Resilience: Evolution, Debates, Components, Issues and Opportunities

Over the past ten years, research on disasters has increasingly focused on the capacity of affected communities to recover from disasters with little or no external assistance. It requires stronger emphasis on approaches to risk reduction and humanitarian and development work that put resilience, rather than just need or vulnerability, at the centre. The current thinking on resilience and explosion of interest is a product of theoretical and practical constructs that have seen the refining and reshaping of the disaster paradigm over the past three decades and also due to contribution from multiple other disciplines.

Etymology and History of the Resilience Concept

The precise origin of resilience is unknown, however it is assumed to be derived from the Latin *resilire, resilio* meaning "to leap"[i]. In Middle ages in England, the term resile was used to describe the act of retracting, or reverting to an old position. The first known definition of the word comes from the Glossographia which was published from 1618 to 1679. In 1890s a Scottish engineer, William J.M. Rankine, used the word resilience to describe the strength (resistance) and ductility (ability to be stretched without breaking) of steel beams. He used it in the discipline of mechanics. Its usage in the modern age started with the field of ecology and psychology associated with somewhat similar meaning of recent times. During the 1950s, the concept began to be used in ecology and psychology[ii]. The ecologist C.S. Holling (1973) in his seminal work entitled *Resilience and Stability of Ecological Systems* conceptualized resilience as a measure of an ecosystem's ability to absorb disturbances and persist without changing its fundamental structure.[iii] In the late 1990s, the term migrated from natural ecology to human ecology due to the attention received by economists and geographers. In the field of risk and disaster management the concept of resilience started being used in the 1970s. However, the concept gained importance especially from the end of the twentieth century and after 2010[iv].

Conceptual Evolution of the Term Resilience in Risk and Disaster Management

Reactive

Resilience was part of reactive framework as disaster research since last twenty years focussed mostly on post-disaster response and recovery rather than pre-disaster initiatives like prevention and preparedness and mitigation[v]. Focus was on hazard or vulnerability and on making communities more resilient towards hazards by reducing the hazard and reducing the vulnerability. Focus was not given to reducing the risk. For example, The Hyogo Framework for Action 2005-2015 states […] the development and strengthening of institutions, mechanisms and capacities at all levels, in particular at the community level that can systematically contribute to building resilience to hazards.[vi]

Proactive

The current thinking of disaster risk governance places risk reduction and resilience in the prime focus. The concept of resilience then gained importance until it was used 60 times in the Sendai Framework for Disaster Risk Reduction 2015-2030. The Sendai Framework makes it its third priority for action: ''Investing in disaster risk reduction

for resilience''.[vii] The explosion of interest in resilience over the last decade has thus contributed to the evolution of the concept and the development of different visions, or even schools of thought, of resilience in the field of risk and disaster. A more progressive and proactive approach to risk reduction is need of the time with focus on reducing vulnerability but also on increasing resilience with valorisation of positive factors such as local capacities and social capital. The abovementioned statement is the voice that has been espoused by many recent researchers in the field of risk and disaster namely McEntire et al. 2002[viii]; Cutter et al. 2008[ix]; Olwig 2012[x]; Twigg 2015[xi]; Williams and Shepherd 2016[xii].

Different Schools of Thoughts/Perspectives on resilience

1. The Utilitarian Perspective: The main debate here encompasses whether Disaster resilience ought to be considered as a process or an outcome (means or an end)

Words have meanings and are contextual. They are prisons, as well as searchlights and pigeonholes, for what we see. And resilience here is torchlight.

Some of the authors who were thinking of resilience as a process to reach an outcome. The use of words like capacity to adapt, cope, respond tolerate suggest that the term was used which indicate a reactive stance.

Author	Definition	Keywords
Wildavsky, 1991[xiii]-	Resilience is the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back.	Cope, bounce back
Holling et al., 1995[xiv]-	It is the buffer capacity or the ability of a system to absorb perturbation, or the magnitude of disturbance that can be absorbed before a system changes its structure by changing the variables.	Ability to absorb
Comfort, 1999[xv] –	The capacity to adapt existing resources and skills to new systems and operating conditions.	Capacity to adapt
Paton, Smith and Violanti, 2000[xvi]-	Resilience describes an active process of self-righting, learned resourcefulness and growth— the ability to function psychologically at a level far greater than expected given the individual's capabilities and previous experiences	Focus on capacity
Kendra and Wachtendorf, 2003[xvii]-	The ability to respond to singular or unique events.	respond
Cardona, 2003[xviii] –	The capacity of the damaged ecosystem or community to absorb negative impacts and recover from these.	Absorb and recover
Pelling, 2003[xix] –	The ability of an actor to cope with or adapt to hazard stress.	Cope and adapt

Resilience Alliance[xx], 2005-	Ecosystem resilience is the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. A resilient ecosystem can withstand shocks and rebuild itself when necessary. Resilience in social systems has the added capacity of humans to anticipate and plan for the future.	Rebuild, tolerate, anticipate and transform without losing essential character
UNISDR, 2005 –	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organising itself to increase this capacity for learning from past disasters for better future protection and to improve risk reduction measures.	robustness, redundancy, Resourcefulness, and rapidity.

Disaster resilience as we see from above table is process oriented as it is a deliberate process (leading to desired outcomes)[xxi]. It is seen as a quality, characteristic or result that is generated or developed by the processes that foster or promote it. It is in positive sense.[xxii]

Resilience as an outcome- In policy context resilience is an end point to be achieved. In this context resilience means irrepressible, buoyant, enduring, flexible; that which can bounce back unchanged from exposure to stresses and shocks and more importantly that which can 'bounce forward' to a new state of existence. Rutter (1990) has described resilience as a positive outcome in overcoming adversity such as chronic poverty[xxiii]. In Disaster Risk reduction context Resilience is and outcome which must be achieved while taking care that risk reduction and vulnerability reduction is wedded with networking and capacity building.

2. **Neoliberal resilience**- competitive advantage and development of mechanisms for constant growth i.e no finite resources vs **Critical Resilience**

The neoliberal thinking provides solution to problems in the form of manufacturing alternatives for constant growth with the aid of economics and technology and implies that there is no dearth of resources i.e. resources can be created incessantly. Resilience can be used as a moralizing discourse for propagation of neoliberal values. Neoliberal resilience through the promotion of community autonomy transfers the heavy responsibility of disaster management to individuals and communities without offering the necessary institutional support for its adequate management[xxiv]. Resilience as a moralizing notion has been criticised as it shifts responsibility away from the state by 'responsibilization of the individual' in the aftermath of 2008 financial crisis where after the state took a back seat by citing the advent of age of austerity. This leads us to ask the question: Resilience for whom?[xxv] Also the neoliberal stance introduces us to the Dark side of resilience and forces us to embrace *critical resilience* i.e. to use reliance to look it from local and marginalization viewpoint, to analyse inequalities in resilience initiatives, to analyse and find out structures of exploitation or status quo in disaster risk reduction efforts[xxvi]. Researchers of *Critical Resilience* have pointed out that outcome-oriented disaster resilience programmes tend to take command and control approach which preserved the status quo by guarding exclusion and hiding the inequality, oppression and entitlement loss in turn creating exposure to insecurity and disaster.[xxvii]

3. **Resilience as progressive development or as an elastic band;** bounce back or bounce forward

Resilience was visualized as an elastic band that can stretch without breaking (ductility) and return to its original shape without deforming. It is manifested in the words 'bounce back' (BB) and also in 'build back' in context of disaster reconstruction. This perspective of resilience thus induces a return to the pre-disaster conditions of the system or community without thinking, without regard to their evaluation, making it possible to return to the conditions of vulnerability that may have caused the hazard or exacerbated its impacts[xxviii]

To take on this problem, the idea of ''build back better'' and ''bounce forward'' emerged and has led to the adding up of post-disaster initiatives like reconstruction, transformation, post-disaster development and adaptation within resilience. Recently, the meaning associated with the expression ''bounce forward'' seems to have shifted to a new one with focus on capacities of
a) anticipation,
b) innovation, and
c) Adaptability to uncertainties[xxix]

The shift in meaning signifies that resilience has become intrinsic in character i.e. It represents ''the intrinsic capacity of a system, community or society predisposed to a shock or disaster to bounce forward and adapt in order to survive by changing its non-essential attributes and rebuilding itself''.[xxx] Adaptability and retention of core functions through innovation in the face of disaster has become definitive words for resilience. At the core of this conception of resilience is a widely known mechanism of human development: experiential learning meaning that people are naturally resilient i.e. they can sustain/transform/adapt through innovation.

4. **Human resilience: Infrastructural resilience: Community resilience**

People adapt, transform, respond and recover effectively after a disaster, whereas physical infrastructure resists to a point and then fails. People can engage in adaptive behaviour but structures only can be adapted to. Humans have the capacity to innovate without losing core character and functions whereas infrastructures lack this element. Within the field of risk and disaster management, building resilience is often community-oriented due to the importance of the localization.[xxxi] The landscape and context and belongingness provide community to be the bedrock for resilience building activities. And among many dimensions- social learning and social capital are the two significant dimensions.

5. **Key components of resilience**

For Tierney and Bruneau (2007)[xxxii], resilience is composed of four main elements:
a) Robustness- ''The ability to absorb and withstand disaster without loss of performance. It relates to reliability''
b) Redundancy- 'The extent to which system units are substitutable having excess capacity and backup which enable the system to retain core functions in disaster or during significant degradation.
c) Resourcefulness- ''The ability to adapt to crisis situation using creativity and innovation by flexibility adaptation and transformation without losing core character.''

d) Rapidity- ''The capacity to restore core functions and adapt and transform in timely way.''
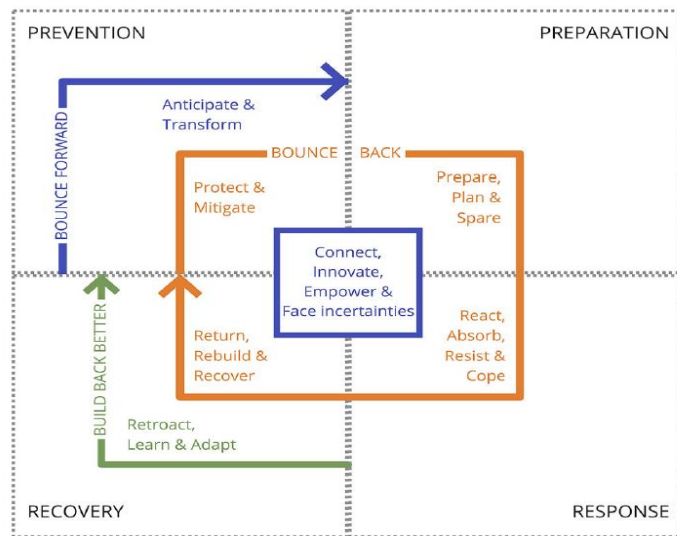

Figure 1. Concept of resilience as per disaster risk management aspect
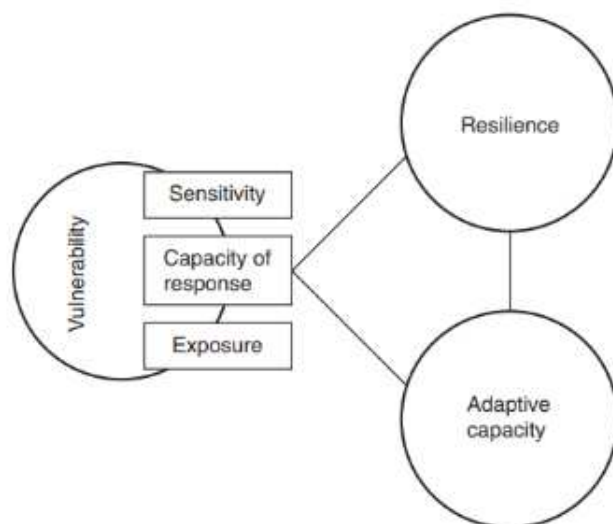

Figure 2- The Concept of Vulnerability and its interconnection with Resilience (adapted from Gallpoia, 2006)

6. **Vulnerability and Resilience: opposing, interdependent, or correlated concepts**
   a) Like resilience, vulnerability as a concept is evolving with multiple and sometimes opposing definitions and interpretations and meanings. Additionally, it is associated with varied indicators and measurements.
   b) Inverse of vulnerability: increasing resilience would reduce vulnerability and vice versa: circular reasoning. The vulnerability approach places emphasis on nature whereas resilience approach focusses on human agency.
   c) Vulnerability and Resilience have been regarded by many to be subcomponents, sub-concepts, or attributes of each other.
   d) Larry Mallak opines that resilience and vulnerability, often seen as opposites, are two separate constructs. A good explanation is Herzberg's two-factor theory i.e. motivation factor and hygiene/affective factors impact both job satisfaction

and job dissatisfaction which are not opposites. The absence of job dissatisfaction does not imply job satisfaction. In the same breath with regards to resilience, the absence of vulnerability does not mean the system is resilient.[xxxiii]

e) It appears that resilience has developed into an independent concept that is somewhat related to and interconnected with vulnerability. It is shown in Figure 2.

Disaster resilience: a paradigm or simply an expression

The concept of resilience has gained currency in the absence of philosophical aspects, substantive theory and clarity of understanding and clarity of definitions. Moreover it has found wide applicability in disaster management and sustainable development theory and practice despite the confusion regarding its definition[xxxiv]. The most plausible explanation for this is that it resonates with hearts and minds of public. The concept of resilience albeit with varying meanings, helps us to obtain a complete understanding of risk and vulnerability which are otherwise fragmented and not easy to comprehend. Focusing on resilience directly rather than vulnerability reduction is important as Disaster Resilience initiatives might lead to activities which enhance community capacity and livelihood thereby giving them the agency and autonomy to make appropriates choices in the context of their environments. Resilience is grounded in decision making among choices/alternatives about future losses when development decisions are carried out (Prospective in conceptualization). Selecting what will be lost in future disasters is a radically novel way to see those losses since it places 100% responsibility for those losses on people versus nature. It also implies that people have choice to build resilience. But the moral hazard here is that it caters way to 'responsibilization of individual' by granting autonomy[xxxv]. Therefore, Resilience can be aptly termed as a new paradigm.

However critics argue that it's an old wine in a new bottle. The only new thing is addition of 'resilience' in disaster and development discourse. Using words without a clear definition or categorisation renders it difficult to come with clarity of concept. Disaster resilience could be viewed as a new terminology describing a desired outcome of a disaster risk reduction. Nevertheless, it does not address the unique condition itself.[xxxvi] Using this lens we can safely label it 'a lens or entry point' or view it as the beginning of a search for a new paradigm within the field of disaster risk reduction rather than labelling it as a paradigm altogether.

Conclusion and way forward

Resilience is a promising concept but there is lack of consensus on definition, lack of unified approach in terms of measurement and implementation. The lack of consensus serves positively in terms of exchange of knowledge across disciplines. It provides a comprehensive multi-hazard, also going to the extent of providing all-hazard, multi-scalar, and integrated approach. The concept of resilience has great applicability. It is applicable to practically every phenomena involving a shock or stress. The imprecise character of resilience, as well as its conceptual flexibility, can assist communication and knowledge sharing across disciplinary boundaries and also across science, policy, and practise.

Resilience also allows for an interdisciplinary examination at some global challenges that were usually comprehended separately such as Disaster Risk Reduction, Climate Change adaptation,

and Sustainable Development (Paris, Sendai and Sustainable Development 2015). Resilience provides the entry point of bringing coherent and integrated policy and creating synergies between the three emergent major global agreements. Policy coherence and policy integration should be achieved at the national level too to reap benefits offered by Resilience. Institutions, mechanisms, laws and policies must aim to make resilience inter-operable within their arenas by arriving at common minimum agreement (synergizing) as resilience is conceptually flexible and imprecise. It is high time that we prioritize Resilience building in the development process and also bring changes in policies in which Disaster Risk Reduction and Disaster Resilience are prioritized rather than Disaster Risk management and Disaster Management.

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