International Journal on Emerging Technologies **8**(1): 27-32(2017)

ISSN No. (Print) : 0975-8364
ISSN No. (Online) : 2249-3255

Sustainable and Resilient Urban Development- Palampur perspective

Ankush Khanna, Chander Kant and Manpreet Singh Saini
Department of Civil Engineering, DAV University Jalandhar, (Punjab), INDIA

(Corresponding author: Ankush Khanna)
(Received 16 December, 2016 accepted 03 January, 2017)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: Rapid growth in small and medium scale urban centers plays a crucial role in economic and societal progress. However, it also strains a city's infrastructure. Key challenges, such as traffic mass, energy usage, public safety, and the building of rational communities are top of mind. Such challenges need to be addressed through the development and implementation of intelligent solutions.
A Resilient City offers decent living options to every resident. This would mean that it will have to provide a very high quality of life (comparable with any developed European City) i.e. good quality but affordable housing, economical physical infrastructure such as 24 × 7 water supply, sanitation, 24 × 7 electric supply, clean air, quality education, health care, security, entertainment, sports, booming and tremendous speed interconnectivity, fast & efficient urban mobility etc.
Himachal Pradesh is the least urbanized state of India with a meager 9.8% of its total population residing as its urban population (Census 2011). Palampur in Himachal Pradesh has become the first town in the state to have free Wi-Fi facility and is also one of the most beautiful towns of the state which is well connected by road and rail network with the rest of India. This paper will help in considering Palampur name in the next list of smart city being synchronized by ministry of urban development.
Keyword:

I. INTRODUCTION

Over the coming decades, the need to build capacity for greater resilience will require our cities to develop tactics for coping with the future shocks and stresses to our urban infrastructure systems associated with climate change. We think that effective urban planning and building design could play an important role in speed up the development of a greater capacity for future resilience.

In its common usage, the word "resilience" is typically understood to describe a material's ability to recoil or spring back into shape after stretching, or being compressed. In ecology, resilience has been described as the capacity of an ecosystem to tolerate disturbance without crumple into a qualitatively different state. Thus, a resilient ecosystem is considered to be one that can more effectively withstand external shocks and rebuild itself after experiencing those shocks.

A Resilient City is one that has developed capacities to help absorb future shocks and stresses to its social, economic, and technical systems and infrastructures so as to still be able to maintain essentially the same functions, structures, and identity.

Peri-urban areas - (also called rurban space, outskirts or the hinterland) are defined by the structure resulting from the process of **peri**-urbanisation. It can be define as the landscape interface between town and country, or also as the rural—**urban** transition zone where **urban** and rural uses mix and often clash.

Why do cities need to become more Resilient?

Today's cities are all subject to the future shocks and stresses that will be associated with climate change, energy shortage and global population growth. Their economies, food supplies, public and private transportation, and the production of materials to build them, are all energy intensive and fossil fuel dependent; and their existing building infrastructure has not been designed to stand up to the future environmental shocks and stresses produced by a warming climate. Over the next 50 years, our societies and cities will therefore need to effectually respond to these challenges, or suffer significant economic and social consequences.

This will happen for two reasons:

Climate Change:

Efforts to reduce CO_2 transmission and otherwise lower Earth's rising average temperature will begin driving serious social and political projects across the globe.

Many societies will depend on the success of these projects for their survival.

Global Population Growth: According to projections, the world population will abide to grow until at least 2050, with the population reaching 9 billion in 2040, and some forecasts putting the population in 2050 as high as 11 billion. This growth, at the present time, seems to be unsustainable by the current holing ability of the planet. Significant resource stresses, causing socio-political stresses seem the most probable result of this projected growth.

It is the purpose of Resilient City to explore how best to react to these two challenges by developing strategies and techniques for increasing the various aspects of urban resilience that will help our cities cope with the impacts of these stresses.

II. URBAN RESILIENCE

In recent years, the popularity of "resilience" has exploded in both academic and policy discourse, with numerous explanations for this dramatic rise. Above all perhaps, resilience theory provides insights into composite socio-ecological systems and their sustainable management, especially with respect to climate change. As socio-ecological resilience theory understands systems as consistently changing in nonlinear ways, it is a highly relevant approach for dealing with future climate uncertainties. As a term, resilience also has a positive societal connotation, leading some to suggest that it is preferable to related, but more charged concepts like "vulnerability".

In particular, resilience has come to light as an attractive perspective with respect to cities, often theorized as highly composite, adaptive systems. Unprecedented urbanization has transformed the planet from 10 percent urban in 1990 to more than 50 percent urban in just two decagon. Although urban areas (at least 50,000 residents) cover less than 3 percent of the Earth's surface, they are responsible for an estimated 71 percent of global energy-related carbon exudation. As cities continue to grow and grapple with uncertainties and challenges like climate change, urban resilience has become an increasingly favored concept.

But what exactly is meant by the term 'urban resilience'? The etymological roots of resilience stem from the Latin word resilio, meaning "to bounce back". As an academic concept, its origins and meaning are more doubtful. Resilience has a conceptual fuzziness that is beneficial in enabling it to function as a "boundary object," a common concern that appeals to collective "social worlds" and can, therefore, care for multidisciplinary scientific association. The meaning of resilience is malleable, allowing stakeholders to come collectively around a common terminology without requiring them to necessarily be of the same mind on an exact definition. But this vagueness can make resilience difficult to operationalize, or to develop generalizable indicators or metrics for.

To better understand how the term has been defined and used across disciplines and fields of study, this paper analysis four decades of academic literature on urban resilience beginning in 1973. Guided by bibliometric analysis, the paper describes the most influential thinkers and publications in this rapidly expanding research area. This review affirms that definitions of urban resilience from this period are underdeveloped in the sense that they have not explicitly addressed important conceptual tensions likely in the urban resilience literature. Moreover, where papers do discuss these constrictions, the authors' positions are often inconsistent.

The first five tensions (also evident in the broader resilience l are as follows:

a. Equilibrium vs. non-equilibrium resilience.
b. Positive vs. neutral (or negative) conceptualizations of resilience.
c. Mechanism of system change (i.e., persistence, transitional, or transformative).
d. Adaptation vs. general adaptability.
e. Timescale of action.

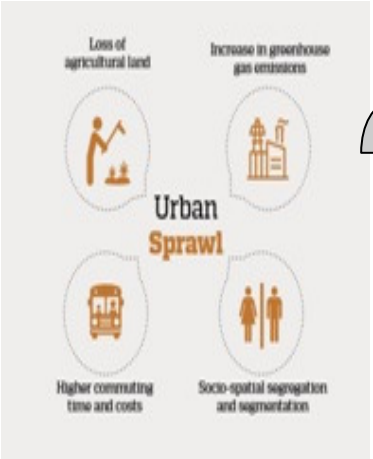
The sixth conceptual tension is specific to the urban resilience literature and has to do with how 'urban' is defined and characterized.

Using the resilience concept in urban groundwork's and for policy contexts hinges on coming to terms with these tensions. Thus, to advance scholarship and practice, this paper states a new definition of urban resilience, one that explicitly includes these six conceptual tensions, yet remains flexible enough to be adopted by a range of disciplines and stakeholders. This definition is as follows:

Urban resilience indicates the ability of an urban system-and all its constituent socio-ecological and socio-technical networks across spatial and temporal scales-to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity.

Picture presentation from urban sprawl to sustainable growth

Problems of unplanned growth **Integration plan of a city** **The planned city**



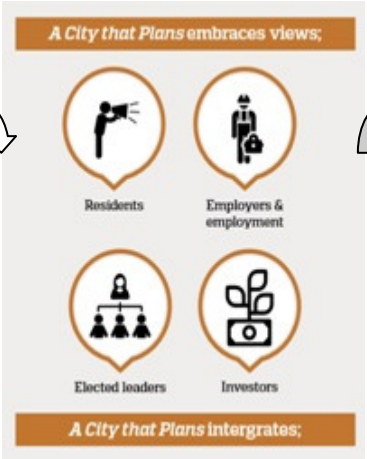


Fig. 1. Urban sprawl. **Fig. 2.** City plan integration. **Fig. 3.** Planned growth.

A. Classification of Urban Hazard

Table 1: urban hazard classifications.

Natural	Technological	Socio-economic-political-cultural crises
Epidemic and Pandemic	Chemical spill	Housing crisis
Insect infestation	Collapse	Energy crisis
Drought	Explosion	Food crisis
Extreme temperature	Fire	Water crisis
Mass movement	Poisoning	Social conflict
Wildfire	Gas leak	Terrorism
Flood	Transport accidents	Business discontinuity
Earthquake	Oil spill	Massacre
Volcano	Radiations	Economic crisis
Storm	System breakdown	Excessive unemployment

III. SCENARIO DEVELOPMENT FOR RESILIENCE PLANNING IN INDIA

India's urban population grew from the 290 million reported in the 2001 Census to an estimated 340 million in 2008, and McKinsey Global Institute (2010) projects that it could soar further to 590 million by 2030. This urban expansion will happen at a speed quite unlike anything India has seen before. It took nearly 40 years (between 1971 and 2008) for India's urban society to rise by 230 million. It could take only half that time to add the next 250 million. Surging growth and employment in cities will pose serious problems. Rapidly growing peri-urban, small and middle-sized cities are particularly at risk. Often lacking financial resources, infrastructure, services and the capacity to administer the increase in urban population, their acknowledgement is increasing and will translate into heavy loss of life and property in case of climate and disaster events, unless proactive measures are mainstreamed into urban governance and planning processes. Mass density of people makes them especially vulnerable both to the impacts of acute disasters and the slow, creeping effects of the changing climate; all making resilience planning seriously important. Building resilience in cities relies on making investment decisions that prioritize spending for activities offering alternatives which behave well under different scenarios. In managing risks today and planning for the future, a balance must be struck between, on the one hand, common sense approaches that minimize impacts through better urban management and maintenance of existing mitigation measures and, on the other hand, far-sighted approaches.

While active urbanization is increasing the wealth and spending potential of India's urban population, urban development has also resulted in changes to land use that have challenged traditional industries; agriculture, fishing, and forestry, which are common in peri-urban domains, all face new obstacles. Additionally, climate change and increasingly frequent extreme weather events have arranged further issues for both urbanizing communities and these climate-based industries. For example, climate change is resulting in an increasingly variable monsoon season, which makes agriculture on the outskirts of cities dangerous. Climate change is also increasing sea level and temperature, harming fishing and putting people at risk.

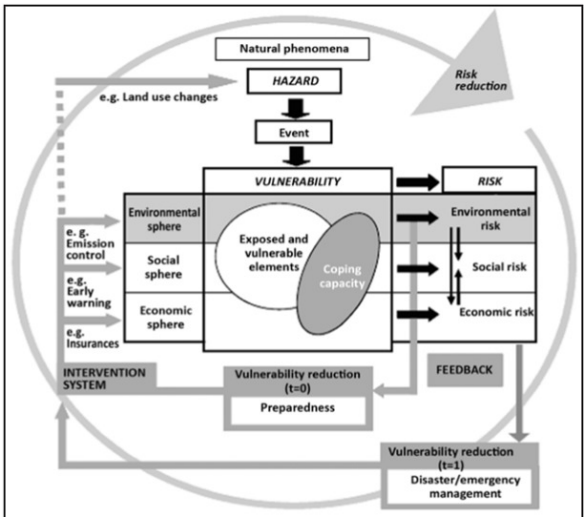


Fig. 4. Disaster risk reduction representation.

IV. INTRODUCTION TO PALAMPUR

Palampur is combination of three words 'Pani', 'Alam' and 'Pur'. 'Pur', means settlement, Pani is water/rain, 'Alam' is environment dominated or adobe of. It is a settlement, the sociocultural and environmental factors of which are determined by rainfall. The town itself has interesting colonial architecture and the area around is richly garnished with historical temples and forts and scores of picturesque hamlets. The city of Palampur is a hill city spread on a ridge and its seven spurs. Palampur features a subtropical highland climate. The city is one of the most popular hill stations of India. The climate in Palampur is predominantly cool during the winter and moderately warm during the summer. Palampur is well connected with both road and rail connectivity.

City resilience strategies for Palampur: (Risk and vulnerability assessment; preparation of resilience strategy)

All the aforementioned steps culminate in a city resilience strategy – a detailed plan of action that draws from the shared learning dialogues, sector specific studies and vulnerability assessments and addresses climate resilience for the city in question through specific strategies.

V. METHODOLOGY

The methodological steps included the following:

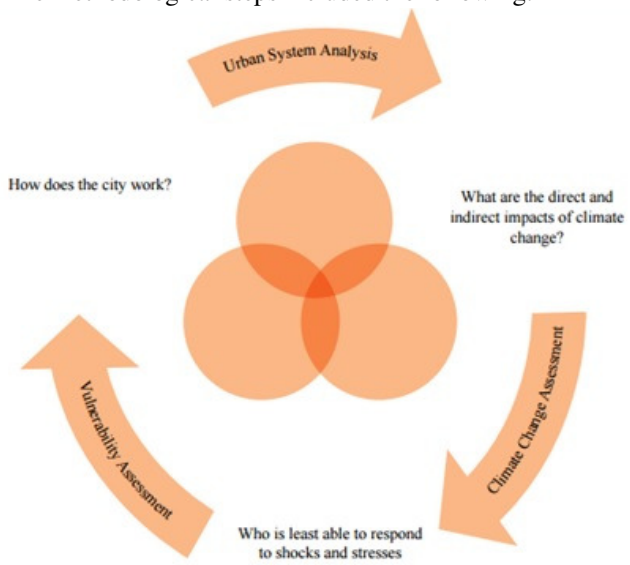


Fig. 5. Urban system framework.

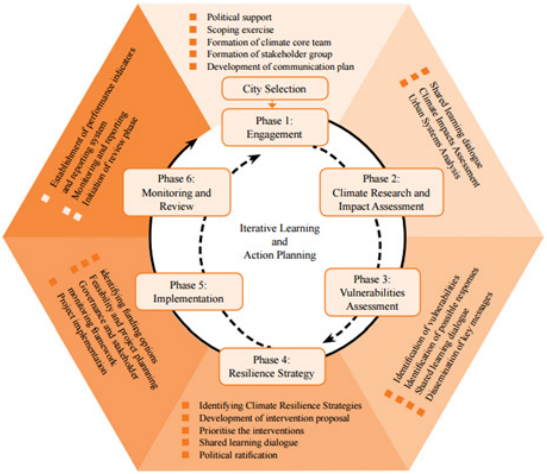


Fig. 6. Methodology for urban resilience.

Engagement stage: This stage included the setting up a committee or group of individual for the city of Palampur who can help is streamlining various projects started under different schemes at one go. These include:

a. Climate core team

The profile of a city will determine its vulnerability and contributes to its resilience.

Basic assumptions of risk can be inferred through city typology; coastal, dry land, inland, and high altitude cities face unique challenges. For illustration, as a coastal city, Visakhapatnam is situated on low-lying land and this increases its risk from a rise in sea level. It is also readily exposed to storm surges.

For the city of Palampur the risk of landslides, cloudburst and earthquake are the three main areas in which the city of Palampur must be resilient. As the area of Palampur is situated in the seismic zone 5 it is very vulnerable to earthquake and Kangra earthquake in which occurred in 1905 is the example as to what extent an earthquake can cause the damage.

b. The formation of a stakeholder groupStakeholders are group of people which are actively involved in the Committee to Advise the Council Regarding a Potential Local Tax to Raise Funds for Transportation Programs and Projects. The stakeholder Group will, through the formation of a clear concept of long-term needs in City, and through continued interactions with the community and City Council and ultimately advice and present a recommendation to City Council on a strategy to achieve long-term goals that are well supported by not just the committee but also the community at large.

c. Political support

Political support is one of the most important factor in developing any city India. The leadership must strong enough to implement bold decision depending upon the nature of urban schemes.

Reasons for Weak urban governance India

- Absence of incentives, encouragement and promotions on basis of efficiency.
- Rampant corruption at multiple levels, discrimination, vested interests, undue political interference, crony capitalism, allocation of tenders to incapable contractors. (Eg-recent flyover collapse in Bengal)
- Lack of monitoring and evaluation of officials and due accountability and responsibility for timely completion of work
- Absence of allocation of subjects as per 74TH CONSTITUTIONAL AMENDMENT,
- Limited capital sources for urban local bodies
- Multiple govt bodies with overlapping mandates leading to in-coordination and delays.

Climate research and impact assessment stage:

This stage included climate impact assessment and urban systems analysis. As already discussed, the climate impacts were derived from reports of MoEF(*Ministry of environment and forest*) and IISC Bangalore (*Indian institute of sciences*). The urban systems analysis included a detailed study of the fragile urban systems and the risks that the urban system would face under changed climate projections.

Identification of vulnerability and possible responses:

The vulnerable spots in the city and vulnerable groups were identified at this stage. A priority exercise was conducted to prioritize areas of vulnerability. It was followed by sector-wise vulnerability assessments of the various urban systems on the basis of the likelihood, consequence and assessment of risks attached to them. Next, wards susceptible to the identified impacts were listed. Vulnerability hotspots were located, which included all wards in which the identified fragile systems were to be impacted.

Implementation of strategies

Having recognized that cities are the engines of growth and are drawing a million people every minute from rural areas, the Government has introduced the 'Smart City Challenge', convey over the onus of planned urbanization to the states.

Smart Cities Mission still has its own challenges to face-

- ***Retrofitting existing heritage city infrastructure to make it smart***

The most important is to determine the existing city's weak areas that need utmost consideration, e.g. 100-per-cent circulation of water supply and sanitation. The integration of formerly detached legacy systems to achieve citywide efficiencies can be a significant challenge.

- ***Availability of master plan or city development plan***

Most of our cities don't have master plans or a city advancement plan, which is the key to smart city planning and implementation and encapsulates all a city needs to develop and provide better opportunities to its citizens. Unfortunately 70-80 per cent of Indian cities don't have one.

Monitoring and review

Three-tier governance: Successful implementation of smart city solutions needs adequate horizontal and vertical coordination between various institutions providing various municipal amenities as well as effective coordination between central government (MoUD), state government and local government firms on various issues related to financing and sharing of best practices and service delivery processes.

IV. CONCLUSION

In this paper we have provided bibliometric techniques on research trends in the urban resilience. The paper presented publication outputs, subject categories and publication pattern, most abundant authors and international productivity, research basements and research trajectories, emerging trends and new developments.

According to the bursts of the node, these keywords were researches, such as "government", "climate-change" and "city''. Future research will focus on three areas mainly, such as ecosystem service, adaptive capacity and human-governed ecosystem. With the development of global city, more topics will be exercised, such as the metrics of urban resilience. It is the purpose of Resilient City to explore how best to respond to these two challenges by developing schemes and techniques for increasing the various aspects of urban resilience that will help our cities cope with the impacts of these stresses. As cities continue to grow and encounter with uncertainties and challenges like climate change, urban resilience has become an increasingly favored concept. For the city of Palampur the risk of landslides, cloudburst and earthquake are the three main areas in which the city of Palampur must be resilient. As the area of Palampur is situated in the seismic zone 5 it is very vulnerable to earthquake and Kangra earthquake in which occurred in 1905 is the example as to what extent an earthquake can cause the damage. Implementation of strategies having recognized that cities are the generator of growth and are drawing a million people every minute from agricultural areas, the Government has introduced the 'Smart City Challenge', handing over the onus of planned urbanization to the states. Most of our cities don't have master plans or a city development plan, which is the key to smart city planning and implementation and encapsulates all a city needs to improve and accommodate better opportunities to its citizens.

Unfortunately 70-80 per cent of Indian cities don't have one. Successful implementation of smart city solutions needs efficient horizontal and vertical denomination between various institutions providing various municipal amenities as well as effective coordination between central government (MoUD), state government and local government organization on various issues related to financing and sharing of best practices and service delivery processes.

REFERENCES

[1]. Climate change adaptation in Himachal Pradesh by Asian development bank.

[2]. Smart city Dharmashala-concept note

[3]. Urban Sprawl and other Spatial Planning Issues in Shimla, Himachal Pradesh-Shashi Shekhar(Institute of Town Planners, India Journal 8 - 3, July - September 2011, 53 – 66)

[4]. Annual Administrative Report (2011-12) Of Town And Country Planning Department Government Of Himachal Pradesh

[5]. Palampur development plan

[6]. INTERNATIONAL CENTER FOR SUSTAINABLE CITIES (ICSC) -Sustainable and Resilient Urban Development

[7]. Green Growth and Buildings Sector: Himachal Pradesh-Green Growth and Buildings Sector: Himachal Pradesh.