

# COMMUNITY DISASTER RESILIENCE STRATEGIES: COMMUNITY DISASTER KNOWLEDGE, SOCIAL CAPITAL, PREPAREDNESS AND MITIGATION MEASURES ENHANCE COASTAL COMMUNITY RESILIENCE TO NATURAL DISASTERS

## Abstract:-

This paper describes the strategies for enhancing resilience of a coastal community to natural disasters by effective disaster preparedness and mitigation measures. It elaborates the importance of capacity building and improved infrastructure performance. Participatory Disaster Risk Assessment (PDRA) is emphasised to understand the diverse vulnerabilities and resilience of the coastal communities. This paper presents a unique approach to integrate the existing capacities, capacities required and important social and economic activities with the key strategies of community disaster resilience. The study focuses on enhancement of community knowledge in disaster management, community social capital, integrated disaster management plan, preparedness and recovery and disaster mitigation measures implemented in the coastal villages for effectively managing the disaster situations. There is a greater emphasis on the need for involving multisectoral and multidisciplinary sections of the community in disaster preparedness and capacities required for minimizing social and economic impact which will further help in developing mitigation strategies.



## Keywords:

disaster, vulnerability, social capital, preparedness, recovery and mitigation.



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## INTRODUCTION

The impact of the December 2004 Asian tsunami, for example, on rural coastal communities in India, Indonesia, Sri Lanka and Thailand, particularly poor fishing and aquaculture households, was disproportionate in comparison with other groups of people in the region. Heavy loss of human lives and property damages in disasters suggests that the coastal communities are not resilient enough to withstand the external disturbance/stress (Birkmann 2006). Over the past decade, the need to accommodate the concept of resilience in research, policy, and disaster risk reduction arenas has been underscored by a number of authors. Disaster and development studies constantly include community resilience as the main focal point after the 2005 World Conference on Disaster Reduction (WCDR), and The Hyogo Framework for action 2005 -2015 (HFA) helped it gain importance in Disaster Risk Reduction (DRR) science. The HFA also moves DRR away from a hazard management focus and sets it in a development context. Instead of merely focusing on emergency response – the approach commonly used by the classical disaster communities – the whole disaster management cycle is considered, including mitigation/prevention, preparedness, response/relief and recovery. In this manner, the approaches have become more integrated. It emphasizes the need for the communities to become more and more resilient to any disturbance. And all the publications that deal with DRR have been regularly using the term community resilience either as a process or as an outcome of development and humanitarian interventions. These usages and analyses provide the base for further enquiry into community resilience.

The 2004 tsunami was uniquely devastating because of the peoples' ignorance about tsunami, absence of preparedness and recovery measures and the disruption of the essential services as a result of the tsunami including healthcare, transportation, communications and food and non-food items. The coastal communities were not resilient enough to restore livelihood and recover as desired, from the aftermath of the tsunami.

Immediately after the tsunami, many countries and international aid agencies poured monetary aids to the affected communities thinking that with the inflow of abundant resources, the communities would undergo an expedited recovery smoothly transitioning between recovery phases, i.e., from emergency phase to short term recovery and from short term recovery to long term recovery (Deshmuk, 2012). But it did not happen as expected because of poor participation of the affected communities in relief, emergency and recovery phases and inefficient provision of infrastructure services. This study identifies the resources available in post disaster situation as the capacity of the community. Enhancing the ability of the community to mitigate the impacts in post disaster situation is defined as capacity building.

This study is based on the concept that coastal community resilience can be enhanced by improving their knowledge in disaster management, building their social capital, having in place an integrated disaster management master plan, enhancing preparedness and recovery activities and implementing mitigation measures.

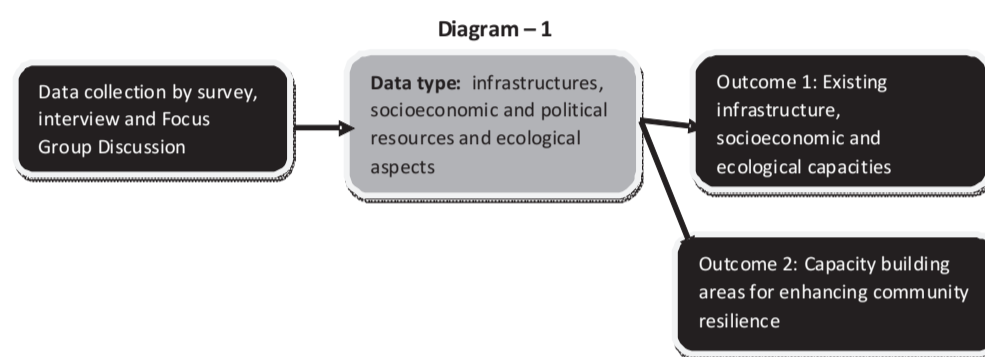
## UNDERSTANDING COMMUNITY RISKS

It is very clear from the fact that India's vast and diverse regions, landscapes and climatic variations will make large number of the population to be at risk from the damaging impacts of disasters. Knowledge and understanding of local disaster risks are very important aspects of a disaster resilient community. For many of the people living in India the term, 'Tsunami' was unheard of until it struck the coasts of South India in 2004. This tsunami was an eye opener even to the Government of India for enacting laws and disaster management authorities at different levels to manage the future disasters. It is very imperative to understand and assess the risks and vulnerabilities inherent in any complex nexus of people, natural systems and built environments before beginning the process of understanding/measuring a community's resilience. Understanding the nature and extent of risks will help the communities to initiate concrete measures to control their impacts, and inform the way the people prepare for and recover from them.

Blaikie et al. (1994) define risk as consisting of two major components. The first component is a measure of the natural hazard to which the community is exposed. The second, vulnerability itself, is equivalent to capacity and is largely determined by socio-economic structure and property relations. It is very clear that vulnerability is always closely linked to a hazard or set of hazards, which means to say that vulnerability and exposure to hazards remain inseparable (Kelly & Adger 2000). Vulnerability is an inevitable component of any community and arises from the intersection of human systems, the built environment and the natural environment (Cutter et al., 2008, Fenton, Kelly, Vella, & Innes, 2007 and Maguire & Cartwright, 2008). The vulnerability is the state of susceptibility to harm from exposure to stresses associated with environmental and social changes and from the absence of capacity to adapt (Adger 2006). Therefore, the concept of vulnerability can be judged by the coping capacity of people to stress and disturbances. Thus, vulnerability is defined in terms of the ability or inability of individuals and social groupings to respond to, in the sense of cope with, recover from or adapt to, any external stress placed on their livelihoods and well-being (Kelly & Adger 2000).

To understand better the term resilience one should make a thorough study on vulnerability and to learn the vulnerability of the socio ecological system it is very essential to bring out the meaning of hazards.

Birkmaann 2006, views hazard as a potentially damaging physical event (e.g. floods, droughts, fire, earthquakes and storms). Disaster occurs as a result of the complex interaction between such a potentially damaging physical event and the vulnerability of a society, its infrastructure, economy and environment, which are determined by human behaviour. Therefore, the communities should understand vulnerability as the pre-existing conditions that make infrastructure, processes, services and productivity more prone to be affected by an external hazard. It indicates the “deficiencies in preparedness” to withstand the disturbances from external stress (Villagra’n de Leo’ n, 2001, 2004). Vulnerability can be classified into social, economic, physical and environmental components. Turner et al., 2003 says vulnerability can be viewed in the context of a joint or coupled human–environmental system. Participatory Disaster Risk Assessment (PDRA) is done to understand better the community risk and vulnerabilities. The following diagram -1 explains the process and result of the PDRA.



Hence, the PDRA exercise helps the people understand the risks that may affect them and others in their community. Based on the risks and vulnerability assessments the communities should have learnt the vulnerable sections, constructions, infrastructures, areas and ecological components. They should have comprehensive local information about hazards and risks, including who is exposed and who is most vulnerable as to become more and more resilient to disasters.

### **SOCIAL CAPITAL**

The literatures on hazards and disasters have increasingly given more attention to the concept of social capital – a term that encompasses the norms and networks that facilitate collective action. The concept of social capital has been utilized for analysing many different collective action problems, including family issues, schooling and education, work and organizations, democracy and governance, as well as development issues (Dynes, 2002). Recovery from natural and other disasters does not depend on the overall amount of aid received nor on the amount of damage done by the disaster; instead, does social capital - the bonds which tie citizens together – function as the main engine of long term recovery (Daniel P. Aldrich 2010).

According to Goodman et al. (1998), community capacity is the presence of inter-organizational networks that are characterized by reciprocal links, frequent supportive interactions, overlap with other networks, the ability to form new associations, and cooperative decision-making processes. Promoting a web of social relationships perceived to be loving, caring, and readily available in times of need.

For instance, community links and networks are very much helpful as they let the individuals to draw on the social resources in their communities and increase the likelihood that such communities will be able to adequately address their collective concerns (Green & Haines, 2002). Community networks can also provide an external resource that may facilitate the developmental process. The concept of social capital is important because it allows citizens to resolve collective problems more easily. The most resilient communities are those that work together toward a common goal (Davidson, 2006). The idea is that, in circumstances where characteristics of a strong community are missing, members of that community tend to have less capacity to cope with disasters. Social capital as a source of community cooperation and efficacy can be measured by the number of non-profit organizations, voluntary associations, religious organizations, voter participation and registration, newspaper readership, and sport and recreational clubs operating in the community. Social capital can thus be measured through the activities such as involvement in public affairs, public meetings, informal sociability and trust. Involving disaster specific organizational networks have three important benefits related to disaster resilience: improve disaster response, improve organizational capacity to survive a disaster, and improve organizational capacity to assist their clients or members during a disaster. It is to be noted here that organizational capacity to coordinate disaster-specific collective action is necessary to foster collective efficacy to its fullest potential.

Daniel P. Aldrich (2010) says that there are three important uses of social capital in the process of rebuilding the affected communities: First the social ties serve as informal insurance and provides the victims with information, financial help, and physical assistance; Second it helps to organize/mobilize the

communities to overcome barriers through collective action; and finally it helps the survivors of the disasters to choose an option to either leave the community or stay and use their voice to call for assistance, changes to rebuilding plans, and accountability from elected representatives. Hence it is imperative for the Government decision makers and non-profit sectors to recognize the critical role of social capital and social resources as the engine for recovery and involve them in the post disaster planning and implementation.

#### **PREPAREDNESS AND RECOVERY**

Communities' knowledge and understanding of hazards and risks have to be translated into relevant controls and mechanisms for dealing with them. Therefore, a disaster plan made anticipating the likely risk factors and the vulnerability of the population will reduce future possible impact of disasters. An integrated disaster master plan covering land use pattern, construction guidelines, maintaining public infrastructures and emergency response and recovery measures will mitigate the likelihood of loss of life, as well as damage to and/or destruction of property and infrastructure. The strategic planning system is particularly important in contributing to the creation of safer and sustainable communities. Such a master plan will indicate that locating new or expanding existing settlements and infrastructure in an area exposed to unreasonable risk is irresponsible. The plan will have specific guidelines for land use, building code standards, maintenance of the existing infrastructures and insurance coverage for the cattle, crops and properties. The plan will forecast the possible risks. Comprehensive consideration of hazards and risks in the planning system needs sound understanding of the hazards and risks, as well as agreement on risk management principles and on the approach to strategic planning and development controls that will adequately mitigate identified risks. As indicated in the plan the communities will undertake all required preparedness measures to reduce the impacts of the disasters.

Communities that are prepared for disaster prevention, response and recovery are able to cope with disasters more effectively. But achieving increased disaster resilience is not solely the domain of the communities living in the coastal villages; rather, it is a shared responsibility across the whole of society. It indicates that the political leaders, governments, business and community leaders, and the not-for-profit sector have to adopt increased or improved emergency management and advisory roles, and contribute to achieving integrated and coordinated disaster resilience. Besides, the communities, individuals and households need to take greater responsibility for their own safety and act on information, advice and other cues provided before, during and after a disaster. Shared responsibility does not mean equal responsibility. Depending on the capacities there might be difference in sharing the responsibilities between different stakeholders. These communities will have readily available the supplies and equipment required in a disaster and maintain them periodically. Different task forces and disaster response team will function in the communities to respond to the impacts of the disasters.

During 2004 tsunami and cyclone Thane the disaster recovery approaches applied by the governments and NGOs centred on the idea of moving more money, supplies, and experts into the disaster hit areas would result in a faster recovery. But the people of the coastal villages proved that it is the social networks not the aid or damage levels create efficient recoveries through establishing linkages and networks with multiple stakeholders. With the guidance of some NGOs involved in mobilizing social resources the affected coastal communities began to improve their trust in fellow citizens and government officials. There was a shift in their focus from passive recipients to active participants. Hence, they started to undertake activities to enhance their abilities to mobilize cooperatively through demonstrations, neighborhood cleanup days, and other collective actions for improving their living standards. It is to be understood that when disaster strikes, the first responders are not trained emergency personnel but rather local residents and neighbors (Daniel P. Aldrich 2010). Therefore, community networks have to be strengthened to improve their resilience to disasters.

#### **DISASTER MITIGATION**

Disaster mitigation primarily focuses on the hazard that causes the disaster and tries to prevent or drastically reduce its direct effects. There are many ways and means for the individuals, families, groups, communities and agencies to prevent and minimise the consequences of disasters. The best example of mitigation is the construction/strengthening of retaining walls or promoting mangrove forests and sand dunes along the coast to prevent intrusion of sea water into the coastal villages.

Mitigation also deals with construction/strengthening of the buildings as to make them tsunami/cyclone resistant, planting of crops that are less affected by disasters, controlling land-use patterns to restrict development in high-risk areas and diversification of economic activities to act as insurance to compensate losses in different sectors. A mitigation strategy is successful only when it has the backing and support of all stakeholders such as the administrative machinery, the research institutions, the non-officials and particularly the community. Therefore, it is imperative to have built-in institutional arrangements and/or legislative backing to implement the appropriate mitigation strategy over a period of time.



**CONCEPTUAL MODEL FOR PROMOTING COMMUNITY RESILIENCE**

The UN/ISDR (2004:16) conceptual framework places vulnerability and the disaster risk reduction elements within a framework called the “sustainable development context”. It means to say that there is a necessity of linking risk reduction strategies should promote sustainable development. In reducing the disaster risk the existing connections between the community knowledge, socioeconomic and ecological resources be best used. The conceptual model also takes into account the concept of adaptation, which is viewed as an element that increases resilience. This framework is a simple and easy to follow at the grassroots level. Moreover, the conceptual framework focuses more on increasing the resilience of the communities by enhancing their knowledge, socioeconomic and political resources and their coping capacities as well as the potential intervention measures. It stresses the fact that vulnerability and risk assessment should take into account exposed, susceptible elements and coping capacities as to enhance the disaster awareness level of the communities the on the likelihood to suffer harm and injury due to a hazardous event.

As the UN/ISDR (2004: 18-19) says the proposed conceptual framework insists upon enhancing community resilience by recognizing and making best use of connections among community disaster knowledge, social, economic and environmental goals in reducing significant hazard risk. It is very much required to healthy and diverse ecological and economic systems that adapt to changes and recognize social and ecological limits. This could be achieved by incorporating appropriate community disaster reduction strategies. Following diagram -2 explains the connections between the proposed community resilience strategies:

**Diagram - 2**



**CONCLUSION**

The study on community resilience brings out the dynamics of awareness level, social capital, the importance of integrated disaster management plan and implementation of preparedness-recovery and mitigation measures. It focuses on adaptive responses to shocks and stresses. The risk analysis shows that community level adaptations need to establish linkages and networks with diverse organizations, persons, institutions and departments particularly with the local governing structures. Hence, the community resilience strategies involve not only the local communities but also different stakeholders. They all together attempt to address social and ecological uncertainty of their communities. The proposed conceptual model having diverse factors and stakeholders will help enhance the resilience of the communities.

**REFERENCE**

- 1.Birkmann, J.2006. Measuring vulnerability to promote disaster-resilient societies: Conceptual frameworks and definitions. Research Brief (1), Tokyo: United Nations University (ed).
- 2.Fran H. Norris, Susan P. Stevens, Betty Pfefferbaum, Karen F. Wyche, Rose L. Pfefferbaum 2008. Community Resilience as a Metaphor, Theory, Set of Capacities and Strategy for Disaster Readiness.

- American Journal of Community Psychology. 03/2008; 41: 127-150. DOI 10.1007/s10464-007-9156-6.
3. Susan L. Cutter, Lindsey Barnes, Melissa Berry, Christopher Burton, Elijah Evans, Eric Tate & Jennifer Webb 2008. A place-based model for understanding community resilience to natural disasters - Local evidence on vulnerabilities and adaptations to global environmental change. *Global Environmental Change*. 10/2008; 18: 598–606. DOI:10.1016/j.gloenvcha.2008.07.013.
4. Graham A. Tobin 1999. Sustainability and community resilience: the holy grail of hazards planning? *Global Environmental Change Part B. Environmental Hazards*. 06/1999; 1: 13–25. PII: S 1 4 6 4 - 2 8 6 7 (9 9)00002–9.
5. Siambabala Bernard Manyena 2006. The concept of resilience revisited. *Disasters*. 12/2006; 30: 434–450. DOI: 10.1111/j.0361-3666.2006.00331.x.
6. Geoffrey T. Stewart, Ramesh Kolluru, Mark Smith 2009. Leveraging public-private partnerships to improve community resilience in times of disaster. *International Journal of Physical Distribution & Logistics Management*. 2009; 39: 343 – 364. ISSN: 0960-0035.
7. Abhijeet DESHMUKH and Makarand HASTAK 2012. A Framework for Enhancing Resilience of Community by Expediting Post Disaster Recovery. 550 Stadium Mall Drive, School of Civil Engineering, West Lafayette, IN 47906-2051, United States.
8. Daniel P. Aldrich 2010. Fixing Recovery: Social Capital in Post-Crisis Resilience, Forthcoming. *Journal of Homeland Security*. 06/2010.
9. Siambabala Bernard Manyena 2009. Disaster resilience in development and humanitarian interventions. A thesis submitted in partial fulfilment of the requirements of the University of Northumbria at Newcastle for the degree of Doctor of Philosophy, 12/ 2009. <http://nrl.northumbria.ac.uk/661/>
10. Michelle Annette Meyer 2013. Social capital and collective efficacy for disaster resilience: connecting individuals with communities and vulnerability with resilience in hurricane-prone communities in Florida. A thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy, Colorado State University, Fort Collins, Colorado. Summer 2013.
11. Rhys Price-Robertson and Ken Knight 2012. Natural disasters and community resilience- a framework for support. *Child Family Community Australia*. 05/2012; Paper No. 3: 13 pp. ISSN: 2200-4106 ISBN: 978-1-921414-88-6.
12. Neysa Setiadi, Joern Birkmann and Philip Buckle 2010 (Editors). Disaster risk reduction and climate change adaptation: Case studies from South and Southeast Asia. A paper submitted at the International PhD Workshop on Disaster Risk Reduction and Climate Change Adaptation in Context of South and Southeast Asia in Yogyakarta, Indonesia. SOURCE - Publication series of UNU-EHS No: 14/2010.
13. Magnus Hagelsteen and Per Becker 2013. Challenging disparities in capacity development for disaster risk reduction. *International Journal of Disaster Risk Reduction*. 03/2013; 3: 4–13. ISSN: 2212-4209.
14. W. Neil Adger 2000. Social and ecological resilience: are they related?. *Progress in Human Geography*. 09/2000; 24(3):347-364. DOI: 10.1191/030913200701540465.
15. P. M. Kelly and W. N. Adger 2000. Theory and Practice in Assessing Vulnerability to Climate Change and Facilitating Adaptation. *Climate Change*. 12/2000; 47 (4): 325-352. ISSN: Print: 0165-0009; Online: 1573-1480.
16. Emmanuel Raju, Per Becker 2013. Multi-organisational coordination for disaster recovery: The story of post-tsunami TamilNadu, India. *International Journal of Disaster Risk Reduction*. 2013; 4:82-91. ISSN: 2212-4209.
17. USAID/AISA. U.S. Indian Ocean Tsunami Warning System Program. 2007. How Resilient is Your Coastal Community? A Guide for Evaluating Coastal Community Resilience to Tsunamis and Other Coastal Hazards. U.S. Indian Ocean Tsunami Warning System Program supported by the United States Agency for International Development and partners, Bangkok, Thailand. 144 p. ISBN 978-0-9742991-4-3.
18. United Nations Development Programme (UNDP) (2004) Reducing Disaster Risk: A Challenge for Development. A Global Report, New York: UNDP – Bureau for Crisis Prevention and Recovery (BRCP), available at <http://www.undp.org/bcpr/disred/rdr.htm>.