African Health Sciences

MAKERERE MEDICAL SCHOOL

EDITORIAL

Resilience to Disasters:
A Paradigm Shift from Vulnerability to Strength

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The idea of producing a special issue on the theme of resilience was first proposed in late 2006 as part of the plans to disseminate the deliberations of our first International Resilience Workshop held at Talloires, France, in July 2007. The workshop brought together a group of interested researchers, planners, practitioners and policy makers from the disaster response and health sectors, both academic researchers and practitioners to present and discuss the salient points of convergence in their work on human, ecosystem and/or institutional/structural resilience. The abstracts submitted and presented for discussion at Talloires were then developed into the articles included in this volume. Graduate students made up over a third of the workshop participants, and the case studies and innovative ideas discussed included resilience of emergency responders (Pietrantoni and Prati, Italy), the role of civic courage and *Upstanders* during the war in Bosnia and Herzegovina (Broz), the role of social innovation in building institutional resilience (Westley), national emergency response planning in the UK (Amlôt), measures of resilience in the UK national health service (Cowley), the Federation of International Red Cross and Red Crescent Societies (IFRC) Psychosocial Support Centre's shift in policy from trauma counseling to resilience building (Christensen), a pilot study of resilience in New Orleans, Louisiana, post-Hurricane Katrina (Glandon *et al.*), a preliminary analysis of social-ecological resilience with respect to traditional water resource management in rural Tanzania and traditional ecological knowledge concerning plant uses in rural Niger (Strauch *et al.*), the role of animals (pets and livestock) in promoting resilience (Lindenmayer), and resilience of international humanitarian workers operating in Africa (Filot and Uriarte, Belgium and Spain, respectively). Abstracts submitted to the workshop but not developed into articles have been included in this volume.

A wide range of conceptualizations and definitions of resilience with corresponding indicators and/or assessment/measurement scales were examined in small working group and plenary sessions. The workshop concluded with a consensus on the need for a programmatic applied research strategy to develop the envisioned multi-dimensional and cross-scale "*Resilience Index*" (RI) for the purposes of gauging sustained global public health and well-being encompassing human, institutional and social-ecological resilience. Subsequent international conference and seminar venues have provided avenues for further development of the interdisciplinary and cross-sector discussions initiated at Talloires, most notably Resilience 2008, convened in Stockholm by the Resilience Alliance (April 2008), and two panel discussions on building community resilience – one at the Institute of Health, Warwick University, UK (July 2008) and the other at the University of Massachusetts in Boston (November 2008) engaging the leadership of the guest editor as a key speaker and/or discussion moderator/facilitator.

The International Resilience Workshop – Talloires 2007 tackled the following set of key questions:

i.   What is resilience, and how is it assessed and/or measured?

ii. How are the questions "resilience of whom or what?" and "resilience to what?" being addressed in different disciplines and/or practice sectors?

i. What is resilience, and how is it assessed or measured?

A multi-dimensional construct, resilience is defined as the capacity of individuals, families, communities, systems, and institutions to anticipate, withstand and/or judiciously engage with catastrophic events and/or experiences; actively making meaning with the goal of maintaining normal function without fundamental loss of identity.[1] At the individual level, human resilience is a normal and common response to adversity.[2-7] At the level of family and/or community, the capacity to anticipate, withstand and maintain normal function following disasters is mediated by right *types, timing*, and *levels* of social support of which international humanitarian assistance is one form.[8]

Sixty-two years ago, the United Nations held its inaugural international health conference in New York where it adopted a holistic definition of health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."[9] Health is a dynamic steady state, a state of successful adaptation to the stresses and strains that may be chronic or acute, of ordinary or extraordinary magnitude. Health is a process, mediated by social and economic capital, also known as "resources for health". [10-12] The same may be true of resilience. As explained by the theory of Salutogenesis (origins of health)[13] the dynamics of health and ill health demonstrate a wide spectrum of levels of adaptation along the ease ⟺ dis-ease continuum (see Figure).

Figure: The theory of *Salutogenesis* (Origins of Health)

Ease ⟵⟶ **Dis-ease**

- Adaptive state
- **Resilience**

- Maladaptive state
- **Vulnerability**
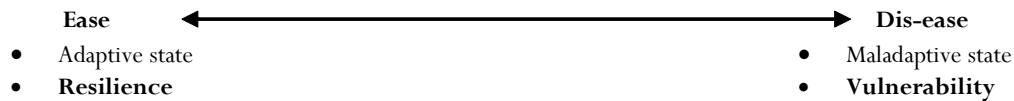
The assumption here is that good health reflects an adaptive state (a dynamic steady-state, and not a static state), while ill health/disease demonstrates the opposite, a maladaptive state of vulnerability. While systems of health care delivery have traditionally focused on curative measures of disease control, dwelling on vulnerability, health promotion through prevention of vulnerability to disease has increasingly been taking a more long-term view of removing the obstacles to health by focusing on the root causes of disease, most of which lie outside the mandate of health care services and in the domain of social, cultural, economic and geo-political situation of communities, countries, and/or regions. Hence the focus on resilience as a basis for sustainability, also with respect to the physical/natural environment and the inter-connected social-ecological systems which influence international humanitarian policy and public health practice are in turn impacted by them.

ii. How are the questions "resilience of whom or what?" and "resilience to what?" being addressed in different disciplines and/or practice sectors?

Health in a broad sense of the term is thus not only the absence of disease, but also the presence of capacity, motivation and conditions that promote wellness. Health promotion is about creating and sustaining dynamic steady states of well-being. Human resilience depends on and also impacts institutional and environmental/ecosystem sustainability.

Although it has in the past been studied from different disciplinary perspectives in the behavioral, clinical and social sciences, human resilience is closely linked to ecosystem resilience. While we as human scientists may examine the interplay of social cohesion, social networks and support systems that contribute to the integrity of the emotional ecosystem in which human lives and livelihoods thrive, often in the face of adversity of different forms and levels of magnitude (including complex emergencies triggered by floods, droughts, and/or armed conflict); environmental scientists (including ecologists, economists, conservation biologists, anthropologists, and sociologists) have also advanced our understanding of resilience of the natural/physical ecosystem as part and parcel of the coupled natural and social systems that contribute to the sustainability of our planet, and/or threaten it, as the case may be. It is important to note that humans are the dominant players in social-ecological interactions that have brought the planet to the state of imminent peril, loss of resilience and reduced sustainability of resources, including human resources. However, not all humans are equal: some are more equal than others in terms of their contributions to sustainability.

As articulated clearly by the Resilience Alliance, "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. Humans are part of the natural world. We depend on ecological systems for our survival and we continuously impact the ecosystems in which we live from the local to global scale. Resilience is a property of these linked social-ecological systems (SES). "Resilience" as applied to ecosystems, or to integrated systems of people and the natural environment, has three defining characteristics:

- "The amount of change the system can undergo and still retain the same controls on function and structure
- "The degree to which the system is capable of self-organization
- "The ability to build and increase the capacity for learning and adaptation"[14]

The above three points have guided the multi-disciplinary research and policy/practice analyses conducted by members of the Resilience Alliance following the leadership of Buzz Holling's (1973) [15] and Elinor Ostrom's (1990)[16] seminal publications on today's researchers in the interdisciplinary fields of resilience theory and also cognitive sciences. Critical among the above three points is the question of learning and adaptation at all levels – individual, collective, and institutional – particularly with respect to local, regional, and international humanitarian policy and public health in Africa.

Resilience to disaster – myth or reality?

The literal meaning of the word disaster is "dis-aster", the sudden misalignment of stars causing destruction. Thus the Tsunami (December 2004) and Gujarat earthquake (January 2001) would fit this simple definition of "natural disaster". Whether or not individuals and/or communities and their institutions can anticipate, recognize the warning signs of, and respond to disasters effectively may predict resilience. The United Nations definition of disaster: "*a serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the capacity of the affected society to cope using only its own resources*"[17], is often interpreted as a call for external human and material resources without due acknowledgement of and/or respect for existing human resources and strengths. Such an observation compelled a Belgian veteran disaster response expert in public health to plead, "*Stop Propagating Disaster Myths*" at the turn of the millennium, pointing out that the resilience of those affected by disasters - who are not "too shocked and helpless to take responsibility for their own survival" - was often undermined by western disaster expert teams who lacked familiarity with local needs and priorities, and more importantly, the mindset and/or motivation to learn.[18] Similarly, "humanitarian spins", akin to the seven deadly sins of medieval theology may erode both the resilience of disaster-affected communities and the integrity of international humanitarian assistance agencies.[19] Valuable lessons learned from the significantly more effective disaster response of grass-root organizations with long range strategies of coping with

adversity, such as that of the Self Employed Women's Association (SEWA) of India has since served to model disaster response that delivers timely assistance to effectively restore human lives and livelihoods. [20]

This special issue of *African Health Sciences* is well placed and timely in its attempt to explore the implications of resilience thinking for African systems of health care service policy and practice today. As African families, communities, countries and regions continue to face the seemingly intractable problems of conflict and political instability, systems of health care service provision have continued to be depleted. Many African Universities and Medical Schools find themselves drained of the most valuable human resources. Trained and qualified healthcare service professionals, nurses in particular, are actively recruited by western countries for higher wages. While this continues to erode the resilience of African systems of health care service provision by reducing institutional capacity for sustaining prevention-oriented public health over the long term, it is considered by many a necessary means of supporting family and community in the short term as remittances keep local economies alive.

Adaptive learning, a key component of the dynamics of resilience at all levels

People and the formal and informal institutions that govern their lives and livelihoods actively learn from events and experiences including complex emergencies as and when they struggle to adapt and reorganize themselves with the goal of maintaining 'normal' function. In the context of systems of health care provision, emergency responders including fire fighters, ambulance drivers, para-medics, health center, clinic and/or hospital emergency doctors, nurses, and others are exposed to situations of extreme distress and suffering while assisting emergency victim-survivors. Some of these are humanitarian agency personnel, both local and international. Unless there are mechanisms for the "institutional memory" for them to tap, mistakes already made by their predecessors are likely to be repeated, threatening the emotional and social integrity of emergency response teams. This is why our International Resilience Workshop – Talloires 2007 sought to open up the discussion between emergency response practitioners, researchers, and policy makers from representative disciplinary and sector backgrounds. The IFRC's model of good practice in building community resilience[21] had already provided grounds for optimism in this regard.

Similarly, efforts to galvanize the governments of United Nations members states to adopt resilience-

building strategies of disaster mitigation and response have made some progress, starting with a focus on school-based training in disaster preparedness. [22] The Hyogo Framework of Action 2005-2015 is not widely known in African health systems where the focus needs to be on maintaining effective health care services with contingency plans for disaster/emergency response. So far, the number of governments who have adopted and/ or piloted education programs designed to inform and train children, youth, as well as adult citizens in practical disaster preparedness and response strategies at the local level is limited. However, the concept of disaster reduction by building human and institutional resilience resonates with the aim of this special issue, which examines the paradigm shift from vulnerability to strength as presented in the lead article (Almedom). We welcome our readers' participation in this ongoing discussion.

Acknowledgements

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Resilience research and policy/practice discourse in health, social, behavioral, and environmental sciences over the last ten years.

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Abstract

Background: Resilience research has gained increased scientific interest and political currency over the last ten years.

Objective: To set this volume in the wider context of scholarly debate conducted in previous special theme issue and/or special section publications of refereed journals on resilience and related concepts (1998-2008).

Method: Peer reviewed journals of health, social, behavioral, and environmental sciences were searched systematically for articles on resilience and/or related themes published as a set. Non-English language publications were included, while those involving non-human subjects were excluded.

Results: A total of fifteen journal special issues and/or special sections (including a debate and a roundtable discussion) on resilience and/or related themes were retrieved and examined with the aim of teasing out salient points of direct relevance to African social policy and health care systems. Viewed chronologically, this series of public discussions and debates charts a progressive paradigm shift from the pathogenic perspectives on risk and vulnerability to a clear turn of attention to health-centered approaches to building resilience to disasters and preventing vulnerability to disease, social dysfunction, human and environmental resource depletion.

Conclusion: Resilience is a dynamic and multi-dimensional process of adaptation to adverse and/or turbulent changes in human, institutional, and ecological systems across scales, and thus requires a composite, multi-faceted *Resilience Index (RI)*, in order to be meaningfully gauged. Collaborative links between interdisciplinary research institutions, policy makers and practitioners involved in promoting sustainable social and health care systems are called for, particularly in Africa.

Key words: Adaptive learning, Disaster mitigation, Human resilience, Resilience Index, Social-ecological resilience, sustainability of human and natural resource management systems.

Introduction

An overview of recent developments and current direction of international research and policy discourse on resilience is presented here with the aim of setting this volume in the wider context of ongoing discussion and debate among scholars, policy makers, and practitioners.

Method

Multiple systematic searches were conducted to identify peer-reviewed journal articles published as sets belonging to special theme issue volumes and/or special sections of journal volumes on resilience and related terms in the human, social, behavioral, and environmental sciences. No limits were set on languages or dates of publication, but those reporting on non-human subjects were excluded.

Results and Discussion

Fifteen journal special issues and/or special sections on resilience and/or related themes published over the last ten years were found and reviewed with a view to summarizing their salient points of direct relevance to African health care and social systems. All of these discussions and debates were conducted in the English language.[1-15] The analysis yielded a rich body of knowledge and shared insights among seemingly unrelated scholars and practitioners who have considered the concept of resilience from a wide range of perspectives, often with divergent aims and objectives stemming from their own individual/independent research and/or policy/practice priorities.

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Table: Public discussion and debate in journal special issue volumes or sections on resilience and related themes (1998-2008)

Journal (year) Title, Volume (pages) – Editor/s and Salient points of direct relevance to current African health research, policy, and practice (Ref)

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1. *Journal of Social Issues* (1998) Special Issue. Thriving: Broadening the Paradigm Beyond Illness to Health. Vol. 54 (237-425) – Issue Editors; Jeannette Ickovics and Crystal Park. Notes from the editors and 12 articles – three of which are most relevant.

   o Qualitative investigation and analysis enable researchers to hear and understand respondents' processes of meaning-making in context (Massey *et al.*);

   o Posttraumatic growth may be accompanied by "increased well-being, but distress and growth may also coexist. Degree of change produced by clinical intervention may be limited in scope, but there clearly are some ways in which the clinician may make growth more likely for the client." Growth is beyond recovery from trauma; positive change occurring in several domains and may be largely "phenomenal" (Calhoun & Tedeschi);

   o Armenia (a small nation that survived against the odds) embodies resilience at the level of individual, nuclear and extended family, community and state on account of its unique cultural and geo-historical characteristics. Child-rearing practices which foster pride in ethnic identity, social cohesion and social support promote and sustain resilience among Armenians at home and in the Diaspora (Karakashian).

2. *Journal of Social and Clinical Psychology* (2000) Special Issue. Classical Sources of Human Strength: Revisiting an old home and Building a New One. Vol. 19 (1-160) – Guest Editors: Michael McCullough and C. Rick Snyder. Editorial introductory and post-script pieces, and 8 articles – two of which are most relevant.

   o Hope – goals, pathway and agency thoughts – a measurably positive correlate of health in those with life-threatening disease (Snyder);

   o Self-control (the ability to alter the self's own states and responses) a strength (a limited, renewable resource) that operates like a muscle that is depleted after use but can be renewed by regular excercise and rest (Baumeister & Exline).

3. *American Psychologist* (2000) Special Issue. Positive Psychology. Vol. 55 (5-183) – Guest Editors: Martin E.P. Seligman and Mihaly Csikszentmihalyi. Editorial and 15 articles - two of which are most relevant. 17 responses to this Volume were published a year later (2001), Vol. 56 (75-90) including the Editors' reply. More debate followed in 2005, sparked by one article.

   o 'Mature adaptive defenses', best investigated longitudinally as they develop cumulatively over the life course; and can be strengthened by increasing social support as well as health promoting behaviors (Vaillant);

   o 'Positive illusions' or 'unrealistic optimism' and finding meaning in life delay progress of life-threatening infection – e.g., HIV (Taylor *et al*).

4. (2001) Section on Positive Psychology. Vol. 56 (216-238) - developed by Kennon M. Sheldon and Laura King. Editorial and 4 articles – two of which are most relevant.

   o Positive outcomes in spite of serious threats to adaptation or development. Resilience is ordinary and common, "Ordinary Magic" (Masten).

   o 'Realistic optimism' – tendency to remain positive based on what is known and accepting what is unknown or unknowable about the (challenging) environment; leniency – adoption of modest thresholds/expectations; hope and aspiration for positive experiences (Schneider).

5. (2005) Debate in response to Bonanno's article (2004) presenting resilience as the absence of PTSD; and hardiness, self-enhancement, repressive coping, positive emotion and laughter as some of the pathways to resilient outcomes – 5 Comments and author's reply. Vol. 60 (261-265).

o   Hardiness is a pattern of attitudes of commitment, control, and challenge to turn stressors into opportunities for growth; measured by the 65-item HardiSurvey III-R (Maddi);

o   PTSD symptoms should not be relied on for measuring risk and resilience - subjective impact and internal distress are not synchronous with functional impact; functional resilience needs to be investigated longitudinally using multivariate qualitative and quantitative methods (Litz);

o   Equating resilience with absence of PTSD is flawed; Holistic studies including a wide spectrum of psychopathology, resilience and adversarial growth and optimal functioning (salutogenic models of health and well-being) are called for (Linley & Joseph);

o   Resilience includes a family of life course patterns and processes of successful adaptation despite adversity (Roisman);

o   Resilience is an innate human psychological immune capacity (Kelley);

o   Above points taken, but the formula resilience = absence of PTSD remained in use (see for instance Bonanno *et at*, 2006).

6.   ***Journal of Clinical Psychology*** ·(2002) Special Issue. <u>A Second Generation of Resilience Research</u>. Vol. 58 (229-321) – Guest Editor: Glenda Wilkes. Introduction and 7 articles – all relevant.

o   A resilient family is a social system with cohesiveness, flexibility, effective and protective communication and meaning-making processes in spite of risk (e.g., neighborhoods of poverty and violent crime); a call for social policies designed to reduce ecological risks and individual level clinical practice that believes in and facilitates family resilience (Patterson);

o   Resilience in children and youth is a continuum ranging from defensive, adaptive and resilient elements (Rak);

o   Resilience is the capacity to overcome exposure to identifiable risk such as child abuse. Abused children grew up to be non-abusive parents on their own - without any external intervention (Wilkes);

o   Resilience is a complex dynamic trajectory along a continuum; should be studied from the subjects' perspectives within which (within-group) variation is to be expected (Morrison *et al.*);

o   Resilient college students with learning disabilities acknowledged their disability and focused on positive events to create an "aura' of success for themselves (Miller);

o   School administrators (high school and middle school Principals and others) can be educated to foster and promote resilience (Bosworth & Earthman);

o   Resilience and resiliency inquiry metatheory charts the paradigm shift from pathogenic to salutogenic – postmodern/spiritual – multidisciplinary thought in three waves: resilience as a phenomenon; a process; energy and motivation to reintegrate resiliently (Richardson).

7.   ***Brief Treatment and Crisis Intervention*** ·(2002) Special Issue. <u>Crisis Response, Debriefing, and Intervention in the Aftermath of September 11, 2001</u>. Vol. 2 (1- 104) – Editor: Albert Roberts. Editorial and 8 articles – three of which are most relevant.

o   Addition to the DSM-IV V code for uncomplicated post-traumatic stress responses would help to distinguish between normal human responses to traumatic events and PTSD (Roberts);

o   Educators and mental health service providers developed a participatory psychoeducational workshop including review and understanding of local resilience – adopted a competence-based instead of pathology-based approach to intervention (Underwood & Kalafat);

o   Post 9/11 mental health/debriefing services (in New York and Boston) tried to normalize reactions and promote social cohesion and support, resilience and self-empowerment (Miller).

8.   (2004) Section on <u>Disaster Mental Health</u>. Vo. 6: 130-170 – no editorial, 4 articles – one of which is most relevant.

o   Evidence from Oklahoma city (post 1995 bombing and post 9/11) indicated optimism and community psychological resilience. This does not discount the need for mental health prevention and support systems (Pfefferbaum *et al.*).

9. ***Journal of Biosocial Science*** · (2004) Special Issue. <u>Mental Well-being in settings of "Complex Emergency"</u>. Vol. 36 (381-491) – Guest Editor: Astier Almedom. Overview and 8 articles – four of which are most relevant.

o Participatory research involving local and international academic and practitioner teams had positive therapeutic effect for Andean village communities in Peru (Snider *et al*.);
o Combining anthropological/qualitative data with psychometric instruments is essential for investigating youth mental well-being and coping in Palestine (Lewando Hundt *et al.*);
o Multi-dimensional diagnostic and plural healing systems operate among Mozambican refugees and South African host communities, calling for both clinical and social diagnostics (SASPI Team);
o Social support of the right type, timing and *level* mitigates war-induced anxiety and mental distress in Eritrea, an ideal site for the study of resilience (Almedom);

10. ***Journal of Loss and Trauma*** · (2004) Special Issue. <u>Risk and Resiliency Following Trauma and Traumatic Loss</u>. Vol. 9 (1-111) – Guest Editor: Matt J. Gray. No editorial, 7 articles.

o This collection of papers focused more on psychopathology, risk/vulnerability, PTSD and social dysfunction including 'cultural trauma' in Rwanda than on resiliency.

11. ***Psychiatric Clinics of North America*** · (2004) Special Issue. <u>Disaster Psychiatry: A Closer Look</u>. Vol. 27 (xi-602) – Guest Editors: Craig Katz and Anand Pandya. Preface and 12 articles – two of which are most relevant.

o Controversy over PTSD diagnostics in international disaster settings acknowledged and culture-specific mental health service capacity building (e.g., *Conselho* model) advocated for (Barron);
o Disaster-exposed populations including in New York post 9/11 are more resilient than imagined - based on their low rates of PTSD and indicators of functional stability – therefore low participation rates in [trauma] research may be expected (North).

12. ***Substance Use & Misuse*** · (2004) Special Issue. <u>Resilience</u>. Vol. 39 (657-854) – Guest Editors: Jeannette Johnson and Shelly Wiechelt. Introduction/Editorial, 6 articles, Selected Resources, Internet Resources and International Abstracts – three articles are most relevant.

o Resilience is a complex and dynamic process involving the individual, the event and the environment; listing universal 'resilience factors' is not that helpful because the factors are context-dependent and ordinary/common (Johnson & Wiechelt);
o Children of alcoholic parents followed up in a 30-year longitudinal study (in Kauai, Hawaii) who became 'competent' adult benefited from significantly larger sources of sustained support of caring adults than those with coping difficulties (Werner & Johnson);
o Ethnic pride promotes resilience among native Hawaiians (Austin).

13. ***Bulletin of the World Health Organization*** · (2005) <u>Round Table</u>. Mental and social health during and after acute emergencies: emerging consensus? Vol. 83 (71-76) Lead article by WHO personnel with comments from two prominent social psychiatrists (academic-practitioners).

o The lack of consensus on the public health value of the PTSD concept and the appropriateness of vertical trauma-focused services was acknowledged, and, social interventions and integrated services called for (van Ommeren *et al.*); Best therapy for acute stress is social - safety, family reunification, justice, employment, re-establishing systems of meaning (Silove); caution against "category fallacy" and assumptions that western (universal) interpretations will apply (Summerfield).

14. ***Global Environmental Change*** · (2006) Special Issue. <u>Resilience, vulnerability, and adaptation: A cross-cutting theme of the International Human Dimensions Programme on Global Environmental Change</u>. Vol. 16 (235-316)

– Guest Editors: Marco Janssen and Elinor Ostrom. Foreword, editorial, and 6 articles including one with a bibliometric analysis of the published literature by citation and author/co-authorship links; and another with a scientific research agenda on the above cross-cutting themes.

o   The links between the human and ecosystem dynamic capacity to adapt to turbulent changes, re-organize and/or transform to continue functioning (Folke); the need for research and policy to move from vulnerability to resilience through 'consilience' (Adger) are elucidated.

o   The impact of Holling's seminal work (1973) on current conservation and sustainability discourse has been phenomenal, along with Ostrom's (1990) in terms of subsequent resilience research of direct relevance to policy and practice implications for adaptive governance of the commons.

15. *Ecology & Society·* (2008) Special Feature on <u>Managing Surprises in Complex Systems: Multidisciplinary Perspectives on Resilience</u>. Vol. Guest Editors: Lance Gunderson and Patricia Longstaff 4 articles, three of which are most relevant.

o   While trust plays an important role in the effectiveness of communication of information needed to prepare for and cope with unpleasant 'surprises' in health and human security systems (such as pandemic flu, bioterrorism, or other disasters), 'unwarranted confidence' in one's own institutional and/or human capacity may reduce institutional resilience (Longstaff and Yang).

o   Human resilience as studied in developmental psychology has much in common with resilience science in ecology with particular reference to environmental catastrophes (Masten and Obradoviæ).

o   Socially cohesive social networks that sustain community resilience need to be structurally linked to macro-level resources and mechanisms to respond effectively to health and other emergencies. (Roderick and Roderick)

The majority of these scholarly discussions and debates demonstrate a concerted move away from the usual emotional/mental distress and trauma-focused psychopathology to a positive psychology of human strengths, encapsulated by the term resilience in its multi-faceted forms (see Table). During the second half of the 1990s, galvanized by the imminent close of the 20th century, psychologists and others had decided to take stoke and re-think prevailing assumptions and claims on the nature of the human capacity to adapt, and even thrive and/or grow in the face of adversity of different types and levels of magnitude. Viewed chronologically, this series of public discussions and debates charts a progressive paradigm shift from the disease-driven inquiries on risk and vulnerability to a clear turn of attention towards health-centered approaches to building resilience to disasters and preventing vulnerability to disease, social dysfunction, human and environmental resource depletion.

The *Journal of Social Issues* (1998, Vol. 54) put the topic of "Thriving" on the spotlight. At that time, the notion of post-traumatic growth (PTG) came as a refreshing change of subject from the then highly controversial diagnostic category of post-traumatic stress disorder (PTSD), particularly with respect to humanitarian policy and practice in non-western settings.[16, 17] Although the post-traumatic growth

inventory, PTGI, was originally developed and tested among American college students, and not disaster-affected communities, it was later successfully employed in a study of displaced people in Sarajevo, exploring the dynamic process of transformation and growth following recovery from the trauma of the Balkan war.[18] Karakashian's interdisciplinary analysis of the historical, geo-political, social and cultural dimensions of human resilience in Armenia, a small nation that had experienced collective trauma of genocidal proportions was featured in this volume; presenting interesting parallels with Almedom *et al.*'s study of human resilience in Eritrea (featured in discussion # 9, Table), another small country for whom human and institutional resilience, particularly in the extraordinary levels of adaptive learning and transformations that took place within the self-organized systems health care, education, and social affairs under prolonged conditions of war and displacement.[19]

The new millennium was ushered in with the publication of special issues of both the *Journal of Social and Clinical Psychology* (2000, Vol. 19) and *American Psychologist* (2000, Vol. 55) focusing respectively on human strength and positive psychology. These took the discussion on the nature of resilience a step forward by arguing that it is in fact not the (rare) phenomenon it was assumed to be, but in fact resilience is quite common,

an "Ordinary Magic". Between them, these two volumes explained the mechanisms whereby human resilience was demonstrated by self-control and mature adaptive defenses; and clarified the concept of hope as long-term goal-driven agency and pathways; a state of "realistic optimism" as perhaps more tangible than "positive illusions" or "unrealistic optimism" among those with life-threatening disease.

Views of resilience as an outcome identified by the absence of PTSD were challenged as simplistic and even misleading as the process of coping with trauma did not in fact preclude the experience of distress and narrative of trauma. As the debate continued in later issues of the *American Psychologist* (2001, Vol. 56; and 2005, Vol. 60), it became clearer that experiences of trauma and growth (vulnerability and resilience) were part and parcel of the same psychological dynamics of human adaptation to turbulent change, two sides of the same coin, as it were. Interestingly, the most recent systematic review, a meta-analysis of the question of acute distress and PTSD with reference to the response of Londoners to the bombings of July 7th 2005 came to the conclusion that "distress – a perfectly understandable reaction to a traumatic event – and post-traumatic stress disorder (PTSD)" should not be lumped together and medicalized… "Resilience is not about avoiding short-term distress – indeed resilient people include those who show their distress… "Resilient people may experience a period of distress and then recover with the support of their families and friends." [20]

Most helpfully, The *Journal of Clinical Psychology* (2002, Vol. 58) provided the most comprehensive and clearly articulated set of articles on human (developmental) resilience with reference to children, youth, and families as social systems. As Richardson explained, the paradigm shift from pathogenic to salutogenic thinking had happened in three waves: Resilience as a phenomenon; resilience as a process; and resilience as the energy and motivation to re-integrate. These may conveniently be summed up as the three 'P's: a phenomenon, a process and the power (of re-integrating) that resilient children, youth, and families demonstrate. It is interesting to note that this third wave resonates with the resilience thinking in social-ecological terms as well. [21]

These discussions and debates were clearly accelerated by recent international political, social and economic concerns and priorities to promote, build, and maintain resilience at all levels – as we are faced with global threats to the health, social, economic, environmental, and geo-political sustainability of human

lives and livelihoods. The practice-oriented journal *Brief Treatment and Crisis Intervention* (2002, Vol. 2) focused on what happened after the terrorist attacks of September 11th 2001 in New York City and in Boston. It became evident that the traditional forms of mental health services had adapted to the changed climate of positive psychology to the extent that competence-based (rather than pathology-based) approaches were promoted. The argument for tailoring mental health services to prevent the worst outcomes by enhancing systems of social support was put forward.

Meanwhile, the *Journal of Biosocial Science* (2004, Vol. 36) published a special issue on mental well being in settings of 'complex emergency' following a panel discussion held at the Society for Applied Anthropology's Annual Meetings in Portland, Oregon, the previous year. As the panel discussion was held on the day after the Iraq war began (March 20, 2003) questions on the levels of PTSD to be expected and the relevance of mental health services with reference to counseling and talk therapy; the uses and limits of psychometric scales for the assessment of metal well-being in the context of protracted conflict and/or post-conflict settings; the role of social support in promoting positive aftermath in the process of psychosocial transition in displaced families and communities were debated from the perspectives of anthropology, sociology, and medical/clinical practice. The theoretical and empirical (qualitative) ground work was laid for measuring resilience in settings of complex emergency using the sense of coherence scale short-form (SOC-13) adapted for use in nine African languages. [22]

In the same year, the practitioner-focused journal *Psychiatric Clinics of North America* (2004, Vol. 27), and *Substance Use & Misuse* (2004, Vol. 39) also dedicated special issues respectively on disaster psychiatry and resilience. Again, evidence of the global paradigm shift was growing in previously seemingly unrelated fields as researchers, practitioners and policy makers continued to take a fresh look with a long-term approach to solving problems in the new millennium. This development was echoed in the World Health Organization's Round Table discussion published the following year in the *Bulletin of the World Health Organization* (2005, Vol. 83). Since then, the Inter-Agency Standing Committee (IASC), a committee of executive heads of United Nations agencies, intergovernmental organizations, Red Cross and Red Crescent agencies and consortia of nongovernmental organizations responsible for global humanitarian policy established in response to United Nations General Assembly Resolution 46/182, has developed guidelines

for coordination of mental health and psychosocial support in emergencies. The guidelines were agreed and commended for adoption by all the parties concerned.[23]

Finally, the last two years have seen increased visibility of the Resilience Alliance's public scientific discourse on resilience documented in the form of a special issue and a special theme section of the two leading academic research journals, respectively *Global Environmental Change* (2006, Vol. 16) and *Ecology and Society* (2008, Vol. 13). The former has brought to the fore the equal relevance of human and natural systems in the dynamics of adaptation and social-ecological resilience as a basis for sustainability, while the latter has focused on disaster management with reference to 'surprises' of environmental and public health consequence, particularly with reference to human security.

The linkages forged between the interdisciplinary research undertaken by Almedom *et al*, and disaster mental health research and practice, as well as the core elements of developmental, positive, and existential sub-disciplines of psychology; medicine/psychiatry; and last but not least resilience science founded in ecology and environmental studies are depicted in the above Figure. Some of these circles embrace more ambiguity and/or paucity of data than others. For example, while there is no shortage of studies in clinical psychology and community medicine/psychiatry using PTSD or absence thereof as a measure of resilience, the development of psychotropic medication, "resilience drugs" designed to alleviate symptoms of acute distress in the aftermath of crises remains a cause for concern[24] and may continue to perpetuate ambiguity in international mental health policy and practice. While it may be justifiable for medical practitioners to prescribe pharmaceutical remedies for those experiencing what may be normal levels of acute distress in the immediate aftermath of crisis, such practice may inhibit normal processes of re-integration and growth. Dependence on medication may militate against resilience building sustainable solutions, particularly in African countries, which continue to face rapid depletion of their human and material resources, rendering their systems of health and social care less than viable. Conversely, the multi-disciplinary fields of ecology, conservation biology and development economics and anthropology seem to have clear theoretical grounds on which to proceed with assessing social-ecological resilience, but there remains paucity of data. The Resilience Alliance's Resilience Assessment Work Books which are currently being field-tested may soon generate

the data awaited by policy makers and practitioners seeking sustainable solutions to mitigate if not reverse the threats of climate change and rapid depletion of non-renewable resources coupled with ill governance and lack of accountability in the management of human resources.[25] This is painfully relevant to African communities, scholars, and health care practitioners whose trained and qualified young health workers continue to be attracted to jobs in western health care services upon graduation from highly respected African institutions such as Makerere University Medical School.

Resilience thinking would be expected to reverse this tide by first changing the mindset of both western governments as well as non-governmental institutions which are already undergoing economic and political transitions that present real opportunities for adaptive learning. Collaborative efforts of both western and African policy makers can result in mutual gains in the long term if active measures are taken now to retain African health professionals in African systems of social and health care. However, this cannot be done by individual countries' independent efforts, unless the "International Community" of leaders and policy makers also re-think the terms of engagement with African countries and their natural and human resources.

Finally, it is important to note here that an increasing number of popular books and agency reports have also advanced our understanding of resilience by generating public discussion and debate through mass media channels.[26-30] These are also timely and relevant to African health and social care systems analysis in its global context and are examined in a forthcoming publication.

Conclusion

Resilience is a dynamic and multi-dimensional process of adaptation to adverse and/or turbulent changes in human, institutional, and ecological systems across scales, and thus requires a composite, multi-faceted *Resilience Index (RI),* in order to be meaningfully gauged. Collaborative links between interdisciplinary research institutions, policy makers and practitioners involved in promoting sustainable social and health care systems are called for, particularly in Africa.

Acknowledgements

Figure: An interdisciplinary overview of resilience research in the interface between disaster mitigation/response, human development, sustainability of social-ecological systems, and human security.

Resilience: a multidimensional process of adaptation

Theory, Method, & Evidence from
❖ Medical Anthropology & Sociology
❖ Social Psychology & Psychiatry
❖ International geo-political history and economics

Empirical/primary evidence from Africa (Eritrea, Niger, Tanzania) and New Orleans, Louisiana, USA
(Almedom *et al.*)

Clinical Psychology & Community Psychiatry
• PSTD-free = Resilience (?)
• "Resilience drugs" (?)

Developmental Psychology
Resilient kids ➔ youth
Resilient adults

Psychology & Social Work
○ Substance Misuse
○ Abused child
Non-abusive parent

Existential Psychology
○ "Hardiness"

Positive Psychology
○ Adult Subjective well-being (SWB)/happiness studies
○ Hope studies
○ Mastery, Thriving, Post-traumatic Growth

Ecology, Conservation Biology, Economics & Anthropology

Resilience Alliance - focusing on *sustainability* of coupled social-ecological systems across scales without hierarchies.

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Resilience among first responders

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Abstract

Background. Emergency rescue personnel can be considered a "high risk" occupational group in that they could experience a broad range of health and mental health consequences as a result of work-related exposures to critical incidents.
Objectives. This study examined the resilience factors that protect mental health among first responders.
Methods. Nine hundred and sixty-one first responders filled out an on-line questionnaire, containing measure of sense of community, collective efficacy, self-efficacy and work-related mental health outcomes (compassion fatigue, burnout and compassion satisfaction).
Results. First responders reported high level of compassion satisfaction and low level of burnout and compassion fatigue. Compassion fatigue was predicted by self-efficacy, burnout was predicted by self-efficacy, collective efficacy and sense of community, compassion satisfaction was predicted by self-efficacy and sense of community. **Conclusions.** Resilience following critical events is common among first responders. Self-efficacy, collective efficacy and sense of community could be considered resilience factors that preserve first responders' work-related mental health.

Introduction

There is considerable evidence on psychopathologic effects of trauma victims. In the last decades there has been a paradigm shift from pathogenesis (etiology of disease) to salutogenesis (origins of health) in the conceptualization of functioning following trauma[1]. The resilience literature best represents this paradigm shift. Traditionally resilience literature focused on childhood development and on adolescence development. However in the last years the resilience studies has considered the adulthood, mainly in the face of loss or potential trauma. Bonanno[2] defined resilience as the "ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event, such as the death of a close relation or a violent or life-threatening situation, to maintain relatively stable, healthy levels of psychological and physical functioning". On the other hand Almedom and Glandon[3] cast doubt upon the equivalence of absence of symptoms of post-traumatic stress disorder with evidence of resilience and proposed that sense of coherence construct "may give a fuller understanding of the complexity of resilience, a dynamic steady state that cannot be measured in isolation from its context of generalized resistance resources, including social support". During the International Resilience Workshop - Talloires 2007, resilience was examined using a holistic approach that embrace both a pathogenic and a salutogenic (health-centered) perspective as two ends of a continuum.

The resilience research suggests two key points. First resilience had recently been recognized as a common human response to potentially traumatic events[4]. Second there are multiple resources, both at the individual and at the environmental level, which could foster adaptation in face of challenge[5].

More recently, the concept of resilience has been applied to first responders: people whose job entails being the first on the scene of an emergency, such as firefighters, paramedics or police officers. First responders are exposed to potentially traumatic events as part of their duty such as accidents involving children, mass incidents, major fires, road traffic accidents, burns patients, violent incidents, and murder scenes. These events are named critical incidents in that may be any event that has a stressful impact sufficient enough to overwhelm an individual's sense of control, connection and meaning in his/her life. Evidences showed that proximity, duration, and intensity of exposure are the most significant predictors of first responders' physical and mental health symptoms[6]. The literature focused on negative outcomes such as traumatic stress symptoms[7,8,9], secondary traumatic stress or compassion fatigue[10,11] and burnout[12,13]. Finally, research findings showed that critical incident exposure and rates of general psychopathology were higher among first responders in South Africa compared to the Sweden and the United States[14].

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In this research area the resilience concept has been useful for three reasons. First, exposure to critical incidents, involving death or life threatening injury, is potentially an integral part of the job for emergency services personnel. First responders can be considered a "high risk" occupational group in that they could experience a broad range of health and mental health consequences as a result of work-related exposures to critical incidents[6]. Thus, it is appropriate to investigate resilience in this population.

Second, traumatic stress, compassion fatigue and burnout are not the only possible emergency work-related outcomes. For example, research findings evidenced that emergency ambulance personnel reported positive post-trauma changes (posttraumatic growth) as the result of the experience of occupational trauma[15]. Stamm[16] introduced the concept of Compassion satisfaction, defined as the benefits that individuals derive from working with traumatized or suffering persons. These benefits include positive feelings about helping others, finding meaning in one's effort and challenges, fulfilling one's potential, contributing to the work setting and even to the greater good of society, and the overall pleasure derived from being able to do one's work well. Thus, the psychological consequences of emergency work are not only negative but even positive. This is a very important point in the resilience literature since resilience is more than absence of negative mental health[3] and encompasses positive aspects and consequences of potentially traumatic events[17]. In fact, resilience could be considered "multifaceted construct are drawn from both the salutogenic and pathogenic camps as well as the interface between the two"[3].

The third reason is related to the identification of the personal and environmental resources that promote positive adaptation in face of critical incidents. Scientific research has focused increasing attention on predictors of potential negative consequence of emergency work resulting from exposures to critical incidents[6]. However, much of the attention on predictors of psychological consequences of critical incidents has been focused mostly on risk factors such as degree of exposure, peritraumatic distress, peritraumatic dissociation, presence of subsequent stressful life events, identification with the victim and hostility7,[18,19,20,21]. By contrast, the resilience field address the role of protective factors in predicting positive adaptation in a risk population such as first responders.

Research findings evidenced that resilience factors are located on individual and contextual resources[5].

Among individual factors, previous researches showed that self-efficacy is an important factor in reducing levels of distress[22,23] and it is associated with lower levels of traumatic stress symptoms and depression in firefighters[20,24,25]. Cognitive mastery of an event has been found as frequently used by first reponders[23]. Efficacy beliefs pertain to the individual beliefs in one's own capability to exercise some measure of control over in one's own functioning and environmental events[26].

Efficacy beliefs are not only related to the individual level but even at the collective level. Collective efficacy refers to what people choose to do as a group, the effort they put into it and the perception of the group's ability to accomplish its major tasks[26]. Emergency rescue work, owing to its characteristics, requires working collaboratively and in a coordinated way as a group: no first responder can be effective working alone without making reference to an organization. As a consequence, the expectation of success influences the outcome of the performance, as it shapes the way group members react to critical incidents. In this perspective, perceived collective efficacy predicts job satisfaction and well being[27].

Besides organizational level, we want to point out that first responders' occupation is aimed at protecting the local area, at alleviating suffering (and saving lives) of individuals and groups, which may belong to their own community. Thus, first responders' sense of community, which includes, according to McMillan and Chavis's model[28], dimensions like feeling of belonging and emotional connection with the community, perceived influence over it and perceived opportunities for satisfying one's needs through such belonging, may be particularly important for rescue personnel, and may constitute a protective factor. The construct of sense of community has been investigated in this population (in particular, fire fighters)[29]. In their study sense of community was related to low level of distress and high level of satisfaction. However, in such research, the construct was examined at the organizational level as the perception of belonging to a community of co-workers.

This study aims at investigating first responders' resilience factors. We therefore expect that self-efficacy, collective efficacy and sense of community could be related to less negative outcomes and to more positive outcomes both related to rescue work.

Departing from previous research on resilience, in the assessment of health outcome a decision was taken to focus not only on posttraumatic symptoms and on negative outcomes in a wider sense but to introduce an

additional assessment of positive consequences of rescue work.

Finally, given that the notions of sense of community and collective efficacy are widely discussed in the literature on mental health and social capital and/or social support, and there is evidence to show gender and age differentials, we assess the effect of age and gender.

Methods
Procedure
The present study employed a survey methodology, using a questionnaire. The instrument consisted an on-line questionnaire. To collect the data, the on-line questionnaire was posted on the webpage of the Emergency Psychology Group of the Faculty of Psychology of the University of Bologna (http://emergenze.psice.unibo.it/ricerca.soccorritori.html). Included was also a general introduction on the purpose of the research and a consent form to be signed as a precondition to proceed with the completion of the questionnaire. In order to obtain a wide representation of the different typologies of emergency work personnel in the Italian context, prior to the beginning of the study, which was conducted in Spring 2007, an e-mail message was sent to the webmasters of the principal Italian organizations of first responders (Fire fighters, Civil Protection, Emergency Intervention Services, Red Cross), at a national, regional and local levels. The mail included a presentation of the study and a request for collaboration by linking the questionnaire web page to their official web site to encourage their members to fill it. We considered the questionnaires completed within five months from the posting of the questionnaire.

Instrument
The questionnaire included the following areas:

Demographics: included were questions on gender, age and length of service.

Work related health outcomes were assessed by the ProQOL R-IV (Professional Quality of Life Scale. Compassion Satisfaction and Fatigue Subscales - Revision IV), including 30 items corresponding to three scales: Compassion Satisfaction Scale, Burnout Scale and Trauma/Compassion Fatigue Scale[16]. Participants were asked to specify how often, during the last month, they had experienced a series of emotional states. Responses were given on a five-point Likert scale, ranging from "never" (value 1) to "very often" (value 5).

The ProQOL was subjected to Factor Analysis procedures. A preliminary inspection of the descriptive statistics leads to discard seven items owing to unsatisfactory psychometric properties or cultural

inappropriateness for the Italian context. Factor analysis (method Principal axis factoring, Promax rotation, kappa = 4) was conducted on the remaining items. Visual inspection of the scree plot, ease of interpretation, and theory indicated that the three-factor solution was the best fit. The first factor ("*Compassion Satisfaction*") includes the items from the Compassion Satisfaction Scale and two items from the Burnout Scale (Variance explained = 22.18%) ($\pm$ =. 86); the second factor ("*Compassion fatigue*") includes six items of the Trauma/Compassion Fatigue scale and two items from the Burnout scale (Variance explained = 11.39%) ($\pm$ = . 80) and the last one ("*Burnout*") includes four items from the Burnout scale and two items from the Trauma/Compassion Fatigue Scale showing higher loadings on this factor than on the original scale (Variance explained = 5.35%) ($\pm$ = . 77).

Subscale mean scores were calculated by averaging across the specific items included into the three factors (see Table 1).

Sense of Community was assessed by the "Italian Sense of Community Scale"[30]. Response alternatives were on a five point Likert scale from "strongly agree" (value 5) to "strongly disagree" (value 1). An overall score of Sense of Community was created, after reversing the negatively worded items, so that higher scores indicated higher Sense of Community. Cronbach's alpha is .81.

Collective Efficacy was measured by the "Perceived Collective Efficacy for members of volunteering associations"[31], including five items. The instrument measures the extent to which members perceive their association or organization capable to face different situations and critical events occurring during their typical everyday activity. Response alternatives are provided on a five-point Likert scale from "completely agree" (value 5) to "completely disagree" (value 1). An overall score was calculated in such a way that higher scores correspond to higher Collective Self-Efficacy. Cronbach's alpha was .85.

Self-efficacy was assessed by the "Perceived Personal Efficacy for members of volunteering associations" [31]. The instrument includes 18 items, assessing the extent to which members of associations feel capable to face the challenges arising from their activity. Response alternatives are provided on a five-point Likert scale from "never" (value 1) to "very often" (value 5). An overall score was calculated so that higher scores correspond to higher personal Self-efficacy. Cronbach's alpha was .78.

Participants
The final sample included 961 first responders, 71.9% male and 28.1% female. Age ranges from 18 to

66 years ($M = 34.10$, $SD = 9.72$). They include fire fighters, Civil Protection volunteers, different categories of emergency medical service personnel (medical first respondents, medical technicians, paramedics, nurses, ambulance personnel, ambulance drivers). Length of service ranged from 0 to 36 years ($M = 9.36$; $SD = 7.40$).

Results

Men tend to show higher scores on sense of community [men $M = 3.66$, $DS = 0.50$; women $M = 3.56$, $DS = 0.49$; $t(933) = 2.75$, $p < .01$]. There are no gender differences on collective efficacy [men $M = 3.72$,

$DS = 0.87$; women $M = 3.74$, $DS = 0.81$; $t(915) = -0.24$, $p > .05$] and self-efficacy [men $M = 3.89$, $DS = 0.39$; women $M = 3.86$, $DS = 0.37$; $t(928) = -1.04$, $p > .05$].

Table 1 summarizes mean values and standard deviations for each variable and reports correlation coefficients. On average, our sample reported mean scores above the mid-range of the scale for the variables sense of community, collective efficacy, self-efficacy and compassion satisfaction. The mean scores for burnout and compassion fatigue were below the mid-range of the scale.

Table 1: Means, Standard Deviations and Zero-Order Correlates for Psychological Sense of Community, Collective efficacy, Self-efficacy, Burnout, Compassion Fatigue and Compassion Satisfaction.

	M	SD	1	2	3	4	5	6	7
1 Age	34.10	9.72	–	.04	-.03	.11***	.08*	.10**	.03
2. Sense of community	3.63	.50		–	.24**	.14**	.17**	-.04	.22***
3. Collective efficacy	3.73	.85			–	.16***	.18***	-.06	.15***
4. Self-efficacy	3.88	.38				–	.24***	.11**	.42***
5. Burnout	1.77	.63					–	.57***	-.15***
6. Compassion fatigue	2.04	.58						–	.08*
7. Compassion satisfaction	3.94	.57							–

Note. N range from 895 to 935. * $p < .05$, ** $p < .01$, *** $p < .001$.

Age is significantly related to self efficacy, burnout and compassion fatigue but not to sense of community, collective efficacy and compassion satisfaction. All the other correlations are statistically significant with the exception of the relation of compassion fatigue to sense of community and collective efficacy. The magnitude of the correlation coefficients is large for the relations between burnout and compassion fatigue and self-efficacy and compassion satisfaction.

In order to assess the predictive role of sense of community, collective efficacy and self-efficacy on the

three dimensions of work related health outcomes controlling for age and gender, three hierarchical multiple regression analyses were performed. According to Cohen[32], f^2 effect sizes of 0.02, 0.15, and 0.35 are considered small, medium, and large, respectively.

Table 2 shows the results of multiple regression analysis on compassion fatigue. The effect size for the second step multiple regression is small ($f^2 = .01$). Self-efficacy is the only significant predictor variable. Female sex and higher age predict compassion fatigue.

Table 2: Summary of Multiple Regression Analysis for Variables Predicting Compassion Fatigue (N = 899)

Variable	B	SE B	β
Step 1			
Gender[a]			
Age	0.21	.04	.18***
Step 2	0.01	.00	.12***
Sense of community	0.00	0.04	.00
Collective efficacy	-0.01	0.02	-.02
Self-efficacy	-0.15	0.05	-.10**

Note. [a] male = 1, female = 2; Step 1 $R^2 = .04$, $p < .001$; Step 2 $\ddot{A}R^2 = .01$, $p < .05$; * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3 presents the results of multiple regression analysis on burnout. The effect size for the second step multiple regression is between medium and small ($f^2 =$ .09). All the variables significantly predicted burnout scores. Female sex and higher age predict burnout.

Table 3: *Summary of Multiple Regression Analysis for Variables Predicting Burnout (N = 895)*

Variable	B	SE B	β
Step 1 Gender[a] Age	0.10 0.01	.05 .00	.08* .09*
Step 2 Sense of community	-0.13	0.04	-.10**
Collective efficacy	-0.08	0.03	-.14**
Self-efficacy	-0.35	0.06	-.21***

Note. [a] male = 1, female = 2; Step 1 R^2 = .01, $p < .01$; Step 2 $\ddot{A}R^2$ = .08, $p < .001$; * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4 shows the results of multiple regression analysis on compassion satisfaction. The effect size for the second step multiple regression could be considered quite large (f^2 = .28). Collective efficacy is the only non-significant predictor variable. Gender and age do not predict compassion satisfaction.

Table 4: *Summary of Multiple Regression Analysis for Variables Predicting Compassion Satisfaction (N = 897)*

Variable	B	SE B	β
Step 1 Gender[a] Age	-0.06 -0.00	.04 .05	-.05 -.04
Step 2 Sense of community	0.19	0.04	.17***
Collective efficacy	0.02	0.02	.03
Self-efficacy	0.62	0.05	.42***

Note. [a] male = 1, female = 2; Step 1 R^2 = .00, $p > .05$; Step 2 $\ddot{A}R^2$ = .23, $p < .001$; * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The present study addressed the protective role of sense of community, collective efficacy and self-efficacy on rescue work. The literature has focused extensively on the risk factors for traumatic stress symptoms following exposure to critical incidents. According to Almedom and Glandon[3] resilience following traumatic events is more than the absence of traumatic stress symptoms. This study investigated the protective factors of a more holistic measure of rescue work related health outcomes ranging from negative to positive indicators. Results showed that first responders experience a good level of satisfaction and low level of burnout and compassion fatigue as results of their job. Thus, this study showed that most of first responders are not affected by traumatic stress or burnout syndrome despite their exposure to critical incidents. It is likely that first responders could rely on personal and social resources in order to cope with critical incident stress. This study showed that personal and social resources could protect first responders' health. Furthermore we discovered that personal and social resources have a different impact on different work related health outcomes.

Overall, results of the study are consistent with our hypotheses, and with previous findings in the literature. More importantly, they provide additional information on aspects that have been insufficiently investigated, such as the role of sense of community and of collective efficacy. First responders' feeling of belonging to the community where they live and work is an important contributor to satisfaction and reduces burnout outcomes. This finding adds to previous research showing the important role of sense of community referred to the "community" of co-workers[29]. The importance of organizational factors, as measured by collective self-efficacy as a group, is in line with these results. However, collective efficacy does not predict compassion satisfaction. We underline that compassion satisfaction and collective efficacy are significantly related but this relation is not anymore significant when controlling for sense of community and self-efficacy. It is likely that collective efficacy could be more important for collective satisfaction than for personal satisfaction. The role of collective efficacy remains to be fully clarified by future studies. Furthermore, either sense of

community and collective efficacy are not related to compassion fatigue. Our interpretation is that organizational and community level variables could be considered as a distal variable that relates the more proximal determinants, such as self-efficacy, of compassion fatigue. The small effect size in predicting compassion fatigue indicates that there are other protective factors, such as hardiness, self-enhancement, coping strategies, social support and social network[2,5], that could explain more variability.

Compassion satisfaction (including positive feelings about helping activity), is strongly influenced by sense of community and self-efficacy. In this study, efficacy beliefs pertain to the individual beliefs in one's own capability to exercise some measure of control in one's own job while sense of community involve the ties that link rescue worker to the place where they live and work.

A perception of confidence in their job-performance abilities and a feeling of belongingness and attachment to a place could be beneficial in first responders in that they give a sense of control and of meaning in their job. Control and meaning are similar, respectively, to Manageability and Meaningfulness, two components of Sense of coherence[1], a construct used to assess resilience in Eritrea[33]. The finding concerning the protective role of self efficacy in rescue work confirms the results of previous studies[20,22,24,25].

Women tend to score lower on sense of community. The difference is minimal albeit statistically significant. Older first responders are different in terms of self efficacy beliefs: it is likely that efficacy is related to work experience. Female gender and higher age are significant predictors of burnout and compassion fatigue. The flinging of gender is in line with the literature on reactions to potentially traumatic events[4]. Higher age is related to higher burnout and compassion fatigue probably because it is a proxy of critical incident exposure.

Some limitations of the study should be acknowledged. First, the cross-sectional methodology employed in this study precludes any inference of causality. Second, in this study we did not employ qualitative methodology. According to Almedom and Glandon[3] resilience is a multidimensional construct that requires a combination of both qualitative and quantitative techniques to be examined satisfactorily.

The results of this study outline the need of interventions aimed at the promotion of resilience factors rather than the treatment of negative health symptoms. The research field on the efficacy and effectiveness of interventions for psychological distress

and post-traumatic stress disorder in emergency service personnel is still a controversial issue[34]. There is a need to take into account less formal strategies such as peer support or health promoting or preventing measures during the training programmes and throughout the course the professional life. In addition, our study reveals the need for increasing first responders' psychosocial competences (e.g., communication skills, decision making skills, team working, leadership competences, coordination, crowd management skills), besides technical skills. Such competences affect first responders' efficacy beliefs and, according to our results, might constitute important protective factors for their work related health outcomes. On this point, a model of non technical skills for members of at risk professions that is currently employed in training courses for emergency workers is NOTECHS model[35] including cognitive, behavioural and interpersonal/group skills that all emergency workers should have, in order to enhance the efficacy of rescue interventions, and by reflection, their resilience.

Given that prevalence of exposure and rates of mental health problems are higher in African first responders in comparison to European colleagues[14], we hypothesize that interventions aimed at promoting sense of community and self-efficacy beliefs may be more relevant to African countries.

To conclude, the results of this paper evidence the protective role of self-efficacy, collective efficacy and sense of community in emergency rescue work. First responders face, as part of their job, critical incidents that pose a threat to their mental health. However the results evidenced low scores of burnout and compassion fatigue and high scores of compassion satisfaction. We suppose that the presence of resilience factors may compensate for the risks that exist in emergency rescue work. We discovered that efficacy beliefs and sense of community have an influence on work related health outcomes, especially compassion satisfaction.

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Resilience in Post-Katrina New Orleans, Louisiana: A Preliminary Study

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Abstract

Background: Much scholarly and practitioner attention to the impact of Hurricane Katrina on the city of New Orleans, Louisiana has focused on the failures of government disaster prevention and management at all levels, often overlooking the human strength and resourcefulness observed in individuals and groups among the worst-affected communities.

Objectives: This preliminary study sought to investigate human resilience in the city of New Orleans, State of Louisiana, eighteen months after Hurricane Katrina struck the Mississippi delta region.

Methods: The Sense of Coherence scale, short form (SOC-13) was administered to a sample of 41 residents of Lower Ninth Ward and adjacent Wards who had been displaced by Hurricane Katrina but were either living in or visiting their home area during March 2007. Study participants were recruited through the local branch of the Association of Community Organizations for Reform Now (ACORN), a nation-wide grassroots organization whose mission is to promote the housing rights of low and moderate-income individuals and families across the USA and in several other countries.

Results: Those who had returned to their homes had significantly higher SOC scores compared to those who were still displaced ($p < 0.001$). Among the latter, those who were members of ACORN scored significantly higher than non-members ($p < 0.005$), and their SOC-13 scores were not significantly different from the scores of study participants who had returned home (including both members and non-members of ACORN).

Conclusions: The findings of this preliminary study concur with previous reports in the literature on the deleterious impact of displacement on individual and collective resilience to disasters. Relevant insight gleaned from the qualitative data gathered during the course of administering the SOC-13 scale compensate for the limitations of the small sample size as they draw attention to the importance of the study participants' sources of social support. Possible avenues for further research are outlined.

Key words: Hurricane Katrina, New Orleans - Louisiana, Resilience, Sense of Coherence.

Introduction

The government response to the Hurricane Katrina disaster which hit the Mississippi delta claiming many lives and destroying the city of New Orleans, Louisiana in August 2005 has become an ongoing story of delay and neglect which continues to generate both public and professional concern.[1-3] Yet for hundreds thousands of survivors whose lives were affected by the hurricane, the story is one of survival against the odds, as the displaced struggle to get by, and in many cases return to their original homes, neighborhood, and city.[2] As of August 2006, the had storm claimed 1,464 lives in Louisiana and left 135 missing.[3] During the brief period of August-September 2005, Hurricanes Katrina and Rita had caused an estimated $70-125 billion in property losses,[4] hence the emphasis on the economic consequences of these disasters, especially Katrina's.

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Naturally, after the initial post-hurricane mayhem and struggle to meet residents' basic needs, public and professional attention focused on the mental health concerns of the affected communities.

Researchers and practitioners flocked to New Orleans to investigate the psychosocial aftermath of the disaster; many identifying symptoms of post-traumatic stress disorder (PTSD), depression, and other conditions that called for expanded mental health care services. Understandably, the discourse on the mental and emotional needs of the residents of New Orleans took a pathology-focused approach. As one observer put it, the difficulties arising out of Hurricane Katrina's aftermath constituted a "recipe for suicide."[5] Clearly, the magnitude of devastation wrought by Hurricane Katrina had caused untold distress for hundreds of thousands of the inhabitants of the Mississippi delta region, and the city of New Orleans still remains the most visible justification for the need to develop and/or improve appropriate mental health care services, especially for the severely and chronically incapacitated. However, it is equally important to recognize that many of the

symptoms of anxiety and emotional distress reported in the wake of such disasters are part of the normal human response to the inordinate levels of stress that is often exacerbated by the loss of home and subsequent displacement. There is a need to pay equal if not more attention to the social and cultural, health-centered mechanisms that mitigate the worst effects of disaster-induced emotional and mental distress[6] in order to prevent chronic pathology, disability and dysfunction in individuals and their families and communities. Indeed, in the case of New Orleans, Lower Ninth Ward, the worst-hit, predominantly African-American parish, increased levels of both mild-moderate and severe mental illness were reported in the first few months after the disaster, but suicidal ideation had decreased significantly and there was evidence of resilience and recovery as measured by the post-traumatic growth inventory.[7]

The concept of resilience has been widely used across many disciplines in the social and bio-medical sciences, engendering numerous definitions of the term, often with corresponding methods and tools for its measurement/assessment, and it is clear that resilience is more than the absence of PTSD.[8] Moreover, resilience is more widespread than pathology and chronic trauma in the wake of disasters as the survival instinct drives positive adaptation.[9] This paper defines resilience as "the capacity of individuals, families, communities, systems and institutions to anticipate, withstand and/or judiciously engage with catastrophic events and/or experiences; actively making meaning out of adversity, with the goal of maintaining normal function" as presented by Almedom to the International Resilience Workshop – Talloires 2007.[10]

Stemming from Antonovsky's theory of "Salutogenesis" (origins of health) the "Sense of Coherence" scale short form (SOC-13) has been tested and validated in at least 33 languages in 32 countries.[11, 12] With respect to its application in Africa, the concept and corresponding scale have both been examined and adapted for assessing/measuring resilience in nine different African languages spoken in Eritrea.[13-16] This preliminary study of New Orleans is the first one to apply the SOC-13 scale in a post-disaster American setting.

This study was planned and executed in consultation and collaboration with the local branch of the Association of Community Organizations for Reform Now (ACORN). ACORN is a nationwide American grassroots organization whose mission is to promote the rights of low- and moderate-income individuals and families across the United States of America and in several other countries. ACORN national and local staff led by Mr Wade Rathke advised and actively collaborated with the third and first authors through telephone and e-mail discussions lasting several weeks in early 2007; and facilitated the first author's fieldwork during March 2007.

As its operational headquarters of ACORN happened to be in the city of New Orleans anyway, ACORN was prompt to help local homeowners (both members and non-members) in the wake of Hurricane Katrina. ACORN's disaster response efforts in New Orleans were and continue to be extensive and comprehensive, including for example, mobilizing 15,000 volunteers to help preserve over 2,500 homes; providing lawn maintenance for displaced residents so that they can avoid city fines; launching a lead paint remediation program; organizing a "human levee" along the Monticello Canal to demand fair flood protection for city residents; redeveloping nearly 150 homes in low- and moderate-income neighborhoods and assisting with small, short-term home rehabilitation projects; and advocating for various legal and policy measures to protect homeowner rights and increase financial assistance to displaced residents.[17]

The data analysis and interpretation phase of this study was strengthened by the deliberations of the "International Resilience Workshop – Talloires 2007" convened at Tufts University European Center in Talloires, France. The workshop participants' interdisciplinary and cross-sector discussions of definitions, determinants, and indicators of human, ecological, and institutional resilience helped the first author develop his thinking on the capacity of local community organizations to adapt their normal functions to respond to disasters of Hurricane Katrina's magnitude, and their role in promoting individual and community resilience. Indeed, the ACORN website had featured a *Los Angeles Times* staff writer's article about the Lower Ninth Ward in March 2007 in which the writer quotes Nilima Mwendo, a former resident, researcher, and community activist's analysis and observes that "resilience and a particular community closeness" grew out of isolation and neglect [of the Lower Ninth Ward].[19]

Participants and methods

The SOC-13 scale was administered to 41 residents of the city of New Orleans who were displaced by Hurricane Katrina and had either returned and were permanently living in, or only visiting New Orleans during March 2007. About half of the study participants were approached when they came in to the ACORN office on Elysian Fields Avenue in New Orleans for their own reasons – ranging from attending meetings to

seeking information or help. The rest of the study participants were visited at their place of residence by first author accompanied by an ACORN staff member.

Twenty of the participants were residents of Lower Ninth Ward and the rest had lived in the 8th Ward (6), the 7th Ward (5), the Upper 9th Ward (3), the 3rd, 6th, 12th, Bywater, Algiers, and Gentilly wards (6). The age range of study participants is 24-85, averaging 53.34 ± 12.98 (Mean ± SD) years. Over half of the respondents are female, and the majority of those who responded to the SOC-13 scale in their home locality were men, as they were more frequently outside working on construction and/or repair of their houses, or talking with neighbors. All of the respondents reported being displaced from their homes as a result of Hurricane Katrina. Seventeen respondents (41.5%) reported that they had returned to their homes permanently, while twenty-four (58.5%) said they were still displaced, housed in temporary accommodation either in Federal Emergency Management Agency (FEMA) trailers (mobile homes), in the homes of family or friends, or some other dwelling. Of the twenty respondents from the Lower 9th ward, sixteen (80%) were still displaced. Nineteen of the participants were active members of ACORN.

The SOC-13 was administered in the English language by the first author who described the study as outlined in the Informed Consent Form (ICF) for participants to sign following the approval of the ICF and SOC-13 by Tufts University's Institutional Review Board (IRB) for research involving human subjects. Out of a total of 57 people invited to participate in the study, 16 declined. Additional participant comments, questions and observations were recorded in a separate notebook as the first author engaged with the study participants before, during and after the administration of the SOC-13 scale. The adapted SOC-13 scale used in this study has already been included in earlier published articles for interested readers' reference.[15, 16]

Data analysis

The SOC-13 data were analyzed using the SPSS statistical software package, version 14.0 (Chicago, 2005). Independent samples two-tailed t-tests were used to test for equality of means to compare SOC scores by gender, ACORN membership, pre-Katrina residence in the Lower 9th ward compared to other wards included in the study, and whether respondents had returned home or remained displaced as a result of the Hurricane Katrina disaster. Potential associations between age and SOC scores were assessed using Pearson's correlation. One-way analysis of variance (ANOVA) was used to compare

SOC scores by respondent age category (below 49, 50-59, and 60+ years), pre-Katrina ward residence, and to examine effect of confounding variables. The second author participated in the statistical data analysis and interpretation.

Results

Sense of Coherence scores ranged from 24 to 64 (65 being the highest possible score), with an average score of 47.76 ± 1.56 (mean ± SE). On average, respondents who had returned home, however fragile their homes scored significantly higher than those who remained displaced: 53.41 ± 1.34 (mean ± SE) and 43.75 ± 2.16 (mean ± SE) respectively (p <0.001). ACORN members scored significantly higher when compared to non-members: 50.74 ± 1.84 (M ± SE) and 45.18 ± 2.34 (M ± SE), respectively. One-way analysis of variance (ANOVA) revealed a significant co-effect between membership in ACORN and extended displacement (F = 7.171, p < 0.011, df = 1). Post-hoc analysis showed that participants who were still displaced at the time of the study but who were members of ACORN scored significantly higher than displaced non-members on the SOC-13 scale (F = 5.165, p<0.005, df = 2 - see Figure 1). There were no significant differences in average SOC scores by age category, gender, or pre-Katrina residence in the Lower 9th ward compared to the other wards represented in the study.

Figure 1: Comparisons of mean SOC-13 scores for two nested social variables.
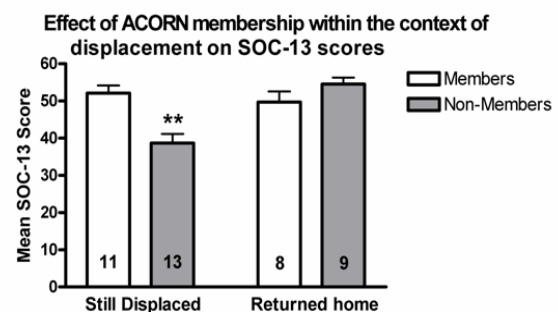
Analysis of SOC scores by sub-scale revealed that respondents scored significantly higher on "meaningfulness" (ANOVA followed by Tukey's pairwise comparison, F= 11.121, all p < 0.002, df= 2 – see Figure 2). "Meaningfulness" sub-scale scores of ACORN members averaged 4.42 ± 0.167 (mean $\pm$ SD) out of 5, which was significantly higher than the average of 3.95 ± 0.166 (mean $\pm$ SD) for non-members (two-tailed independent samples t-test, t=2.024, p<0.05, df =38.7). Participants who had returned home permanently had significantly higher "comprehensibility" and "manageability" scores than those participants who remained displaced/in temporary accommodation (two-tailed independent samples t-tests, t > 3.214, p< 0.003, df = 39 – Figure 2).

The three items of the SOC-13 on which respondents scored highest related to: i) whether they care about what is going on around them (item 1); ii) the clarity of their life goals and purpose (item 4); and iii) the level of meaning in their daily activities (item 12). The items receiving the lowest average scores across the sample were related to the feeling of being treated unfairly (item 5), being surprised by the behavior of people the respondent thought he or she knew well (item 2) especially during the evacuation from their homes when people were looking for places to stay, and having feelings inside they would rather not feel (item 9).

Respondents often mentioned the people, institutions, beliefs, or attitudes that helped them cope with the myriad stressors they faced when Hurricane Katrina hit in August 2005 and in its aftermath. The most commonly mentioned sources of strength and support were: religion, church, or faith; having a job, whether volunteer or paid; the act of helping others; family and friends; and relying on themselves.

Half of the respondents reported that faith in God was critical for helping them cope with the hurricane and its aftermath. Many people said that when things become aggravating, confusing, or depressing, they found solace in believing that there is, in fact, some greater design behind all the disruption and turmoil in their lives as a result of Hurricane Katrina. People commented that when they do not know what to do and cannot see a resolution to some of their problems, they just believe that God will help them find it. One woman commented on how her faith helped her cope with the problems generated by the Katrina disaster: "I prayed. I put it in God's hands, and I left it there…"

In many cases, families in New Orleans left the city and moved in temporarily with relatives elsewhere in the country while they tried to get back into a home

Figure 2: Comparisons of mean SOC-13 sub scores for all participants (A) and for the two significant social variables: B) ACORN membership status among participants; C) participants who had versus had not returned home at the time of the study (extended displacement).

Sub-score analysis
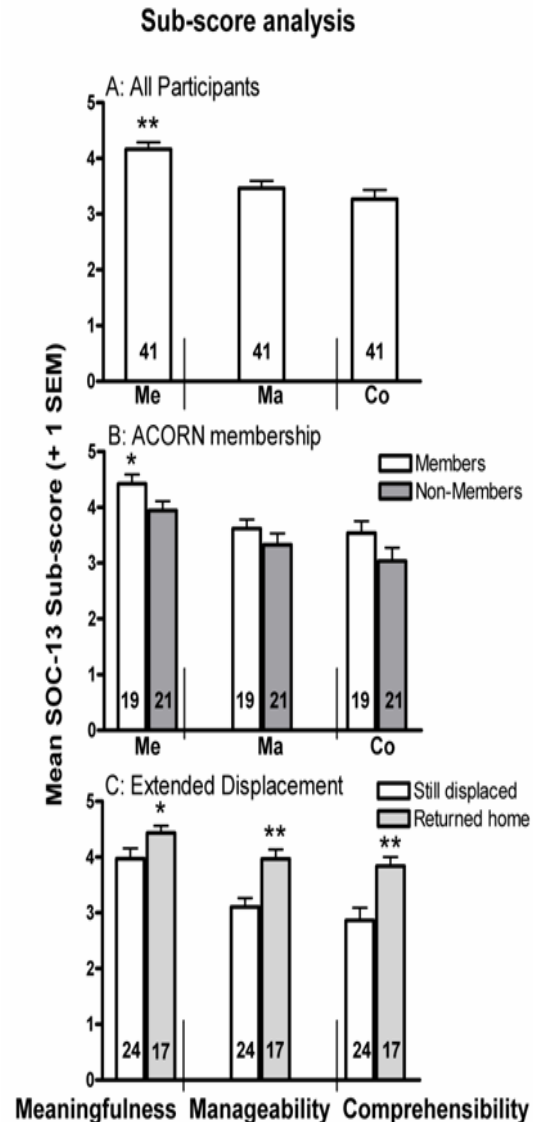
of their own. Family and friends were described as both a source of comfort and a source of surprise and distress. Particularly right after the storm, many participants were relieved when they found out their relatives and friends were safe and appreciated having them around to share resources or simply to commiserate. However, when discussing how they have been coping with the myriad snafus left in Katrina's wake, respondents commonly stated that they ultimately had to rely on themselves to deal with their problems. While most people appreciated having family members around, many echoed one woman's comment that "you can't always look to other

people to do things. You have to take initiative and do things on your own." Although these statements were sometimes delivered with a hint of bitterness, they usually conveyed a sense of pride and determination. Few participants provided specifics about their experiences living with their extended family but many offered simply, "you don't really know someone until you live with them."

Discussion

Reference to hurricane Katrina is still very much a mainstay of daily conversation in the city of New Orleans and the wider Mississippi delta region. While for many Americans "Katrina" has become a one-word expression of frustration with governmental ineptitude at disaster response and a reminder of the nation's persistent race/class divide, the term has a much more immediate and personal meaning for those whose lives and livelihoods were directly affected by the disaster. Many New Orleanians continue to struggle to find jobs, fulfill basic human needs for themselves and their families, rebuild their homes or find a new home, and seek hope and emotional solace despite a government-funded reconstruction effort that seems to view recovery more in economic than social/human terms.

While this is a preliminary exploratory study involving a small sample of respondents, it has yielded two important findings. Firstly, that long-term displacement has a deleterious effect on human resilience (Figure 1), which is consistent with previous research results from a different country.[15] These findings suggest that the home is an important asset for coping with adversity, as it is at the core of individuals', families, and communities, rootedness. Fillilove et al of the "Root Shock Institute" have argued that in the aftermath of Hurricane Katrina, "the need to reknit social connections at the level of the family, the neighborhood, the city and the region" is critical for the purposes of "mindful re-rooting" which involves "connecting every organization to every organization, ensuring that every citizen has the means to return home, engaging every citizen in envisioning the future", and making holidays and festivals an active part of recovery/healing.[20] With respect to New Orleans, the human cost of maintaining large displaced populations in temporary accommodation such as FEMA trailers should also be taken into serious consideration as government and non-government officials and city planners calculate the purely economic costs of rebuilding vulnerable neighborhoods.

For those participants who continue to be displaced the data presented above suggest that grass-root organizations like ACORN play a very important role in building and promoting community resilience. ACORN members had higher Sense of Coherence scores than non-members even when they were still displaced and in temporary accommodation eighteen months after the disaster. It should be noted here that ACORN extended its original mission in order to help the worst affected local communities recover from the disaster regardless of individual ACORN memberships. Further analysis of the social/interpersonal versus material benefits gained by ACORN membership is beyond the scope of this study, but the results presented do raise important questions for further investigation: What are the mechanisms whereby civic participation through ACORN membership increase individual and collective resilience mediated through increased social capital? How do those mechanisms build individual and collective capacity to anticipate, prepare for, manage, and recover from complex (natural and man-made) disasters like Hurricane Katrina?

The four most commonly mentioned factors that helped people cope were: faith in God; having a job, whether volunteer or paid; helping others cope; and having family and friends around. Association between these factors and psychosocial resilience has been documented elsewhere. Existing research documents the association between religion/spirituality and resilience to various adverse events such as stress-induced depression,[21] the death of a parent,[22] and coping with Hurricane Katrina specifically.[23] Consistent with the qualitative findings presented here on the participants' reports that having a job helped them cope with the aftermath of the hurricane, Almedom et al. (2005b) observed that women in Eritrea experienced satisfaction from their daily work caring for their children, possibly relating to the inherent sense of agency arising from that role.[16] Greenfield and Marks observed positive associations between psychological well-being and formal volunteering in a study of older adults experiencing role-identity absences (i.e. vis-à-vis a partner, job, or parenting).[23] Social support has also been documented as a source of resilience for various groups, including adult men and women,[24] adolescents,[25] and low-income families.[26]

The importance of faith for many participants may not be surprising given the historic prominence of the church in African-American communities[27] and the observed efficacy of "religious coping" in other studies.[28] This observation suggests that, for disaster-stricken communities with strong religious ties, providing access to places of worship or spiritual reflection may promote resilience. However, as the vast majority of respondents who mentioned faith as a coping mechanism described

their personal relationship or understanding with God and not their church or religion, per se, it may not be necessary to have a facility for each branch or sect of a religion practiced in the community. This reliance on spirituality, although not necessarily church membership, as a source of resilience has been documented previously amongst older low-income black Hurricane Katrina survivors.[22] In places where religious facilities have been damaged or destroyed, local officials should consider the provision of temporary interdenominational places of worship with local residents and religious organizations.

According to the accounts of the participants, the mechanisms by which having a job and helping others supported their resilience were similar. For each activity, respondents described a feeling of self-worth and meaningfulness that arose from having activities to do each day. Carrying out a specific task — paid or volunteer, for an employer or someone else — provided the doer with a sense of purpose and completing the task conferred a feeling of accomplishment. The individual's perceived agency in effectively responding to a disaster has been described elsewhere as one of the most important determinants of post-disaster mental health — more important than the type of coping strategies used.[7,29] Furthermore, many respondents stated that staying busy kept their mind off their own problems, thus averting some negative thoughts. This indicated the benefits of supporting local volunteer organizations, engaging members from the affected community in disaster relief efforts and finding employment for displaced community members. If affected residents can receive financial or in-kind compensation for their work in the rebuilding effort, they may gain the double-benefit of material and emotional support through such a program. Greater integration of local organizations into disaster relief efforts may also contribute to a heightened sense of agency, and thus more effective coping, within the affected population.

Another key finding from this study is that money is still important. Those who seemed to be coping the best tended to be the ones who were able to begin rebuilding without having to wait for money from the *Road Home* program, which provides up to $150,000 in compensation to Louisiana homeowners whose homes were damaged by Hurricanes Katrina or Rita. The program also provides loans and grants to rental property owners who offer affordable rates to home renters and various support resources for building professionals.[30] Although a variety of other sources of funding and assistance were available to hurricane survivors, the *Road Home* program was the only one mentioned by participants. Those who reported having sufficient savings before the storm to cover costs of most of the repairs upfront seemed more optimistic about recovering from the disaster. Many said they were hoping for government reimbursement but that ultimately they were going to get it done with or without support. Interestingly, these people tended not to make as many critical comments about the government or state that they had been treated unfairly. Ostensibly, having a little extra money and a lower perceived dependence on the government helped these people regain a sense of control and normalcy in their lives. As we seek ways to promote resilience in communities, we cannot forget the reality that disasters are often less painful for those with some extra cash.

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Exploring the Dynamics of social-ecological resilience in East and West Africa:Preliminary evidence from Tanzania and Niger

Strauch AM, Muller JM, Almedom AM

Abstract

Background: Social-ecological resilience refers to the dynamic process of adaptive learning, reorganization and meaning-making demonstrated in linked human, animal, and plant ecosystems often organized in formal and/or informal social institutions, as they anticipate, withstand and/or judiciously engage with adversity while maintaining function without fundamentally losing their identity.

Objective: To present two sets of examples that illustrate the complex ways in which *transformation* and *persistence*, two key aspects of the adaptive cycle may work together to preserve established patterns of human and/or animal uses of water resources and food plant species, in rural East and West Africa, respectively around the Serengeti National Park (Tanzania), and "Park W" (Niger), with the aim of identifying possible indicators of social-ecological resilience.

Methods: Selective combinations of ecological and anthropological, quantitative and qualitative methods, including participatory tools of investigation and analysis.

Results and Discussion: Our preliminary results are presented with minimal commentary and discussion in order to avoid hasty and/or unwarranted interpretation of the ongoing purposely iterative processes of investigation and analysis in the two study sites. Nevertheless we have identified a number of possible indicators of social-ecological resilience that may be tested in other localities in Africa and elsewhere.

Key words: Social-ecological resilience, Traditional Ecological Knowledge (TEK), Traditional Resource Management (TRM), interdisciplinary research, Sonjo, Zarma, Serengeti, Park W.

Introduction

This paper explores the notion of social-ecological resilience around two internationally designated conservation parks: the Serengeti National Park in Tanzania, East Africa, and Park W in Niger, West Africa. It was both instigated and informed by the deliberations of the participants of the International Resilience Workshop held at Tufts University's European Center, Talloires, France, during 2-6 July 2007. [insert link to IRW website here].

Interdisciplinary natural resource and economic ecologists use the term 'social-ecological system' in order to draw scientific scholarly research and public policy attention to the interdependence of human and non-human ecosystems in the context of rethinking 'sustainable development'[1]. There are practical implications of the arbitrary and often conceptually problematic delineation between social and ecological systems that limits researchers' and policy makers' understanding of "sustainability". Alternative systems of traditional ecological knowledge (TEK) and traditional resource management (TRM) warrant serious consideration and that interdisciplinary studies of linked social-ecological systems hold the key to unraveling their resilience: the capacity to absorb turbulence and continue to function without fundamental loss of identity[1]. In 1999, the "Resilience Alliance" was formed by a group of scientists and practitioners representing several disciplines and relevant sectors with the express aim of collaborating to explore the dynamics of social-ecological systems in order to examine key concepts of resilience (adaptability through transformation and persistence). Exploring social-ecological systems through the "resilience lens" is an innovative development in contemporary international scientific and policy discourse on the sustainability of human and non-human ecosystems – see http://www.resalliance.org/1.php for more detail.

Elsewhere, the study of human (psychosocial) resilience in the face of adversity wrought by conflict and displacement has been the focus of attention of a growing number of researchers and practitioners – see for example Almedom and Glandon[2] as well as Almedom[3] for an overview and analysis of the meaning/s and measurement/s of the construct. While recognizing the differences in meaning and purpose, the above-mentioned International Resilience Workshop sought to bring together diverse perspectives on resilience. This paper seeks to present preliminary findings on the possible indicators of the adaptive capacity of communities—the ability to learn flexibility under

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different conditions—that support their social-ecological resilience in sub-Saharan Africa[4]. Our first data set (Example 1) comes from the first author's field research that aims to:

- Understand traditional water resource management and its impacts on health (including the physical, economic and social components) in a semi-arid environment bordering the Serengeti National Park
- To survey water resource quality using qualitative and qualitative methods.
- To Spatially analyze the social institutions affecting water use, water resource quality for improving water resource development strategies.

The second data set (Example 2) is part of an ongoing field research undertaken by the second author with the following objectives:

- To survey local knowledge within the village of Boumba, Niger and document the indigenous use and conservation of wild resources;
- To verify the conservation status and representation of locally valuable plant species, gain knowledge of the effects of local harvesting on the border regions of Park W and evaluate current park management goals; and
- To determine maximum harvest levels and help guide sustainable land use policies for the park and its border regions.

Both of these ongoing field studies involve local stakeholders who are involved in the process of data gathering and on-site analysis at different levels, and are expected to use the study findings for the purposes of informing public health and conservation policy and practice at local, regional, as well as national levels.

Example 1: Samunge, Tanzania

The first author set out to determine if one social-ecological community, the Sonjo in rural Northern Tanzania, demonstrated some of these attributes. The Sonjo and the Maasai are the two dominant tribes that inhabit the region East of the Serengeti National Park—one of the principal tourism highlights in East Africa and the focus of intense ecological study. Previous work in the Serengeti-Mara Ecosystem has examined the potential vegetation regime shifts as related to elephants and fire that are both influenced by human-wildlife interactions[5]. However there is little information related to the usage of water resources in the surrounding communities and the potential interplay between water management and water-related diseases.

We used participatory techniques, including group discussions, seasonal calendars, household interviews, questionnaires, observations, and key-informant interviews to assess the utilization, management and influence of water resources on the largest and oldest of the Sonjo villages: Samunge[6]. This village is geographically varied, lying at the base of a valley and largely isolated from neighboring villages, external water sources, and communication. Water availability is confined to a few springs that feed seasonal rivers critical for sustaining communities and wildlife. Water resource quality in this region varies seasonally and geographically due to local geology and patterns of utilization by wildlife, livestock and humans. Water quality was determined by bacterial analysis using the QunatiTray® Colilert-18 method (IDEXX laboratories, Westbrook, ME, USA) to enumerate *E. coli* colonies[7]. The Sonjo were originally agriculturalists and have more recently adopted a number of pastoralist customs from their Maasai neighbors—in part due to the pressing need to diversify their resource use[8]. The initial settlement of Samunge, in the upper elevations, permitted year-round irrigation for all residents. Samunge was then resettled into the lower portions of the valley according to land-redistribution policies following Tanzania's independence. The Sonjo use a combination of traditional resource management practices and formal institutions to manage the environment that they so heavily depend upon for ecosystem services; including the protection of micro-catchment forests, equitable use of grazing lands and water resources[8,9]. Furthermore, they have developed various mechanisms that buffer the community against environmental variability, including livestock redistribution, water resource management, a pasture management system with seasonal communal and private grazing lands, strong social networks built around accepted norms of resource use, agricultural diversification and a forest management system that protects watersheds.

The adaptive capacity to adjust to changing environmental conditions has become ever more useful as increased population growth has forced the Sonjo to settle on lands beyond the original village and their traditional methods of management. To extend local protection of water resources, the Sonjo have developed social, spiritual, political and physical mechanisms based on TEK developed over generations that purport to reduce potentially contaminating behaviors and limit the consumption of and contact with poor quality water[10]. The *benamiji* (*mwenamjie* singular) are the original traditional water rulers that govern the protection of watersheds, water withdrawals for irrigation, and water use. However, the expansion of Sonjo into regions utilizing non-traditional water sources that are beyond

the control of *benamiji* has required the village council to establish a second set of water managers. Animals are perceived as the primary source of water contamination and it is customary to water livestock in the early afternoon—after water is withdrawn for consumption and used for laundry and bathing. Water users at each of the resources in the village also attempt to physically separate withdrawals along the stream based on their potential to contaminate the resource. The most benign uses, such as withdrawing water for household consumption, are furthest upstream (see Box 1). Social capital plays an important role in preserving these norms of use.[10] For this reason, livestock are watered as far downstream as possible before water is diverted for irrigation. Such a system reinforces the local concept of spoiled water. Women form strong relationships with each other while gathering water for the family, washing clothes and watering livestock. Relationships are also strong between long-time neighbors within sub-villages, clan members that share ancestry and age-cohorts from school. These relationships help to reinforce the temporal partitioning of water resources (see Figure 1) and are believed to reduce disease transmission by limiting activities that spoil water sources to downstream reaches (see Figure 2).

Example 2: Boumba, Niger

To understand how local botanical and ecological knowledge can inform global discourse on issues such as conservation and natural resource use, this study uses a participatory research framework in the context of the socio-ecological system surrounding the village of Boumba, Niger. This study aimed to examine how residents of the Boumba village conceptualize, value, use, and manage the plant resources that are found in the surrounding fields, woodland, gardens and the bordering Park W (see Figure 3).

The study site, Boumba, is located along the Niger River near where it is adjoined by the Mékrou, on the edge of the Park W boundary. The second author spent considerable time in this village and got to know the local healers, environmental agents, and village chief.

We defined the limits and the members of this socio-ecological system using participatory community analysis techniques. Based on the maps created during a community mapping exercise (Figure 3) the study area extended beyond political boundaries of the village to areas the community can access on foot or by local means of transportation and therefore view as a part of their resource base. Recognizing the contested nature of the term community[11] Boumba community members for the purposes of this study we re defined as self-identified long term residents and therefore represented a mix of ethnicities, histories, and demographics. For this paper, we will focus predominately on the village ethnic majority, the Zarma, as they figure most importantly in the discussion and identification of edible plant resources. As Almedom et al[6] advocate for a triangulation of methods in order to obtain complete and reliable information, a variety of methods including, key informant interviews, free-listing exercises, history line, seasonal charts and systematic walks, were employed to explore local concepts of plant resources.

Often called leaf eaters, Zarmas have a long-lived asset of TEK[12], which they use in their strategies for supplementing their diet to survive times of scarcity[13] and increase their income. Children supplement their diet with foraged nuts and seeds, mothers create meals out of weeds, and fathers build houses out of grass[14]. Although this sort of plant use is common throughout many subsistence communities in Niger and much of the world, locally Zarmas are known as experts of edible leaves. Their breath of knowledge of edible leaves and love for a dish featuring these edible leaves is recorded in Nigerien pop songs, traditional sayings and validated in our discussions with local residents of Boumba[15]. This group of plants is dominated by gathered plant foods, but often includes plants that are cultivated on smaller scales or are promoted through traditional resource management. So far little is known about the impact of human foraging on this region, even less about the impacts on Zarma TEK and culture as climate change continues to threaten to change the plant community compositions and habitat boundaries.

Results
Box 1. A schematic demonstrating the spatial partitioning of water resources among the various uses by villagers. Each subsequent use is believed to contribute to the contaminant load of the water. There may be physical barriers, such as logs or Acacia branches separating areas in the stream where livestock are watered from the other areas.

| Source | → | Household | Bathing/Laundry | Livestock | → | Irrigation |

Figure 1: Mean (±SE) time of water related activities as reported to have taken place during the day through interviews in Samunge, Tanzania. 61 different households were interviewed during May-June 2007 representing the geographic and demographic diversity of the village. If sunrise or sunset were reported, then 6:30am or 6:30pm was used, respectively. If respondents reported morning or midday, then 7:00am or 12:00pm was used. Local correspondents justified such values.
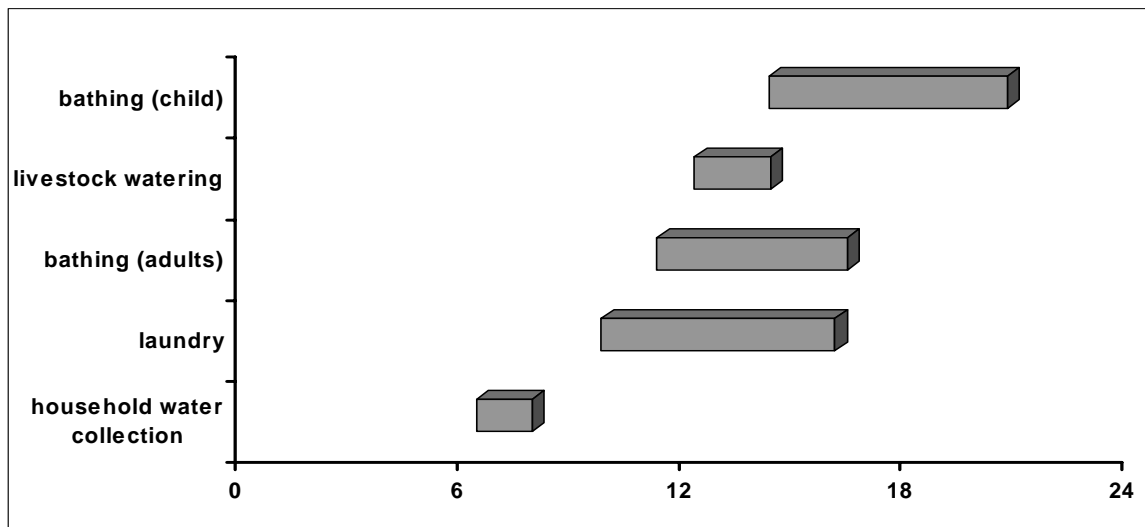

Figure 2. Mean (±SE) most probable number of *E. coli* colonies per 100 ml water sample taken upstream from where water is withdrawn for household consumption and downstream from where livestock are watered in July 2008 (N = 3). The Ngela watershed is traditionally managed by the *benamiji* and elected village leaders manage the other two watersheds. Adapted from Strauch et al.[11]
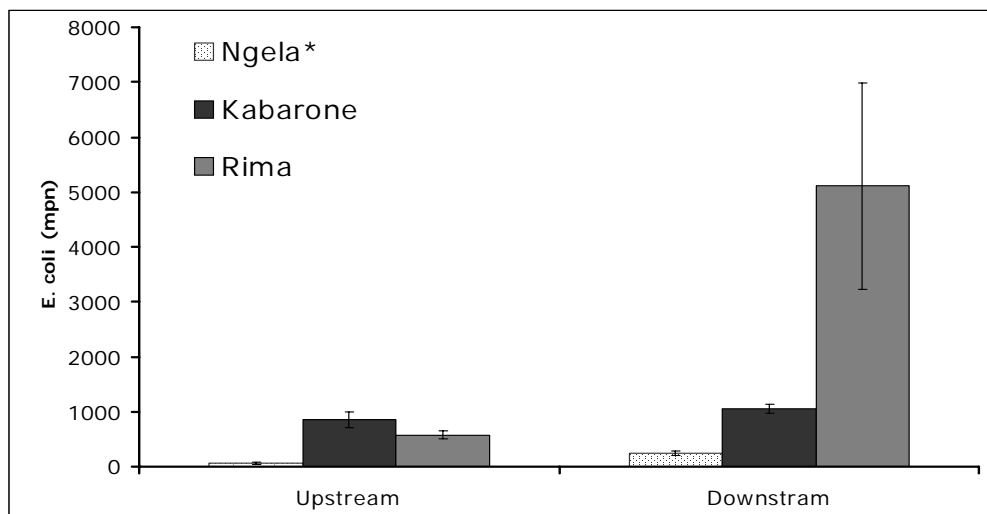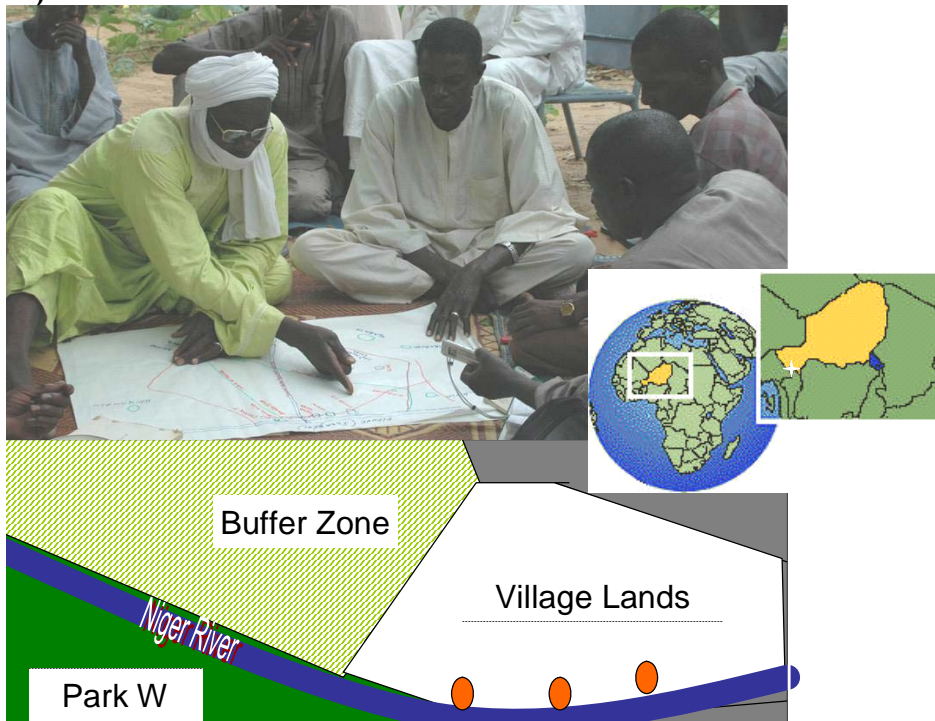
Figure 3: A schematic of the study site showing the placement of the Boumba settlements (orange) in relation to the three management zones: the park (green), the buffer zone (striped) and the locally managed lands (white). The schematic is based on maps created by local leaders and forestry agents (above).

Buffer Zone

Village Lands

Niger River

Park W

Box 2: Favorite Foods not Famine Foods: a resilient strategy[14]

Favorite foods not Famine Foods: A resilient strategy?

Hyp: "famine foods" should be a discrete and cohesive concept
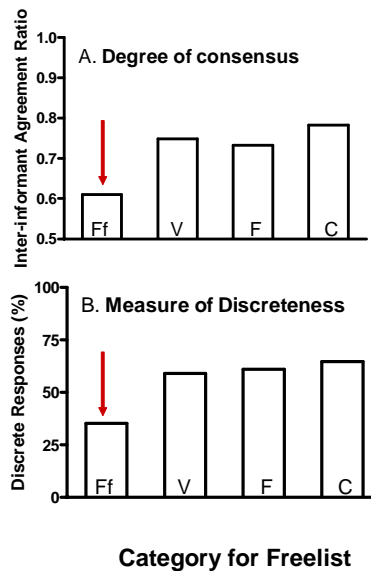
Results
- Not Cohesive: Lower Inter-informant Agreement Ratio
- Not Discrete: Fewer discrete responses

Explanation
- Incorporation of "famine food" resources into "favorite foods"

New Hypothesis
- When famine foods become favorite foods resilience to famine on a whole is increased

A. **Degree of consensus**

B. **Measure of Discreteness**

Category for Freelist

Discussion

Current sustainability research and resilience theory has proposed models which help us to understand what characteristics define resilient systems and how such systems move through the adaptive cycle, to gain or lose resilience. There have been many examples given to help us understand factors important in promoting resilience of ecological systems[16,17] or in sociological systems[18,19], but the evidence is lacking in the interaction of these systems. We used resilience concepts of stability and change to understand our exploration of local water resource management in Tanzania and of local famine foods in Niger.

Access to a clean water supply is an important part of rural life in East Africa and essential for maintaining good health and hygiene in arid and semi-arid environments[20]. Water scarcity exacerbates the health consequences of poor water quality and resource management. In a world of increasingly simplified systems, traditional resource management may have advantages over non-traditional techniques to manage the physical, social and biological dimensions of water resources[21]. The combination of political and social flexibility with traditional conservation policies demonstrated by the Sonjo has contributed to the region's social-ecological resilience. The Sonjo have transformed their system of resource management over the generations to meet the needs of a changing community which supports the argument by Holling et al.[21] that the inherent complexity and unpredictability of social-ecological systems can be best viewed from a co-evolutionary perspective. To predict local social-ecological resilience, the adaptive capacity of communities to cope with changes in water resource availability and water quality must be stressed, especially in the face of population growth and finite resources[4].

Climate change is expected to exacerbate current problems of water supply in sub-Saharan Africa[22]. It is likely that Samunge will experience an increased length in the dry season and at the same time, more severe rainfall[23]. These changes will exacerbate water supply problems in the region by lengthening dry periods and intensifying wet periods and determining if the Sonjo will be resilient to such changes is difficult. Households generally store enough water for three or four days of consumption, but if the natural water resources on which the Sonjo rely upon dry up, there may be serious consequences. Land that is irrigated produces a bountiful diversity of crops that may be harvested throughout the year and the loss of irrigation is likely to be devastating to the nutritional base. The Sonjo have already begun rainfed cultivation and increased livestock production in many regions. Heavy precipitation is already identified by villagers as reducing water quality by transporting fecal waste into surface water sources and increased rainfall intensity will only exacerbate water quality issues created by population growth.

While TRM in Samunge reduces conflicts over disparate water uses, the whole system is still vulnerable to catastrophic shifts. TRM currently reduces the contaminant load over non-traditionally managed water sources (see Figure 2), but as a greater proportion of the village relies upon non-traditionally managed resources, the village becomes more vulnerable to outbreaks of water-related diseases. Niamir-Fuller[24] argues that water-scarce social-ecological systems, such as the previously discussed example, are resilient until, "deforestation, over-cultivation and continuous grazing pressure simplify its structure and reduce its functional options." Increases in land clearing for cultivation, the expansion of fire to maintain grazing lands and a dependence on communal forest resources for fuel are slowly eroding local ecological resilience. Wildlife is now scarce, soil erosion is common and water resources are being stretched to their limit. A growing population is expanding cultivation and herds of livestock, possibly pushing the system closer to a new regime if formal or traditional methods of management fail to curtail their impact on the local environment.

With mounting concern over climatic changes, a system that is currently showing elements of resilience may be pushed over the threshold into a new, undesirable basin. The community's flexibility to adapt new political structures for managing water and land resources outside of the traditional institutions of control without changing it's fundamental identity demonstrates the potential adaptive capacity of the Sonjo[21]. The consequences of this system being pushed into an unstable or undesirable regime may be devastating to local wildlife resources. How the community responds to future perturbations will determine if the system collapses and reforms a new identity or if it there is enough flexibility for the system to stabilize.

Current investments in the development of water-related infrastructure in sub-Saharan Africa are predominantly limited to large-scale irrigation projects and municipal distribution systems in urban environments. This is primarily the fault of international non-governmental organizations that tend to focus on funding single large projects for development. Sustainable water resource development requires an integration of the drivers of change in social-ecological systems: the ecosystem, people and technology, local

knowledge, and property rights[1]. Mechanisms that help a community maintain normality when faced with perturbations to their social-ecological system increase that community's resilience. Small-scale investments in water infrastructure that complement current methods of resource management and permit the type of flexibility in use as needed by the Sonjo would be a better use of funds than the often proposed large-scale regional projects focused on irrigation.

In Niger, as in much of Africa, plant foods that are not among the top agricultural products, including edible leaves, are often referred to as "famine foods". With this label comes the assumption that such a category of foods is composed of plants harvested preferentially in times of famine. Our study sought to understand which groups of plants fall into this category. However, when we examined local understanding of this category of foods in Boumba, a community that routinely experiences food shortage, we found the local understanding to be not only different from what was published in the literature[26], but also did not match within itself[15]. In contrast to the literature, the plants listed by participants specifically excluded certain gathered plants and included several agricultural products both local and imported[26]. But at the same time there was a lower degree of consensus among participants as to what really is a famine food. Very few plants were listed exclusively as a famine food. Furthermore, the qualitative data indicates that many of these plants are not "famine foods" but favorite foods (see Box 2).

Social mechanisms such as favoring key "famine" resources in times of plenty can maintain stability by preserving the knowledge of that resource, promote its conservation in times of agricultural bounty and help people cope both physically and socially in times of food shortage[15]. Knowing a diversity of edible plants and their preparations helps women and their families survive periods of food scarcity. While depending on favored foods, during times of stress, may help to maintain the social fabric and promote resilience. By maintaining dietary practices that are often linked to social institutions, local knowledge of the value of biological diversity to famine survival is stored and used even outside of the context of famine[12]. This increases both the social and ecological resilience by allowing persistence of traditional practice to reduce the negative impact of sudden and/or turbulent transitions from times of plenty to times of scarcity. Furthermore, social mechanisms such as adapting to new crops can promote provide a level of dynamism also vital in maintaining resilience. Of the few discrete responses, a third were newer agricultural products or imports, e.g., cassava or corn. While this finding was originally unexpected because of the way wild plants are associated with "famine foods" in the literature it is not surprising when looked at from a social-ecological system resilience perspective. By associating themselves with both wild and cultivated plant resources, the Zarma are able to increase the diversity of food resources that they rely on, and thereby promote and preserve plant biodiversity. Most famine intervention programs seek only to supplement main calories, rather than promote the preservation of such networks of diversifying resource use. And when programs turn their eyes to the lesser-known plants, they seek to improve them and bring them into cultivation, rather than promoting preservation in the field. If we are to look at the system as linked, then cultivation becomes less important and diversity and stability of the whole social-ecological system through the role of supplementary resources[16] comes sharply into focus.

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What can emergency planners learn from research on human resilience?

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Resilience is a concept that is widely used in emergency planning and preparedness activities (e.g. www.ukresilience.gov.uk). Working definitions of resilience in infrastructure, systems and communities exist for the purposes establishing benchmarks for effective emergency response, however it is not clear to what extent these initiatives are informed by the broad and well-established research literature on human resilience. Efforts to define, measure and promote physical and psychological resilience can be identified in a number of diverse fields, including developmental and clinical psychology, anthropology, disaster management and the study of social-ecological systems. Resilience is often defined in studies of positive responses and coping in the face of challenging or traumatic events, or in the ability of communities to survive and thrive following disasters or emergencies. Recent research points to the importance of considering resilience in these terms, rather than simply as the absence of trauma in the face of tragedy. [1,2]

Research on human resilience has the potential to inform emergency planning in a number of important ways. By identifying those most prepared to withstand the impact of future events and by contrast those most vulnerable, provision of limited resources or capacity can be optimally designed for an effective and flexible response. Additionally, community-based interventions can be appropriately tailored to support restoration and promote recovery activities. A parallel literature on the provision for psychological support after traumatic events supports the importance of appropriate designing population-based interventions[3], advocating measured responses that include access to timely, practical support and the promotion of existing social networks as strategies to promote psychological resilience. [4,5] Public engagement in emergency preparedness activities provides another avenue for identifying and promoting resilience, both for emergency planners and responders themselves, and in the communities engaged in preparing for emergencies. [6,7]

Resilience research provides important insights into the personal, social and environmental conditions that can predict the presence or absence of resilience. It is increasingly acknowledged that planning assumptions concerning public responses to extreme events need to be challenged, and that evidence-based approaches are needed to inform preparedness activities. Whilst emergency planners will continue to have to prepare for the worst, efforts designed to identify the correlates of resilience in the systems and communities they serve can only inform and improve emergency response initiatives.

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Civil courage: Good people in an evil time, building and promoting resilience

Svetlana Broz

From the perspective of the continuing relevance of studying the efforts directed towards rebuilding a resilient community in the former Yugoslavia, and more specifically, Bosnia and Herzegovina, the experiences of a local non-governmental and non-profit organization are both valuable and relevant. Eleven years after the violence was ended by international intervention, the region still suffers many serious social ills. Life is incomparably more difficult now than at the outbreak of the war fifteen years ago. Despite the tragic fact that the violence was politically initiated and orchestrated, reconstruction efforts have often been designed along ethnic-nationalist distinctions, thus further engraving lines of social division between people. Social incoherence did not lead to the violence. But, it has become one of the tragic consequences of the war, the peace agreement that divided the country along ethnic-nationalist lines by constitution, and, to some extent, of many efforts for resilience and reconciliation.

As a result, large scale activities aiming for resilience have perhaps left the region less resilient than it was. What does this mean for the understanding of a resilient community and what can the experiences of a practitioner/an NGO contribute?

Civil courage: Good people in an evil time

Refusing to believe that nothing human existed amidst all the madness of war in Bosnia and Herzegovina and that society was destructing itself from within, I searched for the humanity behind the headlines. I started going to the war zones in January 1993—initially as a cardiologist determined to help at least one person lacking proper medical care because of the war.

But while providing care for the people of three major ethno-national backgrounds—distinguished as Catholic Croats, Muslim Bosniaks, and Eastern Orthodox Christian Serbs by nationalist politicians—I felt their need to open their souls and talk as human beings, without being judged about their fates in the war. From their short, spontaneous confessions in the cardiology ward, I understood their need for truth, which in places where bombs were actually falling, was surprisingly nuanced and refined compared to the dominant much more simplistic pictures of the Bosnian war zone.

I was told stories of individuals in Bosnia and Herzegovina who had the courage to stand up to crimes being committed against the innocent, even when they had no weapons to help them. These people served as genuine examples of the goodness, compassion, humanity, and civil courage that continued to exist in these times of evil. They broke free from the identity of the *bystander,* that person who chooses to look away, to ignore, and to silently accept the suffering of others. Instead, these human beings provided compelling examples of *upstanders,* people who stick to their moral convictions and norms, and demonstrate great civil courage through their acts, even in a situation as horrific as the Bosnian war. My book *Good People in an Evil Time* is a collection of 90 first-hand testimonies from people who survived the war, illustrating the ways in which anonymous people were upstanders.

Some people may dismiss these stories, believing that wartime examples of violent behavior reveal far more about human nature. I disagree. We must pay careful attention to these stories, because they hold up a mirror and require us to reflect on our own acts and behavior. They clearly demonstrate the possibility of choice, even in the most trying circumstances. When shared, these stories can therefore encourage more people to stand up and speak out against evil, and to act in accordance with their moral norms. The hundreds of interviews I've conducted, and the reactions from the tens of thousands of people with whom I have shared these stories, have repeatedly confirmed this idea. Indeed, I've found that imparting upstanders' actions can have the very real and enduring effect of inspiring others to follow their example.

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These examples of individual human resilience affecting the human community where external assistance was absent, have led me to found NGO GARIWO in Sarajevo. Its purpose is to teach young people about the individual's capacity to protect people of other faiths and ethnicities from crimes against humanity. It educates young people about the multiple acts of both kindness and courage that many people selflessly performed during the tragedy that befell Yugoslavia little more than a decade ago. Learning about those who stood up against mass hatred and atrocities in the worst of circumstances serves reconciliatory purposes, because it demonstrates the goodness of individual human beings and not the evil of socially constructed groups. Moreover, it helps the current youth here realize that they too have a choice. Either they keep quiet and accept things the way they are, or they decide to defy immorality and injustice for a better future.

The effects of the war that ended just over eleven years ago continue and social destruction will persist if not countered. Intolerance, ethnic division and impunity inspire hatred, fear and mistrust and impede the country's progress and development. This is why the primary focus of our program is to help people look forward, not back. Learning about civil courage inspires people to act. GARIWO therefore conjoins educational with civic activities in order to stimulate civil courage and enhance its effects. Its regional network of young leaders is continuously expanding and providing ever greater opportunities for (international) collaboration.

How does this contribute to the development of a *Resilience Index*?

The focus on good people, rather than on victims, perpetrators and ethnic-nationalist groups, aids confidence, social action and collaboration. As a result, raised awareness about individual, human, civil courage can be fostered. This builds resilience. Every act of civil courage serves as an example that restores faith in humanity and opens perspectives for social coexistence. In the end, all real positive changes in Bosnia and Herzegovina, and elsewhere, will depend on the individual who lives up to his responsibility to act against prejudice, bigotry, inhumanity and violence. This is the subject of civil courage, which is relevant not only in public emergency situations but also - of greater immediate relevance - in the moral challenges of everyday work and social life. It is also how, I believe, NGO GARIWO's objectives of and the testimonies of good people in an evil time can contribute to defining resilience, understanding the resilient community, and the development of a *resilience index*.

From trauma to resilience

Lene Christensen

The Psychosocial Support Program of the International Federation of the Red Cross and Red Crescent (International Federation) emerged in the early 1990s, at a time when an increasing number of National Societies realised that disasters may lead to both physical and mental problems and that the simple provision of shelter, food and medical care in many cases was not sufficient. Hence in 1993 the General Assembly recommended the International Federation to "give high priority to psychological support issues and strongly advocate the implementation of psychological support programs in National Societies" and to "secure adequate material and human resources to implement those programs" (General Assembly, IXth Session, Birmingham, 1993, Decision 26). The same year this recommendation resulted in the establishment of the IFRC Reference Centre for Psychological Support.

The mid 1990s saw a growing dissatisfaction with the traditional trauma-focused mental health interventions that were being implemented in the aftermath of disasters and conflicts. There was a growing realisation within the Psychological Support Program, informed by powerful critiques from Europe and the USA that conceptualising the suffering caused by natural catastrophes and conflicts primarily in terms of Post-Traumatic Stress Disorder (PTSD) or associated mental disorders was a hindrance to providing adequate support. Experience has taught that major accidents and disasters do not produce huge numbers of people with acute psychiatric disturbances. Psychological reactions can be considered "normal" in the context of "abnormal" circumstances"[1]. Whilst acknowledging that some individuals do require treatment of psychological disorders, the Psychosocial Support Program believes that the majority of the affected people have a need for

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information and have practical, social, emotional and psychological needs. This more generalised support will enable them to better access the material and social resources they seek.

Along with the critiques of the trauma approach, the mid 1990s saw the articulation of many alternative approaches to psychosocial intervention, which acknowledged people's capacity for resilience and aimed primarily to enhance and support this. Inspired by such examples, the Psychosocial Support Program attempts to develop interventions that address the social, emotional and material concerns of people in ways that strengthen their capacity to manage adverse circumstances or challenges to their well-being – within the limits of human, social and material resources of the communities in which they live.

Basic emotional support would normally be provided through existing social networks. In many cases, family, friends and neighbours offer a helping hand and a listening ear to survivors and their families in order for them to cope with their loss and grief. But in some situations, survivors may be physically separated from their communities or the community's ability to provide support may be seriously impaired. These situations require anticipation and a pro-active response of well coordinated multidisciplinary support. Psycho-social needs are likely to persist over a much longer time than the usual intervention period of emergency services. Local National Societies, through their networks of volunteers, have been and will continue to be essential in facilitating psychosocial support after critical events.

Psychosocial Support Programmes in the International Federation

The overall objective of the International Federation's Psychosocial Support Program (PSP) is to assist the Red Cross/Red Crescent Movement to create awareness regarding psychological reactions at a time of disaster or long-term social disruption, to set up and improve preparedness and response mechanisms at global, regional and local levels, to facilitate psychological and psychosocial support before, during and after disasters, to promote the resilience and thereby the rehabilitation of individuals and communities, and to enhance emotional assistance to staff and volunteers.

Definition

Psychosocial support is a process of facilitating resilience within individuals, families and communities. Through respecting individuals' and communities" independence, dignity and coping mechanisms, psychosocial support promotes the restoration of social cohesion and infrastructure.

Within this framework the Reference Centre for Psychosocial Support (PS Centre), housed by Danish Red Cross in Copenhagen, works to achieve these. The main activities of the PS Centre include 1) documentation and dissemination, 2) capacity building in National Societies, and 3) operational assistance to international programs.

Through its work with National Societies throughout the Red Cross and Red Crescent Movement, the PS Centre promotes a community-based approach to promoting resilience and strengthening coping mechanisms within individuals, families and the wider community. Examples of community-based PS activities that have seen to be effective at times of crises are:

- Supporting the return to school, work, normal daily routines
- Play and recreational activities
- School-based programmes
- Children and youth clubs

- Religious and cultural ceremonies (and the facilities for these)
- Community sensitization to increase awareness on psychological reactions to critical events
- Drama, art, cultural activities
- Livelihood oriented activities and life-skills training
- Supporting families to function
- Supporting those who support others

In relation to the International Resilience Workshop in Talloires the PS Centre, through its representative, hopes to be able to contribute to the on-going work of developing a Resilience Index. Being on the practical end of implementing programs to restore psychosocial well-being, we are especially interested in the process of 'translating' psychological states into effective programmes that will make changes in the lives of beneficiaries.

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Developing and measuring resilience for population health

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Much research and writing about resilience focuses on extraordinary situations, which has two advantages. First, that acknowledges the depths of human suffering as well as the human capacity to survive despite extreme adversity, with some amazing individuals who are able to thrive or excel in the most shocking or dreadful situations. Second, for research purposes, extreme situations are often the most clearly defined, which helps with conceptualising, theorising and measuring. However, there are disadvantages. Human suffering, trauma and disruption can all suddenly affect people whose lives were previously stable and contented; so resilience needs to be 'everybody's business,' not an issue of concern for just a few. Suffering is also a very personal experience. Whilst health, social and economic inequalities create conditions where considerable resilience is needed, neither wealth nor absence of disease will guarantee happiness, social or mental well-being.

The late epidemiologist, Geoffrey Rose, pointed out that, although health needs may cluster in areas of disadvantage, they are widely distributed throughout the population[1]

To focus only on the most 'at risk,' would miss the majority of need in the population as a whole. This, it seems, also applies to resilience. The whole population has a need for resilience, even if it surfaces with the greatest clarity in times of high risk or suffering, so we need to understand mechanisms for developing resilience that are common to the whole population.

Rutter[2] offers a useful starting point when conceptualising resilience, which is that for all kinds of difficult circumstances people respond in a vast assortment of ways. Some succumb to pressure and others manage successfully in the most difficult of circumstances. Moreover, an individual's responses are not fixed or immutable, but dynamic and contextual; that is someone may react badly in one situation but cope well in another. Context and process are both central to studies of resilience, with resilience being defined as a:

- "a process or phenomenon reflecting positive child adjustment, despite conditions of risk." (page 10)[3] or
- "the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances" (page 426)[4].

Embedded within the concept of resilience are two component constructs: *risk* and *positive adaptation*[55] These lie at the heart of assessing resilience, which as a process cannot be directly measured, but needs to be inferred on the basis of these constructs. Positive adaptation points to outcomes that are better than would be expected following occurrence of the risk factor being studied. Garmezy[6] described three major categories of *protective factors* that would contribute to this adaptation. These are individual attributes, such as intellectual abilities, positive / optimistic outlook, high self esteem, family qualities, such as warm, caring and consistent parenting, family cohesion, positive expectations and involvement in family life and supportive systems outside the family, such as robust social networks and high-quality schools.

Such protective factors are largely developed within the early months and years of life, although clearly all of childhood and family life are important and intertwined with the wider community within which individuals live. These are the focus of interest for health visitors, who aim to work through the strengths of the family, developing a one-to-one relationship and providing a supportive and educative function so the best potential of each child can be reached. Cowley[7] identified that health visitors treated health as a process to be developed, focusing on key 'resources for health' that were both personal and internal to the individual or the family, or were external, arising in the current situation or context at the time. Further work with the clients served by health visitors[8] clarified that the

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definition of what constitutes a 'resource,' and the distinction between 'internal' and 'external' lay within personal experience, rather than in observable factors or normative descriptors; this creates difficulties for measurement. However, the resources were conceptualised as lying within the practical and physical environment, emotional and social situation, or the field of understanding and development. These have a clear resonance with the three central components of a sense of coherence, identified by Antonovsky[9] [10]as manageability, meaningfulness and comprehensibility; also with social capital or community cohesion[11,12].

My methodological work focusing on the measurement of social capital included the validation of Antonovsky's sense of coherence scale for a UK audience[13] and a theoretical description of the process of social capital development[14], which identified key points for measurement of this contested concept. Like resilience, social capital is fungible; it is not fixed or immutable, but is constantly changing and dynamic. It is personally experienced and defined according to context. The method of identifying key transition points for development might, therefore, be worth considering in respect of identifying a scale for resilience, if indeed it is feasible to measure this concept.

Finally, an area of great personal interest for this resiliency workshop, would be to explore what effect, if any, practitioners might have on the development of resilience in infants and pre-school children. Parenting style and very early experiences have a clear influence on brain development and later responses to stress[15]. We hypothesise that positive approaches by the parent, and therefore likely development of resilience in infants, are encouraged by the presence of a practitioner/client relationship that

mirrors the preferred parental style[16 17 18 19]

Unfortunately, organisational influences often act in opposition to the development of either personalised approaches to assessment,[20 21 22 23] or the development of partnership approaches to health visiting work[24] (Roche et al 2005). We are currently exploring the potential for measuring the nature of the professional/client relationship (Christine Bidmead, PhD student) and the mechanisms for evaluating self-efficacy[25] and parenting support within a real-world, ever-changing personal and service situation[26].

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Resilience in MSF and its Personnel

Annick Filot and Carla Uriarte

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Médecins Sans Frontières (MSF) is an independent international medical humanitarian organization that delivers emergency aid in more than 70 countries to people affected by armed conflict; epidemics; natural or man-made disasters; or exclusion from health care. There are 19 sections, of which 5 are operational. In this workshop we will be representing the Belgium (MSF-OCB) and Spain-Greek (MSF-OCBA) operational sections. (When referring to MSF in this abstract we refer to the OCB and OCBA psychosocial units approach)

In emergencies and their aftermath, MSF provides essential health care, rehabilitates and runs hospitals and clinics, performs surgery, battles epidemics, carries out vaccination campaigns, operates feeding centers for malnourished children, and offers mental health care. When needed, MSF also constructs wells and dispenses clean drinking water, and provides shelter materials like blankets and plastic sheeting.

Through longer-term programs, MSF treats patients with infectious diseases such as tuberculosis, sleeping sickness, and HIV/AIDS, and provides medical and psychological care to marginalized groups such as street children.

MSF staff is very diverse and is the basement of our work in the Psychosocial Care units. The diversity of our staff has multiple sides; the main ones are individual, professional, cultural and social backgrounds. Inside this population, at the given moment, we have staff working, in their own country (6000 national staff) and staff working out of their country (900 expatriates from at least 25 nationalities) on 3 to 12 months contracts. Both subpopulations will have common and specific stress factors and resources to consider.

Working in a humanitarian organization is inherently stressful. Indeed, the nature of MSF is to work close to human suffering in, often, extreme psychological and physical conditions. Adjusting to the environment, facing up to potentially traumatic events, the proximity to human suffering, the lack of means to support the population in need like we would like to, difficulty in stepping back and giving space to oneself, the urgent pressure of the needs, team living, violence, poverty of the beneficiaries, … are potential common stressors for all MSF staff. The national staff is, in a lot of places, chronically exposed to the stress linked to their socio-economico-political context and/or to the the stress associated to their survival after natural disasters. In the other hand, the expatriates experience the stress of remoteness from familiar systems to which they belong. A major difference between the two populations is the choice they have or not to be where they are and to leave it or not.

MSF Resilience Model

To speak about **resilience** we have chosen the definition given by Bonnano as the capacity to, in the face of loss and trauma, maintain relatively stable, healthy levels of psychological and physical functioning. So it would not be the capacity to recuperate from a disorder but the ability to not have one. To present the relevant resilience factors, their indicators and how MSF promotes and supports them, we have modified the stress model to organize the information:

The resources we believe are most relevant for MSF staff have been gathered into a questionnaire. We have designed it in order to assess the importance of all these resources by contexts, and to analyze trends to help us promote those perceived by international staff as most relevant. It is not designed to be an academic instrument, but to use in a trend report. In MSF we have been passing the questionnaire since March, although validations and data analysis will not be possible until the second half of this year.

For MSF teams in the field, external resources can be grouped as:
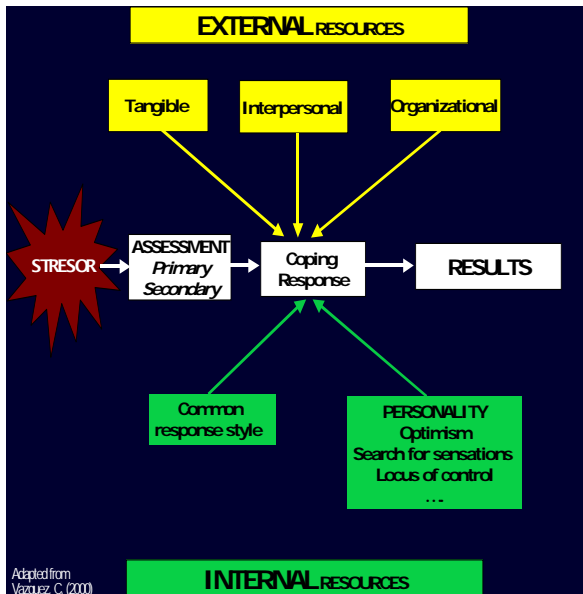
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Adapted from Vazquez, C. (2000)

- **T**angible (housing, climate, access to goods and logistics resources, etc.)
- **I**nterpersonal (social support from others in the field and at home, team dynamics, supervision and support from coordinators, contact with local culture and beneficiaries, etc.)
- **O**rganizational (rest periods promoted, job profile and tasks, pertinence of the project, etc.)

For example, in a on going war emergency, with teams working many hours on end, few tangible resources and strict security norms constraining personal liberty, interpersonal and individual resources become most important.

In missions where the context is stable, and the activities are programmed and planned (ie. HIV/AIDS projects) organizational factors might gain more importance, such as rotation, access to ARV medicaments, etc.

Internal Resources for MSF staff can be:
- **A**ctive coping mechanisms
- **S**ocial skills
- **O**ptimism
- **A**utonomy
- **P**roblem solving skills
- **A**bility to put things in perspective
- **O**penness to new experience
- **S**eek for sensations
- **I**nternal locus of control
- **F**lexibility
- **H**ardiness
- **S**elf esteem

So for us, the effectiveness of these resources varies greatly from mission to mission, and to person to person.

Resilience Promotion and Intervention in MSF
As part of the organizations policy some operational sections have created units with the mandate to support the organization and it's staff in preventing and managing mental health problems in the field team members. In MSF OCB and MSF OCBA units we agree in the need to promote resilience at the individual, interpersonal and organizational level. In order to accomplish this we carry out the following activities:

- In the hiring, screening and assessing staff process resilience traits are taken into account (information sessions and assessment centers)
- Preparation of staff
  - Before leaving on a first assignment all international staff go through a week pre-departure preparation workshop, with special training on interpersonal communication and stress management skills
  - When leaving for a mission all international staff go through a briefing process, on the project, the context, the security, the job and tasks, etc. For specific contexts they undergo a psychosocial preparation briefing.
- Trainings and field workshops
  - Technical skills trainings
  - HR management skills
  - Stress and mental health management skills
- HR management practices
  - Ie. Clear job profiles, clear organigram
  - Taking care of team dynamics
  - Supervision, evaluations
  - Monitoring and support of staff well-being
- Psychosocial support sessions in specific contexts
  - Support with respect to traumatic stress
  - Training of coordinators on enhancing resilience in the aftermath of incidents
  - Critical incident interventions
  - End of assignment support
  - Debriefings
- HR, technical and psychosocial
  - Specific psychological support (also to review individual resources and learn new ones)

Animals as key promoters of human resilience

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The concept of resilience has been applied in a wide variety of situations and from the molecular to the ecosystem level. It has been most commonly used, however, to describe the capacity of human populations to survive disasters of acute onset and broad scope that are political, economic, social or environmental in origin. One aspect of resilience that is frequently overlooked is the role that animals may play in helping human populations to maintain and restore resilience. The role of animals encompasses companion animals as key sources of social support, as was seen in the United States after Hurricane Katrina, to livestock as critical sources of social and economic capital, as has been seen among herding communities after drought and forced migration in Africa and elsewhere. Because the role of animal populations in disasters is typically overlooked, data on the role of animals in maintaining and restoring human resilience is scant.

In situations where human communities maintain strong bonds with animals, regardless of the nature of those bonds, immediate post-disaster response must include efforts to address the survival needs of animals. Intermediate and long-term response planning must include efforts to restore animals to those communities. Public and private veterinary services should be included in post disaster response efforts. Veterinary services can assist by responding to animal needs, documenting critical needs of affected animal populations and thereby providing data for future disaster plans, and helping to restore resilience to human communities after massive disruptions.

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Renewal and Resilience: the role of social innovation in building institutional resilience

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Society faces a number of ongoing and seemingly intractable problems – poverty, homelessness, environmental degradation, and disabilities among others – which governments and NGOs struggle to address. When efforts fail, it could be said that the system is caught in a trap, unable to respond to "chronic disasters" (Erikson, 1994) or immediate crises. On the other hand, social innovation, generally associated with creative initiatives on the part on one or many individuals, can at times transform such trapped systems. How and why does this happen? This abstract draws on a framework developed by a group of interdisciplinary scholars known as the Resilience Alliance (www.resalliance.org). This group, initially led and created by C.S Holling focuses on linked social and ecological resilience, defined as follows:

> *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. "Resilience" as applied to ecosystems, or to integrated systems of people and the natural environment, has three defining characteristics:*
>
> * *The amount of change the system can undergo and still retain the same controls on function and structure*
> * *The degree to which the system is capable of self-organization*
> * *The ability to build and increase the capacity for learning and adaptation*

This definition of resilience relies on a particular model of ongoing and dynamic change, called the "adaptive cycle" and the introduction of novelty through "bricolage" and through cross scale interactions across all phases of this adaptive cycle (Gunderson, Light and Holling, 1995; Gunderson and Holling, 2002).

This abstract will focus on social innovation as a particular dynamic that increases the resilience of social systems and institutions, through introducing and structuring novelty in apparently "trapped" or intransigent social problem areas. We define social innovation as:

> *A process of alteration of what is established by the introduction of new elements or forms (including new ideas, practices and policies, or resource flows). In particular the alteration of patterns of social action and engagement to allow for an improvement in or transformation of intransigent and broadly based social problems (Westley, Zimmerman and Patton, 2006).*

We will first use the adaptive cycle to explore the particular phase specific dynamics of social innovation. We will then look at three cases – the introduction of new approaches to saving endangered species, the creation of the micro-credit and the Grameen Bank, and changing the institutional dynamics of the disability agenda in Canada. In each of these cases, we will focus on the role of the social/institutional entrepreneur, as a *manager of emergence*, someone capable of using the dynamics of complex systems to address intractable problems. In particular we will link their strategies to the management of cross scale dynamics (or "panarchy"). We will highlight the capacity of the social/institutional entrepreneur to a) manage meaning through the identification and clarification of social purpose and vision b) manage power dynamics both horizontal ("finding flow") and vertical and c) managing the dynamics of both success and failure. We will conclude by linking our research on social innovation with the elements of the resilience index - comprehensibility, meaningfulness and manageability- and argue that the social/institutional entrepreneur enhances social system capacity for all three.

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