Social resilience in the context of South African cities: Exploring the interdependencies of urban and social resilience

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Abstract

Urban areas as socio-ecological systems can be seen as consisting of an urban environment created by biogeochemical processes (including those originating from human activities) and governed by natural laws and an interior noosphere created by and experienced through the human psyche and social interaction to give rise to social and cultural structures. These two spheres interact to create the dynamics of a city and therefore urban resilience needs to consider not just biophysical or social resilience, but also the interactions between them. To date, most work on urban resilience tends to focus on the exterior aspects of the city, while work on social resilience tends to ignore the city and its biophysical aspects. This paper explores the interdependencies between resilience in the social and biophysical systems of the South African city. From the scenarios based on real events in cities in South Africa we can see the relationships between the social and biophysical resilience of an urban environment.

Keywords: Resilience, interdependencies, urban resilience, social resilience

1. Introduction

The notion of urban areas as socio-ecological systems is becoming more widely accepted (Alberti et al. 2003; Moffat and Kohler, 2008; Du Plessis, 2009a). As such they can be seen as consisting of an urban environment created by biogeochemical processes (including those originating from human activities) and governed by natural laws, and an interior noosphere created by and experienced through the human psyche and social interaction that give rise to social and cultural structures (Haberl et al., 2004; Du Plessis, 2009b). These two spheres interact to create the dynamics of a city and therefore urban resilience needs to consider not just biophysical or social resilience, but also the interactions between them. To date, most work on urban resilience tends to focus on the exterior aspects of the city, while work on social resilience tends to ignore the city and its biophysical aspects.

This paper explores the interdependencies between resilience in the social and biophysical systems of the South African city through the use of scenarios constructed from an

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individual's perspective of three recent events in South Africa. These scenarios are based within the City of Tshwane as a model apartheid city.

2. Approach

The approach used to explore the interdependencies of urban and social resilience is formative scenario analysis. Formative scenarios can be a useful tool to guide one towards a differentiated and structured understanding of a case's current state and its dynamics. Comprising of a sufficient set of impact variables and the linkages of these variables to gain a valid description, scenarios are useful tools to gain insights into a case and its potential developments and dynamics (Scholz and Tietje, 2002 pp80-85).

The three scenarios constructed in this paper are based on real events and conditions experienced by citizens of the City of Tshwane as a typical South African city and are formulated from an individual perspective. These scenarios were based on news articles, interviews and engagement with the subjects involved. In the next section we examine the literature on resilience. Both social and urban resilience are examined to see whether there is a juncture between them or not.

3. Resilience

Resilience was first used as a term in engineering in the field of material sciences to describe the ability to store strain energy and deflect elastically under a load without breaking or being deformed (Plodinec, 2009).The Resilience perspective grew in the 1970s and 1980s to include ecological as well as psychological interpretations of resilience. In terms of the ecological resilience perspective the term was used to describe the capacity of ecosystems to recover from environmental stresses (Holling 1973; Abel and Stepp, 2001; Resilience Alliance, 2006; Jentsch et al, 2011) and emerged due to the dissatisfaction with other existing models of ecosystem change (Cote and Nightingale, 2012). However, this equilibrist model of resilience has been questioned, as in practice ecological recovery does not inevitably entail a return to the system's original state. The understanding of resilience has subsequently been expanded to a more evolutionary model that acknowledges the ability of the system to adapt and transform to a new state of being while still maintaining previous functions (Kirmayer et al., 2009 pp64; Zolli and Healy, 2012 pp13). The main characteristics therefore of ecological resilience are adaptation, transformation and continued functioning (Waller, 2001).

From this point of departure, it is suggested (Carpenter et al. 2001:766) that the resilience of social-ecological systems has a three part definition: the amount of disturbance a system can absorb and still remain within the same state or domain of attraction; the degree to which the system is capable of self-reorganisation; and the degree to which the system can build and increase the capacity for learning and adaptation.

In psychology the concept of social resilience developed in parallel, with focus on the strengths that people and systems demonstrate that enable them to rise above adversity (DuPlessis Van Breda, 2001; Masten and Obradovic, 2006). As with ecological resilience, it

developed out of dissatisfaction with the distorted focus on vulnerability and deficit models and not on strengths and adaptability. The concept of individual resilience expanded to include family resilience, community resilience, as well as broader social resilience. However, there is as yet little integration between the work on social resilience and the resilience of social-ecological systems.

In the following sections we will discuss the emphases that urban resilience (focussing on climate proofing, disasters etc.) and social resilience (focussing on the individual, family, community and society) has taken in practice.

3.1 Urban resilience

The development of assessment systems or planning guidelines for urban resilience introduces concepts such as diversity, redundancy, modularity and interdependence of system components, feedback sensitivity and capacity for adaptation to the planning lexicon. However, there is still no consensus about what these and other resilience thinking concepts actually mean when applied to cities.

Urban resilience research has been centred on climate proofing (see Muller, 2007; Tomkins and Adger, 2004 and Newman et al, 2009), disasters such as flooding (see Lamond and Proverbs, 2009), oil spills (see Dow, 2010), terrorism (Coaffee, 2009; Coaffee and Wood, 2006) as well as sea level rise (see Muller, 2007). These are very specific disturbances to the urban system and fail to take into account the complexity and interdependence of all the social, ecological, economic, political and physical aspects of an urban environment that contributes to its general resilience. These studies also tend to focus on the vulnerability of the exterior or physical aspects of the city such as its infrastructure or ecosystem services and the concomitant strengths and vulnerabilities in the economic or political structures of the city. They rarely look at the relationship between the systems of the city (whether institutional, biophysical or economic) and social resilience.

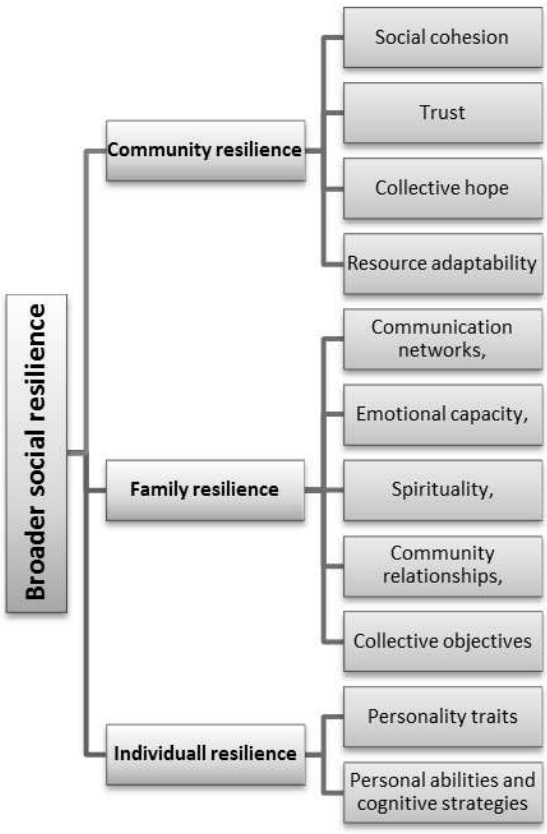

Figure 1: Components of broader social resilience

3.2 Social resilience

Social resilience can broadly be grouped into four strata consisting of individual resilience at the base, family resilience, community resilience and then broader social resilience of communities incorporating towns, cities and even entire nations (Kirmayer et al., 2009). Figure 1 describes the components of broader social resilience that will be discussed in this section.

3.2.1 Individual resilience

Individual resilience or personal resilience could be seen as the basis of societal resilience building the upper strata of social resilience (Kirmayer, et al., 2009). Individual resilience focusses on an individual's personality traits and capabilities (personal abilities and cognitive strategies) of adaptability and transformation (Lemay and Ghazal, 2001; Rutter, 2007; Tugade et al, 2004; Kirmayer et al., 2009; Hefferson and Boniwell, 2010).

When considering individual personality traits there is an abundance of literature on various different sets. We therefore focus on certain key traits that have reference to several others: self-efficacy, confidence, hope and optimism. Confidence can be defined as the "individual's conviction…about his or her abilities to mobilize the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context". Confidence can be seen as a positive psychological capacity (Luthans et al., 2004 pp47).

Hope is also seen as an indispensable trait for both individuals as well as communities. Hope is the capacity of an individual to conceptualise goals, develop pathways to achieve these goals; and initiate and sustain the motivation required to achieve them (Snyder et al. 2002; Morrow, 2010; Braithwaite, 2004). Optimism is another individual resilience trait in positive psychology that comes from Seligman's theory of learned optimism. Seligman's (2002) definition focuses on permanence of events and pervasiveness. Permanence, in this case, refers to the perceived permanency of events in terms of time. Pervasiveness has to do with significance. For bad events, "optimists make specific attributions, while pessimists make universal attributions" (Luthans et al., 2004 pp45; Hefferson and Boniwell, 2011 pp117).

Resilience in terms of personal capabilities depend on mental operations and mediating processes that reflect personal agency, self-efficacy, idiosyncratic habits, coping mechanisms, mental sets, and the ways that people deal with challenges (Bandura, 1982; Rutter, 2007; Kirmayer et al., 2009).

3.2.2 Family resilience

Resilient individuals influence the resilience of a family system and the inverse is also true. A family unit can be seen as a self-regulating system that interacts with a larger community, social system, ecology or urban environment (Kirmayer et al., 2009, pp70-71). As with individual resilience, a family unit adjusts its roles, goals, values, rules, and priorities according to external changes in order to achieve and maintain certain levels of balance and harmony, as well as to transform or bounce back. In terms of general family resilience great emphasis is placed on a supportive environment for the individuals within the family unit as well as the support the family receives from outside such as schools, community members, religious institutions, government and others (Kirmayer, et al., 2009).

Culture and ethnic identity is another important support to enhance family resilience. It is a grounding element that supports families in times of rapid change and could be a source of stability. Protective factors like cultural knowledge and practices allow for both flexibility and

consistency, which are key components of both individual and family resilience (Kirmayer, et al., 2009, pp71). Key steps towards creating resilient families would be to establish supportive communication networks, build emotional capacity, support spirituality, foster community relationships and to cultivate collective objectives or goals (Kirmayer et al., 2009).

3.2.3 Community and broader social resilience

Individuals and families do not exist in isolation and are part of a complex web of relationship within their environment. Community resilience accentuates assets or resource adaptability, collective processes such as collective hope and strengths such as social cohesion and trust (Kirmayer et al., 2009).

Resource adaptability (asset based resilience) focuses on the quality and quantity of resources accessible to the community and the extent to which these resources can be modified to meet changing social environments and adapt to breakdown in the system, and build on the strengths of such a community (Adger, 2003). These resources take account of not only physical resources but also social resources such as the individuals, networks and other associations that individuals or families would not necessarily have access to if they were not included in this community. However this view is over simplified, only taking stock of resources but failing to consider the interactions between these resources as something of consequence.

Collective processes linked to resilience incorporate visioning and collective hope. Visioning give both individuals and communities an opportunity “to express how they wish the world to be” and therefore make allowance for collective hope (Morrow, 2010, pp6). Sustainable collective action requires individuals to genuinely buy into the collective hope process with a shared vision of desired social change and a belief that change can happen (Braithwaite, 2004). Collective hope has to provide a framework for understanding how individual hopes are coordinated into a common aspiration and then into collective action (McGeer, 2004). It is therefore essential that all involved recognise that “others care about their well-being; that the society will help deal with the desired goals; that resources are available; and that the goal is worthy” (Braithwaite, 2004). If their goals are not reached it is also important to review and build onto these aspirations to keep the collective hope operating (McGeer, 2004).

Social cohesion is linked to the collective processes and is also an important element of social resilience. Social cohesion is a set of social processes that focuses on the feelings of solidarity between citizens, development of shared values, equal opportunity, feelings of involvement within the community, cooperation with other people as well as institutions and place attachment (Jenson, 1998). This also links to aspects of trust in one another, as well as trust in the government’s capabilities and integrity.

As with urban resilience, social resilience has thus far focussed mainly on interrelations between social strata with few linkages to the properties in the urban environment and when it attempted such linkages (e.g. asset based resilience), the complexity of the interactions

were disregarded. In the next section we elaborate on the linkages with the urban resilience of South African cities.

4. Reciprocity of South African urban and social resilience

To explore the possible reciprocal relationships between urban and social resilience, we will discuss a few scenarios in which the interdependencies between urban and social resilience are illustrated. These scenarios are based on real events and conditions experienced by the City of Tshwane as a typical South African city and are discussed from an individual perspective.

Illustration of urban-social interdependency – Soshanguve train

Nombeko is a 39 year old single mother who lives in the dormitory township of Soshanguve with her four children. She travels to inner city (35km from the train station) to work as a domestic worker. She leaves home at five in the morning to be at work at seven. Walking 8km to the Mabopane station she arrives to find the train late, at the arrival of the train 50 minutes later she gets onto the train. Ten minutes later the train unexpectedly stops in the middle of nowhere. In the confusion she gets out of the train to see a train support vehicle stopping next to the train and a minute later dash away with the train driver. She stands back hopelessly as her fellow commuters, outraged by the continued poor service delivery, set fire to the train. She has to walk home and let her employer know that she will not be able to come to work as taking a minibus taxi would equate to her day's pay. The next morning she hears that Metro Rail has discontinued services to Mapobane in the face of severe threats to the safety of their personnel, damage to infrastructure and losses of rolling stock due to a number of similar incidents in the past couple of years. This leaves only the unaffordable taxi as an alternative means of transport.

If we consider the factors at hand, the low adaptive capacity of the physical environment maintains the isolation of Soshanguve and the failure of the urban environment to provide the urban poor with equal access to economic opportunities within the city. Current development by the metro council according to national guidelines situates affordable housing infrastructure predominantly in the old townships located on the city periphery.,A a practice which further entrenches the spatial segregation of the poor in isolated areas far from any economic opportunities (Vanderschuren and Galaria, 2003:268). It is unfeasible for the private sector to invest in Soshanguve as the area has low connectivity and low economic opportunity. The inhabitants then become dependent on work elsewhere in the city. However, Tshwane's spatial structure necessitates long travelling distances and with the low densities of the city, this makes public transport unaffordable and limited viable public transport options are available to the people in these isolated areas, lowering the adaptive capacity of the transport system.

This physical rigidity then influences the social resilience as these poor communities are fixed in an area with low opportunities, increasing their vulnerability to factors such as increased transportation costs or the failure of transport systems. The social resilience of these communities falters as their assets (such as their transport system) fail. When the

transport infrastructure, like the train, comes to a stop there are not sufficient or cost-effective alternatives for people like Nombeko to continue functioning as she did previously. People lose trust in their government's ability (or willingness) to provide for them or care about their well-being and their personal goals, and feel exploited. The social cohesion weakens as the cooperation with other people and explicitly government institutions weakens and people lose their attachment to place (Jenson, 1998). They then respond from a place of anger, resulting in social unrest and even mob justice through actions such as burning trains and threatening train drivers. This then in turn influences the ability of the physical environment to function as infrastructure is damaged or destroyed. Replacing and repairing infrastructure place a further economic burden on the city and displace funds from other service delivery programmes such as the provision of affordable housing.

Illustration of urban-social interdependency – Plastic View squatters

Alakhe is a 36 year old man who settled with his family in an informal settlement on a vacant plot within walking distance of the work he acquired as a gardener in a prestigious golf estate. It was a tossup for the family between living in the outskirts of the city with low probabilities of finding employment and staying close to work but with no running water or electricity. They opted for proximity. Their shack (informal built structure) made of corrugated sheeting wasn't much but it was home. His wife and he could easily get to work and shops however their children could not go to any schools nearby and stayed at home. Coming home from work one day he arrives at a mess of smoke and bewildered occupants. Anguished over the safety of his family he starts negotiating his way through the huddle and finds his wife and kids settled atop a pile of their belongings in the field adjacent the burning settlement. Perplexed he listened to his wife's account of how the police came into their home and chased them out with just enough time to grab their belongings before they set their shack alight and started to burn shack after shack. They slept in the field that night as they were rendered homeless. The next morning he hears that the home owners' associations in the adjacent affluent (and influential) areas were putting pressure on the council to move them and that the Metro wants to relocate them to some far off area.

After this disruption in the community the informal settlers stood together and took the government to court with the help of a local NGO. Six years down the line, after standing together as a community, the 865 households were given the right to stay, and Plastic View will be formalised.

If we reflect on the dynamics in this scenario, the urban poor communities are adapting to the existing state of affairs, as described in the Soshanguve scenario. The result is an infiltration of the informal into the formal settlement areas. As the government fails to provide them with affordable housing close to job opportunities, the poor locate themselves close to job opportunities at the cost of other social amenities and access to basic services.

The ability of the political environment to resolve this issue is restricted due to the rigidity of strict policy and land use management systems and larger economic forces that effectively prohibits a diverse range of housing options. Additional forces in terms of land markets and

social pressures demand that government take action, and eventually the Metro respond to these pressures by forcefully removing illegal squatters.

The community's social resilience is tested by the actions taken by government as their shacks are destroyed. However this community's solidarity and cooperation with each other and institutions like the NGO, cultivated the community's resilience. They took action toward a collective goal and confronted the council in court and won. Which in turn influenced the physical environment, as the council now has to provide formal low cost housing. By formalising Plastic View, the community may now have access to job opportunities, but these are still lowly paid and the costs of formal housing (rates and taxes, basic services) will place a heavy demand on disposable income. There are also no public health facilities or affordable schools in the vicinity which greatly reduces the personal resilience of people staying in these informal settlements. Furthermore, Plastic View is located on a floodplain, making it vulnerable to (and contributing to) the documented increases in flash flooding as a result of hardening of urban surfaces and the increased rainfall and strong storm events some are attributing to climate change (Cox et al., 2004). Thus an intervention which aimed at resolving one pressing issue may actually reduce the broader economic resilience of the individual and the small community.

Illustration of urban-social interdependency – Backyard shacks

Msizi is a 45 year old male, who stays in Mamelodi Township which he has made his home with his wife and two children. He has been on the waiting list for a free government provided house in Mamelodi for almost ten years now. With the cost of formal rental accommodation disproportionately high in terms of his income, he lives (like many other locals with little income)in a backyard shack. Dissatisfied with waiting for government to provide him with a house, he feels no remorse at the illegal connections of electricity to his backyard shack or the hosepipe they run from the public tap. However, the shared ventilated improved pit latrine cannot cope with the sixteen people living on the stand, resulting in a number of health problems for his family.

If we reveal the dynamic forces, the political and economic environment retains low capacity for providing housing for the poor. The delivery of subsidised housing units has time and again failed to reach the annual target of 300,000 houses per year, with for example only 161,854 housing units and 64,362 serviced sites delivered in 2009/10 (Khumalo, 2012. pp15), while a large young and unemployed populace continue increasing the backlog. According to recent statistics approximately a third of the youth (15-24 years) were neither employed, nor in education or training (StatsSA, 2012).

The social resilience is then affected as poor communities have no alternative formal housing. The community's resource adaptability focuses on the quality and quantity of resources accessible to the community and the extent to which these resources can be modified to meet changing environments (Adger, 2003). These backyard shacks build onto the existing infrastructure and resources to fulfil a housing demand (Poulsen and Silverman, 2012), thereby encouraging the infiltration of informality into the formal settlement. Unlike the informal settlements, backyard shacks reduces the housing demand in areas demarcated for

residential use, which are serviced and have access to social amenities. However, this informal social intervention then places additional pressures on the resilience of the physical environment, especially municipal services, as these areas were not serviced to accommodate these numbers (Poulsen and Silverman, 2012). This could ultimately lead to poor service delivery which could subsequently lead to other social dilemmas such as outbreaks of diseases such as cholera or social unrest such as described in the Soshanguve train scenario.

5. Conclusion

In the literature on social and urban resilience we have found a disjuncture between the two aspects of the social-ecological system. To date, most work on urban resilience tends to focus on the exterior aspects of the city, while work on social resilience tends to ignore the city and its biophysical aspects. The formative scenarios illustrated how resilience of both the biophysical system (spatial segregation), as well as the social structures (housing subsidy schemes) leads to the rigidity of these systems, which in turn impacts on the resilience of smaller scale systems. These scenarios illustrated how the biophysical system's resilience can influence social resilience and similarly how social resilience at smaller scales can influence the resilience of the larger system. With the rigid biophysical and institutional system, individuals are forced to self-organise. However this self-organisation then place pressures on the biophysical system, as well as the larger social system. These pressures could lead to a breakdown in the urban system and the social response then impacts the system in other ways. It is suggested that researchers in urban resilience should incorporate social resilience in their study of the biophysical aspects and social resilience should consider the influence of exterior aspects of the city on social resilience. It is the interdependencies of these systems and their ability to work together and adapt when other systems falters, that strengthen or reduce urban resilience.

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