2.25	2.97

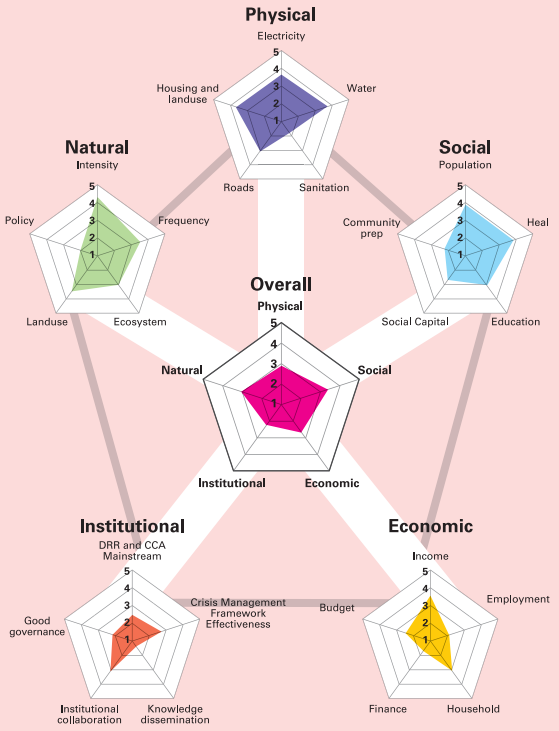
Strengths

- High income level
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Restructure crisis management framework

Ward Name- Dindayalpur
Ward Number- 16
Population – 11,415



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.85	2.89	3.41	2.68	2.24	3.04

Strengths

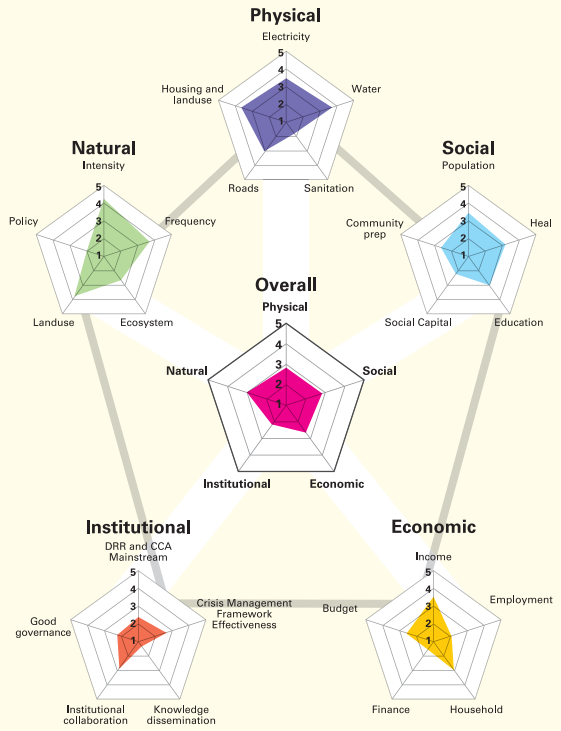
- Low intensity of disasters
- High population resilience
- Developed health, water and electricity services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Pahariya
Ward Number- 36
Population – 19,223



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.71	2.85	2.87	2.67	2.15	3.00

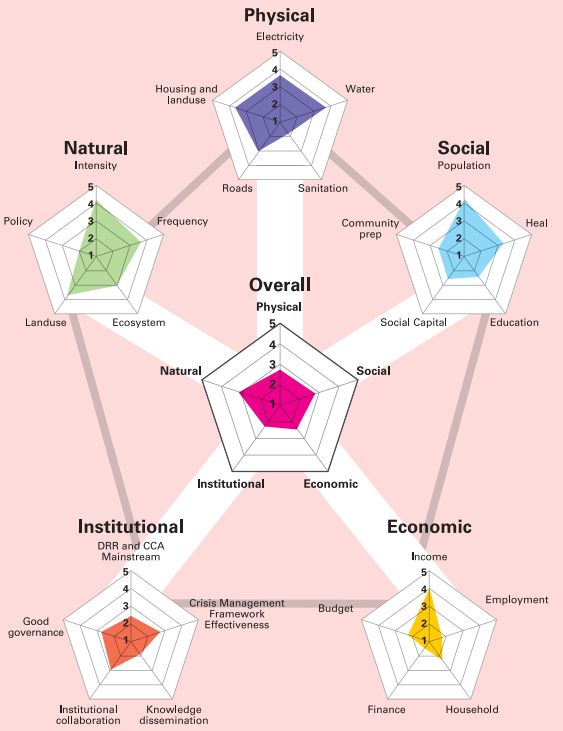
Strengths

- High income level
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Ward Name- Ramrepur
Ward Number- 26
Population – 14,469



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.66	2.89	2.89	2.00	2.44	3.08

Strengths

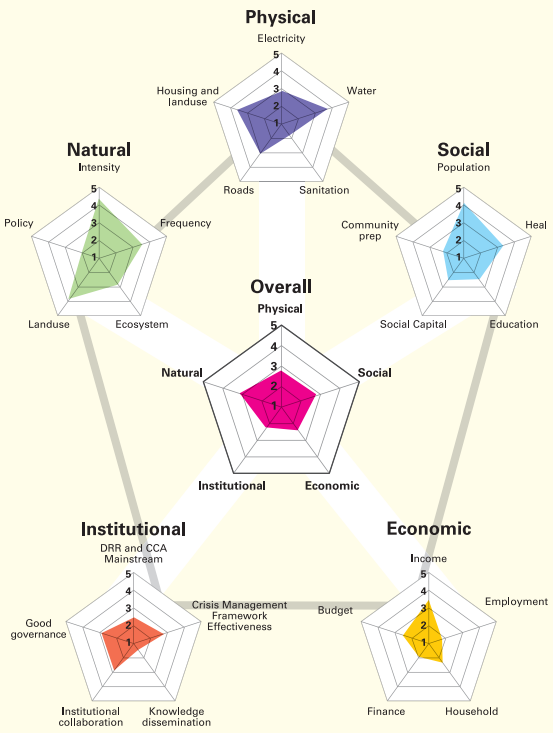
- High income level
- Low intensity of natural hazards
- Land use less vulnerable to climate induced disasters
- Developed water and electricity services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Sarasauli
Ward Number- 6
Population – 12,658



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.68	2.74	2.86	2.79	2.50	2.55

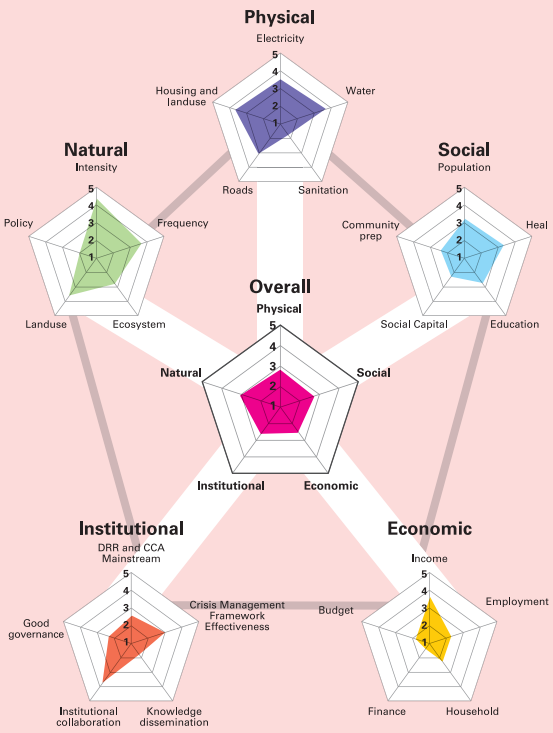
Strengths

- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Developed water services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Ward Name- Hukulganj
Ward Number- 7
Population – 17,874



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
3.01	2.76	2.84	2.59	2.30	3.00

Strengths

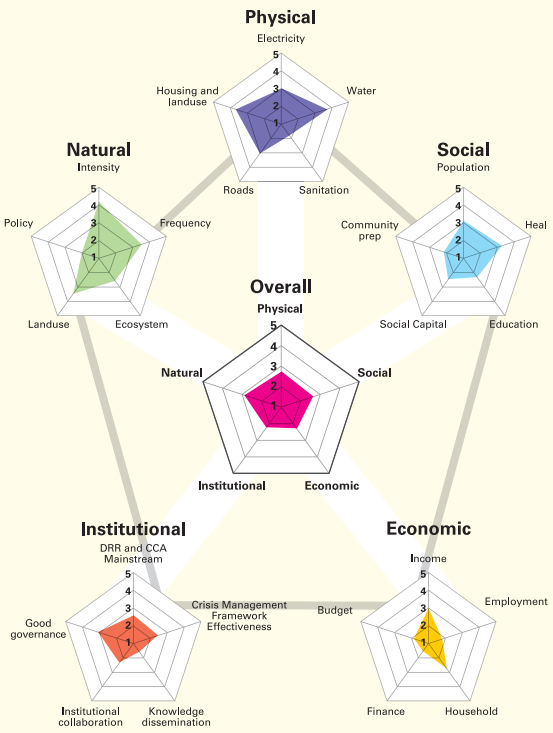
- High income levels
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Developed water services
- Strong housing and land use planning
- Strong institutional collaboration

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Raja Bazar
Ward Number-22
Population – 15,343



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.56	2.70	2.76	2.84	2.59	2.30

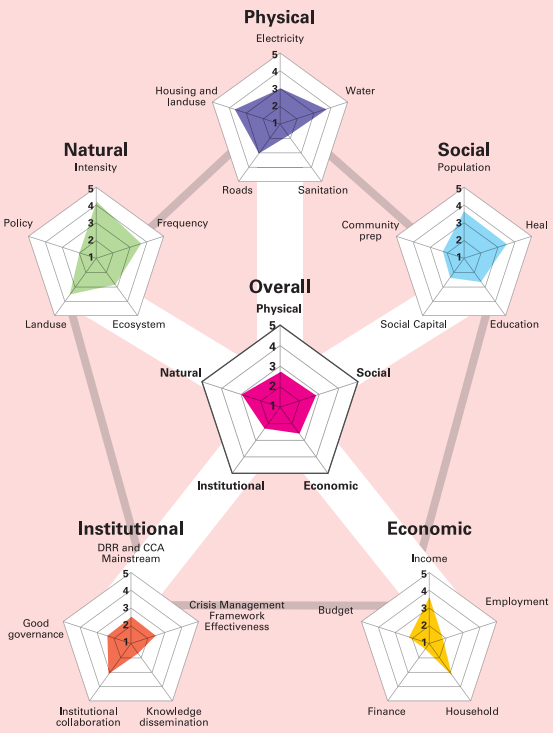
Strengths

- Low intensity of natural hazards
- Land use less vulnerable to climate induced disasters
- Developed water and health services
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Ward Name- Sikraul
Ward Number- 20
Population – 12,733



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
3.00	2.86	2.79	2.50	2.55	3.01

Strengths

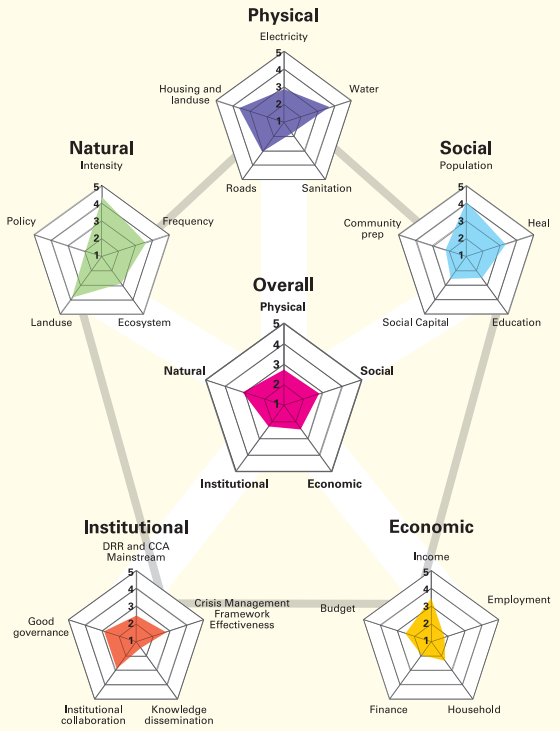
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Developed water services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Khajuri
Ward Number- 18
Population – 16,244



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.68	2.74	2.86	2.79	2.50	2.55

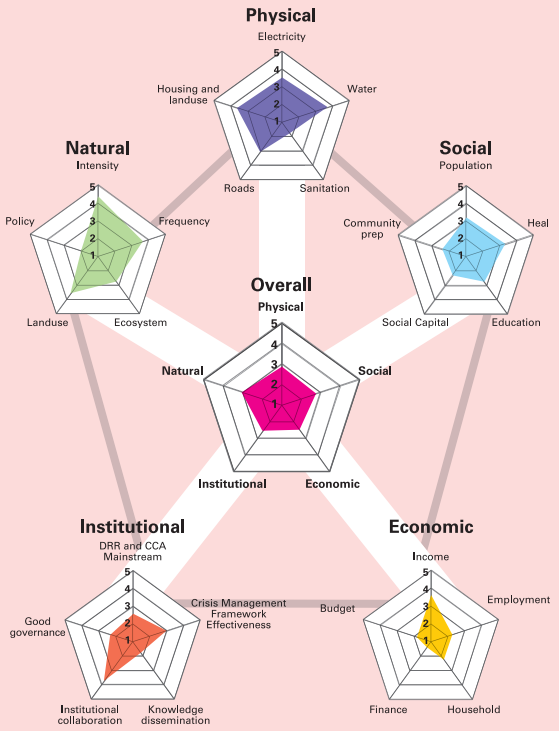
Strengths

- High income level
- Low intensity and frequency of disasters
- High population resilience
- Land use less vulnerable to climate induced disasters

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Create opportunities for employment generation
- Improve sanitation and waste disposal services

Ward Name- Tarna
Ward Number- 3
Population – 20,307



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
3.01	2.76	2.84	2.59	2.30	3.00

Strengths

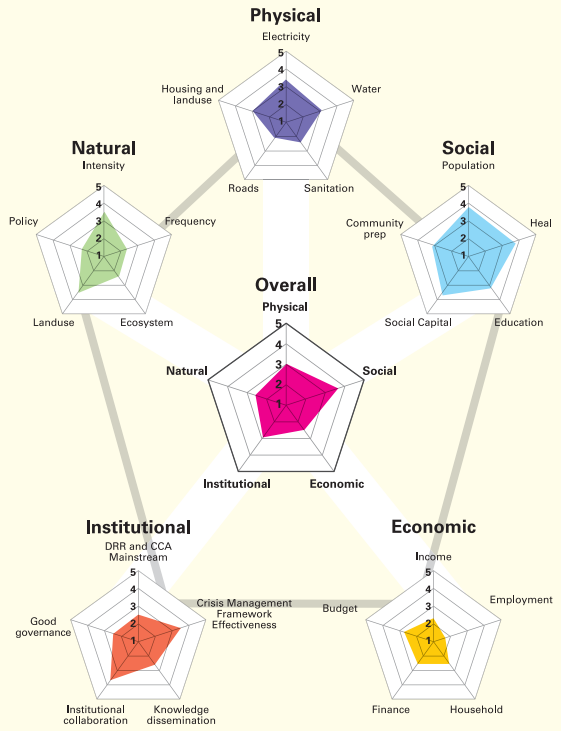
- High income levels
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Developed health and electricity services
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Strengthen household assets
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Indrapur
Ward Number- 1
Population – 16,875



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.71	2.94	3.65	2.47	2.96	2.59

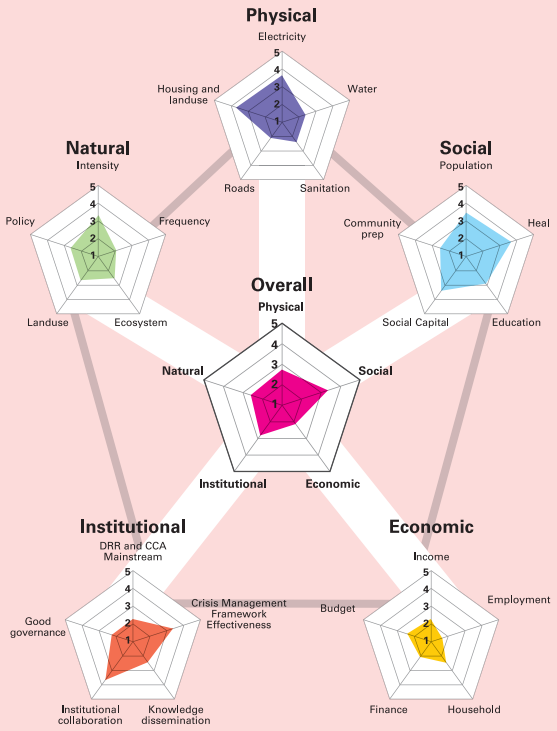
Strengths

- Low intensity and frequency of natural hazards
- Developed health services
- Developed electricity services
- High population resilience

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Improve sanitation and waste disposal services
- Strengthen household assets

Ward Name- Pandeypur
Ward Number-33
Population – 19,084



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.71	2.76	3.36	2.12	2.82	2.58

Strengths

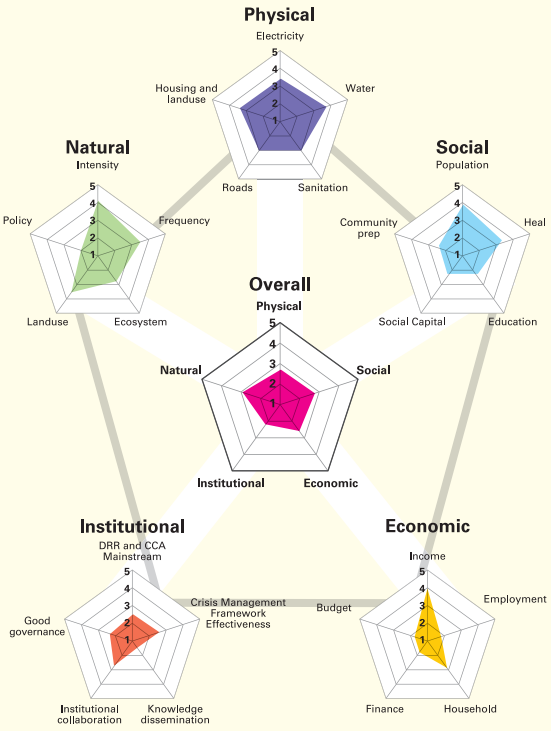
- High income levels
- Low intensity and frequency of natural hazards
- Developed health and water services
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Strengthen household assets
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Sarnath
Ward Number- 30
Population – 13,670



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	3.13	2.90	2.89	2.27	2.67

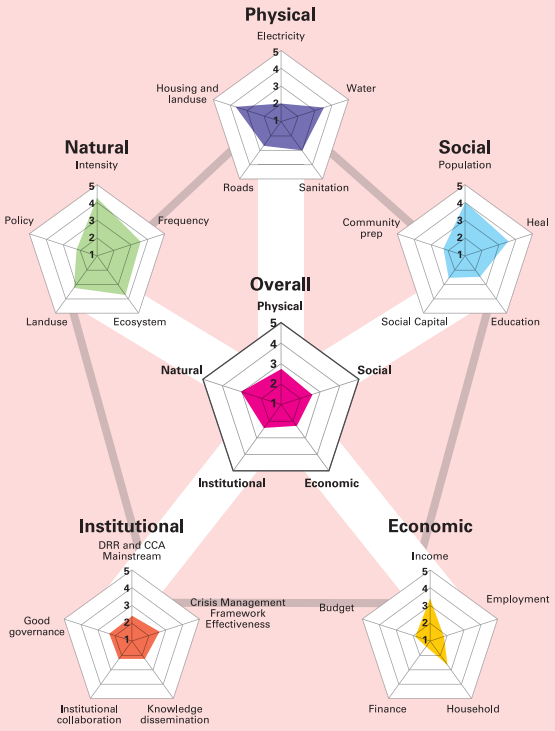
Strengths

- High income levels
- Low intensity and frequency of natural hazards
- Developed electricity and water services

Scope for Improving Resilience

- Strengthen environmental policy
- Strengthen mainstreaming of disaster risk reduction and climate change adaptation
- Strengthen economic resilience by supporting financing and saving
- Strengthen knowledge dissemination mechanism
- Strengthen community preparedness

Ward Name- Nayi Basti
Ward Number-29
Population – 15,812



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.59	2.68	2.75	2.34	2.39	2.79

Strengths

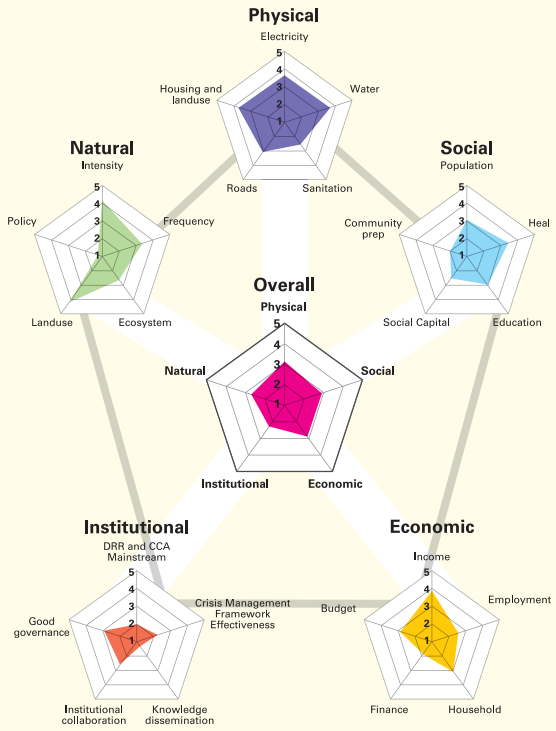
- High income level
- Low intensity and frequency of natural hazards
- Land use less vulnerable to climate induced disasters
- Strong housing and land use planning
- Developed water services

Scope for Improving Resilience

- Strengthen environmental policy
- Create budget head for disaster risk reduction
- Strengthen economic resilience by supporting financing and saving
- Strengthen knowledge dissemination mechanism
- Create opportunities for employment generation

Trans Varuna Zone

Ward Name- Nadesar
Ward Number- 15
Population – 10,783



CDRI SCORES					
Overall	Physical	Social	Economic	Institutional	Natural
2.77	2.59	2.68	2.75	2.34	2.39

Strengths

- Low intensity and frequency of natural hazards
- Developed electricity and water services
- High population resilience
- Strong housing and land use planning

Scope for Improving Resilience

- Strengthen environmental policy
- Strengthen economic resilience by supporting financing and saving
- Strengthen knowledge dissemination mechanism
- Strengthen community preparedness
- Improve sanitation and solid waste disposal services

Sanitation and Solid waste disposal in Varanasi

Waste Disposal along the streets in Dashashwamedh zone


City's waste water draining into Varuna river in Adampur zone


Sanitation and Solid waste Disposal issues in Adampur zone

Heritage zone of Sarnath in Trans Varuna zone

Dharhara Mosque along the Ghats in Varanasi

About the Organization

Kyoto University

Environmental Education Laboratory, Graduate School of Global Environmental Studies of Kyoto University targets to reduce gaps between knowledge and practice through pro active field level, community based project implementation in the field of environment, disaster risk reduction, climate change adaptation and disaster education.

Banaras Hindu University

Institute of Environmental and Sustainable Development, Banaras Hindu University contribute significantly to the development of appropriate knowledge and competences in the area of sustainable development, The institute tries to cover education about sustainable development (developing an awareness of what is involved) and education for sustainable development.

Varanasi Nagar Nigam

The Varanasi Nagar Nigam (city corporation) had been established in the year 1959 under the act of Uttar Pradesh Government. The present population of the city is 1,197,629 as per 2011 provisional census data. The city corporation has been taking earnest efforts to solve the multi faceted problems, which have accompanied the rapid growth and expansion of the city with specific focus on the civic services.

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2. Joerin, J., Shaw, R. (2011): Mapping climate and disaster resilience in cities In: Climate and Disaster Resilience in Local Governments, eds. Shaw, R., and Sharma, A., Bingley, Emerald Publishers. 47-61.

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