URBAN RESILIENCE

A concept for co-creating cities of the future

RESILIENTEUROPE

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About this concept note

This document is a concept note on urban resilience that aims to provide an overview of its meaning and its dimensions as well as a perspective on how to experiment for understanding and achieving place-explicit action for urban resilience. As such it is developed to be employed as an input to discussions on strategic and operational action for urban resilience, and to inform multiple stakeholders on the caveats of urban resilience (thinking). It is not a comprehensive literature review on urban resilience, and, it is not an in depth problematization on the concept. This is not an academic paper on urban resilience even though it builds from and is inspired by academic writings on resilience.

Above all, this concept note aims to introduce urban resilience to cities that are in the forefront of action for the future and requested a new frame of reference – 'urban resilience' – to progress both their planning practice as well as their policy learning. After a co-creation phase of five months with 11 different cities across Europe that participate in the Resilient Europe project, urban resilience is adopted as a new frame of reference to promote holistic thinking, meta-governance orientation across different departments of the cities.

As such, it is not a finalized concept note. It is expected to be revised and enriched with the inputs and co-produced knowledge of the second phase of the Resilient Europe interactions and co-creation processes. The content of the concept note is for the partnering cities of the Resilient Europe and should not be copied without the permission of the author.

Dr. Niki Frantzeskaki, Lead Expert , Resilient Europe, 2016.

DRIFT, Erasmus University Rotterdam, The Netherlands

@NFrantzeskaki

Urban resilience - What is it?

Urban resilience is the capacity of urban systems, communities, individuals, organisations and businesses to recover maintain their function and thrive in the aftermath of a shock or a stress, regardless its impact, frequency or magnitude.

Urban resilience is not a new concept, it has been debated and discussed over the past decades across scientific disciplines including urban planning. With its origins in ecology (Folke 2002; Gunderson and Holling 2002) the concept has diffused across types of systems also including the city. Following the diffusion of the concept and its uptake over the past years is not an easy task, with the amount of cross-citations to the original founding thinkers of resilince like Carl Folke counting to 80,063 (google scholar profile, visited 12.03.2015).

There are however overarching characteristics to what we understand and conceptualise as 'system's resilience' that are recognized across the multiple fields and applications: (a) the attribution of capacity to a system to absorb, recover, restore and thrive in the aftermath of a impactful event and (b) the reference to a system-wide property rather than to its parts and (c) the implication of social, ecological, technological, economic and institutional dimensions to building resilience at system level.

Resilience has been defined as the amount of disturbance a (urban) system can absorb and still remain within the same state or domain of attraction, and the degree to which the system can build and increase its capacity for learning and adaptation (Folke et al 2004). When a human or ecological system loses its resilience, it becomes increasingly vulnerable to disturbances that previously could be absorbed. Although resilience has been explored in many complex social-ecological systems (Folke et al 2004) it has only recently been applied in the context of cities (Ernstson et al 2010). "Resilience thinking has developed effective heuristics concerning change, i.e., adaptation, transformation, panarchy, but less focus has been given to the notion of stability, or theorizing the stable characteristics of a resilient system." (Rotarangi and Stephenson, 2014)

Resilience is the "capacity of a community or society to adapt when exposed to a hazard. (...) A resilient society can withstand shocks and rebuild itself when necessary. Resilience in social systems has the added human capacity to anticipate and plan for the future" (Presad et al 2009, p.32) (also supported by Mumby et al 2014). In the similar approach, is the definition of resilience as "the ability of systems and components thereof, to react in such a way to external or internal disturbances that – after a period of recovery – the essential characteristics (abiotic and biotic characteristics, as well as functional relationships) are retained." (Knaapen et al 1999) (also supported by Remmelzwaal and Vroon, 2000; van Bohemen 2012; van Bueren et al 2012).

It is only recent, that resilience has been enriched with cultural understandings. Cultural resilience "has emerged to refer to this continuity of a co-constituted set of long-term relationships between the cultural identity of a people and the set of social-ecological relationships within which this identity was founded." (Rotarangi and Stephenson, 2014).

In Resilient Europe, we start with the definition of urban resilience as follows:

'urban resilience is the capacity of urban systems, communities, individuals, organisations and businesses to recover maintain their function and thrive in the aftermath of a shock or a stress, regardless its impact, frequency or magnitude'.

Resilience of cities

Cities are homes to the future. With more than 60% of world population living in cities, the focus is on how to make them more sustainable in terms of consumption, living conditions and socio-environmental footprint. Europe is in general in a good position for developing the new tools needed for realising a positive transition to resilient and sustainable urban areas.

Compared to most other continents, the living standards are good, the decision- making processes are fairly open, and the level of knowledge is high. European demographics, though, i.e. ageing populations, represent a challenge to innovative transitions.

However, these may be turned into opportunities, since an ageing population due to gender differences in life expectancy results in increased participation of women in decision-making. This growing segment of the population may likely be more willing to invest in green innovations that increase quality of life in return. However, with no '100 new million-big cities in 20 years' projects, which is the major focus for investment and driver of urban development in Asia, the Middle East and South America, Europe has to focus on projects of retrofitting, regeneration and redevelopment of existing cities. Thus, Europe needs new innovative income/jobs gene

rating models and governance approaches. We position that urban resilience as a new concept and guidance principle can elucidate ways to restore, create and advance Europe's cities for the future we want. As thus, new ways of thinking of resilience of cities are required also including the on-going emerging and facilitated/ planned processes that contribute to this aspiration.

The (positive) transition to the urban resilience represents the focus of studies and analyses and cities to work towards resilience in cities that includes mainly four urban domains: 1) Urban landscape, urban ecosystems also referring to supply and enjoyment of ecosystem services, 2) Infrastructures including structures and services, 3) People, the communities and their capacities to recover, thrive and innovate and 4) Institutions and governance including but not limited to adaptive governance, collaborative decision-making and behavioural change.

Positive or in the context of Europe, desirable transition is the process through which a city understands vulnerabilities, adapts urban planning accordingly and foster collaboration at multiple scales. This happens so as to fully integrate public and private sectors and citizens in the process of transformation to sustainability. The city strives to reconnect with vital social and ecological systems beyond its jurisdictional boundaries, thus fostering a state of high adaptive and transformative capacity building urban resilience.

A negative or undesirable transition is the process through which a city fails to adapt to and anticipate urban crises and undergoes forced transformation at an unacceptable socio-economic and ecological cost, resulting in urban erosion or urban collapse, i.e. cities transformed into an undesirable state as a result of inaction to address the challenges and system pressures and where citizens lack sense of place. Responses to improve urban resilience are not always in tune to the adaptive and reflexive approaches that are required to address the interconnected systems and components thereof that contribute to urban resilience. Such a incremental response is urban optimisation.

Optimization refers to the process of improving the existing city structures and responses, "more of the same". Examples of optimization of an existing system include the heightening of dikes for flood control infrastructure, expanding of road capacity by adding an extra traffic line, installing air-conditioning to cool buildings using fossil fuel generated electricity, etc. This may lead to a high risk of an urban lock-in i.e. where the urban system is unable to transform itself due to sunk costs, investments in existing infrastructures, dominating practices, routines and "thick" institutionalization.

To address the transition to urban resilience a framework for understanding 'what makes up urban resilience' and a process approach on 'how to get there from present states' are required to be linked. The following sections progress into the understanding of urban resilience and 'what makes up' urban resilience and conclude with the way to achieve it in the scope of the Resilient Europe project.

Resilience for cities

Urban resilience is a concept that only recently has been actively undertaken by cities around the world. Even though the concept exists in the scientific literature since the 1970s and research on urban ecology has engaged with the concept mainly for introducing thinking on complexity, social-ecological systems and their vulnerabilities (Pickett et al 2008; McPhearson et al 2015; Andersson et al 2015), it is only to a limited degree informed plans and policies at city level. Interpretative and analytical work on the benefits of urban resilience concept as an analytical bridging concept for urban planning provided directions for its adaptation by cities (Wilkinson et al 2010; Wagenaar and Wilkinson 2015).

In this concept note we build on this work as already introduced in the preceding sections and extend it by showing what the recognized benefits are when introducing and taking up the concept of urban resilience in strategic level as well as in program level of urban governance. We build from a knowledge co-production discovery journey (Frantzeskaki and Kabisch 2016) that brings together insights from 11 European cities that forerun in adopting the urban resilience concept at strategic and program level. The commonly recognized benefits of (uptaking and adopting the concept of) urban resilience in urban planning and governance include five deployments of the concept of urban resilience at strategic and program levels.

At the strategic level of urban governance include that urban resilience is an integrative, solution-searching and orienting and transformative concept. First, urban resilience is an integrative concept that allows connecting objectives and actions across different departments for developing a common understanding and strategic agenda for achieving it. Indicatively, for the city of Antwerp, the concept of urban resilience provides a new frame to integrate social and spatial issues into the climate adaptation policy development process. As a connecting and integrating lens, urban resilience is employed in the city of Antwerp to continue experimenting with co-creative ideas to improve livability and sustainability in the city. The city of Antwerp is established as a city open to experiment on new concepts and ideas together with the community. The city's progressive platform for urban living, the StadsLab 2050, includes a series of experimental interventions and processes of co-production that citizens and civil society organisations are included in the beginning of the process to think, imagine and design with the local government urban interventions.

In the same vein, for the city of Ioannina the concept of urban resilience provides a new frame to connect different urban aspirations and ideas about livability, sustainability, cohesion, development and robustness that also consider chronic stresses and shocks the city is facing. As such, the city adopts the perspective of urban resilience to allow for an integrative mode of planning to bring together social, ecological and infrastructural aspirations that will co-shape city's future. At present the city faces pressures for regeneration of urban areas, for maintaining urban infrastructure and for dealing with the ecological degradation and depreciation of its greater asset that is the Pamvotida lake. With the city slowly growing and the local government attempting to establish an outward and forward looking approach in seeking lessons, best practices and new approaches, there are lots of persisting challenges that need a different approach. The disrupted communication across departments of the local government, the discontinuous inter-agency collaboration that creates relations of mistrust and confrontation, the creativity loss since creative solutions are not connected to plans and programs when they are formulated but remain latent and an urban development that has only partially appreciated and valorized the lake's beauty and recreational value.

Second, urban resilience is a concept that allows searching for systemic solutions in (view of) vulnerabilities and risks ("turn risks into opportunities"). Indicatively, for the city of Potenza, the concept of urban resilience is a new frame that allows positioning civil protection as an element for urban development and not as the core and only priority for the future of the city. The frame of urban resilience allows and will benefit the city of Potenza to take a multi-dimensional approach to be a city of the future. The city of Potenza is build in a hill with most of the urban dwelling benefiting from a view to the valley and to the sprawling extensions of the city over the past years. With the city of Potennza taking Le Corbusier's planning paradigm as the only way to earthquake-proof the city, a lock-in in thinking and imagining entrenched planning ways. Thinking about urban resilience is a way to shift mindset and policy priorities to a more forward-looking integrated approach.

Third, urban resilience is transformative concept that requires new planning approaches that address resilience qualities such as redundancy and flexibility that are contradictory to the quality of efficiency (that is a basic principle to new public management approach that many cities follow). Indicatively, for the city of Glasgow the concept of urban resilience is employed as a frame to continue the community development works the city has been doing while considering dimensions of ecological and infrastructural integrity. The city of Glasgow has long been working on connecting environmental and social policies and programs and considers the frame of urban resilience to contribute fundamentally to planning and policy integration. As such, urban resilience understanding allows further integrating and modernizing the programs and plans across different levels of involvement: district, city and region. For deepening the impact of the new approaches and new programs for urban resilience across the different levels, the city of Glasgow takes up an experimental approach with a place-explicit focus – the Glasgow Urban Living Lab- as the way to engage with multiple stakeholders beyond consultation and service provision and with the focus on empowerment and co-creation.

At the program level of urban governance, urban resilience is used as learning and empowering concept. Fourth, urban resilience is a multi-faceted concept that requires a new understanding of contextual conditions across social, ecological, economic and institutional sub-systems and in turn, allows for policy learning about assets and vulnerabilities. Indicatively, the city of Vejle identified urban resilience as a frame of reference that provides the opportunity to combine new thinking about social, economic, ecological and institutional assets and vulnerabilities with acting for social shocks and stresses with ecological and economical programming in the city. The urban resilience frame enables rethinking current approaches, sheds light to new opportunities for urban planning as well as attracts community members to actively collaborate with the city and create socially fit plans and programs. With this understanding that a new integrative approach is required, the city proposed as an experimental site the West End district that faces newly recognized social challenges such as illegal small-businesses, increased criminal activities although marginal incidents have occurred and increased unease in the areas although not openly shared but concentrated in small community networks. The reason for choosing an experimental approach as a means to design action for urban resilience is that a top-down approach to resolve such an interconnected problem of urban upheaval due to limited knowledge it brings and the requirement for a place-specific and community-supported if not community-led intervention.

Fifth, urban resilience is an empowering concept for community engagement and programs that allows deeper understanding of assets and barriers to overcome social vulnerabilities and social problems. Indicatively, for the city of Malmo, the concept of urban resilience provides a new frame to renew and rediscover a new way to community engagement, from consultation to co-creation. The city of Malmo with its established profile as a city of knowledge economy and innovation is facing pressures for new housing that does satisfy the needs of new residents and especially families. The urban resilience frame allows searching of new ways to create sense of place and sense of communities from the bottom up engaging with visions for place and community and establish new collaborative relations between the city and its citizens.

For the city of Bristol, the concept of urban resilience provides a frame to create synergies across different programs for climate adaptation, community empowerment and urban regeneration. It is a synthesis frame that adds to the progressive efforts of the city to become more socially innovative, attractive and inclusive to its diverse communities. The biggest assets for the city of Bristol include a well educated and self-organised innovative population that is shown by the variety of community initiatives on urban gardening, urban living labs, energy initiatives, co-labs and fab-labs in the city as well as the open attitude of the city to different visions and ways of engaging citizens, communities and businesses with urban planning processes. With a growing ICT sector and a high percentage of highly educated people living in Bristol, the city is progressing to a new knowledge economy. The pace of progress cannot be followed by all citizens, with a number of communities left behind in terms of opportunity and fitness to the new future.

The city of Bristol has worked actively with communities to enable dialogue, to establish partnerships with community led organisations where they exist and to try to articulate what services the communities need, and use plans as means to provide them. However, there is a lesson learnt that new approaches are required to shift from waiting and servicing, to a more open and experimental approach to learn together with the community on how to co-create community development. With this in mind, the city of Bristol will build upon experience of bottom up community development programs that aim to shift practice and perceptions about the relations between the city and its citizens from a servicing ('do it for citizens') to empowerment ('citizens do it themselves').

"Resilience is greatly influenced by the quality of urban governance and the level of infrastructure and services provided by the government."
Prasad et al 2009, p.33,
The World Bank

Resilience in cities

Cities are vulnerable to shocks and stresses that can erode and/or compromise their structures and in turn their resilience. Shocks refer to acute and sudden events of high impact to a city's structures like an earthquake, a fire or a flooding. Stresses refer to continuous processes that erode the capacity of city's community and structures to recover properly. A resilient city has the capacities in place to shift into a different state in the aftermath of a shock or disaster while restoring its functions and services. An 'unresilient city' has limited or restricted capacity to recover, and "has high poverty and crime rates and devastated natural environment, or 'a ghost town'" (Pickett et al 2013).

Cities experience the imprints of on-going transitions that are local manifestations of global transformations and relate to a variety of stresses and pressures.

The ***post-industrialisation transition*** that is the result of the conflated de- and re-industrialisation processes. De-industrialisation is about escaping the industrial past with the abrupt or slow-paced phasing out of past industrial activities and the related extractive or manufacturing economies. Re-industrialization results in "the rise of new flexible forms of economic organization and productions" (Carmona et al 2003). In this process, the cities need to rethink of new uses for the vacant industrial infrastructure and on ways to capitalize on the past legacy without losing on new opportunities. A number of cities turned old industrial infrastructures as cradles for the creative industry and combined contemporary art and recreational functions to repurpose industrial blocks. Reindustrialisation includes the processes of reskilling and repurposing of knowledge and technological capitals into new economic activities, with the well-known examples of USA cities turning automobile industries into renewable energy technologies (e.g. wind-turbines and solar panel) manufacturing industries in cities. Post-industrialisation impacts the city's structure and has place imprints, since "it involves a combination of decentralization and recentralization, the peripheralisation of the centre, and the centralization of the periphery" (Soja 1995; Carmona et al 2003).

The ***post-capitalism transition*** refers to the emergence of different economic alternatives not only in terms of thinking and in terms of frames of reference like degrowth (ref. Latouche, Kallis, Kercher) or panarchy (Loorbach 2015), but also in terms of new types of markets including the sharing economy (Botsman and Rogers 2010; Schor 2014, The Economist 2015), solidarity economy, alternative currencies, and timebanks. With main expressers of the post-capitalism to having a more prominent role in the restructuring of global economy (Stiglitz; Picketty 2014) and the awakening of civil society as a global driver of new forms of socio-economic organisations, the cities also experience the 'clash' of the two frames of reference (capitalism and post-capitalism). Cities experience austerity policies and the roll back of the welfare state by a new class of urban poor and marginalized. In the midst of this paradigm shift, civil society organisations, grassroot actors and movements can provide knowledge on which solutions and policy interventions fit the specific context and socio-political conditions. As such can be valuable in streaming resources to solutions that have higher chances to work by bridging the fitness gap in sustainability institutions for cities (Romero-Lankao, 2012, p. 18)

There are common contemporary stresses for urban resilience as co-identified with 11 cities across Europe that work on urban resilience, including: Antwerp, Bristol, Burgas, Glasgow, Rotterdam, Thessaloniki, Ioannina, Potenza, Katowice, Malmo, and Vejle. Social stresses include unemployment, urban poverty, migration, and limited access to reskilling and lifelong education/training programs. In addition to them, cultural stresses include cultural or location-driven stigmas, involvement in criminal activities and/or gangs. Social-technological stresses include digital exclusion and low education rates overall as well as in respond to new types of jobs in the knowledge and service economy. Ecological stresses include stress of climate change with a specific focus on water inundation and water stress in urban infrastructure. Social-ecological stresses include health issues due to pollution, impoverishment of urban ecosystems or limited access to urban green.

All these stresses are interconnected in the way that dealing with one requires examination of how to further address the others in a more systemic and integrative manner. For example, dealing with urban poverty for example is not an issue of providing subsidies or simply "pumping money" but rather dealing with reskilling and educating people to seek and source opportunities to escape the trap of urban poverty.

Unpacking urban resilience

For escaping these stresses that manifest undesirable and often persisting situations, cities need to mobilise their capacities to overcome them and create fundamentally different conditions, reflexes and ultimately situations. This requires capacities to transform from current stressful situations that challenge and deteriorate urban resilience to new states of higher resilience. Such urban renewal processes of transformation call upon the establishment and strengthening of inherent/internal dimensions of urban resilience like people-capital (individuals and communities), technological-capital (infrastructure), natural-capital (urban ecosystems, ecoscapes of the cities) and governance-capital (institutions, partnerships, rules and laws).

People Resilience

People's resilience or social resilience is conceptualized as the capacity of people to self-organise and mobilise their skills and abilities to source new opportunities and to create new forms of innovation as well as their capacity to act with solidarity in the aftermath of a disturbance. Frist, for people to be resilient, community ties and sense of community are very critical. Ojeda (2005, p.50-53) identified key elements of social resilience to be "collective self-esteem, that is an attitude of pride in the place where the community lives. Cultural identity leading to the group's adoption of customs, values, idiomatic expressions, dances, songs, etc as defining elements, social humor, that is the ability to see the comedy in one's own tragedy, and collective honesty, that is the decent and transparent exercise of public functions." Adger (2000) identifies community resilience as the ability of communities to absorb shocks with and within their social infrastructures, adhering to the notion that social ties and community identities (Mira and Dumitru, 2014). Second, social resilience is also the capacity of people to act with solidarity in the aftermath of a shock that in turn will result in a social cohesive society. Citizens "should believe that in order to build a vibrant community, they would have to develop a "sense of community", preserve their cultural integrity and consider how to best meet the needs of a local workforce" (Flint, 2013, p.105).

Places' Resilience

How cities look, their landscape context has an important effect on how they can recover and thrive from stresses and disturbances. Place includes urban ecosystems (green and blue infrastructures) and infrastructure systems (such as energy, mobility, housing).

Urban Ecosystems

Cities are rich on biodiversity and have remnants of ecosystems or well manicured urban ecosystem elements in place. Urban ecosystems contribute to quality of urban environment and provide multiple ecosystem services and as such contribute to wellbeing and quality of life in a city (Muller and Werner, 2010, p.22-23). Despite the recognized benefits of urban ecosystems to citizens and to urban communities, it remains that each urban community has to self-recognise and put importance of ecosystem services in its own meaning and frame of reference.

Elmqvist, Frrantzeskaki et al (2016) also address that individual cities cannot be considered "sustainable" nor "resilient" without accounting for their dependence on ecosystems and resources from other regions around the world (Folke et al. 1997, Seto et al. 2012). Urban planning therefore will need to increasingly work at urban and periurban but also regional scales while considering responsibility for the global connectivity and resource imprint of cities that influence the ability of cities to improve resilience and enable sustainability transitions (McPhearson et al., 2015).

Despite the writings and case studies on urban resilience that have a spatial focus and an urban ecology background, there is a criticism that looking at place-explicit constitutions of urban resilience will be detrimental to it since urban resilience requires a holistic and systemic view. Urban inhabitants both influence and rely on resources and ecosystem services, from food, water and construction materials to waste assimilation, secured from locations around the world. The current focus on single scales when examining urban resilience is counter-productive, this includes focusing on the scale of single cities without considering the effects globally, just as it does focusing on building resilience in a particular neighborhood, without considering effects on other neighborhoods within a city.

Urban resilience is a systemic property and as such needs to be examined as an interconnected concept, however understanding the way different dimensions of urban resilience and how they relate to each other in making a complex adaptive systemic configuration is also pertinent for urban action and urban planning overall. To become meaningful, urban resilience has to address scale issues appropriately. As McPhearson et al (2015) address "understanding and addressing resilience through and of urban ES may enable urban planning and governance to become adaptive and reflexive not only to external drivers (e.g. climate change extremes and vulnerabilities) but also to internal drivers. (…) For example, enabling citizens to take up initiatives for restoring green infrastructure in urban neighborhoods can act in synergy with city plans to add permeable surfaces, and in this way increase stormwater absorption/retention in urban spaces."

Infrastructures

Infrastructures are the hardware of our cities. They ensure that basic services are provided and that there is a level of service-amenities to all urban citizens. With an significant percentage of European population living in cities, future investments in infrastructures aim to improve their environmental performance as well as ensuring the creation of new businesses via the coupling of infrasystems and creating service-based economies (e.g circular economy, sharing economy). This is also a window of opportunity for rethinking how retrofitting of infrastructures can further contribute to urban resilience. There are two quality characteristics that relate with how infrastructures can ensure delivering on urban resilience in the future: robustness and adaptability.

Robust infrastructures means that infrastructures maintain function over time regardless the stresses and shocks experienced. Robustness-orienting strategies focus on 'climate-proofing to a range of possible futures" (Van Bree and van der Sluijs, 2014, p.31). This overall means that an infrastructure system continues performing in an array of changing variables and conditions and satisfies the originally identified needs that the infrasystem was constructed to provide.

Adaptive infrastructures means that they are providing services that relate to social demands of today and social needs of future generations – respond to an array of social needs over time

Investment in infrastructures in cities is important to consider urban sustainability since infrastructures remain for multiple generations and determine how future generations will be serviced and structured over everyday practice. Resilient infrastructures also landmark cities that can withstand shocks and stresses and are places to invest in, attracting economic/business as well as people capitals. As stated by Rees (1997) "cities are the engines of economic growth, the centres of social discourse and the living repositories of human cultural achievement, but also nodes of pure consumption and entropic black holes of industrial society".

Institutions for urban resilience

For building urban resilience, proactive leadership is paramount (Prasad et al 2009, p.9-11). It is important to anticipate shocks and understand the long-standing vulnerabilities experienced due to urban stresses. In this front, political leadership may face resistance to new measures and institutional arrangements, since long experienced stresses may not be perceived as 'urgent matters' to take into consideration for investing public resources and may also understood as manifestations of systemic conditions rather than as 'resolvable issues'. For political action to be backed up, proposed actions require a multi-actor partnership from public, private and civil actors.

Institutional arrangements for supporting urban resilience need to promote and enable interconnectedness, redundancy and flexibility. A way to achieve this is by forging partnerships between different social actors: public, private and civil society actors. As Flint (2013, p. 208) addresses "collaborative partnerships are a powerful way to improve communities. That is, to improve a community, we must all work together to solve problems. Even neighborhood-level change requires relationships and partnerships with entities beyond the neighborhood to optimize funding and access needed expertise and skills." This goes beyond social synergies. Enabling collaboration between these different actors creates the conditions for resource and governance synergies (Frantzeskaki et al, 2014) that further ensure resourcefulness of social institutions. For the substantial investments in infrastructures required to more resilient cities, partnerships between different public, private and civic actors are of paramount importance (Newman et al 2009).

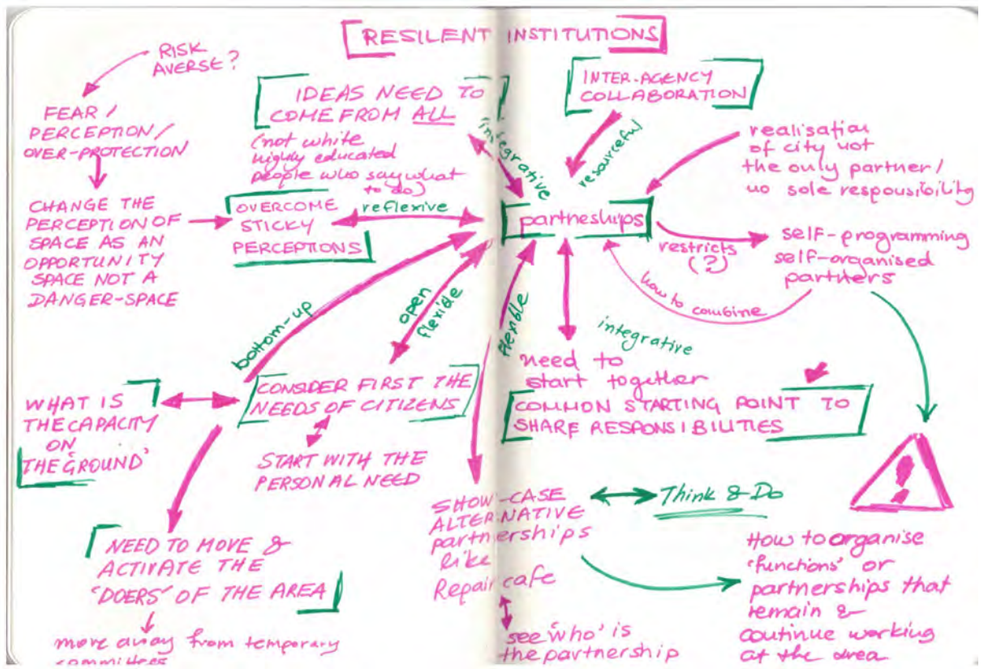
Next to this, we also look at partnerships to revatilise urban economies. In his work on local economies, Shuman (2015, p.158) addresses that "partnerships also provide another way to think about economies of scale. (…) Partnerships offer local businesses the possibility to achieve almost any economy of scale, not through endless growth, but through carefully constructed collaborations."

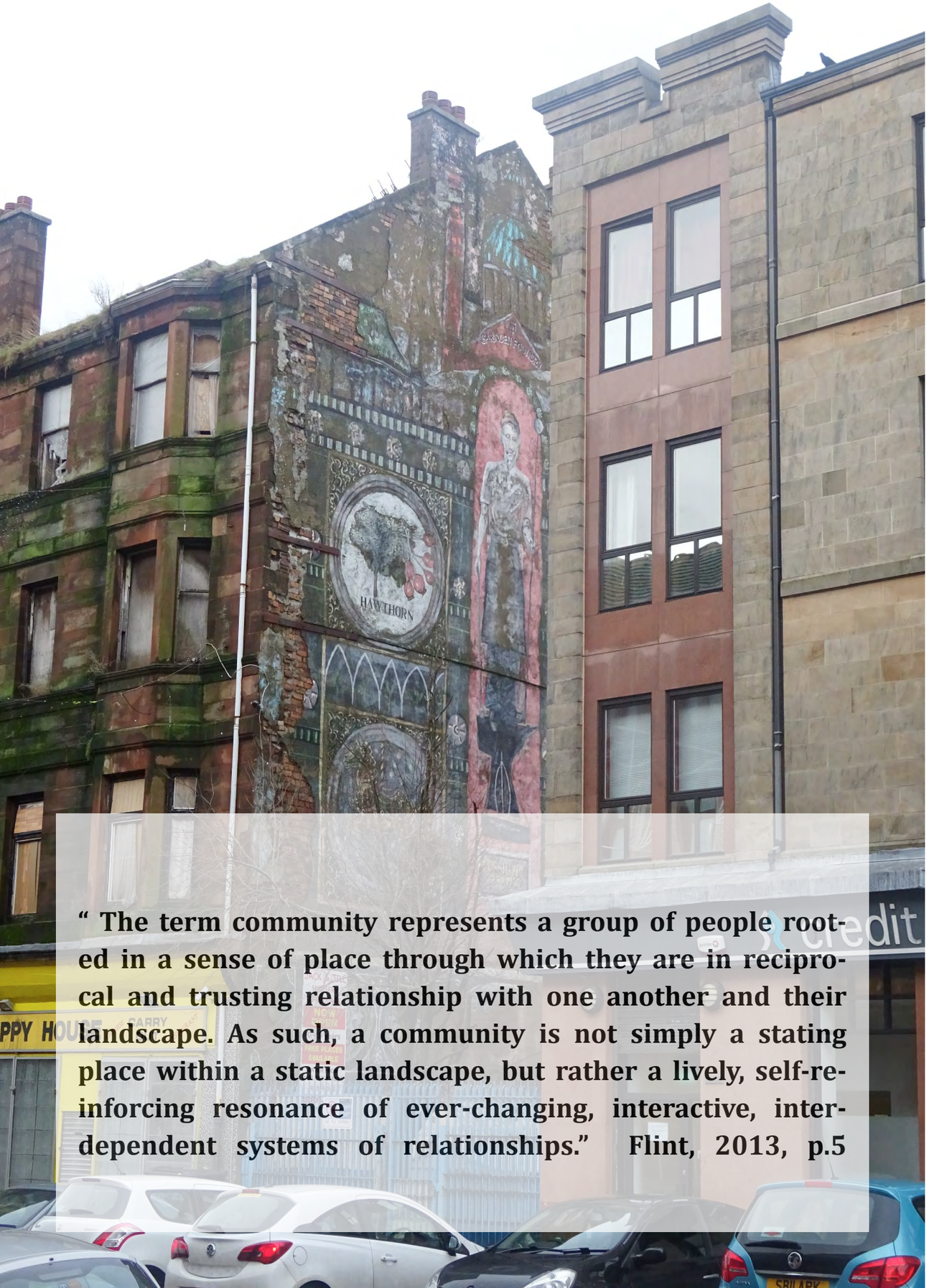
For dealing with stresses and shocks effectively, intersectoral collaboration is essential. This however does not come easy in most of the city organisations. Ad hoc teams across departments that work together on the topic of urban resilience need to consider principles of good governance like trust and transparency in order to establish collaboration and source resources for common projects and seek policy/planning co-benefits.

As Prasad et al 2009 (p.69) also "as a concept, intersectoral cooperation goes against the grain of most government systems. Councilors and officers, usually representing specific disciplinary areas and professional groups, may want to defend their sector's interests and compete with each other over limited budgets. (…) Singapore, Makati City and Tokyo are among cities that provide examples of ownership by line departments with the capacity and authority to ensure proper coordination between the various agencies. Programs report to and are monitored by high level institutional mechanisms".

With the view on how different innovations or innovative actions from bottom-up initiatives maintain or enrich urban resilience, it appears to be a paradoxical finding. While bottom up initiatives are creating social capital and are the 'pulse of urban innovation', at the same time often focus solely on maximizing efficiency, minimize energy, and reduce redundancy and material use. Yet, redundancy is one of the hallmarks of a resilient system. Sustainability goals and resilience goals, if not examined carefully can therefore be completely at odds with each other.

As Elmqvist, Frantzeskaki et al (2016) address in their recent work on urban resilience, this trade-off is a result of sustainability discussions failing to apply a cross-scale and more holistic systems approach needed to stay on a sustainability trajectory despite disturbances and the failure to recognize the cost of efficiency in designed and/or optimized systems (Frantzeskaki and Loorbach 2010). For example, additional but alternative institutional arrangements may seem redundant since they need to operate in harmony with existing institutions while satisfying same objectives. However, such designed intentional redundancies provide the necessary enabling institutional context for adaptation and transformation trajectories towards sustainable outcomes.





“ The term community represents a group of people rooted in a sense of place through which they are in reciprocal and trusting relationship with one another and their landscape. As such, a community is not simply a stating place within a static landscape, but rather a lively, self-reinforcing resonance of ever-changing, interactive, interdependent systems of relationships.” Flint, 2013, p.5

Plurality and redundancy of institutional arrangements implies that planners should search for solutions to achieve sustainability through a co-creation process in parallel to streamlined planning processes so that multiple solutions can be experimented with across the city, i.e. through collaborative and polycentric governance. Further, by applying resilience thinking and resilience principles (sensu Biggs et al 2015), sustainability may be considerable strengthened through interlinking and analyzing numerous sustainability initiatives at multiple scales, initiatives that otherwise would just have aimed for increased efficiency and optimization often within narrow sectors. Also, clear, sustainability oriented goals will help educe the implications of high and low specific as well as general resilience.

In efforts to unpack the multiple meanings that both sustainability and resilience can incorporate for an urban context, a knowledge co-creation process may be essential (Pereira et al 2015). We propose that a deliberation process for knowledge co-creation can enable locally informed and globally related meanings and understandings of both urban resilience and urban sustainability. Such a process could be particularly important for exploring designed redundancy and diversity in the urban development. Empowerment of citizens to co-design, co-create and co-produce urban places is essential so as to have a shared responsibility and accountability of the present and the future of urban resilience. As Newmann and Jennings (2008, p.159) address “empowerment and participation go hand in hand. City governments need to develop strategies for empowering people through transformation of structures and processes to enable people to participate in decision making”.

Planners must also engage with a large nested hierarchy of spatial scales to take increased responsibility for motivating and implementing solutions that take into account their profound connections with, and impacts on, urban regions, other cities and the rest of the planet. Collaboration across a global system of cities could and should provide a new component of a framework to manage resource chains for sustainability through resilience. In this way, planners and policy makers can create a more inclusive process to determine which potential pathways will offer the desirable sustainability and/or resilience outcomes (Redman 2014).

“Cities need migration; fresh blood. But when migrants come in, unless you are a Harvard professor, you start from zero and then you have to climb step by step. So there are two parties you need to consider. First, what is the willingness of the migrant themselves to be part of this new society? It is a mental switch. One you decide that you will invest in your own position, you will stand on firmer ground. But on the other side of the story it is not fair to ask migrants to burn all their vessels behind them. It is not ethical to do so.”
Mayor Ahmed Aboutaleb, Mayor of Rotterdam, Piece from his interview in Forecast Monocle, 2015, p.021.

“The mobility, innovation, entrepreneurship, and creativity typical of cities allows them to experiment and reform themselves, and borrow and adapt best practices from others.”

Barber 2013, p.217, If Mayors Ruled the World.

Sustainable Development Goal 11

“Make cities inclusive, safe, resilient and sustainable.”

(https://sustainabledevelopment.un.org/)

There are ten targets for SDG#11 that start to unpack the SDG’s meaning and philosophy, and also imply actual measures of progress:

By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries Strengthen efforts to protect and safeguard the world’s cultural and natural heritage

By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

“Cities cannot achieve the goals of the Urban SDG if they act alone. They must have the support of regional and national governments and institutions. However, support is also not enough. Cities must work together to ensure that efforts undertaken at the local scale are not subverted by strategies at other scales or by other actors. This will require a lot of coordination and sustained dialogue among diverse institutions, leaders and communities.”
Karen Seto, 2015, The Nature of Cities (http://www.thenatureofcities.com/)

“If Goal 11 is to be met, urban planning must take an integrated approach—not only in terms of the different socioeconomic classes within the city, but also in terms of the city and its surrounding landscape.” William Dunbar, 2015, The Nature of Cities (http://www.thenatureofcities.com/)

From understanding to planning and acting for urban resilience

Resilience of cities, involves a broader category of stakeholders, but particularly those associated not only with technical networks like water, electricity, sewage, waste disposal, and telecommunications, but also with agriculture, mining and other broader interests in society. It is very much concerned with the need to ensure the supply of external resources needed to sustain today's cities.

When turning resilience theory towards practice it should be noted that since we build on a systems approach we aim to deliver knowledge that can generate systemic changes so as to generate more sustainable trajectories. Research so far has proposed more general notions for practice on how to build urban resilience, including: (i) enabling high rates of innovations; (ii) maintaining diversity (both social and ecological, (iii) maintaining modularity, (iv) restoring lost ecological functions, (v) tightening feedback loops, (vi) building social capital and address equity, and (vii) building overlap in governance (Walker and Salt 2006; Ernstson et al. 2010). In taking these general notions into more concrete applications more work needs to be done, especially in relation to urban planning as a process and practice.

Box 1: Guiding principles for fostering resilience by Walker and Salt (2006)

- Diversity: Promoting diversity in all its dimensions, from biological to economic, encourage multiple components and resource uses to balance and complement homogenizing trends.
- Economic variability: Seeking to understand and work with the boundaries of the inherent variability of ecological and social ecological systems, attempting to tame such variability is often a recipe for disaster.
- Modularity: Maintaining modularity can help hedge against dangers of low resilience caused by over-connectedness in system structure and function.
- Acknowledging slow variables: Managing for resilience means understanding the slow or controlling variables that underpin the condition of a system, especially in relation to thresholds. By recognizing the importance of these critical variables, we can better avoid shifts to undesirable stable states and possibly enhance the capacity of a desirable regime to deal with disturbances.
- Tight feedbacks: Tightening or maintaining the strength of feedback loops allows us to better detect thresholds. The weakening of feedback loops can result in an asymmetry between our actions and the consequences stemming from them. Salient examples of such dynamics include pollution and overconsumption.
- Social capital: Promoting trust, social networks, and leadership to enhance the adaptive capacity for better dealing with the effects of disturbance
- Innovation: Embracing change through learning, experimentation and promoting locally developed rules, Instead of narrowing our range of activities and opportunities, we should be seeking to explore and cultivate new ones.
- Overlap in governance: Developing institutional arrangements that manage for cross-scale influences. Developing redundancy and overlap in governance frameworks enhances response diversity and flexibility.
- Ecosystem services: Recognizing and accounting for ecosystem services when managing and designing for resilience. The benefits society derives from nature are regularly underpriced and ignored. Such services are often lost as social ecological systems shift into different, less desirable regimes.

How to foster urban resilience?
Real-life place-explicit experimentation in urban living labs

A place-explicit experimental intervention for urban resilience – in the form of an urban living lab- is chosen to unpack what can foster urban resilience in cities. Place-explicit real-life experimentation can promote collaboration between different social actors (public, private, civil society) and between different sectoral departments within the city. With space as a boundary object amongst different actors, collaboration can be enhanced and forged and in this way, new social relations and partnerships can be established. As Nassaeur (2013) also addressed "designing landscapes together across diverse participants is not only a means of engagement, it is a means of mutual learning and rectification of differences, at least within the frame of the selected landscape" (p.89; cf. Albert et al 2012; Bohnet 2010).

Through the engagement of 'practitioners' and stakeholders from civic society, interests and needs of citizens and communities are brought to equal grounds with the considerations and aspirations of policy actors in order to achieve solutions and desirable outcomes. In fact the equal participation allows an 'increase (in) the accountability of science by increasing or operationalizing the ''responsibilization' of all actors involved - be they scientific, political, industrial, or lay'' (Polk, 2015). The inclusion, collaboration and, thus, the co-production of knowledge among multiple social actors are thus interconnected with the creation of a mutual responsibility and a shared aim among the multiple actors involved in the experimentation process.

What makes urban living labs different from other interventions aimed at (governance) innovation in an urban context is that they are aimed at dealing with sustainability challenges with questioning current ways of organizing and connecting (challenging the status quo) and at the same time aim to uncover hidden dimensions of sustainability threats (e.g. issues of justice, accessibility, equity, exposure to vulnerabilities) as well as conflicts of interests, needs and aspirations. Urban living labs involve multiple actors that in a facilitated way test new ways of dealing with contemporary sustainability threats and challenges, innovate with new ways of organizing and critically examine the fitness of new technological configurations to specific contexts.

Urban living labs are experimental intervention in contemporary urban (governance) dynamics that is place-bound ('it happens in a specific place in the city'), it is on-going ('it happens here and now') and involves testing of new ideas, practices and/or approaches to current threats with the aim to inform and inspire future action for urban resilience across scales. Urban living labs have an experimental function. An urban living lab is a form of experiment that can exert or be employed to exercise different forms of power depending on context conditions and momentum of the intervention. In addition to this, an urban living lab is purposefully fostering learning through an open and engaged experimentation. What makes ULL distinct is the place-explicit (urban) focus and the fact that they experiment with future solutions and/or approaches while addressing a current sustainability problem.

Building from writings on pilot studies, transition management and strategic niche management that also provide empirical grounds for experimental interventions, we argue that urban living labs are distinct in multiple ways. More specifically, a ULL is different from most pilot projects in three ways: (i) urban living labs are not relating to testing or evidence gathering of a policy program, (ii) urban living labs have an open-ended learning and innovating objective (outcomes are uncertain, high-risk but high-potential for impact) and (iii) urban living labs have an explicit spatial focus on dealing with a present sustainability threats and challenges by examining in a co-creating way.

Through the urban living labs, we will further explore new types of social relationships between citizens, businesses, experts and planners. The metaphors of resilience will be explored through continuous professional development with urban practitioners, which is of critical importance when assessing the conceptual frameworks practitioners have for approaching wicked problems in complex urban systems and how resilience can complement and change such frameworks. The relevance of the methods of analysis and synthesis resilience offers will be progressed by critically testing and then refining operational handbooks for resilience developed for application in natural resource systems for urban systems (especially Walker and Salt, 2006).

"A resilient city must have strong infrastructure, policy and human resource response capacities to avert potential impacts of natural hazards" Prasad et al 2009, The World Bank

How to facilitate urban living labs' experimentation? The Transition Management Approach

Transitions are reconfigurations of social, ecological, economic and technical systems that provide societal services such as water, energy, and food supply. The majority of case studies from sustainability transitions scholarship have focused either on particular scales (e.g. national energy infrastructures), particular services (e.g. transport systems) or particular actor perspectives (e.g. supply vs. demand side perspectives) with an increasing number of cases that deal with multiple systems and multiple scales (Farla et al 2012; Hodson and Marvin 2012; Kivimaa 2014).

With the focus of transition studies in the recent years to how transformations transcend across infrastructure systems and drift between multiple systems/regimes (Frantzeskaki et al 2015), the challenge is to bring the existing knowledge on complex societal dynamics of transitions to examine and understand the nexus dynamics and its governance.

As the governance approach from sustainability transitions' studies, Transition Management can offer a theoretical and process design basis for bringing together the multiple knowledge holders and stakeholders operating in and for the nexus to create an active knowledge co-production platform. Transition Management is a governance theory and approach for enabling and triggering transformative action that empowers frontrunners and change agents from different sectors and organisations (Loorbach and Rotmans 2010; Avelino 2009; Brown et al 2013). As an approach it systematically drives the co-creation of transformative visions, actions and strategic agendas in the form of transition pathways that can inform and mobilise action on the short-term, medium-term and long-term, connecting in this way actions of 'here and now' to desirable futures 'there and tomorrow' (Frantzeskaki et al 2012).

With applications in low-carbon climate mitigation and adaptation in cities (Nevens et al 2013) and in urban sustainability with the focus on climate adaptation (Frantzeskaki et al 2014; Wittmayer et al 2014) as indicative to how Transition Management can benefit traditional strategic planning, we will apply it as an approach to bring together different knowledge holders and stakeholders in co-creating transformative agendas with integrative solutions and strategies for the nexus in an open process.

Transition management is a cyclical governance process at various levels (Loorbach, 2007). The core idea is that four different types of governance activities can be distinguished when observing actor behaviour in the context of societal transitions: strategic, tactical, operational and reflexive. The activities exhibit specific characteristics (in terms of the type of actors involved, the type of process they are associated with and the type of product they deliver) which makes it possible to (experimentally and exploratively) develop specific systemic instruments that have the potential to govern societal transitions. The transition instruments relate to specific phases of the transition management cycle. The transition management cycle consists of the following phases: (a) Problem structuring, establishing and organizing the transition arena and envisioning; (b) Developing a transition agenda, a vision of sustainability development and transition pathways; (c) Establishing and carrying out transition experiments and mobilizing the resulting transition networks; and (d) Monitoring, evaluating and learning from the transition experiments and, based on these, making adjustments in the vision, agenda and coalitions (Loorbach, 2010; Loorbach et al 2015; Frantzeskaki et al 2012).

All the transition management tools are participatory and with an explicit focus to stimulate and/or facilitate innovation (of different types, e.g. technological innovations, governance innovations, etc). To enable transitions, institutional flexibility and innovation in governance should, among other things, build on local knowledge including that of residents and experts, where technological and institutional systems are viewed as ingredients for reducing environmental risk regimes. There is a substantial agreement among scholars in the transition management field that involving social actors and the creation of a "sustainable network of practitioners providing the link between the relevant parties - politicians, administrators, researchers, educators and citizens" is essential in institutional and governance innovation. Incorporating citizen knowledge in new and strengthened institutions represents a significant step forward, since the citizens not only have to be involved, but also are considered as holder of a relevant knowledge useful for preventing and managing risks and reducing vulnerabilities.

play out on the benefits of proximity

rethink responsibilities

→ what are the responsibilities of citizens

cultural change from conflictual to allow discussion on opportunities

averting change or any intervention → being always in the midst of conflict

show how different plans connect people and infrastruct.

change mode of thinking

SHOWCASE WITH EXPLICIT EXAMPLES

map new responsibilities

opening-up to new ways

convince with small changes

rethink social relations

TRANSFORMATIONS TO STRENGTHEN RESILIENT PEOPLE

POTENZA

PARADOX of THE STATE

change institutional culture → from 'servicing' (assistenza) to empowerment

allow for evolution of the community - away from one-off interventions

Empower & activate

activate resources & capacities instead of resisting any change

→ discover own capacities

→ 'new capacities' (?)

autonomy?

civil society needs different stimuli → motivate and avoid fear-strategies that result in resistance

reactivate trust and collaborative spirit in community

THINK OF HOW TO MAINTAIN THE ATTRACTIVENESS OF THE AREA

AMBASSADORS OF THE AREA

YOUNG IN THE AREA TO BE THE CHANGING FORCE & PULSE OF CITY-LIFE

Opportunities & Ideas

facebook

fast!

FINDING NEW COMMUNICAT CHANNELS & WAYS

RESILIENT PEOPLE

sense of community 'who to ask for help'

mixed identity of the area makes it challenging & interesting as well

residents have taken some initiative

how to connect with the community & youth in the area

connect to act!

immigrants in the area (alochtonen)

aged people (elderly) and how to function with the youth

reach-out to the community and in case of crisis

social housing associations

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αστική ανθεκτικότητα

urban resilience

resilienza urbana

menneskernes resiliens

veerkracht

resilienta