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Resilience, Adaptive Cycle, Slums, Social Capital, Bonding & Bridging Capital, Linking Capital

## Resilient Slums: Role of Social Capital

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### ABSTRACT

Interest in slums within the urban planning community has increased recently (Porter, 2011; Dovey, 2012). It is a welcome move considering, over a billion people live in these settlements worldwide (UN-Habitat, 2010). However, most of the existing urban policy frameworks often consider them a sign of planning failure due to their physical imperfections. The objective of this paper is to contradict such perception by exploring and celebrating slums as resilient urban systems. Here, we argue that the social capital of slums contributes to their resilience.

In this paper, we propose a conceptual framework to study the resilience of slums. We illustrate this conception of resilience with snapshots of two slums from Mumbai, India and one from Rio, Brazil. In many cases, physical infrastructure of slums is deficient and is the focus of policy debates. However, with the proposed framework, we seek to recognise social capital as an important dimension of slums that can become part of the policy discourse on slums.

## Introduction

This paper attempts to revisit, redefine, and celebrate slums by exploring their resilience as one of their less researched potentialities.

Previous works (Gans, 1962; Perlman, 1976; Turner, 1977; Gilbert & Ward, 1985) as well as the contemporary research on slums (Arefi, 2011b; Alsayyad, 2004; Andavarapu & Edelman, 2013; Datta, 2012; Satterthwaite & Mitlin, 2013; Moser, 2008; Neuwirth, 2005; Rakodi, 2002; Roy, 2007) have articulated the malleability of slums in the face of natural and man-made disasters. These researchers saw that underlying the apparent chaos and shagginess, slums possessed high stocks of social capital. In this paper we expand on the resilience of slums and propose an adaptive cycle framework to explore these communities.

Social capital refers to the networks of relationships among people who live and work in a particular society, enabling that society to function effectively. Researchers have often distinguished between three forms of social capital: Bonding, Bridging and Linking. Bonding capital refers to relationships with family members and relatives, whereas bridging capital refers to relationships with neighbours and friends. Both are key elements of social capital, they represent the internal horizontal linkages within the community. Linking capital refers to vertical linkages between the community and external agencies. In the case of slums, these external agencies are national and international NGOs, Local Government and Community-Based Organisations (CBO). These organisations, especially NGOs and CBOs mobilise, empower and organise slum dwellers to fight against man-made (eviction/crime) or natural

(floods/fire) threats (Patel, d'Cruz, & Burra, 2002). Linkage capital is therefore crucial to the resilience and sustainability of these settlements. Adopting a conceptual framework based on resilience offers a nuanced and systematic approach to study the role of social capital in the long-term stability of these settlements.

This paper has four sections. The first section reviews the literature on resilience and the reasons for its pivotal role in studying slums. In the second section, we discuss five definitions of resilience frequently used in urban planning literature, namely, Engineering Resilience, Equilibrium Resilience, Evolutionary Resilience, Community Resilience and Adaptive Cycle. Upon evaluating these five definitions, we identify adaptive cycle as the most appropriate definition to study slums based on three reasons: this definition is applicable to study short, mid-term and long-term challenges faced by slum dwellers; it recognises the severity of external threats that the slum dwellers face; and the most important, the adaptive cycle framework recognises that social capital plays a vital role in the resilience of slums.

In the next section, we provide snapshots of two slums in Mumbai, India to show how these communities used their social capital to fight external threats and emerge as resilient systems. In that section, we also provide an example of a non-resilient slum from Rio, Brazil. We conclude the paper by probing the applicability and limitations of the adaptive cycle framework to study the resilience of slums.

## Resilient Slums

Slums typically connote a derogatory manner of living reflecting substandard physical

appearance and socially marginalised populace (Gilbert, 2007). However, this terminology seems appropriate for this paper due to three reasons: First, studies we draw from such as UN-Habitat's State of the World Cities (2010) or World Bank's Global Monitoring (2013), refer to these types of settlements as slums. Second, in countries like India and Thailand an official slum notification is a prerequisite for several government programs. In these countries, many communities embrace the term slum and use their political leverage to become identified as one (Naidu, 2006). Third, instead of shying away from the term, 'slum', academics and scholars ought to analytically refine the term to reduce the derogatory connotations associated with it. In this paper we use the term slums and informal settlements interchangeably to refer to settlements which are officially recognised by national/state governments as slums; settlements which might not have adequate access to water, sewer, electricity or might have substandard structures; and settlements in which large segments of the urban poor live and work.

More than half of the world's population currently lives in cities and this trend is on a rise, especially in the developing countries (World Bank, 2013). Findings from the global monitoring report, published by World Bank and IMF, estimates that by 2030 an additional 1.4 billion people will be living in developing countries, 96% of that population will live in urban areas (World Bank, 2013, p.1). More than 32 percent of the urban population in developing countries lives in slums (World Bank, 2013). This phenomenon can be attributed to large-scale urbanisation coupled with lack of affordable housing (UN-Habitat,

2010, p.31). In some cities, the percentage of slum residents is as high as 44.1% in Visakhapatnam, or 41.3% in Mumbai (Indian Census, 2011).

There is a complex and elusive relationship between urbanisation and poverty. On one hand the urban poor face far more health related problems than their rural counterparts and pay more to access basic necessities such as water and sewer (UN-Habitat, 2010, p. 22); on the other hand urbanisation provides better income opportunities, access to schools, and health care facilities (Rakodi, 2002, p.30). These findings were also reinforced based on the data collected by Indian Census, 2011, where slum dwellers were shown as having access to better infrastructure such as water, sewerage and electricity than their rural counterparts. Despite these complexities, the urbanisation rate is increasing and the locus of poverty is shifting to urban areas (Rakodi, 2002). Slum population worldwide, is estimated to increase by 10 % every year (UN-Habitat, 2010, p.30).

Given their prevalence, informal settlements are receiving increased attention from planning professionals and academics. Journals such as *Planning Theory and Practice* (2011), *Built Environment* (2011) and *International Development Planning Review* (2012) had special issues dedicated to informal urbanism. These special issues provide a rich tapestry of empirical and theoretical research articles aimed at exploring new ways of thinking about informal urbanism. In spite of, increased attention and escalating interest in slums, there is considerable disagreement on how these settlements should be defined and examined.

Many existing theories on how cities function, remain rooted in the developed world. These theories perceive slums as marginal to the formal development process (Al Sayyad, 2004; Roy, 2009; McFarlane, 2012; and Dovey, 2012). Modernist and Western concepts such as universal access to water and sanitation are far from reality in many of developing countries. For example, 2011 Indian Census shows that

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nearly a quarter of formal settlements in India do not have access to drinking water in their homes. Similarly, a third of the formal settlements do not have access to adequate sanitation. Formal and informal settlements in India share similar concerns of inadequate infrastructure. The gap between formality and informality is not as wide as is usually presumed (Roy, 2007; Dovey, 2012).

Recent publications on urban informality have theorised world-class cities & globalisation (Weinstein, 2009); advanced marginality (Ghertner, 2010); law, space & gender (Datta, 2012) and ladder of community participation (Patel, 2013). These studies improve our understanding of social structure of these settlements. However, many of these studies were focused on studying and observing complexities involved in slum redevelopment rather than studying the existing social capital of the slums.

There is a lacuna with regards to an understanding of resilience and social capital of informal settlements in the 21st century slums. Slums in Asia and Africa are increasing at a very high rate, recent evidence shows that as new satellite towns are built informal settlement emerge at their fringes to service the middle-income and upper-income residents of these settlements (Rumbach, 2011). Slums or informal settlements are a core feature of urbanisation in the global South.

Statistics about poverty do not give a holistic understanding of the quality of life in informal settlements and challenges faced by the residents on a daily basis (Satterthwaite and Mitlin, 2013, p.10). Slums epitomise resilient urban systems (Dovey, 2012) and using a resilience lens to study and observe these eco systems will allow us to learn how these communities use their limited resources to fight external threats. There is a need for research along the lines of Perlman (1976), Gans (1962) or Turner (1977) conducted in North America and Latin America. Qualitative ethnographic research on the social capital and resilience of the 21st century slums will better inform policy.

The concept of resilience has evolved from its origins in ecology and is now widely used in an array of disciplines like psychology, disaster management, economics, geography, and urban planning (Davoudi et al., 2012). This common use and broad application, implies that it means different things to different people. For example, in certain contexts resilience means reverting back to pre-disaster conditions or it can mean pursuing a better alternative for the community. It also refers to

constant evolution of social-ecological systems. While the applicability of resilience concept to urban planning is generally accepted, there is a theoretical and practical gap when it comes to defining resilience in an urban context (Stump, 2013; Jabareen, 2013).

Resilience thinking originated in 1973 in a seminal article by C.S. Holling (1973). In this article he has challenged the command and control approaches to eco system management advocated by the ecologists of the time. Holling dismissed the idea that eco systems organise around a single equilibrium point to which a system will automatically return following a disaster. In his article, Holling outlines a new ontology of eco-systems rooted in the discourse of complex adaptive systems.

After its initial introduction in ecological thinking, the concept of resilience has gained tremendous traction and prominence across several disciplines such as disaster aid, climate change, and urban planning. The prominence of resilience thinking among scholars can be contributed to the fact that the concept is based on the innate capability of humans to fight and persevere in the face of natural or man-made disasters. Resilience reflects a deep faith in humanity and humans to do the right thing.

Resilience thinking has tremendous potential in shifting deep-rooted paradigms. In Climate Change, the resilience thinking has shifted the conversation from adaptation to resilience and transformation, where the emphasis is not adapting to climate change, but transforming cities to better respond to crisis (Pelling, 2011; Satterthwaite & Dodman, 2013). In disaster recovery, the conversation moved from

vulnerability and panic, to a phenomenon known as resilient population. Resilient population refers to the well-documented phenomenon of wide spread cooperation, even altruism which often manifests during disasters. Social norms, far from breaking down, not only continue to govern behavior but also prove remarkably resilient with incidences of violence and crime often subsiding significantly (Zebrowski, 2013).

Resilience thinking although ubiquitous is far from hegemonic in urban planning literature. One of the primary reasons is the lack of clear definition of the concept. The strength and weakness of the resilience concept is its malleability and plasticity. The multiple meanings and interpretations of resilience have resulted in rich scholarship and discussion in urban planning literature (Rogers, 2012). In the next section we explore the scholarship on resilience in the context of slums and discuss five different interpretations of the term.

### **Five Definitions of Resilience**

'Engineering Resilience' places emphasis on bouncing back to the original state if the original state was desirable to begin with (Campanella, 2006). It is applicable in the aftermath of natural disasters like hurricane Sandy. In a recent report UNISDR (United Nations Office for Disaster Risk Reduction) calls for cities to develop capacity to withstand or absorb the impact of a hazard through resistance or adaptation (UNISDR, 2012). Although this definition is one of the frequently used frameworks for cities to retain and enable their function in case of disaster, it is not appropriate in the context of slums. Unlike in case of most cities, the original state

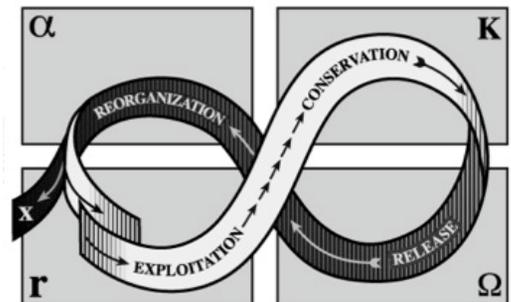
of slums, especially the physical aspects such as housing, water and sanitation, might not be a desirable state that one wants to revert back to.

**'Equilibrium Resilience'** takes two forms: 'equilibrium' or reverting back to a previous status or 'non-equilibrium' pursuing a preferred option (Pickett, 2004). The non-equilibrium view of resilience is more dynamic and evolutionary (Arefi, 2011a). Under the non-equilibrium paradigm, resilience is the ability of a system to adapt and adjust to changing internal or external processes. The emphasis is not to reach or maintain a certain end point or a terminal condition, but to stay in the game. This definition of resilience promotes flexibility by focusing on form, function, and flow of the built environment (Arefi, 2011 a). In an urban context, form refers to buildings, function reflects purpose, and flow represents the movement of information, services, and people. This definition of resilience can be particularly relevant for studying slums since it incorporates the process of change. The definition however is not holistic and does not consider the long-term challenges that the slum dwellers face. It also does not provide room to incorporate the concept of social capital.

**'Evolutionary Resilience'** challenges the whole notion of equilibrium and suggests that it is in the nature of the system to evolve and change with or without external disturbances (Davoudi et al., 2012) This definition has some validity in the context of informal settlements, since they do evolve over time and adapt to changing conditions. Nevertheless, this definition does not take into consideration the severity of natural (fire/flood) or man-made (eviction/redevelopment) threats that slum dwellers face.

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**'Community Resilience'** refers to when community members develop personal and collective capacities to respond and influence change to sustain and renew the community (Magis, 2010). Residents of poor communities, especially informal settlements invest time and energy to develop community resilience to fight against external threats such as eviction or flooding. Although this definition emphasises the social capital within the community, it does not give weightage to the severity of external threats that the slum dwellers face. This definition assumes incorrectly that the communities have adequate resources to survive or rebuild after disasters.



**Figure 1: Adaptive Cycle Framework**  
(Source: Holling & Gunderson (2002), p.34.)

**'Adaptive Cycle Framework'** (Figure 1) as proposed by Gunderson & Holling (2002) posits that socio-ecological systems go through four phases of development in their life cycle. They are growth/exploitation, conservation, release/creative destruction, and reorganisation. Informal settlements are

organic eco-systems that evolve over the years and adapt to natural (fire/flood) or man-made (eviction/crime) threats using their social capital. The adaptive cycle framework studies these transformations and allows us to follow the changes over time (Dovey, 2012).

Dovey (2012) applied the adaptive cycle framework to informal settlements and argued that the growth phase (r) occurs when the first hut is built on a vacant land. The settlement enters the conservation phase (K) as permanent structures are added; residents create new norms and networks for their community, and over time improve their social capital. New linkages with external agencies are formed. Informal settlements can continue in this stage for a long time, but in some cases, creative destruction ( $\Omega$ ) phase might occur when the community is threatened by manmade or natural disasters. If a disaster strikes and devastates the community, the community enters the reorganisation ( $\alpha$ ) phase, when a new order may begin to appear. It is in this phase that the community's social capital is tested: the residents may use their linkage capital to formalise their slums and gain tenure security; in case of natural disaster such as flood/ fire, the residents may choose to collectively rebuild their community. On the contrary, during this phase, the residents can be displaced or the settlement can spiral downward and stabilise as a dangerous and resilient slum (Dovey, 2012, p.356).

Recent case studies on informal settlements show that these communities face severe natural or manmade threats in short, mid or long term. The residents use their social capital to adapt to these external threats. In the

aftermath of the Indian Ocean tsunami in Tamil Nadu (short-term), villages and neighborhoods with strong social capital implemented faster recoveries (Aldrich, 2011). Villages, which had vertical linkages with the aid agencies, were able to access the aid and distribute it efficiently among the residents. When faced with redevelopment and eviction threats (mid-term), Dharavi and Sanjay Gandhi Nagar slums in Mumbai used their linkages to external agencies to emerge into resilient systems (Weinstein, 2009; Neuwirth, 2005). Tomang and Mangarrai slums in Jakarta are constantly flooded due to their location in the city. In order to adapt to this long-term challenge the residents developed informal warning systems using their social networks and created policies to protect their communities from looting and destruction (Welhelm, 2011).

Based on these examples, any definition of resilience that is selected to study slums has to be applicable to short-term, mid-term and long-term challenges that slum dwellers face. Additionally, the definition needs to acknowledge that these external threats can completely devastate these communities. Finally the definition has to recognise the importance of social capital in the capacity of informal settlements to adapt to these external challenges. In the table below we evaluate the five definitions of resilience using these three criteria.

As seen in the **Table 1**, only the adaptive cycle definition incorporates the three criteria needed to study the resilience of informal settlements. The adaptive cycle framework considers the short, mid-term and long-term challenges that the residents of these

Definitions	Temporal Scale*	Severity of External Threats**	Social Capital***
Engineering	Short	Yes	No
Equilibrium	Short and Mid-term	Yes	No
Evolutionary	Short and Mid-term	No	No
Community	Short and Mid-term	No	Yes
Adaptive Cycle	Short, Mid-term and Long-term	Yes	Yes

\*Refers to the applicability of the definition ranging from short-term (recovery from a shock), mid-term (recovery/adaptation to other shocks) or long-term (transformation of system)

\*\*Refers to whether the definition takes in to consideration the severity of external threats such as fire or eviction that residents of these communities face on a daily basis

\*\*\*Refers to whether the definition incorporates the internal strengths of these communities

**Table 1: Comparison of resilience definitions and their applicability to informal settlements.**

(Source: Compiled by authors)

communities face. The four phases of adaptive cycle framework allow us to study the constant transformations occurring in these settlements. The 'creative destruction' phase (Figure 1) demonstrates the severity of external threats that these communities face. The reorganisation phase recognises the ability of these communities to engage their social capital to emerge into new resilient systems. Therefore, the adaptive cycle framework is a good exploratory framework and best suited to study resilience of informal settlements (Dovey 2012).

To further explore the resilience in informal settlements, the social-ecological systems literature suggests two questions: resilience to what, and resilience of what? Residents of informal settlements want resilience against natural disasters, crime or threats of eviction depending on various political or social circumstances (Waters, 2012). In many cases, residents are stuck in a poverty trap and their access to basic services such as water and sewerage are deplorable. Despite those limitations, informal settlements continue to be

resilient and adapt to natural or manmade threats as long as their social capital is intact.

The next section presents snapshots of two resilient slums (Sanjay Gandhi Nagar and Railway quarters) and one non-resilient slum (Favelas of Rio) to investigate the applicability of the adaptive cycle framework. These snapshots were selected for this paper as they show the progression of the slum through the different phases of adaptive cycle. In case of two of the snapshots, the physical slum itself was demolished; however the residents of these communities had vertical linkages with external agencies, which provided them with the resources to rebuild their life. In the case of Rio, the favela which was once safe and affordable has spiraled downward and stabilised as a dangerous and non-resilient slum. While these cases demonstrate that social capital is critical in creating or maintaining resilient slums, but in some cases, external factors which are out of the control of the slum residents can result in dangerous, crime ridden or very substandard slums.

### **Resilience Snapshot 1: Sanjay Gandhi Nagar, Mumbai**

The adaptive cycle framework posits that informal settlements may go through some or all the four stages of resilience (Growth, Conservation, Creative Destruction and Reorganisation). The social capital of the residents provides them with the leverage to maneuver these transitions. Residents of Sanjay Gandhi Nagar slum in Mumbai, India used their social capital to maneuver through these four stages of resilience.

Sanjay Gandhi Nagar was originally leased to house construction workers of new high rises in 1976. When the job was finished and the lease expired, some of the people refused to leave the site. Slowly others joined them and soon the colony housed nearly 300 families. People were putting down roots, improving their modest bamboo huts with wood and metal, and beginning the slow process of saving money to make even more improvements to their homes (Neuwirth, 2005). This phase represents the growth and conservation phase in the adaptive cycle.

In 1985, a fire hit the slum and burned down two-thirds of the neighborhood to the ground. Just as they began to save and rebuild, the residents of Sanjay Gandhi Nagar received the notices that their slum was subject to demolition as it was considered an encroachment. The Creative Destruction phase for the neighborhood started on March 12, 1986, when the police forcefully evicted the residents and destroyed their buildings with hammers and crowbars (Neuwirth, 2005, p.104).

Ninety of the original three hundred families occupied the sidewalk for nine months to protest the forceful evacuation. The residents collaborated with external NGOs and went on a three-day hunger strike. After these demonstrations, the residents were offered a three-acre tract of land for ten-year lease with a nominal rent of Rs 500 per month. The plot of land that they received was 15.5 miles from their original homes and had no amenities such as water, sewerage or electricity (Neuwirth, 2005, p.105). While at the onset the tract of land was worthless, the residents made the best of the situation.

In the reorganisation phase, the residents pulled their resources together, extended water and electricity and divided their plot into 300 lots for the 300 families who were originally displaced. After a few years of leasing, the residents bought the land as a cooperative society. By 2005, Sanjay Gandhi Nagar moved into a new cycle of growth and conservation. It was no longer a slum, all the houses in the settlement were three story masonry structures with access to water and electricity and the community had access to public toilets. The residents built individual toilets and were waiting for the municipality to extend sewer line to their settlement (Neuwirth 2005, p.110).

As seen in this case study, Sanjay Gandhi Nagar went through all four stages of the adaptive cycle framework of resilience. In the first stage the residents established their community and developed it over the years. However, the community faced two different creative destructions; the first was the fire and second was the eviction. After the fire, the residents used their internal horizontal linkages (bonding

and bridging capital) to rebuild their community.

When the community was brutally evicted, the bonding and bridging capital of the residents fell short; they needed expertise and resources of an external agency. So the residents harnessed their linkage capital and collaborated with external organisations such as NGOs to fight for their rights. Although they did not receive their previous houses, they rebuilt their lives on a new plot of land. To avoid future evictions, the residents created a co-operative society and collectively bought the plot of land. The adaptive cycle framework incorporates the vitality, productivity and adaptability of slums.

### **Resilience Snapshot 2: Railway Settlement, Mumbai**

In 2001, the World Bank awarded funds to State government of Maharashtra to improve the efficiency of their railway systems under the Mumbai Urban Transport Project (MUTP). As part of the project, a slum settlement near the railways with 60,000 people was proposed for demolition. Rather than fight the resettlement, the residents decided to partner with the State government and World Bank in the transportation project. Unlike the previous example, the residents of the railway settlement skipped the creative destruction phase by collaborating with the government agencies.

The women's savings group within the settlement, along with three other NGOs (Mahila Milan, Society for Promotion of Area Resource Center (SPARC) and National Slum Dweller Federation (NSDF)) carried out a baseline survey of their settlement. They matched families to be resettled to the most

appropriate resettlement option. Due to their organised efforts the residents were resettled into new housing in little over a year without any police or government force (Patel et al., 2003; Satterthwaite & Mitlin, 2014).

The residents identified their relocation site and were involved in the design of the permanent housing, layout of the site, provision of community facilities, road networks, open spaces and building design. Prior to moving, the residents put a system of institutions in place to manage their new building. After the move, the women's saving group gave micro loans to women to start small-scale businesses (Patel et al., 2002). In this case, the railway settlement residents went from growth to conservation to reorganisation. The slum residents avoided the chaotic creative destruction phase by partnering with the government agencies. NGOs such as SPARC were instrumental in the transition of this slum from informal to formal settlement and in negotiating with the external agencies.

### **Resilience Snapshot 3: Catacumba Favela (Slum), Rio**

Janice Perlman's path breaking research on favelas in Rio was instrumental in breaking stereotypes regarding the myths associated with slums and slum dwellers. In that research Perlman argued that favelas possessed high stocks of social capital and that these slum residents were culturally, socially and economically integrated into the mainstream society. Perlman's research was based in three favelas or slums of Rio, Nova Brasilia, Catacumba, and Duque de Caxias.

During her initial study in the 1968- 1970 period, Perlman argued that despite the common perception that the favelas were dangerous, she felt safe and protected. The favelas back then had poor infrastructure and the community was poor, but people mobilized to demand improved urban services, worked hard, had fun and had hope. They watched out for each other, and daily life had a calm convivial rhythm (Perlman, 1976, p.243).

Perlman returned to Rio later in 1999 to track down as many of the original participants as she could, to see how they fared. She managed to track just over 40% of the original research participants and set about working why some had stayed poor while others had flourished and whether the slums were indeed the poverty traps that they seemed to be. Her findings were surprising, more than half of the original study group had moved out of the favelas, suggesting that slums are not the dead-end, that many people suppose them to be (Perlman, 2010).

Although, the original participants fared well, the same cannot be said about the slums of Rio. While the infrastructure in the slums had improved considerably, slums were no longer the safe havens they once were. Where once there had been hope, there was fear and uncertainty. People were afraid of getting killed in the cross fire during a war between rival gangs (Perlman, 2010, p.23). Perlman observes that the residents' fear of eviction was replaced by the fear of violence. The fear and danger were a consequence of the drug wars, which had taken over the hills of the favelas in Rio. She goes on to suggest that this violence marks the transition of marginality from myth to reality.

Slums like Sanjay Gandhi Nagar and Railway Settlement are marvelous and compelling examples of resilience. The adaptive cycle framework of resilience alters our perception of these settlements by giving us a more holistic understanding of these settlements and their emergence from one stage of adaptive cycle to the other state. The residents of these settlements used their internal resources and their social capital to exert control over the external variables. Perlman's account of the slums in Rio in the 1970s and 2000 is an account of a slum that was once resilient. But due to the destructive and corruptive forces of drugs and drug related violence, these slums have become crime ridden and have settled down as dangerous slums.

### **Discussion**

Resilience Alliance defines resilience as the ability to cope, ability to learn and to self organise. As seen in the case of Sanjay Gandhi Nagar, the community draws heavily on their bonding and bridging relationships to face the immediate crisis. Support through bonding and bridging networks- sharing food, providing comfort, mutual works etc is very important initially. Other researchers have also identified that slums are adept at using their bonding and bridging social capital to cope with minor disasters such as flood or fire (Braun & ASheuer (2011); Chatterjee, M. (2010).

However, in many cases the residents of these settlements are not equipped with the language or tools to negotiate or interact with formal agencies. In cases of large-scale disasters or changes where the slum is entirely destroyed, the residents need organisational support from an external agency. This external

Stages of Adaptive Cycle	Length/ Cause	Role of Social Capital (Bonding, Bridging, or Linking)
Exploitation	When and how was the community established? What is its history?	Was the community homogenous? What were the bonding and bridging linkages within the community like?
Conservation	What were the physical, economical or political factors that allowed for the growth of the community?	What are the social factors that allowed for the growth of the community?
Release	Did the community face any kind of natural or man-made disaster? How severe was the threat?	Did the community receive external aid? Which external agencies were most influential? Who were the key persons or groups that provided links to these external agencies?
Reorganisation	Did the community ever fully recover from the disaster? What are the physical, social and legal characteristics of the reorganized community? Are the residents better off than before?	Were there any drastic changes to the social capital of the community? Are the bonding, bridging and linking ties within the community still intact? Are there new vertical linkages in the community?

**Table 2: The Adaptive Cycle framework to study resilience and social capital of slums.**

(Source: Compiled by authors)

support (also known as linking capital) through an NGO provided the knowledge, tools, resources and primarily confidence for the slum dwellers to learn and self organise. The linking capital was an essential ingredient in an orderly transition of these communities from informal to formal.

In the case of the railway quarters of Mumbai, the transition from informal to formal would have been more chaotic without the guidance and expertise of NGOs. The NGOs, SPARC, Mahila Milan and NSDF, acted as the bridge and communicator between the government agencies and the slum dwellers. These NGOs took the opportunity of transition to provide the residents with knowledge and tools to interact with the government agencies. In the case of Rio, the community had strong horizontal linkages but these linkages were

crushed under the crime and drug traffic violence. When Perlman revisited Rio in 2011, she found that the horizontal linkages were still strong but were under a lot of stress due to the drug traffic. Recent evidence shows an emergence of new organisations at the local level to counter the violence and create a space for artistic engagement, children education and other small scale endeavors to slowly regain control of the favelas<sup>1</sup>. These organisations at the local level have a lot of potential but need support of external agencies, which can provide monetary and organisational support.

The purpose of this paper was to develop a theoretical framework to study the resilience of slums. A theoretical framework is a logically structured representation of the concepts, variables and relationships involved in a scientific study with the purpose of clearly

identifying what will be explored, examined, measured or described. The conceptual framework presented here is an amalgamation of theories on resilience, social capital and slums. In this framework (Table 2) we present some of the questions that researchers need to explore when studying the resilience of a slum. The table can be used a starting point to probe deeper in to the long-term historical study of the slum.

Over the years, our understanding of slums has evolved and today there is a growing recognition of resilience and sustainability of these settlements. The adaptive cycle framework of resilience focuses on a holistic understanding of slums over a longer period of time. In this paper we unfolded the concept of resilience in the context of slums and identified the adaptive cycle framework as a relevant frame of reference to study these unique urban eco systems.

Here we have suggested that the slum dwellers use their social capital to leverage external threats and maintain resilience of their community while incrementally improving their quality of life. If this hypothesis is confirmed in empirical studies, it would demand some rethinking of the relative weight placed on social capital of informal settlements and primarily the role of vertical linkages in the ongoing development of these communities.

The adaptive cycle framework of resilience challenges the view of slum dwellers as passive disaster victims and focuses on their ingenuity and adaptability to overcome external circumstances. The framework creates a standard definition to observe and understand

resilience in informal settlements. There is a possibility that resilience or the adaptive cycle framework will be seen as a call for the slum dwellers to be left to their own devices and avoid any form of assistance. While strong social capital within these communities fosters adaptive capacity and enhances transformative resilience, it is not a substitute for responsive

**Over the years, our understanding of slums has evolved and today there is a growing recognition of resilience and sustainability of these settlements. The adaptive cycle framework of resilience focuses on a holistic understanding of slums over a longer period of time.**

and accountable governance (Davoudi et al., 2012). Therefore, we present the adaptive cycle framework as a lens to identify the capacity of residents to organise and confront their own vulnerability. This will allow government agencies to improve the quality of life of the residents without dismantling the entire urban eco systems (slums).

The adaptive cycle framework of resilience is not superficial but calls for an in-depth understanding of the community, its history and its social capital. It calls for an in-depth qualitative study with ethnographic observations and open-ended interviews, which can be very information intense. An ethnographically oriented, qualitative research is the only way to unravel the multiple dimensions of social capital contributing to the resilience of slums. Ethnographic research also promises a more nuanced and grounded study, which is empathetic to the research subjects.

The adaptive cycle framework of resilience explores beyond the physical realities of slums and studies their nervous system, and skeletal structure. Creating a global research database using this framework based on geographically diverse case studies, representing different phases of adaptive cycle, may make a convincing argument to bring social capital to the policy forefront. The use of adaptive cycle framework for studying slums would allow urban planners a glimpse into the organic process of resilience that has always been part of informal settlements. ■

#### Notes:

<sup>1</sup> Blog post by Marcela Pizano Castillo appeared in Favel Issues on Nov 12, 2014

<http://favelissues.com/2014/11/11/agents-of-change-and-their-critical-role-in-societal-development-the-case-of-mare/>

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