Exploring Resilience in Urban Management

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Abstract: Exploring urban resilience

Until recently, resilience among adults exposed to potentially traumatic events was thought to occur rarely and in either pathological or exceptionally healthy individuals.

However, that the most common reaction among adults exposed to such events is a relatively stable pattern of healthy functioning coupled with the enduring capacity for positive emotion and generative experiences. A surprising finding is that there is no single resilient type. Rather, there appear to be multiple and sometimes unexpected ways to be resilient, and sometimes resilience is achieved by means that are not fully adaptive under normal circumstances.

More often than not resilience is still mostly discussed as “bouncing back” from a disturbance of some sort, be it terrorism, building collapse, floods, drought, fires, climate change etc.

The focus is very much on rebuilding and recovery, a particular engineering resilience perspective. However, the current, more ecological concept of resilience is not only about “bouncing back” and recovery in my opinion, but also about the ability to adapt, often discussed as adaptive capacity. In this context resilience is the capacity of a system to experience shocks and stresses while retaining function, structure, feedbacks and, therefore, identity. Resilience is not just about bouncing back as it were, it is a lot more than that.

If you buy the idea that we need to be building social-ecological resilience, then city or urban planning and management still has a long way to go towards definition or understanding of social-ecological resilience that moves beyond recovery and rebuilding following disturbance of any kind as discussed above.

Additionally, resilience needs to be linked to sustainability so that the resilience we are trying to plan and design for actually helps us move towards desired future sustainable systems states, and not undesirable ones. Current resilience planning and management efforts may just as likely be locking our urban systems into undesirable ones, away from sustainability.

Planning for urban resilience, and specifically adaptation, is well under way in a number of cities around the world. This abstract gives and explores some of the current approaches and strategies to urban resilience in cities. Resilience is key to enhancing adaptive capacity.

Are there elements that sustain adaptive capacity of social-ecological systems in a world that is constantly changing? Addressing how people respond to periods of change, how society reorganizes following change, is the most neglected and the least understood aspect in conventional urban management. We can identify and expand on two critical factors that interact across temporal and spatial scales and that seem to be required for dealing with natural resource dynamics during periods of change and reorganization:

- learning to live with change and uncertainty as is the case in the 21st century;
- nurturing diversity for resilience;

Key words: Resilience; vulnerability; risk; recovery; disaster.

INTRODUCTION

WHAT DO WE UNDERSTAND BY RESILIENCE?

The term resilience is used to describe anything that resists time and decay no matter what.

- Something/somebody that withstands shock
- Something/someone that resists in a context of precariousness, abuse, disaster or violence of any nature.

Resilience is the capacity of people and structures to effectively cope with, adjust, or recover from stress or adversity. According to the American psychological Association (APA), resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress such as family and relationship problems, serious health problems or workplace and financial stressors. It means "bouncing back" from difficult experiences.

The word resilience comes from the Latin term resicindere, meaning cancelling or terminating a convention or official act. The term covers people and structures ability to return to their initial state following a deforming impact.

The definition includes description of resilience that is being used commonly by societies in many areas of inquiry. It is the capacity of a system to absorb disturbance and reorganise so as to retain essentially the same functions, structure, and feedbacks, in other words to have the identity.

PSYCHOLOGICAL ASPECT OF RESILIENCE

Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress. It means "bouncing back" from difficult experiences. Resilience is about mental health and there is no health without mental health.

Bonnano, G. A (2007). Current direction in psychological sciences. A journal for the association of psychological sciences. From a psychological point of view, a person who is resilient has emotional strength and perseverance in the face of challenges or adversity.

- Such a person manifests courage, optimism, adaptability and resourcefulness
- Resilience is seen as a tool which calls upon humans to survive hardships and to overcome trauma.
It encompasses the individuals capacity to resist hardships and to pursue his personal development despite what he is going through.

An individual who has been damaged by the circumstances of his life must first admit to himself that he is capable of getting out of his hard, desperate place before he can erect the necessary defence mechanism and behaviours that are adapted to his situation.

Basically, the individual needs to find the resources from within to deal with his own plight according to mental health.

He /she develops healthy functioning across time-move from being a victim to being a “survivor” and even to becoming a “thriver”

Be “stress hardy” adapting to whatever life sends, and for some, even evidencing “post-traumatic growth”, not PTSD Susanne M. Dillmann, (2011). The key is to identify ways that are likely to work well for you or a community as part of own personal strategy for fostering resilience.

Resilience involves maintaining flexibility and balance in your life as you deal with stressful circumstances and traumatic events. This happens in several ways, including:

- Letting yourself experience strong emotions, and also realizing when you may need to avoid experiencing them at times in order to continue functioning.
- Stepping forward and taking action to deal with your problems and meet the demands of daily living, and also
- Stepping back to rest and reenergize yourself.
- Spending time with loved ones to gain support and encouragement, and also nurturing yourself.
- Relying on others, and also relying on yourself.

The American psychological association continues to argue that a combination of factors contributes to resilience. Many studies show that the primary factor in resilience is having caring and supportive relationships within and outside the family. Relationships that create love and trust, provide role models and offer encouragement and reassurance help bolster a person’s resilience.

Andrew Zoli & Ann Marie Healy (2013, several additional factors are associated with resilience, including:

- The capacity to make realistic plans and take steps to carry them out.
- A positive view of yourself and confidence in your strengths and abilities.
- Skills in communication and problem solving.
- The capacity to manage strong feelings and impulses.

All of these are factors that people can develop in themselves

**URBAN MANAGEMENT AND RESILIENCE**

**How can urban developers enhance resilience?**

As is clear from the above, resilience is mostly discussed as “bouncing back” from a disturbance of some sort, be it terrorism, building collapse, floods, drought, fires, climate change etc……the list is endless. The focus is very much on rebuilding and recovery, a particular engineering resilience perspective. Cities all over the world, are a complex network of interconnected systems. These are ecosystems of people, nature or their environment and also the infrastructure around them. They are interdependent and that is the reason it is important that they are seen as a whole picture.

Laura Hillenbrand. (2010), however, the current, more ecological concept of resilience is not only about “bouncing back” and recovery but also about the ability to adapt, often discussed as adaptive capacity.

**Towards resilient thinking:**

Paradigm shift- towards social ecological system.

Ecosystem as is well known is the complex network or interconnectedness in a system. Cities all over the world are ecosystems of people, nature or environment they live in and the infrastructure surrounding them. These aspects are interdependent and it is important they are seen in the bigger picture. This system has to be understood by its stakeholders. The concept of ecosystem gives the impression that to understand this system, this complex adaptive system, one has to know everything about it. And this is because, everything seems to be connected to everything else and until one has a comprehensive knowledge of everything, there is nothing one can do. One does have to know quite a bit about the system. One does have to develop an idea about every aspect of the domain in question.

According to Timon McPhearson. (2014), the truth is that not everything is connected to everything else. Resilience thinking actually aims to help the stake holder identify the minimum but sufficient information one needs to effectively manage their system for the values they hold to be important.

Therefore, the current thinking is that resilience builds on three radical premises:

- The first is that humans and nature are strongly coupled and co-evolving all the time, and should therefore be conceived of as one “social-ecological” system, that the systems we manage are interlinked social-ecological systems,
- The second is that the long-held assumption that systems respond to change in a linear, predictable fashion is simply wrong. These systems are complex and adaptive, and
- Thirdly they interact across scales in space and time, Complex systems are, according to resilience thinking, rarely static and linear, instead they are often in constant flux, highly unpredictable and self-organizing, with feedbacks across time and space.

Resilience for social ecological systems is related to:

- The magnitude of shock that the system can absorb and remain within a given state
- The degree to which the system is capable of self-organization and
- The degree to which the system can build capacity for learning and adaptation
The underlying core principles of the social ecological model concern the interrelationships between the different levels of influence on the individual. Resilient social ecological systems incorporate diverse mechanisms for living with and learning from change and unexpected shocks.

Cities and towns have become increasingly interested in building resilience to cope with surprises, however, how to do this is often unclear. Cities and local governments have recently become interested in building resilience.

Bonnano, G. A (2007) argues that management can destroy or build resilience depending on how they enable the social ecological system organises itself in response to management actions. Urban planners can organize themselves proactively to prepare for climate change and hazards by assessing their risks and vulnerabilities and learning from global experience.

These ideas are increasingly being embraced in urban planning, but urban planning lacks tools to analyze these issues. For example, the dynamics of complex systems are neither included in main stream sustainable development. This lack of practical approaches to social-ecological complexity in urban planning suggests that the Resilience paper has the potential to contribute new tools and ideas.

Disaster management requires multilevel governance system that can enhance the capacity to cope with uncertainty and surprise by mobilising diverse source resilience.

**URBAN RESILIENCE**

Urban resilience then is the ability to withstand and recover from unexpected shocks associated with natural hazards and climate change.

Building resilience to these risks can be done most effectively through strengthened urban planning and management. Considering and responding to these risks are an essential part of proactive urban management strategies and infrastructure development plans.

**REASONS CITIES ARE AT RISK**

Cities occupy less than 2% of the earth’s surface yet they are home to over 50% percent of the world population. Today, more than 3 billion people which constitutes half the world’s population, live in urban areas. Global populations living in urban centres has increased making urban centres the dominant habitat for mankind.

Timon McPhearson. (2014), people are moving to cities in greater numbers than at any time in history, pulled by hope of better opportunities or pushed from rural areas by poverty, environmental degradation, conflicts, floods or drought. Natural increase is also a large contributor to urban population growth and density. High population density is a significant risk driver where the quality of housing, infrastructure and services is poor. The major climate related risks to anticipate in most cities, although this varies from country to country are several. In developing countries, the proportion of people living below the income poverty line are extremely high. In addition, a significant number part of the poorest population segments live in underprivileged settlements in our cities and particularly in areas vulnerable to floods.

The cities, as hubs of most human activities in this rapidly urbanising world, cities are useful laboratories for developing innovation in all directions including climate change.

The growing concentration of people and assets in cities means disasters are affecting more people (urban dwellers) with increasing harmful consequences, among the Post Traumatic Stress Disorders (PTSD) for survivors.

**True cities a nations:**

- Economic engines
- Centres of technology
- Living evidence of our cultural heritage

**But also:**

- Can become generators of new risks
- Failed infrastructure and services
- Environmental urban degradation
- Increasing informal settlements
- Slum dwellers

These and many more factors make many urban citizens vulnerable to natural hazards.

**OF CONCERN TO URBAN MANAGERS AND PSYCHOLOGISTS**

Robards, M.L. Schoon, L. Schultz¿ P.C. West. (2012), natural hazards should be of major concern to urban planners, psychologists, managers and other stake holders. The impacts of these events are increasingly costly in terms of lost lives and property.

Timon McPhearson. (2014). The rise of resilience: living resilience and sustainability in city planning. The number of people living in slums is on the rise all over the developing world, including Kenya where this study took place. Increasingly, as cities grow, marginal land is consumed by residents who cannot afford to live elsewhere, apart from whatever space they occupy. This land is often on steep hillsides, flood plains, coastal zones, or situated near hazardous waste, putting residents at high risk from the impacts of climate change and natural hazards. Slum dwellers typically live in poor quality and overcrowded housing, and have limited access to water, energy, sanitation, and solid waste services, among the basic services. A heavy rain can quickly turn to a disastrous flood. Such flooding can destroy the assets of the poor, halt economic activity, destroy their productivity, and interrupt their income. It can contaminate the water supply, lead to disease, and displace populations. This study calls on cities to take a lead role in proactively addressing the risks of climate change and natural hazards at the local level, with a focus on populations at highest risk. It suggests a number of actions that cities can take to build resilience, beginning with mainstreaming pro-poor risk reduction policies into urban planning and management. Such policies, including those dealing with land use, relocation, or new development, come with difficult trade-offs that must be carefully
balanced in consultation with stakeholders at the local level. They also come with substantial financing needs that must be met through public and private resources, and will require new financing opportunities. Good things come at a cost.

Kame Westerman (2013). Poor people living in slums are at particularly high risk from the impacts of climate change and natural hazards. They live on the most vulnerable land within cities, typically areas deemed undesirable by others and thus affordable. Residents are exposed to the impacts of landslides, sea-level. Exposure to risk is exacerbated by overcrowded living conditions, lack of adequate infrastructure and services, unsafe housing, inadequate nutrition, and poor health. These conditions can swiftly turn a natural hazard or change in climate into a disaster, and result in the loss of basic services, damage or destruction to homes, loss of livelihoods, malnutrition, disease, disability, and loss of life. rise, flooding, and other hazards.

This study analyzes the key challenges facing the urban poor, given the risks associated with climate change and disasters, particularly with regard to the delivery of basic services, and identifies strategies and financing opportunities for addressing these risks. The main audience for this study includes governors and other city managers, national governments, donors, and practitioners in the fields of climate change, disaster-risk management, and urban development.

Therefore, it follows that natural hazards affect cities in different ways but there is potential for disaster as city authorities struggle to manage overcrowding, rapid urbanization, and environmental degradation.

Earthquake:

Many densely built and populated cities lie on earthquake belts.

Non-engineered and poorly-built or badly-maintained buildings cannot withstand the force of seismic shocks (earth vibrations), and are more likely to collapse. Most earthquake deaths are due to building collapses and survivors and rescue workers dealing with loss, grief and PTSD.

It need not be so. Many high density residential areas in Europe, Japan and North America are indeed safe, and protect citizens from storms and quakes. This is not the case of an increasing number of informal settlements.

Landslide:

A growing number of badly built or makeshift homes that have sprung up on or below steep slopes, on cliffs or at river mouths in mountain valleys, combined with poor drainage or slope protection, means that more people are exposed to catastrophic landslides, triggered by rainfall saturation or some other activity.

Volcanic Eruption:

Settlements on volcano flanks or in historic paths of mud/lava flows put millions of people at risk. Adequate early warning systems and constructions to withstand ash and lahars are concerns for urban and rural areas near volcanoes.

Tsunami & tropical cyclones:

Many cities have been built along tsunami-prone coasts. Adequate construction, early warning systems and evacuation plans are primary measures to address these.

Shanty towns along coasts are a particularly urban concern. Construction and early warning are concerns for both urban and rural areas.

Many urban areas are exposed to cyclones, strong winds and heavy rain. Wind resistant constructions, early warning systems with advice for households to lock up windows and secure property and, if necessary, evacuate are primary measures.

Floods:

Flash floods are a growing urban hazard because concrete and compacted earth will not absorb water, open spaces have been colonised, engineering works have diverted river flows, and city drainage systems are inadequate. Housing on river banks or near deltas, may be badly built or dangerously sited.

Wild Fires:

Urban fires stem from industrial explosions or earthquakes. Accidental fires are serious, especially in informal settlements. Fire risks are increasing due to high density building, new construction materials, more high-rise buildings, and greater use of energy in concentrated areas. Uncontrolled wildfires can reach urban areas.

Drought:

Drought is an increasing slow onset disaster that triggers migration to urban areas, putting pressure on housing, employment, basic services and the food supply from surrounding countryside. Many slums in Africa are filled with rural families driven from their villages by prolonged drought or conflict.

Technological disasters:

These are systems failures, (e.g. Kenya Pipeline). Chemical accidents, industrial explosions, spillage in ground, water or air. These can be a secondary disaster following earthquakes, and other natural disasters. These risks are increasing with rapid uncontrolled urbanization and industrialization.

Possible approaches for building urban resilience include but are not limited to the following:

Laura Hillenbrand. (2010). Resilience comes at a cost. Building resilience is definitely not free, it comes at a cost. It comes with both the direct costs , which are obvious to a casual observer, that implies, the actions the stake holders take and indirect costs that are not so obvious , that is opportunities lost by not using the resources in some other way.

- Collect natural hazard and climate change information, on urban assets and population, in order to undertake hazard and vulnerability assessments to inform urban planning and disaster response operations.
- Provide basic urban services to all urban residents with a focus on households who are least able to cope with
natural hazard risks (e.g., households living in informal settlements).

- Corruption or lack of interest in building code enforcement can be associated with some of the worst disasters in modern times. Therefore, implement development controls such as building codes to ensure that houses and buildings are constructed to appropriate standards and to increase enforcement of those building codes, to ensure that all structures comply with minimum requirements that address risk.

- Preserve natural ecosystem functions such as natural drainage channels, green space, and natural shoreline buffers to protect properties from flooding, storm surge, and coastal erosion.

- Implement effective early warning systems, emergency disaster response, and

- Post-disaster recovery to support effective response and recovery following a natural disaster event in order to minimize injury, loss of life, and property damage and support early recovery.

It has become necessary for us to start talking, writing, carrying out research and also brainstorming on issues of the way forward to build cities and regions that have inbuilt flexibility, adaptively, and so resilience in their land uses, transportation and infrastructure system, city forms, open space patterns and similar structural elements to change quickly as the situation demands, require or dictates.

KEY MESSAGES

- Climate change heightens vulnerability of poor and marginalized groups in informal settlements who are among the most exposed to disaster risk.

- Integration of climate change adaptation and disaster risk reduction and management in urban planning produces synergies that can enhance urban resilience.

- Good governance (urban and multilevel) is key to building urban resilience.

- Sustained capacity development (individual and institutional) of the urban sector (as well as efficient financing) is crucial for building climate-resilient cities.

- Significant knowledge gaps need to be addressed related to relationships among the complex biophysical and socio-economic dynamics that underpin urban vulnerability.

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