Resilience: Interdisciplinary Perspectives on Science and Humanitarianism
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A SOCIAL-ECOLOGICAL PERSPECTIVE OF RESILIENCE

Brian Walker[1]

Interest in the topic of resilience is rising rapidly, in academic circles, amongst practitioners and in policy development. The rise is occurring in response to increasing uneasiness about potential looming shocks that would sorely test the coping capacities of countries, regions and the world as a whole. Climate change, economic uncertainty, new pandemics, food shortages, water 'wars' and other worrying developments are coming together in a way that evokes considerable concern, akin to the mood Winston Churchill described as 'the gathering storm' (the title of his first volume on the history of the Second World War). The spectre of being hit by serious double or even triple 'whammies' has raised the notion of resilience high on the agendas of many governments, corporations and organisations.

The rising popularity of resilience has led to a plethora of papers with different interpretations of what it means. Some are tightly defined, others loose and ambiguous. Particularly across disciplinary fields there are different interpretations with consequent misunderstandings. There is a need for a better understanding of the processes involved in resilience dynamics and more rigour in the use of the term, and this puts a special emphasis on cross-disciplinary studies and learning. The initiation of this new cross-disciplinary journal is therefore very welcome.

Arising out of ecological work a common definition of resilience (Walker et al 2004) is "the capacity of a system to absorb disturbance and to reorganize while undergoing change so as to still retain essentially the same function, structure, feedbacks and, therefore, identity." The ecological and social aspects of resilience come together in the study of linked systems of people and nature – social-ecological systems, like fisheries and agricultural systems. For too long natural systems have been seen as apart from human systems, behaving in linear and predictable ways. Now we increasingly understand that nature and society are intrinsically connected, in social-ecological systems, and present complex dynamics with alternate stable states, tipping points and regime shifts. The problems can no longer be considered as environmental issues alone. We have to consider the earth system as a fully coupled system of natural and social sub-systems, in which the continued provision of ecosystem goods and services is fundamental to human wellbeing.

Ecologists have come to realize that understanding the resilience of just ecosystems is inadequate for contributing solutions to the problems of resource use and sustainability. Because ecological and social systems are strongly interlinked, at multiple scales, contributing viable solutions to the problems we face requires bringing together the understanding that has developed in the areas of psychology, social science and ecology.

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The word "identity" in the definition above is important. It implies that the system can have the same identity while undergoing changes, but only up to a point. If change exceeds some critical amount then the system is no longer able to self-organise in the same kind of way, and it changes to some other way of functioning, with a different structure and different regulating feedbacks – and it develops a different identity (Cumming et al 2005).

It was this word 'identity' that triggered the initial interaction between me and Astier Almedom (the initiator of this Journal). She, too, had focussed on identity as the defining feature that captured critical change in the psychosocial transition people make in the aftermath of disasters (Almedom, 2004; Almedom and Tumwine 2008). Resilience of individuals, families, communities and institutions is determined by their capacity to maintain their identity while undergoing transformations (adapting to adversity) through persistence with routine functions and rituals which make them who they are as people, communities, cultures, nations and/or institutions. Human agency and deliberate action to maintain one's integrity is where we differ in thinking about identity. An ecosystem's identity is described by the functions and controls that distinguish it, while human identity is imbued with agency, customs, rituals, and deliberate action.

Ecosystems and people are self-organising, complex adaptive systems with non-linear dynamics. They can exist in multiple (alternate) stability domains, or 'regimes', and the shift from one to another is triggered when they cross some critical threshold. And a crucial point is that the positions of such thresholds are not fixed. What we do to ecosystems, and the kinds of natural and social environments that people live in, influence how much they can change before they reach a threshold, which is a measure of their resilience.

If there is no possibility of 'regime shifts' (cf Scheffer and Carpenter 2003), no possibility of 'tipping points' in human behaviour, or threshold effects in ecosystems, then there is no fundamental problem in resource management or in human welfare because the system is always smoothly reversible. It is globally stable and recovery is always possible without major interventions. In non-linear systems, however, the likelihood of alternate system regimes is high and a shift (intended or unintended) from one to the other can be irreversible, or very hard to reverse. Resilience management therefore places an emphasis on identifying alternate regimes and what determines the thresholds between them.

I conclude with a few observations, emerging from comparative analyses of resilience in various regions of the world (see, for example, Walker et al 2006), on actions that can build or reduce resilience.

Probing the boundaries of resilience

Keeping things constant reduces resilience. A common objective of policies aimed at optimizing some particular product or outcome is to identify an 'optimal' state of the system, and then to somehow try and keep it in that particular state. In fact, keeping a system in one particular state leads to self-organized changes that make the system less and less resilient. As an example, preventing fire in a forest in an attempt to keep it in its

present state leads eventually to the loss of species able to withstand fire. To keep a forest resilient to fire it is necessary to periodically burn it.

Pushing problems up-scale

Increasing resilience at one scale can reduce resilience at other scales. A common problem is that attempts to increase resilience at small scales (for example, individual farmers) leads to the system at a higher scale (the farming system as a whole) becoming less resilient. The European "Butter Mountain" and the Australian "Wool Mountain" were examples of this.

Pursuing efficiency, narrowly defined

Short term cost cutting frequently results in getting rid of 'redundancies', which later turn out to have been alternate ways of doing things in response to shocks. Response diversity is a key part of being resilient.

Secondary, unintended effects often occur across scales and across domains (social, economic, ecological), triggering threshold effects where they were not expected. You cannot understand or manage a social-ecological system by focusing at only one scale and on one domain.

The need for both general and specified resilience

Channeling all attention and effort into managing for particular aspects of resilience and associated thresholds can inadvertently reduce resilience in other ways. There is therefore a need to consider both general and specified resilience. General resilience involves such things as diversity, tightness of feedbacks and modularity. While it is reasonably straightforward to estimate the costs of maintaining general resilience (some form of foregone extra yield or profit that it entails), it is much harder to estimate the costs of *not* maintaining it (since it is unspecified).

Enhancing resilience vs. transformation

If a threshold has been crossed, or crossing it is inevitable, further efforts at adaptation amount to 'digging the hole deeper'. In such cases the need is to transform into a different kind of system, with different ways of making a living.

The question facing policy makers and planners will increasingly become: "which parts of our (locality, region, country) need enhanced resilience in order to ensure their present states can continue, and which parts need to be transformed?"

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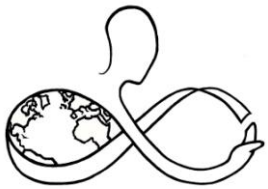

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RESILIENCE: Interdisciplinary perspectives on science and humanitarianism

As we embark on the second decade of the 21st century, resilience thinking has emerged at the cutting edge of interdisciplinary research and scholarship, particularly in the context of global public health, humanitarian assistance, and human security. This journal aims to open up this important field of inquiry to students and practitioners in international affairs – at the Fletcher School and its affiliates – and elsewhere across all schools of Tufts University, and beyond. The content will include a diverse array of new explorations, reviews of the literature - targeted, as well as systematic – and ideas in germination. All content is under copyright, and so we encourage proper attribution in citations using the short title - *Resilience.*

Scientific inquiry into resilience has profound implications for international humanitarian policy and practice – the art and science of giving and/or receiving technical and/or material assistance for disaster response. However, international humanitarian aid has traditionally been initiated by observed and/or reported crisis events exposing vulnerability. Resilience is the flip side of vulnerability. Both constructs – resilience and vulnerability - are complex, multi-dimensional and not unconnected, but they are governed by diametrically opposed assumptions. The devil is in the dynamics: vulnerability discourse dwells on real or perceived weaknesses, rigidity, lack of awareness, and dependence on external controls in collapsing, often dysfunctional systems; while resilience brings to light existing strengths of substance and function associated with disaster preparedness, responsiveness, reflexivity, effectiveness of communications, flexibility, and agility in self-organizing, functioning systems. Vulnerability thinking and acting breeds and perpetuates dependency. The actors on the vulnerability stage are distinctly different from those on the resilience stage – or are they? What is resilience? Why is it desirable, and to whom? What has the humanitarian sector got to lose or gain from promoting and building resilience in earnest? – These are some of the questions asked and discussed among students and faculty in the classroom. We now open them up for follow-up, and wider participation of interested readers.

Resilience has been defined and measured/assessed in different ways. Because it is a multi-dimensional construct, it lends itself to multiple lines of inquiry; each dimension is describable by its own set of variables. Transdisciplinary scientific theory holds that the dynamics of resilience exhibit complexity at all levels. This journal is concerned with resilience as it applies to multiple layers and scales of human organization, a complex system that is maintained by non-linear processes of thought, action, communication, learning, and subsequent action, un-learning, re-learning, and so on.

As proposed by Buzz Holling, the father of resilience science, the theoretical framework and process for understanding complex systems has to "satisfy the following criteria:

- Be 'as simple as possible but no simpler' than is required for understanding and communication.
- Be dynamic and prescriptive, not static and descriptive. Monitoring of the present and past is static unless it connects to policies and actions and to the evaluation of different futures.
- Embrace uncertainty and unpredictability. Surprise and structural change are inevitable in systems of people and nature." (391)

These criteria apply to social-ecological systems, as much as they do to the complex systems of international humanitarian action that continue to operate at various points along the "development—emergency response—re-development—disaster mitigation--response" continua.

Three fundamental principles appear to rule the dynamics of resilience in complex systems of human organization: purposeful ***adaptation,*** active ***learning***, and effective ***governance***, all of which are interwoven and held together by the common thread of ***diversity*** of sources, resources, methods, long-term survival strategies, and short-term coping mechanisms – Figure.

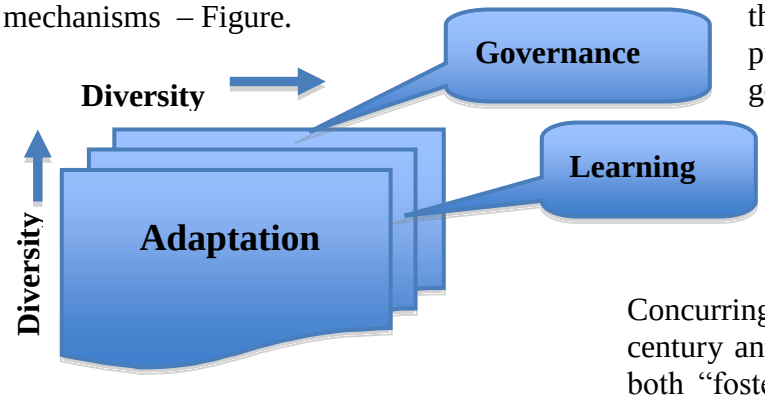

Figure Fundamental principles of resilient systems of human organization.

Diversity of adaptive strategies informed by multiple ways and sources of learning is a good indicator of effective adaptive governance in resilient systems.

The late Professor John Bennett, eminent cultural anthropologist – veteran applied anthropologist - who dedicated his life to the study of human ecology, was first to point out that *anticipation* is the basis of adaptation: "Anticipation in the human realm may appear in the form of purpose, needs, desire, foresight, will, or simply consciousness of continued existence."(25) People use their cognitive capacity to imagine and effect changes to their realities by conceiving of new possibilities and thereby creating new anticipations. When existing realities pose threats to survival or simply need to change in order to turn anticipation into reality, individuals may be said to be coping. Bennett proposed that individuals "adapt"; while groups form a culture pattern, make collective decisions, and take collective action.

"Culture" is a major consequence of anticipatory functioning that sets precedents grounded in adaptive, coping behaviors. Human adaptation is therefore reflective of culture – precedent setting and symbol generating; learning - memory storage; and "preservation of outmoded (perceptually maladaptive) solutions that generate conflict." (29)

Concurring with another influential 20th century anthropologist Franz Boas, who both "fostered and refuted the Culture-Nature dichotomy", Bennett believed that "humans exist in a milieu of their own making that is always a mixture of freedom and conformity… Adaptation, a

word for the human capacity for coping with milieu in order to establish protocols of both freedom and constraint, is a field that is worthy of attention by researchers since anthropology has already developed many of the necessary concepts, however disguised these may be by the abstract language of patterns, values, and the like." (38)

Bennett had first coined the phrase "socialnatural system" as an "empirical generalization that attempts to combine nature and culture" in his *Ecological Transition* book (1976) - the content of which was in part reprinted twenty hears later. Bennett explained that in this relationship between people and the natural environment, "humans provide the goals and means and the environment the wherewithal" (13). Bennett was critical of the "normative orientation" of "want-dominated" culture; expressing concern that excessive permissiveness had allowed people to live in "freedom" from environmental constraints during the second half of the 20th century when traditional modes of subsistence were "redefined as 'poverty' and rapidly took political form. Demands escalated and continue to do so, creating all sorts of secondary effects, including massive environmental destruction… Humans approach Nature as they approach Society: they do unto the natural world what they do unto themselves…We once considered the "environmental crisis" of our time solely as a matter of humans doing bad things to the environment, but in recent years the other side of the coin has emerged: humans have been injuring the environment in order to injure other humans." (10-11)

John Bennett did not hesitate to point out that human [maladaptive] behavior is largely motivated by greed - which he defined as both a *constant* and a *variable*. "Greed is an innate manifestation of human behavior, but human behavior is always capable of modification by Culture. If Culture can encourage greed, it can also restrain it." (9). However, we must first unveil it.

Maladaptive human behavior may be linked to causes and consequences of disaster. Greed, unchecked, unrestrained growth may continue to motivate (economic) development, as we know it. What about altruism? How do we reconcile human greed with altruism, a trait that presumably is the basis for humanitarianism? Is altruism also motivated by self-interest? Is humanitarian action Hippocratic or hypocritical? This journal invites contributions that tackle critical questions such as these, as they point to our collective responsibility to address the inherent conflict between the social, economic and political drivers of the humanitarian imperative, and the visions, desires, and aspirations that dictate the resilience imperative.

Active learning is adaptive learning. It implies openness to and integration of new information with the old; but it may also involve un-learning maladaptive ways or indeed re-learning what has been lost and forgotten. Computer simulated modeling and scenario development incorporating ecological and social variables have offered new tools for policy development informed by resilience thinking. Resilience science has also illuminated our understanding of the role of adaptive governance in social-ecological systems.

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Simultaneously, the humanitarian sector is constantly striving to reconcile competing interests engendered in the political ecology and economy of international aid as most comprehensively documented by Professors Clark Gibson, Nobel-laureate Elinor Ostrom, and their colleagues. This journal aims to facilitate open and rigorous debate – beyond the classroom - on the whys and wherefores of international humanitarian aid and cooperation.

How might emergency humanitarian assistance be used to reduce long-term vulnerability and dependency? Godfrey Orach Otobi's proposal to contribute to the current revisions of the Sphere Minimum Standards for Disaster Response is on point. Many readers may not be aware of the collaborative efforts of international humanitarian organizations to improve quality and accountability of humanitarian assistance which was spear-headed by Oxfam-UK in the latter half of the 1990s. As an active contributor who hosted one of the initial meetings of the Sphere Project steering group in London myself, I am encouraged to see the project continue to invite wider participation. Similarly, Ted Mathys' article has direct practical relevance to public health measures to reduce the burden of malaria, particularly in settings of complex emergency. Nicholas Cooper and Alok Kanojia are presenting country-specific novel ideas with profound practical and policy implications for human security and mental health, respectively in Egypt and India. With particular reference to social capital and mental health, Sara Jackson's targeted review is illuminating and highly relevant to public health responses to disasters. Evelyn Brensinger's review of *The Transition Handbook: From oil dependency to local resilience* introduces innovation in the way that she has analyzed and brought in the public online responses to the author's talk. In this vein, interested readers are invited to respond to the content of this journal and participate in the integrative discussions of resilience through our electronic International Resilience Forum. The second book review, *Crazy Like Us* by Evelyn Brensinger is equally engaging.

This journal owes its existence to the exceptional collegiality and dedication of the following members of the editorial team at Tufts University and beyond. These are, in alphabetical order, Victor Galaz (Stockholm Resilience Centre), Dave Henderson (Harvard Medical School, Program on Refugee Trauma), Joann Lindenmayer, Bill Moomaw, Nick Stockton (Humanitarian Accountability Partnership, Geneva), Linda Tickle-Degnen, James Tumwine (Makerere University, Kampala), and Don Wertlieb. All have all given most generously of their time and energy to review and comment on the ten submissions received, five of which made it through to publication in this first volume. The rest were either deferred pending revisions (3) or withdrawn (2) by the author. None were rejected.

The open review system we have adopted was well received and has proved effective. There is of course always room for improvement, and it is my hope that we will continue to build on the spirit of open learning and collegiality between faculty and students

across discipline and school boundaries demonstrated here.

Special Acknowledgement

We thank Douglas M. Glandon, MPH, graduate of Tufts University (2007) who designed the journal logo. It captures the human and global dimensions of resilience as part and parcel of the inherently evolutionary adaptive cycle in complex systems of human organization with non-linear dynamics.

Astier M. Almedom, 17 March 2010.

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EFFECTIVENESS OF ZOOPROPHYLAXIS FOR MALARIA PREVENTION AND CONTROL IN SETTINGS OF COMPLEX AND PROTRACTED EMERGENCY

Ted Mathys[1]

Summary

Zooprophylaxis is a malaria prevention technique involving the use of animals for diversion of blood-seeking mosquitoes away from humans. This article examines the potential effectiveness of zooprophylaxis in the prevention and control of malaria in settings of complex and often protracted emergency. A brief background and history of zooprophylaxis research is presented; and the salient characteristics of mosquito vector biology for zooprophylaxis identified, using the evaluative framework proposed by the Inter-Agency Field Handbook for Malaria Control in Complex Emergencies, with reference to three forms of the technique used in contemporary sub-Saharan Africa. It is suggested that zooprophylaxis is most promising in regions where the dominant mosquito species prefers to feed on animals instead of humans; prefers to rest outdoors instead of indoors; and is sufficiently dominant relative to other local species. Particular attention is paid to *Anopheles arabiensis* because it holds these characteristics. The literature further suggests that zooprophylaxis is most effective when the animals used are bovine and when human-cattle habitat separation is maintained. The effectiveness of zooprophylaxis is site-specific. Where it can be employed, it is relatively more effective than other environmental management techniques in protracted emergency situations, but it should be considered supplementary to primary techniques such as the use of insecticide treated bed nets. Zooprophylaxis is considered low cost, although there are no published accounts of systematic cost-effectiveness analyses of the technique, particularly for emergency settings. Presence of cattle, the capacity to conduct experiments on mosquito biology and feeding habits, and nuanced understanding of the socio-cultural value attached to cattle, all contribute to the effectiveness of zooprophylaxis in particular parts of Sub-Saharan Africa. Areas for future research and collaboration among humanitarians and public health professionals are discussed.

Background

Malaria is among the worst health problems in the world, infecting up to 500 million people each year and claiming the lives of more than one million. Malaria is particularly ravaging in sub-Saharan Africa, where one in five children dies from the disease (Nothing But Nets). Sub-Saharan Africa is also beset with ongoing violent conflicts and complex emergency

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situations, many of which unfold in malaria endemic areas. This brutal calculus raises the chances of a malaria epidemic exponentially (Mitchell). The difficulties of battling malaria in conflict and post-conflict zones demand new analyses of possible treatment and prevention techniques. This article evaluates the potential of zooprophylaxis for malaria prevention in protracted emergency and post-conflict settings in sub-Saharan Africa.

Overview and Method

In the acute phases of an emergency, the Inter-agency Field Handbook for Malaria Control in Complex Emergencies* prioritizes prompt and effective treatment of all clinical malaria episodes in order to limit avoidable malaria deaths. As the situation evolves from acute to chronic emergency or to a post-conflict environment, broader prevention measures might supplement case management and contribute to saving lives (Inter-agency Field Handbook 110). Three forms of zooprophylaxis – passive, active, and insecticide zooprophylaxis – are evaluated here using five criteria developed for the handbook: demonstrated need for malaria prevention measures; efficacy of the technique as evidenced in trials; effectiveness relative to other malaria control and prevention methods; cost-effectiveness; and feasibility of implementation in protracted emergency and post-conflict settings.

The article first investigates the link between malaria and complex emergencies and reviews the prevailing vector control methods currently in use. Next, a brief history of zooprophylaxis research is outlined, and the technique discussed in the context of mosquito vector biology, geography, and feeding habits. The article then turns to several key field trials from the published literature in order to highlight insights that might bear on future zooprophylaxis research, before concluding with an evaluation using the above criteria.

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The method employed is a targeted review of the literature on zooprophylaxis focusing on emergencies and sub-Saharan Africa. The published scholarly reports of field trials discussed here were culled primarily from database searches for key terms – such as "zooprophylaxis," or "cattle" and "malaria" – in BioMed Central, CSA Illumina, PubMed Central, ScienceDirect, Web of Science, and *Malaria Journal.* Articles published within the last fifteen years were purposely evaluated for their relevance to sub-Saharan Africa, but only a handful were selected to generate questions of potential research interest of significance to public health policy and humanitarian response programming in malaria endemic settings. Non-refereed publications – policy and/or practice guideline papers and research reports belonging to the "grey literature" where included where relevant.

Malaria in Complex Emergencies

In times of peace, the World Health Organization (WHO) advocates a systematic approach to malaria vector control known as Integrated Vector Management (IVM). The framework is based on evidence and knowledge of the local situation that informs a decision-making process for the management of mosquito populations. An IVM approach assesses available health infrastructure and resources and develops a portfolio of measures to fight malaria (DDT Information System). The controversy over the use and overuse/misuse of DDT, particularly in Africa, is ongoing and beyond the scope of this article to evaluate.

Complex emergencies present unique challenges that complicate efforts to implement IVM. Emergency situations are typified by the breakdown of existing health systems; the loss of health workers and field staff with malaria expertise; displacement of large masses of citizens, who may be forced to sleep outdoors with little protection or in overcrowded temporary quarters;

movement of non-immune people to malaria endemic areas; and a lack of clean water, adequate food, and sanitation facilities (Mitchell; Inter-agency Field Handbook vii). As a result, WHO recommends focusing efforts during the acute phase of an emergency on the prompt and effective diagnosis of malaria episodes and treatment of those afflicted (Inter-agency Field Handbook 110).

The changing nature of conflict in recent decades means that some of these crises evolve into situations of "protracted emergency" or "chronic emergency," where internally displaced persons and refugees are neither on the move nor able to return to their homes and livelihoods. Populations become less mobile and dwellings more permanent, and in some cases international aid declines (Rowland & Nosten 746). Chronic emergencies are thus low-resource settings in which a temporary population must operate as though it were permanent. In these cases there is a need for not only malaria diagnosis and treatment, but also for broader prevention measures.

Prevention Measures

Malaria prevention and control can be divided into chemical, biological, and environmental techniques. In chronic emergencies, WHO focuses primarily on chemical insecticide methods. Two common chemical interventions are insecticide treated bed nets (ITNs) and indoor residual spraying (IRS).

An ITN is a mosquito net treated with a Pyrethroid insecticide, usually Permethrin or Deltamethrin, under which a resident sleeps. ITNs provide better protection than untreated nets, and if relatively high coverage (50 percent to 60 percent of dwellings) is achieved in the community, ITNs can significantly reduce the local mosquito population. IRS involves spraying an insecticide onto the interior walls and ceilings or onto the roofs and eaves of houses and huts.

To be effective, IRS requires high coverage (85 percent of dwellings) and must be timed accurately so that spraying occurs before peak malaria transmission season. WHO recommends a dozen different insecticides for IRS that last anywhere from two to six months, at which point spraying must recur (Inter-agency Field Handbook 112-115).

Widespread reliance on insecticides has resulted in the development of insecticide resistance in many mosquito populations (Kawaguchi, Sasaki & Mogi 301). However, resistance has little bearing on the effectiveness of biological and environmental malaria prevention methods, such as larval control, scrub removal, drainage and water management, and zooprophylaxis.

Larval source management (LSM) takes several forms, from dropping oil or other chemicals into standing water to suffocate or kill mosquito larvae to introducing cyclopoid copepods or larvivorous fish into local waters as predatory agents (Marten & Reid 65-69; Walton 184-199). According to WHO, LSM is generally not appropriate for chronic emergencies. Where it is a viable option, it must be carried out very thoroughly to have an impact, and it is most practicable in areas where breeding sites are permanent and few in number (Inter-agency Field Handbook 125). In Africa, LSM has been shown to reduce malaria transmission in Eritrea, Tanzania, and Kenya, but in each of these cases the studies were carried out in areas with well-defined breeding sites. The prospects for LSM in other parts of sub-Saharan Africa with more diffuse breeding sites are uncertain (Fillinger et al. 2).

There is no evidence that scrub removal, or cutting down grasses and scrub brush around dwellings, has an impact on malaria transmission. Water management may have an impact, but it requires entomological expertise and strong local knowledge of breeding sites. Where these conditions do not prevail it can waste time. Neither scrub removal nor water management is

recommended for chronic emergencies (Inter-agency Field Handbook 126).

As a biological control method in resource poor settings, zooprophylaxis predates many of these interventions, and WHO has recommended the use of cattle as a protective measure against malaria since 1982 (Bøgh et al. "Zooprophylaxis" 593). It is only in the last decade, however, that the potential of zooprophylaxis for malaria prevention in sub-Saharan Africa has been revisited.

A Brief History of Zooprophylaxis

Malaria parasites are transmitted by the female *Anopheles* mosquito. To transmit malaria, an *anopheline* must take at least two blood meals from humans. Therefore, the degree of human-vector contact is an important component of disease transmission (Muriu et al. 2). Since some mosquito species also feed readily on animals, the presence or introduction of animals into a community may affect the degree of human-vector contact. Whereas passive zooprophylaxis refers to the natural prophylactic effect of cattle or other livestock in the community, active zooprophylaxis denotes a deliberate attempt to introduce animals as a means of vector control (Bøgh et al. "Effect" 822). Insecticide zooprophylaxis, or "cattle sponging," is a method by which insecticide is applied to domestic livestock, using a sponge or animal dip. Mosquitoes pick up a lethal dose when they attempt to feed on a treated animal.

Zooprophylaxis research is informed by a scientific lineage that originated in Europe. Giovanni Battista Grassi, an Italian mosquito expert, asserted at the beginning of the twentieth century that only the *Anopheles* species carried malaria. Subsequent experiments in Europe and India by other teams of malariologists led to the discovery that *Anopheles* is in fact a genus complex, comprised of numerous species that exhibit different transmission characteristics

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(Litsios 38-39). Because of the identification of the female *Anopheles* mosquito as the culprit, Grassi and others expected to see correlations between areas high in *anophelines* and malaria incidence. However, some experiments showed an inverse relationship, even where there was only one *Anopheles* species present. This discrepancy came to be known as the "anophelism without malaria" paradox (56-58).

With malaria on the rise after World War I, there was a resurgence of interest in "anophelism without malaria." Investigators revisited earlier conjectures that in some areas *anophelines* had learned to prefer the blood of domestic animals to that of humans. After extensive studies in Italy, American malariologist Lewis Hackett claimed "anophelism without malaria" was the result of evolutionary processes in which distinct *anopheline* species had developed differing egg types, feeding habits, optimal temperatures, and so forth. Hackett found that some subspecies of the European *An. maculipennis* were zoophilic, feeding on humans only when no animals were present. This helped explain why malaria had disappeared from many areas of Europe, even where no malaria control measures had been undertaken. Changing agricultural patterns and the increased presence of cattle in areas with zoophilic vectors presumably contributed to the decline in malaria (58-61).

Drawing on the work of Hackett and the German medical historian Erwin Ackerknecht, several malariologists in the southern United States began experimenting with zooprophylaxis as a control measure (Humphreys 39). J.B. Rice and M.A. Barber developed a method whereby mosquitoes were trapped from a location near animals, such as near a stable or under a farmhouse. The specimens were dissected to test for a blood meal, and if the mosquito had fed on blood, Rice and Barber used a precipitin test to identify the meal source (50). Blood analysis of this sort anticipates the Human Blood Index (HBI) tests employed today. HBI represents the

portion of blood meals of a mosquito population obtained from humans, and it is generally determined through laboratory testing (Muriu et al. 3).

Research was abandoned abruptly in the 1940s with the development of DDT. When research resumed in the 1980s and 1990s, scientists focused once again on the feeding habits and geographical distribution of the *Anopheles* genus complex.

Biology, Geography, and Behavior of Anopheles

The *Anopheles* genus is comprised of roughly 400 distinct species, of which only 30 to 40 transmit malaria. The potential for zooprophylaxis to divert mosquitoes away from humans depends on whether the local *anopheline* mosquito species is anthropophilic, preferring to take blood meals on humans, or zoophilic, preferring to take blood meals on animals. Since humans predominantly sleep indoors and cattle are usually tethered outside, another determinant is whether the local vector is endophagic, exhibiting a preference for indoor feeding, or exophagic, preferring to feed outdoors. Similarly, mosquito vectors that tend to inhabit and rest indoors are designated as endophilic, and those that prefer to inhabit and rest outdoors are exophilic (CDC Malaria Glossary). Different species exhibit different combinations of these qualities, and zooprophylaxis research is largely an effort to determine which combination defines a local species. For example, an anthropophilic, endophagic, exophilic mosquito would tend to live outside, enter dwellings to feed on humans, and then return outside to rest.

The *Anopheles gambiae sensu lato (s.l.)* species complex is regarded as the most important group of vectors for the transmission of the deadly *Plasmodium falciparum* malaria parasite in sub-Saharan Africa (Bøgh et al. "Effect" 823). Within the *An. gambiae s.l.* complex are several sibling species, including *An. gambiae sensu stricto (s.s.), An. melas,* and *An.*

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arabiensis. These species exhibit regional variation in feeding preference, depending on host availability and local genotype. In general, *An. gambiae s.s.* is highly anthropophilic. While *An. melas* is regarded as more zoophilic than *An. gambiae s.s.*, there are few regions of sub-Saharan Africa where it dominates. *An. arabiensis* is also generally regarded as more zoophilic than *An. gambiae s.s.*, and it is a dominant vector in some regions of sub-Saharan Africa (Tirados et al. 425). These characteristics suggest that in areas where *An. arabiensis* dominates, zooprophylaxis research warrants attention.

Found in over 70 percent of sub-Saharan Africa, *An. arabiensis* dominates in arid zones and some highland areas. It is a major vector, particularly in southern Africa, Madagascar, and along an East-West belt fringing the Sahel (425-426). It has flexible feeding habits and has been documented to change feeding behavior depending on host availability. When hosts are predominantly domestic and indoors, it is endophagic and endophilic, but when hosts are outdoors it can adopt exophagic and exophilic patterns (Mahande et al. "Feeding" 2). *An. arabiensis* also exhibits varying behavioral patterns across its geographic range. In West Africa the vector tends to feed on humans and rest indoors. By contrast, in eastern Africa a greater proportion of *An. arabiensis* feed on cattle and rest outdoors (Tirados et al. 426).

Key Zooprophylaxis Field Studies

The following studies highlight the contours of contemporary zooprophylaxis research, with particular attention to sub-Saharan Africa and the *An. arabiensis* species. I foreground particular findings in order to bring into focus the larger web of challenges that make up this field of inquiry.

One of the first studies of zooprophylaxis in a refugee setting was undertaken by Hewitt

et al. in an Afghan refugee camp in the North West Frontier Province of Pakistan in 1994. This entomological investigation of the impact of cattle ownership on malaria revealed that animals are only likely to have a worthwhile prophylactic effect when the vector is zoophilic (160-164). The requirement of zoophily for zooprophylaxis is now widely accepted.

The first zooprophylaxis study in Africa was carried out by Bøgh et al. in the Gambia in 2001 ("Effect"). Mosquitoes were collected from the households of a paired cohort of children who lived near (within 20 meters) or far (greater than 50 meters) from cattle. Nearly all specimens collected belonged to the *An. gambiae s.l.* complex, and *An. gambiae s.s.* was dominant. The team found flexible feeding habits among all constituent species, but only *An. arabiensis* exhibited a significant reduction in HBI (from 82 percent to 52 percent) between households without cattle and those with cattle tethered near. These findings suggest that zooprophylaxis may have an effect on *An. arabiensis*. Unfortunately, *P. falciparum* sporozoite analysis on all collected specimens revealed no significant difference in malaria sporozoite rates between vector species. The presumed zooprophylactic effect of cattle on *An. arabiensis* did not ultimately matter for malaria transmission, likely because this vector population was relatively small compared to *An. gambiae s.s.* Thus vector dominance is an important consideration.

As a component of their global "Malaria Stability Index," Kiszewski et al. mapped the dominant *anopheline* vectors in most areas of the world (487). *An. arabiensis* was found to dominate in several areas of sub-Saharan Africa (see Map).

The potential for zooprophylaxis as an intervention in areas where *An. arabiensis* dominates has been studied by Mahande et al. in Tanzania, Muriu et al. in Kenya, Tirados et al. in Ethiopia, Bulterys et al. in Zambia, and others. Mahande et al. investigated the resting and feeding habits of *An. arabiensis* in several villages in Lower Moshi, Northern Tanzania

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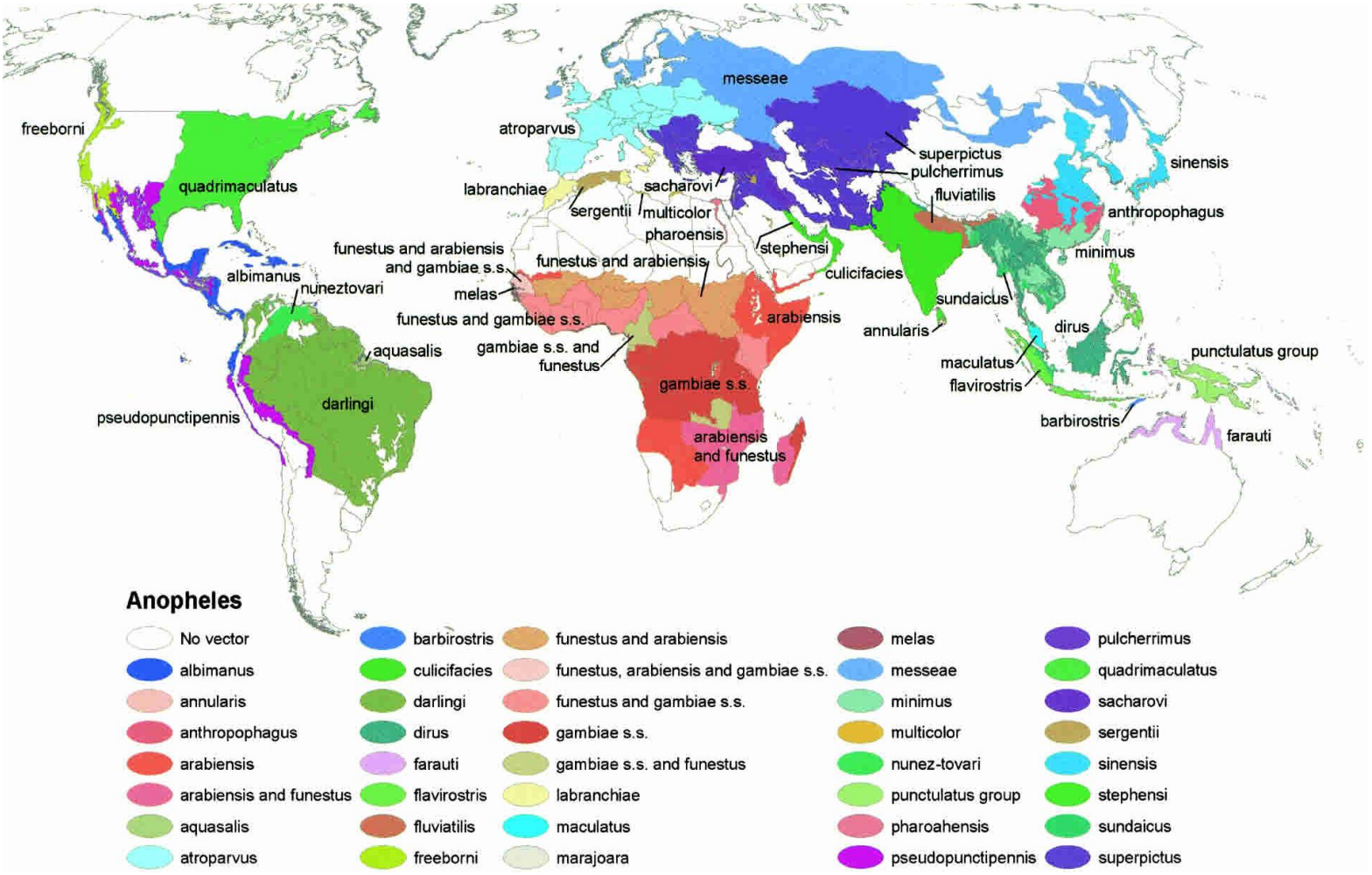
Regionally Dominant Malaria Vector Identities



Source: Kizsewski et al, 2007

("Feeding"). Here, *An. arabiensis* accounted for 99.3 percent of *anophelines* collected. Using veranda hut experiments, the researchers found strong exophilic tendencies among *An. Arabiensis.*

This suggests that *An. arabiensis* tend to escape from houses after feeding, which may compromise the effectiveness of indoor residual spraying, since the mosquitoes do not spend enough time on interior walls to pick up a lethal dose of insecticide. Odor Bated Entry Trap (OBET) experiments and HBI analysis also indicated that *An. arabiensis* in this area overwhelmingly prefer cattle to humans, cattle to sheep, cattle to goats, and cattle to pigs. Because of the combination of exophily and zoophily, the authors are optimistic about the potential for zooprophylaxis and recommend that villagers tether cattle close to their dwellings.

Muriu et al. collected 3,333 *anopheline* mosquitoes near the Mwea rice scheme in Kenya, and *An. arabiensis* was identified as the dominant vector. Through HBI analysis and Bovine Blood Index (BBI) analysis, the team found that all species collected displayed a high preference for bovine over human and goat blood meals. However, the authors postulate that for *An. arabiensis* this zoophily was driven by community protection measures, not by vector biology alone. Because villagers live near the rice cultivation area and are aware of the heightened mosquito density, they have enforced bed net use. Consequently, the mosquitoes revert to feeding on animals. As mosquitoes adopt new feeding habits, malaria rates drop, despite higher vector densities. Personal protection is thus a factor driving zoophily in this area, and the authors conclude that "the pattern of host choice and preference of *Anopheles* mosquitoes is site-specific and dependent on local ecological factors. It is, therefore, conceived that decisions regarding zooprophylaxis can only be made based on local context of available hosts and blood feeding preferences" (4).

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The finding that personal protection and zoophily have interactive effects in this area highlights a larger methodological concern. In many areas where zooprophylaxis is tested, more than one intervention is in play, so studies must account for the combined prophylactic effects of multiple interventions. For example, in a study in the Mwea rice scheme that was contemporaneous with the Muriu et al. research, Kaburi et al. demonstrated that ITNs and zooprophylaxis together reduced human risk to mosquito bites and had additive effects in the control of mosquito densities. Mutero et al. also found that residents in the Mwea region who lived near irrigated rice paddies had lower malaria infection rates than those who lived away from irrigated agriculture areas, despite the much greater densities of *An. Arabiensis* in the irrigated areas. The authors attribute the so-called "paddies paradox" to the greater number of cattle present near paddies. Though the irrigated paddies attracted greater mosquito densities, the tendency of *An. Arabiensis* to feed on cattle kept infection rates low (Mutero et al. 2010). In sum, since there are interactive effects between interventions, as well as between interventions and the agro-ecosystems in which they are embedded, there is a need for innovative research on the systematic links between agriculture, malaria, and socio-economic development. Some early research in this area is being pursued by the Systemwide Initiative on Malaria and Agriculture under the auspices of the Consultative Group on International Agricultural Research (CGIAR).

An analysis of more than 45,000 *An. arabiensis* females in southern Ethiopia by Tirados et al. complicates but does not contradict the findings of Mahande et al. and Muriu et al. The results of catch experiments, HBI analysis, and OBET experiments in a village and a semi-pastoral cattle camp suggest that the *An. arabiensis* population in this area may be inherently anthropophilic, but this biological preference is counterbalanced by exophagic and postprandial

exophilic tendencies. Zoophily among *An. arabiensis* may therefore be the result of flexibility in feeding habits and availability of outdoor hosts rather than innate preference.

Bulterys et al. examined the relationship between *P. falciparum* malaria incidence and a large group of variables in southern Zambia. *An. arabiensis* is dominant in the region, though *An. funestus* is also a major vector. The variables tested included domestic animal ownership, mosquito breeding sites, density of people, distance between dwelling structures, use of ITNs, and others. Data were collected from a control group of thirty-seven households that exhibited no malaria infection from 2005-2008, and 34 households with recurrent malaria over the same period. In multivariate regression analysis both cattle ownership and greater distance between dwellings were significantly associated with reduced risk of recurrent infection at the household level.

There are three potential dangers of zooprophylaxis identified in these and other field trials. First, in areas where the technique is employed, cattle should be tethered near houses but not kept inside. In a study of cattle and *An. arabiensis* in northern Ethiopia, Ghebreyesus et al. note that cases of malaria infection nearly doubled in the rare situations in which cattle were kept in houses where families slept. Similarly, Kawaguchi, Sasaki, and Mogi modeled various habitats and found that "the mixed-habitat model predicts that placing livestock among humans leads only to a higher malaria prevalence. […] Habitat separation is primarily important for zooprophylaxis to work" (307).

Second, some researchers postulate that increased presence of cattle may in fact lower normal rates of mosquito mortality while searching for a blood meal. Writing in 1999, Mutero et al. describe the dilemma succinctly: "However, there are two schools of thought: (1) that reduced feeding on people by mosquitoes due to availability of cattle could lead to reduced malaria

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transmission; or (2) that increased transmission could occur due to an expanded vector population resulting from unlimited access to bloodmeals" (394). A mathematical model developed by Sota and Mogi predicted that the introduction of domestic animals might make it easier for mosquitoes to take a blood meal and thereby increase the density of the population. Bouma and Rowland found support for this theory in Afghan and Pakistani refugee villages through parasite prevalence surveys among school children who lived in houses with and without cattle. Their findings "support the prediction of the Sota-Mogi theoretical model that domestic animals can enhance rather than reduce malaria transmission when vectors are zoophilic, the infection rate low, and the human: cattle ratio high. All these conditions applied in the study area" (351). More recently, however, mathematical models developed by Killeen et al. and Allan Saul predicted that an increase in cattle populations had either beneficial or negligible effects. With input data from Tanzania and The Gambia, the Killeen et al. model predicted that increased cattle populations would not affect malaria rates in the Tanzania study site and might "drastically reduce transmission in The Gambia or where *An. arabiensis* is the dominant vector" (469). Saul's model likewise predicted that changing the numbers and accessibility of cattle had very little impact on vector mortality while searching for a blood meal (32). Finally, Mahande et al. found that cattle to human ratio did not affect the prophylactic effect of cattle ("Feeding" 5). In short, the research is inconclusive with regard to whether the introduction of cattle affects malaria transmission by increasing vector longevity.

Finally, there is a need for investigation of the interplay between zooprophylaxis and other vector borne diseases. For instance, Muriu et al. call for greater attention to the relationship between zooprophylaxis and arboviruses, warning that that the presence of domestic animals

may enhance or suppress transmission of arboviruses such as West Nile Virus and Rift Valley Fever Virus (5).

Together the above studies outline the basic conditions in which zooprophylaxis deserves more attention and research. First, zooprophylaxis requires a dominant vector that is zoophilic (or exhibits zoophilic tendencies) and exophilic (or flexibly adopts exophilic tendencies). For sub-Saharan Africa, this often translates into *An. arabiensis.* This vector's dominance should also be sufficiently large relative to other species if zooprophylaxis is to have a significant impact on the reduction of sporozoites being transmitted to humans. Second, determining vector characteristics requires the capacity and resources to undertake controlled field studies of species composition and behavior, whether through verandah hut experiments, OBET experiments, lab work such as HBI analysis, or other means. Finally, since cattle are regarded as the most effective animals for zooprophylaxis, the technique requires the presence of, or access to, cattle. In areas where the technique is used, studies suggest that cattle should be placed near dwellings as a zoobarrier but not placed inside dwellings, and habitat separation between humans and cattle should be preserved.

Insecticide Zooprophylaxis

Malaria parasites have a closed infection cycle between humans and *anopheline* mosquitoes, so cattle serve as a "dead end host" for the parasite, with or without insecticide (Ault 38; Kawaguchi, Sasaki & Mogi 301). The fact that *P. falciparum* cannot reproduce in livestock, coupled with the potential of insecticide applied to cattle to kill a mosquito immediately or over time, has led to optimism about this technique. It is the only form of zooprophylaxis recognized by the Inter-agency Handbook as a possibility for malaria prevention in complex emergencies

(Inter-agency Field Handbook 124). Insecticide zooprophylaxis may be a more efficient method of insecticide use than IRS in areas where the dominant vector is zoophilic (Hewitt & Rowland). When used in conjunction with IRS, insecticide zooprophylaxis also may allow for reduced spraying volume and thus reduced resistance to the insecticide. By finding a suitable balance of spraying rate and cattle density and location, malaria might be controlled without mosquitoes developing insecticide resistance (Kawaguchi, Sasaki & Mogi 301).

The most ubiquitous insecticide for this method is Deltamethrin. Livestock sponging has been in practice in Afghan refugee camps for years, and a community randomized trial in which these refugee communities applied Deltamethrin to their animals four times a year reduced the incidence of malaria by 56 percent. In the same communities in previous years, malaria reduction by IRS achieved similar results but required five times the amount of insecticide (Rowland & Nosten 746). In some areas in sub-Saharan Africa, Deltamethrin is already present and in use on livestock as a control agent for ticks and tsetse flies (Mahande et al. "Role" 2).

Habtewold et al. tested the ability of insecticide zooprophylaxis to affect the vectoral capacity of dominant *An. arabiensis* mosquitoes in an area of Ethiopia in which the practice was already in use for the control of ticks and tsetse flies. The authors questioned whether treating Zebu cattle with insecticide would cause the vector to revert to feeding more readily on humans. Contact bioassays and behavioral assays demonstrated that the mosquitoes readily fed on cattle treated with the insecticide and were not deflected to human hosts. The authors also conclude from DNA-fingerprinting of bloodmeals that *An. arabiensis* feeds most frequently on older cattle. Finally, they observe that more than 90% of *An. arabiensis, An. pharoensis* and *An. tenebrosus* feed most readily on the legs of cattle, where insecticide wears off quickly, and that they alight on the animals for less than one minute. These characteristics may mute the

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effectiveness of the insecticide against mosquitoes. They suggest that in areas where insecticide zooprophylaxis is in use for ticks and tsetse flies, it might achieve greater impact on mosquitoes if the insecticide is applied selectively to the legs of cattle as well.

Evaluation

1. Demonstrated Need

There is a pressing need for malaria prevention in post-conflict and chronic emergency situations in sub-Saharan Africa. Killeen et al. suggest that the focus on malaria is justified because "it is the world's most important vector-borne disease and currently the target of a renewed global control campaign" (470). Since the "bulk of the worldwide malaria burden" occurs in sub-Saharan Africa, naturally this region should be a primary site of research (470).

The vast majority of complex emergencies take place in malaria endemic areas, many of them in sub-Saharan Africa. Complex emergencies are often caused by political or military conflict resulting in large-scale displacement of populations. When accompanied by the breakdown of social infrastructure and health systems, they present a raft of new challenges for malaria research, treatment, and prevention (Inter-agency Field Handbook vii). The Inter-agency Field Handbook focuses primarily on the acute phases of complex emergencies, because this is when "reliance on international humanitarian assistance is greatest" (vii). Yet since some complex emergencies develop into protracted emergency situations, there is a need for continued research on longer-term malaria prevention measures in these settings. The need to understand fully both sides of the argument on the ongoing debate and controversy over the use of DDT is equally urgent, particularly with respect to social-ecological resilience, and sustainability of lives and livelihoods.

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2. Efficacy of Zooprophylaxis

Perhaps the only conclusive finding of this article is that the efficacy of zooprophylaxis must be determined in a site-specific fashion. Efficacy depends primarily on the biology and behavior of local mosquito species. Determining efficacy also comes with methodological obstacles. Primary among them are the difficulties posed by the large numbers of variables at play in experimental studies of this sort; the multiple and sometimes contradictory methods for determining mosquito behavior and feeding preference, from odor-baited entry traps and indoor resting collection to HBI and BBI analysis; and the difficulty of isolating the prophylactic effects of cattle from those resulting from other prevention techniques, such as ITNs, when used concurrently by residents in the study area.

Despite these hurdles, the studies outlined here suggest that passive and active zooprophylaxis may indeed be effective at diverting *anopheline* mosquitoes away from humans in certain situations. Insecticide zooprophylaxis holds the added benefit of killing vectors immediately or over time. The studies further highlight that it would be fruitful to concentrate zooprophylaxis research in areas where the dominant vector is zoophilic and exophilic, and where this vector dominance is relatively large. Finally, the research suggests that animals used for the technique should be bovine, and cattle should be tethered outside near human dwellings to preserve habitat separation between humans and cattle.

3. Effectiveness Relative to Other Methods

ITNs are perhaps the most effective method for personal protection, and they are more feasible for communities on the move than most other interventions. They are therefore at the

forefront of international campaigns against malaria (Nothing But Nets). ITNs require high coverage in order to reduce a mosquito population and also require behavioral change. Motivating households to adopt bed net use often "requires sustained communication interventions guided by well-planned and locally appropriate communication strategies" to induce behavior change (Roll Back Malaria Partnership). Where people have no tradition of bed net use or where shelter is basic, residents may be unwilling or unable to use ITNs, and zooprophylaxis might serve as a supplemental technique.

IRS is also highly effective, but spraying requires substantial advance planning, logistics, and human and material resources. Additionally, families must remove all household items and leave their homes during the process. IRS requires very high coverage and a large volume of insecticide (Inter-agency Field Handbook 112-115). When used in lieu of or in conjunction with IRS, insecticide zooprophylaxis may reduce the amount of insecticide required and reduce the possibility of mosquitoes developing resistance. IRS is primarily an indoor technique and thus less effective on exophilic vectors, so in areas where exophilic vectors predominate, zooprophylaxis might offer an alternative or supplement to IRS.

Biological and environmental techniques such as larval control and water management have been shown to be highly effective in some circumstances but are generally not feasible in chronic emergency settings. They require professional management capacity and present substantial logistical hurdles (Inter-agency Field Handbook 125-126).

Zooprophylaxis therefore holds more potential for use in chronic emergency settings in sub-Saharan Africa than most other environmental and biological techniques, but it should be seen as either supplemental or secondary to ITNs and IRS.

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4. Cost-effectiveness

Environmental management of malaria is often regarded as cost-effective because it "can be integrated relatively easily with other control measures, and can be an appropriate technology chosen for the level of socioeconomic development and resources available in a community" (Ault 43).

Passive and active zooprophylaxis harness local capacity and local animals, and the costs incurred relate largely to pen siting and livestock arrangement. For example, Mahande et al. suggest that "in areas with a predominant *An. arabiensis* population, cattle should be placed close to dwelling houses in order to maximize the effects of zooprophylaxis" ("Role" 1). The exact costs of this sort of placement will vary with local conditions, but they are presumed to be low. In addition, compared to other chemical techniques, insecticide zooprophylaxis is low in cost because less insecticide is used and the technique requires no high-pressure spray cans or other infrastructure.

Developing an accurate picture of the cost-effectiveness of zooprophylaxis relative to other interventions would require a cost-effectiveness analysis. Ault describes this process as one in which the objectives of the interventions are clearly delineated in terms of a specific health effect such as case-years of infection prevented or reduction in the number of hospital beds devoted to patients with the disease. Cost-effectiveness analysis would then set about determining "which among a number of interventions would achieve the health objective for least cost, or given a fixed budget, which intervention will maximize the achievement of the health objective" (43). Perhaps because of the presumption of low cost, to date there has been a dearth of such systematic analysis of the costs of zooprophylaxis.

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5. Feasibility of Implementation

Feasibility requires local understanding of the role of mosquitoes in malaria transmission, as well as the capability and resources to identify the dominant vector and study its biology and feeding habits. Since vector dominance varies widely throughout regions, site-specific testing is essential. In this sense, feasibility is tied to the costs incurred in the research, unless those costs are borne by external actors.

More importantly, a nuanced understanding of the role of cattle as social and economic currency in many parts of sub-Saharan Africa is important for zooprophylaxis to be feasible. In much of sub-Saharan Africa, "bride price is commonplace, and thus marriage and family formation are directly tied to having income or property" (Barker & Ricardo 161). In areas where men are engaged primarily in agricultural work and in many pastoralist communities that rely on cattle herding for subsistence, "manhood begins when a father bestows land and livestock to a son," which can in turn help the son secure marriage (161). Among cattle herders in northeastern Uganda, for example, this dynamic has established delicate intergenerational power tensions between "age-sets" of men (Stites et al. 4-5). Tensions between different pastoralist groups in this region have also frequently manifested in armed cattle raiding (Gray et al. S3). In addition, internally displaced persons often lose their livestock during war. In chronic emergency and post-conflict situations, it is therefore imperative that public health professionals proceed delicately with interventions involving livestock. The social and economic role of cattle also points to the continued need for collaboration among humanitarians, anthropologists, and public health professionals in exploring zooprophylaxis as a possible intervention.

In conclusion, there is a demonstrated need for malaria prevention in chronic emergencies in sub-Saharan Africa, and zooprophylaxis deserves more attention in areas where the dominant

anopheline vector is zoophilic and exophilic, where cattle are tethered outside, and where there is human-cattle habitat separation. Zooprophylaxis seems relatively cost-effective at least in some settings where cattle are present and their social currency is not prohibitive. Where local knowledge and understanding of local mosquito vectors exist, use of zooprophylaxis is likely to be effective if informed decisions are made at the community level.

[*] The field handbook was developed by the Roll Back Malaria (RBM) Network and published by the World Health Organization in collaboration with Médecins Sans Frontières, the United Nations High Commissioner for Refugees, Shoklo Malaria Research Unit, Malaria Consortium, Merlin, The London School of Hygiene and Tropical Medicine, Health Net International, and the Centers for Disease Control and Prevention.

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PETS AS GENERATORS OF SOCIAL CAPITAL: A PRELIMINARY REVIEW OF PRIMARY EVIDENCE

Sara Jackson[1]

Summary

The past few years have witnessed an increase in research investigating the social benefits of pet ownership. This preliminary review examines primary research evidence from quantitative and qualitative studies, and attempts to "connect the dots" between companion animals and the ability for people to generate social capital of the bonding and bridging types. Pet owners appear to be more likely to interact with others in their communities, and to have longer conversations with other people. The studies also indicate that seeing people out and about with their pets is conducive to positive feelings of community dynamics, with a sense of security, civic engagement, and reciprocity between neighbors. In addition, companion animals help improve social networks and elevate their owners' sense of psychological well-being. Further research into the social capital benefits gained from interactions between pet owners and others in the community, with a focus on the practical implications of human-pet interactions is suggested.

Introduction

When Hurricane Katrina swept through the southern states in late August 2005, inhabitants were forced to choose between their pets' and their own survival; Rules prohibited most evacuees from taking pets with them. Although most pet owners followed the advice of officials and left their pets behind, some refused and died in their flooded homes. Why were people so hesitant to leave behind their pets? What do pets do for us?

Since the late 18th century, pets have been used in therapy programs. There is substantial evidence that owning pets reduces pain, improves health, lowers blood pressure, and reduces

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anxiety—among other health benefits. Were Hurricane Katrina victims hesitant to leave their pets because of the physical and psychological benefits of pet ownership? If animals improve both physical and psychological health, can they also enhance social capital? Does the pet-owner relationship strengthen social capital, and if so, how?

These questions led to a preliminary review of primary evidence linking pet ownership and social capital and mental health during a semester's seminar course on social capital and mental health in 2007. To lay the groundwork, this essay will define social capital and provide a brief review of the research on pets as conduits of physical and psychological health improvements.

Main electronic databases in the health as well as social sciences were searched systematically for articles on 'social capital and animals', 'social capital and pets' appearing in the title, abstract, or text of peer reviewed articles along with 'social capital and health or mental health. The most relevant results of the electronic searches were handpicked to follow up references, using reports of primary data/evidence as the key criterion, focusing on pets and pet ownership. The final set of articles for review was selected on the basis of presence of information linking health or mental health and pets and social capital and pets. The abstracts for over 30 articles were reviewed and a final selection made based on the design or analytical rigor of the research. Studies with inconclusive evidence were included. The final list of primary sources was then divided into three categories: (A) Pets and physical health; (B) Pets and psychological benefits; and (C) Pets and social capital.

Electronic databases and journals were also searched for "pets and social ties" and "pets and social linking" but the articles that the searches produced were in no way connected to social capital or health benefits. These articles primarily dealt with the bonds and social ties that pets can

have with their elderly owners. For this reason, these articles were excluded because they did not deal specifically with social capital.

What is social capital?

In an interdisciplinary review of evidence, Almedom (2005) stated that social capital is "an umbrella term embracing social cohesion, social support, social integration and/or participation, among several other social determinants of health in general and mental health in particular" (944). Similarly, Harpham et al define social capital as "the degree of connectedness and the quality and quantity of social relations in a given population" (106). These definitions are more focused on mental health, than Putnam's definition of social capital as the features of social organization such as networks, norms and trust that can improve the efficiency of a society by facilitating coordinated actions and enabling participants to pursue shared goals (as cited in Almedom 2005).

Do Animals/pets improve physical & psychological health of humans?

Because social capital is strengthened by interactions between people, understanding how pets improve the physical and psychological health of their owners is important in order to understand how pets serve as conduits of social capital. For example, improved physical health might lead to taking more walks outside with a companion animal which can therefore lead to increased interactions between neighbors. In addition, improved psychological well being promoted by a companion animal may cause that person to want to interact more with others and have longer conversations, thus strengthening social capital. Conversely, it could be argued that pet ownership is more likely to be common among healthy and active citizens who interact with

their neighbors and community acquaintances on a regular basis. Nevertheless, the evidence reviewed seems to suggest that there is a strong correlation and improved physical and mental health.

For example, a 1980 report on animal companions and one-year survival of patients after discharge from a coronary care unit was the first to document that after a heart attack, the ownership of any animal correlated with an improved survival rate of 94% whereas only 72% of heart attack patients without pets survived (Beck and Meyers 250).

Another study found animals to be beneficial for patients with diminished life skills resulting from dementia (Laun 49). Pets lessened withdrawal of patients through stimulation of the senses, improve short-term memory, triggered long-term memory, enhanced communication skills and reinforce spatial concepts. Pets also helped patients improve their motor and social skills as well as learn sequences of events. In this way, pets can contribute to self-efficacy, or the degree of confidence people have in their ability to perform specific behaviors (Berkman et al 850). By being responsible for and taking care of an animal, people, especially the elderly, improve their sense of self-efficacy.

Serpell (1991) had also demonstrated the benefits of pet acquisition on human health and behavior. He collected personal and socio-demographic details, as well as information on physical and psychological health of 71 pet owners and 26 non-pet owners. His research participants filled out a checklist of twenty minor health complaints experienced in the previous month. The General Health Questionnaire (GHQ) scores and reported minor health problems of the non-pet owning group did not change whereas dog owners reported a highly significant reduction in minor health problems and a reduction in the GHQ scores during the first month of pet acquisition. This effect

persisted for ten months. Dog owners also increased the number/duration of recreational walks taken after the first month of pet ownership. The results of Serpell's study did not show any significant evidence that walking on its own accounted for the health benefits reported by dog owners. This study also took prior health status into account and the two groups "did not differ significantly from each other in terms of age, marital status, sex ratio, type of housing, number of minor health problems reported or GHQ-30 scores" (718).

Earlier, Baun et al (1984) had demonstrated that individuals who petted their companion dogs exhibited a decrease in blood pressure. Participants' blood pressure was measured while reading quietly, petting an unknown dog, or petting a dog with which they had a relationship. The biggest difference was seen between petting a companion dog and petting an unknown dog. "In this protocol, systolic pressure decreased by a mean of 7.8 mm/Hg and diastolic pressure decreased by a mean of 4.3 mm/Hg, as compared to reading and petting an unknown dog where systolic pressures decreased by 7.2 and 1.2 mm/Hg and diastolic pressures decreased by 1 and 1.1 mm/Hg respectively" (Baun et al 128). The data demonstrated that petting a companion dog may help reduce blood pressure. "When the two protocols using the bonded dog and the unknown dog were compared there was a statistically significant difference over time in both systolic and diastolic pressures" (128). However, these authors stated that petting a companion dog had the same effect as quiet reading, and petting an unknown dog didn't seem to have any statistically significant effect on blood pressure, so the associations between pet ownership and physical health indicators such as blood pressure are not simple or clear cut. Baun et al's subjects were asked, "If you were upset about something not related to this dog, would you ever look to this dog for comfort?" Out of the 24 participants, 23 answered yes to this question, demonstrating the

comforting role pets play as their owners bond with them.

Animals also reduce stress and provide people with companionship and a sense of security as well as the opportunity for fun, play and relaxation. According to Beck and Meyers in "Health Enhancement and Companion Animal Ownership" some psychiatrists treat mentally ill patients using companion animals. Animals help patients laugh and maintain a sense of humor. As Beck and Meyers stated, "Laughter, or at least encouragement to find humor, is a recognized medical intervention and animals are a frequent source of that humor" (252). In addition, animals may help people develop trust, overcome isolation and improve their confidence (Cangelosi and Embrey 2006: 17). These authors stated that animals help bring ease to people who are hospitalized or who live in health care facilities. A visit by a "therapy dog" helped lesson the burden of illnesses, separation from the family, fear, loneliness and depression.

In 2005, Wood et al conducted a study on 339 survey respondents in Australia to test the mental health benefits of pet ownership. After age adjustment, "significantly fewer pet owners reported being lonely compared with non-pet owners, with 70.5% of pet owners indicating that they rarely or never felt lonely, compared with 58.3% of non-pet owners" (1165).

Furthermore, an earlier study had shown that companion animals alleviated distress in children undergoing physical examinations. Thirty-four children were assigned either to a treatment group in which a dog was present during their physical examination or a control group in which no animal was present. Blood pressure, heart rate and fingertip temperature were measured and the subjects were videotaped for analysis of behavioral distress using the Observation Scale of Behavioral Distress (OSBD). Subjects in the treatment group had statistically significant lower behavioral distress than subjects in the control group (Nagengast et

al 1999). This study demonstrated the positive effects animals have on the psychological health of humans. Animals not only reduced stress, loneliness and alleviated anxiety, but they also improved trust, confidence and psychological well-being: all key factors in developing strong social capital and cohesion within a community.

Animal companions (Pets) & social capital

Current evidence demonstrates the physical and psychological benefits of animal companions as well as suggests a link between improved physical and psychological health and improved social capital. This section will review links between pets and social capital to determine the extent of the relationship.

In Western Australia, qualitative data was collected from 86 participants about sense of community, trust and community involvement. In addition, quantitative data collected from 113 participants using a random cross-sectional telephone survey measured social capital, sense of community, mental health, neighborhood perception, and relationships with pets (Wood 2005: 46).

In the qualitative research, dogs were often referred to in conversations about meeting and getting to know people locally, both by pet and non-pet owners. Dogs increased the likelihood of their owners meeting other people by increasing the frequency and length of recreational walks and by creating "social interactions that link or cut across different communities or groups": also known as bridging social capital (Harpham 2002: 106). In addition to the creation of weak ties, results showed that providing pet-related favors promotes other favors among neighbors, contributing to neighborhood goodwill and trust. Perceptions of helpfulness as well as reciprocity between neighbors were higher among pet owners than non-pet owners.

In the quantitative analysis of Wood et al's research, dog owners were almost twice as

likely as non-pet owners to feel that living in their suburb gives them a sense of community and 2.23 times more likely to feel loyal to neighbors. A social capital scale relating to trust, reciprocity, civic engagement, perceived suburb friendliness, and social networks was also conducted among survey participants. Pet owners were 74% more likely to have a high social capital score compared with non-pet owners (Wood 50-51). In addition, 74.5% of pet owners reported rarely or never finding it hard to get to know people, compared with 62.6% of non-pet owners. After adjusting for age, pet owners were also 57% more likely to be civically engaged that non-pet owners.

The benefits of pet ownership documented in this study were not limited to the pet owners themselves. Neighbors also reported on the benefits of having pets in their community. In regards to pet owners walking their dogs, one such neighbor stated "It makes me feel really good to see lots of people out and about. It gives me a sense of community" (50). Wood et al's study went beyond the traditional research of individual benefits of pet ownership and demonstrated the positive ripple effect that pets can have on a community. "The social lubrication and contacts derived from dog walking did not accrue only among dog owners but often extended to residents generally including those without a dog" (48).

McNicholas and Collis (200) had also demonstrated the ability of pets to enhance social interactions between people, improving social networks and thus elevating psychological wellbeing. In this study, an experimenter was observed in public places both with and without a dog. The dog was trained to not solicit attention. Interactions with the experimenter were categorized based on length and the approachee was categorized as a friend, acquaintance or stranger. The results indicated that dogs may act as catalysts for social interaction even when the

appearance of the dog and/or the experimenter was less appealing. Of the 206 interactions initiated by the aproachee, only 50 took place in the absence of the dog. Of the acquaintances that approached the experimenter, many continued to initiate social interactions even when the dog was not present.

Hunt et al 1992 had produced similar results, with the added insight that it is not only dogs that are associated with generating social interactions in public spaces. Other animal companions (pets) had similar effects on people's responses and levels of interest aroused. Their study observed a woman confederate in a park who had with her either a turtle or a rabbit. For comparison the woman blew bubbles or watched television. Results showed that the woman was approached frequently by strangers when with the rabbit or when blowing bubbles, approached numerously when with the turtle and approached rarely when watching the television.

Clearly, pets may help improve psychological well-being by generating social interactions between their owners. For example, dog owners may form interest groups that create social capital of the bonding type. Bonding social capital is defined as social cohesion within a group or structure (Harpham 1165).

Among the practical applications of the above findings, particularly in the aftermath of Hurricane Katrina, is that the US government Centers for Disease Control and Prevention (CDC) adopted promotion of pet ownership as part of its public health policy implementation strategy. This was done so that both health workers and lay people, ordinary citizens may access useful relevant information directly from the CDC website, including a link to the American Veterinary Medical Association (AVMA) which had issued a statement affirming the health benefits people gain from pet "animal companionship".

Limitations

The limitations of this review are two-fold. First, using documents that must contain the words "social capital" may limit the quantity and type of research found since it is a relatively new term associated with pet ownership. However, when including the words "social bonds" and "social links" no relevant articles were found.

In addition, it is possible that people who choose to own pets are already healthier physically, psychologically and have stronger social capital before pet acquisition. However, research suggests that even people who do not own pets may benefit in all three respects (physically, psychologically and improved social capital) from having other people's pets in their communities as long as the pets are cared for and their owners do not neglect their civic duties of keeping public spaces such as parks and side walks clean and safe for all community members, especially young children.

Conclusion

In conclusion, the studies reviewed demonstrate the positive effects of pets on the physical, psychological, and social well-being of humans. Pets increase human survival after a heart-attack, address problems associated with dementia, improve the general health of owners, reduce blood pressure, stress and loneliness, alleviate anxiety, improve trust and confidence, and promote social interactions.

Pets also act as instigators of social ties by enticing people outside their homes and into public spaces where they are likely to meet other people, some of whom may share their own characteristics as fellow pet owners in their surrounding neighborhoods. This may increase the frequency of social interactions of community members, which further increases feelings of trust,

reciprocity, safety and sense of community. These studies also demonstrate how pets act as catalysts for the exchange of favors between neighbors, furthering the feeling of reciprocity and social connectedness. Pets (mainly dogs) are shown to be facilitators of community participation in activities that directly or indirectly involve pets such as dog walking, or meeting regularly at the local park. Finally, this review shows how pets can act as a protective factor for mental health, which in turn may influence attitudes towards, and participation in the community and relationships with community members. Although more information is needed on the concrete effects pets have on social capital, preliminary research shows that animals act as catalysts in social "reactions": producing feelings of trust, reciprocity and sense of community. Further research should focus on the positive benefits that companion animals have on social interactions and mental health. The use of animals in health care settings as well as in communities should be researched in greater detail to determine their possible psychological and social benefits for humans. For example, after more extensive research on the relationship between companion animals and social capital, nursing homes and hospitals might consider having a "pet" dog in the facility. This would encourage patients and residents to interact more amongst themselves and create stronger bonding between people. Schools could also think about using companion animals to reach out to the children who are more timid and not as keen on interacting with others. Companion animals are beneficial in many respects and the practical implications of this research are endless.

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A PROPOSAL TO HARNESS CAPACITIES FOR PROMOTING RESILIENCE OF EGYPTIAN YOUTH FOR NATIONAL AND INTERNATIONAL SECURITY

Nicholas Cooper[1]

Summary

The percentage of the Egyptian population aged 15-24 surpasses 22 percent, resulting in a 'youth bulge' on the Egyptian population pyramid. This is of urgent concern to Egyptian decision-makers, who must harness young people's potential for fueling economic growth and maintaining social and political stability. While a successful demographic transition offers the promise of the 'demographic dividend' as a large proportion of the population moves through the productive phase, failure to provide attractive and viable livelihood choices to Egyptian youth may lead them to become destabilizing social forces who may turn to violence to meet their livelihood needs. An adapted Sustainable Livelihoods framework is proposed for the purpose of assessing Egyptian youth's access to financial, human, social, natural, and physical capital with the aim of promoting resilient strategies for sustaining livelihoods. The policy applications of the proposed model are explored, and the limitations of crude indicators of social and other forms of capital obtained from available population-level databases acknowledged. Nevertheless, it is argued that providing Egyptian policy makers a general framework for practical ways to simultaneously enhance the sustainability and resilience of livelihood strategies, while actualizing youth's potential as agents of peace and development is worthwhile. Further research to examine the overlap between the different forms of capital is suggested.

Introduction

Foremost among states' responsibilities is to guarantee the security of their populations (ICISS 13). Proponents of the 'youth bulge' theory typically characterize adolescents' and youths' experience of violence and armed conflict in one of two ways: young (usually male) individuals are perceived either as deviant, violent, destabilizing social elements, or as (typically female) passive victims of insecurity (Sommers *Youth and Conflict* 5). This dichotomy ignores young people's agency in the pursuit of peace,

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focusing on vulnerability rather than resilience. As the proportion of the population aged 15-24 in Egypt surpasses 22 percent (ESIS 1) and the demographic composition converges to a 'youth bulge' (Figure 1), Egyptian decision-makers grapple with the task of harnessing the potential of youth, while also harboring concerns over the growing young population's effect on social stability.

Programs and policy towards young people and security in Middle Eastern and North African countries have generally been based on the assertion that young people constitute a threat to social stability. The specter of "too many young men with not enough to do" (Cincotta, Engelman and Anastasion 44) has shifted the policy debate on livelihoods from the realm of development to that of security (Ebata et al.). The policy approach of 'keeping young people occupied,' rather than gainfully utilized has limited the effectiveness of initiatives to both protect the potential victims of conflict and dissuade young people from engaging in violent activities.

Recognizing the potential of young people as agents of positive change necessitates providing them with viable, attractive choices (Sommers "Embracing the Margins" 111). In order for choices to be both viable and attractive, they must lead to positive outcomes for the individual and society as a whole.

Governments and institutions have the capacity to enhance both the viability and the attractiveness of options by providing programs and incentives, leading to the promotion of peace and development. Thus, to actualize the potential of Egyptian youth as a stabilizing force, it is incumbent upon government and institutions to promote such choices. Egyptian policy-makers and programmers must have access to high quality data

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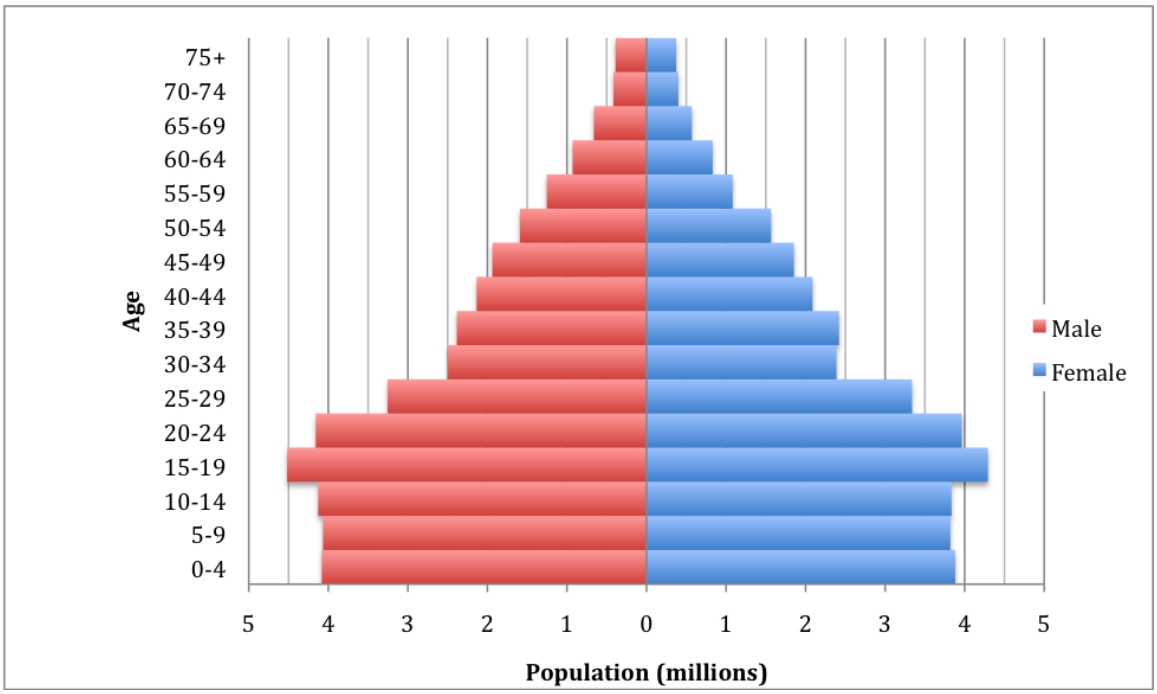
and analyses to inform their decisions. Informative analyses are necessary for Egyptian policy-makers to realize the potential of the youth bulge.

Figure 1 Egyptian population pyramid: 1 July 2008 (Estimate)



Source: ESIS. *Population Estimates by Sex and Age Group, 1/7/2008 Estimates*. Egyptian State Information Service. 2009. Web November 1 2009.

Most young people resist engagement in violence (Barker and Ricardo 181). By strengthening young people's pre-existing resilience strategies, and providing viable and attractive choices for young people to fulfill their needs outside of violence and armed conflict, policy-makers and programmers can simultaneously decrease adolescents' and youths' vulnerability to armed conflict and violence, while also reducing their propensity to engage with destabilizing social elements. Additionally, this approach fosters adolescents' and youths' empowerment, allowing them to exercise their autonomy and decision-making capacity towards the shaping of their own futures.

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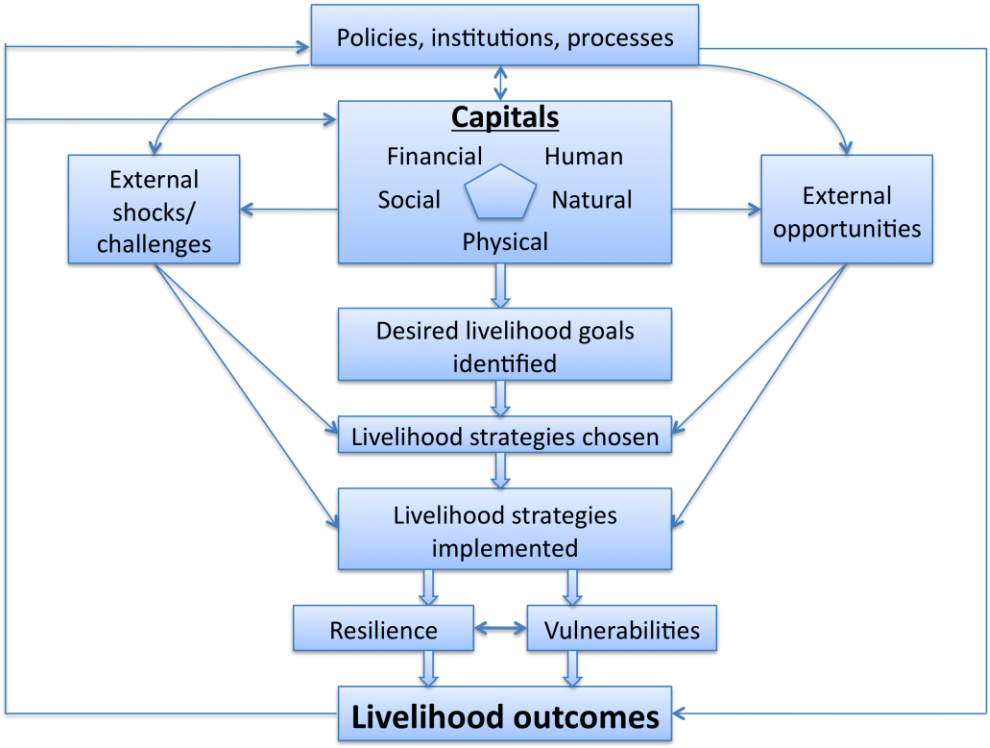
The Sustainable Livelihoods (SL) approach was first developed by Amartya Sen and the United Nations Development Programme in response to the relative deficiencies of previous development planning strategies, which focused only on vulnerability rather than assets and capitals (Khanya-Aicdd Understanding the SLA). Instead, the SL approach assesses five areas of capital people utilize in their formation of livelihood: financial capital, human capital, social capital, natural capital, and physical capital (Figure 2). In this case, the time period of sustainability is a person's lifetime, as a person's descendants are likely to pursue different livelihood strategies. This interpretation differs from that of the 1987 World Commission on Environment and Development (also known as the Brundtland Commission), where sustainability refers to the inter-generational availability of resources, rather than the sustainability of a livelihood strategy employed by an individual over the course of their life (Brundtland 54). Figure 2 presents an adaptation of the conceptual framework for visualizing the way different forms of capital (or deficiency thereof) may determine livelihood outcomes, and the long-term prospects of either building resilience or exacerbating existing vulnerability. This model includes the role of resilience in affecting the success of a livelihood strategy, addressing the deficiency of many models that focus only on vulnerability. Access to the five domains of capital informs the livelihood goals individuals choose to pursue. Livelihood strategies are then conceived as the means to achieve those livelihood goals. These strategies are context-specific, informed by the presence of external challenges and opportunities. The implementation of these strategies is similarly cognizant of the external environment; an individual's success in achieving their livelihood goals will depend on the resilience of their livelihood strategy to external

shocks and their underlying vulnerabilities, and may also influence the presence of external challenges and opportunities. Livelihood outcomes may in turn affect individuals' access to the five domains of capital, while also affecting macro-, meso-, and micro-level policies, institutions and processes. External opportunities may also determine livelihood outcomes – for example, for professionals hired by foreign institutions with higher salaries and other incentives including bridging social capital. Moreover, macro policies may also directly impinge on livelihood outcomes – for instance, immigration policies associated with the "War on Terror", taxes, or food rations provided in times of hardship.

Figure 2 Sustainable Livelihoods model (adapted from Khanya-Aicdd 2006)



Resilience and vulnerability are two ends of a continuum (Almedom and Tumwine S2). Furthermore, system-wide resilience may include elements of vulnerability that are inherently built-in the adaptive cycle where the feedback loop

involves transformation and persistence taking place simultaneously while the system is reorganizing, with the aim of maintaining "normal" function without losing its identity (Almedom).

The UK Department for International Development defines sustainable livelihoods as: "The capabilities, assets (including both material and social resources) for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base" (Solesbury 1). This conceptualization of sustainability bears marked similarity to established interpretations of 'resilience.' This interpretation holds that resilience is the outcome of adaptive capacity. Increasing the range of attractive and viable choices available to young people provides alternatives that can be utilized in circumstances where pre-existing livelihood strategies become unsustainable. Analysis of the levels of capital available to Egyptian youth can, therefore, be seen as an indicator of their adaptive potential. When a person's strategy to achieve their livelihood goals is supported by a range of attractive and viable alternatives, it becomes more resilient to external shocks, thereby increasing the sustainability of the person to achieve those goals. Resilience and sustainability can therefore be viewed 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" (Almedom and Tumwine S1). Egyptian youth's resilience to the effects of conflict and their propensity to engage with destabilizing social elements is therefore socially contextualized, necessitating a national

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and community-wide response to utilize their potential. Application of the Sustainable Livelihoods model to Egyptian youth's lived experience empowers programmers and policy-makers to increase the availability, viability, and attractiveness of choices, strengthening resilience while simultaneously promoting peace and security.

This article explores Egyptian youth's access to the five forms of capital: financial, human, social, natural, and physical. Current levels of capital available to Egyptian youth are examined for the purposes of identifying a range of attractive and viable choices available to youth and policy makers alike, both of whom are presumed to be striving to achieve sustainable systems of governance and livelihoods. When livelihoods are sustainable, they will be more resilient in the face of shocks, be they natural hazards such as drought or flood, or anthropogenic, such as conflict. The inverse is also true – resilient systems promote sustainable livelihoods at multiple levels: local, national and international. This article aims to stimulate interest in research looking at how Egyptian youth may actualize their potential as agents of development, peace, and security.

Methods

Building on a previous assessment of young people in the Middle East and North Africa (MENA) region, this desk review draws on official national and international reports, statistical databases and secondary analysis to quantify aspects of the Sustainable Livelihoods framework for resilience assessment. This article uses the UN standard definition of youth as those individuals aged 15-24. Sources using different age categories, or categories that could not be aggregated without reference to external population references to provide age-range specific estimates, were excluded from the

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analysis. Three statistical databases and statistical annexes provided the data for the majority of indicators used in this paper, while official national and international reports and published articles provided additional details and qualitative information. The Gallup World Poll and World Values Survey, which provide data disaggregated by age from large, nationally representative samples, were used for many indicators, while the statistical annex of the UN Department of Economic and Social Affairs (UN DESA) 2007 World Youth Report provided age-specific information for a range of youth-specific indicators routinely collected through UN reporting mechanisms. Data from the Gallup World Poll and World Values Survey were compiled independently of other databases, while information from the UN DESA report originate from a number of different UN agencies, raising concerns of comparability and selection bias. A total of 12 reports from United Nations agencies and departments were reviewed, the majority published by UNICEF, UNDP, UN DESA and UN ESCWA. Many of these reports drew on statistical databases utilized in the preparation of the 2007 World Youth Report, which provides a comprehensive statistical annex of youth-specific indicators, and general population-based indicators either disaggregated by age, or averaged using population data from the UN Population Division. Egypt-specific data were drawn from the Egyptian State Information Service. Additional quantitative data was derived from the World Health Organization's Mortality Database and a range of publications from international research institutions, notably the Middle East Youth Initiative of the Brookings Intsitution and the Dubai School of Government, and the Population Council. Many reports were reviewed and rejected due to duplication of data already in the 2007 World Youth Report. Additional qualitative insights into the situation of youth in Egypt

were drawn from these sources, and are attributed where appropriate. Data presented in the text of this article are attributed in summary tables, unless otherwise indicated. The aim is to holistically explore the hypothesis that the Egyptian "youth bulge" need not have a negative impact on the stability of Egyptian society, if decision makers are prepared to see youth as assets and promote resilience at multiple stages of the livelihood continuum.

Results and Discussion

Financial capital:

Most development practitioners regard financial capital as the foundation of resilience. This is largely due to financial capital's liquidity; it can be exchanged for goods and services required to pursue a livelihood strategy in a way that other simply capitals cannot. However, deficiencies in access to financial capital, in the form of income, savings, and/or credit, may be supplemented by other forms of capital.

Young people's access to financial capital in Egypt derives from two primary sources: employment, and family networks, the latter of which is also known as bonding social capital and is restricted to ties of solidarity in relatively homogeneous groups. Youth in Egypt reported dissatisfaction with national employment prospects. Only 30 percent of those surveyed had a job, and only 28 percent satisfied with job growth efforts, and even fewer thought that now was a good time to find a job in their city or nation as a whole (Table 1). Dissatisfaction with employment prospects may have led to relatively low Labor Force Participation Rates (16 percent among those aged 15-19, 44 percent among those aged 20-24), especially among women. However, the Gallup World Poll

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found that 85 percent of those who had a job were satisfied, possibly indicating that the availability of work, not the quality of work itself that is important.

Table 1 **Financial capital among Egyptian youth**

Topic	**Percentage**	**Source**
Food insecurity	22% food insecure	Gallup Worldview
Shelter insecurity	16% shelter insecure	Gallup Worldview
Have a job (paid & unpaid)	30% yes	Gallup Worldview
Satisfied with job	85% satisfied	Gallup Worldview
Good time to find a job in city	18% yes	Gallup Worldview
Good time to find a job in nation	21% yes	Gallup Worldview
Satisfaction with job growth efforts	28% satisfied	Gallup Worldview
Labor Force Participation Rate aged 15-19	16.2%	World Youth Report: 2007
Labor Force Participation Rate aged 20-24	44.1%	World Youth Report: 2007
Labor Force Participation Rate sex ratio ages 15-19	0.4	World Youth Report: 2007
Labor Force Participation Rate sex ratio ages 20-24	0.4	World Youth Report: 2007
Absolute poverty rate	3.1%	World Youth Report: 2007
Relative poverty rate	43.9%	World Youth Report: 2007
Percentage of total unemployed who are youth	65.9%	World Youth Report: 2007

Sources: Gallup. *Gallup Worldview*. 2009. Web October 14 2009. <www.gallup.com/worldview>.
UN, DESA. *World Youth Report 2007*. New York: United Nations, 2008. Print.

Family networks provide another opportunity for Egyptian youth to gain access to financial capital. This is a significant source of the bonding type of social capital. However, relative poverty, food and shelter insecurity cluster within families reflecting high rates of intergenerational poverty, present real obstacles for young people.

In Egypt, marriage is the largest intergenerational transfer of wealth, averaging approximately four and a half times the average GDP per capita in 1999 (Assaad and

Barsoum 28). Additionally, marriage is regarded as "the cultural meaning of adulthood" (Singerman 8). Egyptian youth's economic exclusion through unemployment has resulted in delayed marriage, creating a dual burden of financial and social marginalization (Assaad and Barsoum 6). While men generally marry at older ages than women in many countries in the Middle East and North Africa (MENA), potentially reducing the impact on marriage of a low Labor Force Participation Rate for Egyptian male youth, quantitative data on age-specific marriage rates for men are not available to substantiate this hypothesis.

Human capital:

Since 1970, large investments in education across the MENA region have resulted in significant improvements in literacy rates and average years of schooling (UN). In Egypt, secondary school sex ratios have almost reached parity, while 85 percent of Egyptian youths are literate (Table 2). Similarly, Egypt has achieved near-universal primary school enrollment (96 percent), while the secondary Gross Enrollment Ratio (GER) has risen 19 percent since 1987, to 87 percent (UNDP 152). While aggregate educational attainment has recently increased, increases have not been uniform across governorates (Goujon 20) and there are regional differences that are beyond the scope of this article to explore.

Table 2 **Human capital among Egyptian youth**

Topic	**Percentage**	**Source**
Personal health	95% satisfied	Gallup Worldview
Health problems	11% with health problems	Gallup Worldview
Education system	62% satisfied	Gallup Worldview
Quality of healthcare	62% satisfied	Gallup Worldview
Youth literacy rate	84.9%	World Youth Report: 2007

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Secondary Gross Enrollment Ratio	87.1%	World Youth Report: 2007
Tertiary Gross Enrollment Ratio	32.6%	World Youth Report: 2007
Secondary school sex ratio	0.94	World Youth Report: 2007
Secondary Net Enrollment Ratio	79.1%	World Youth Report: 2007

Sources: Gallup. *Gallup Worldview*. 2009. Web October 14 2009. <www.gallup.com/worldview>.
UN, DESA. *World Youth Report 2007*. New York: United Nations, 2008. Print.

However, 62 percent of surveyed youth reported satisfaction with the education system. This may suggest a disconnect between education curricula and the needs of the job market, as increased levels of education have not translated into long-term economic growth. Transitioning effectively from school to decent employment remains a tremendous obstacle for many MENA youth.

While satisfaction with the quality of healthcare available to youth is relatively low, the vast majority of youth are satisfied with their personal health. The WHO estimates that most deaths are attributed to accidents and related causes (WHO *Mortality Database: Table 2*) indicating that more investment is required in preventative healthcare and safety education. Such investments may reduce incidence of these most common forms of mortality, while also improving the perceived quality of healthcare.

Social Capital

Egyptian youths' access to social capital can be viewed at 2 distinct levels: the interpersonal sphere and the community/national sphere. At the interpersonal level, Egyptian youth report high rates of the 'bonding' type of social capital (see Table 3). 91 percent of Egyptian youth rated friends as either 'very important' or 'rather important', while the same question about families elicited a response of nearly 100 percent, and 76 percent said that they had someone they could count on to help if they needed it.

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Table 3 **Social capital among Egyptian youth**

Topic	**Percentage**	**Source**
Count on someone to help	76% yes	Gallup Worldview
Treated with respect	91% yes	Gallup Worldview
Good place for racial and ethnic minorities	35% yes	Gallup Worldview
Good place for immigrants	21% yes	Gallup Worldview
Donated money in past month	18% yes	Gallup Worldview
Volunteered time in past month	4% yes	Gallup Worldview
Helped a stranger in past month	44% yes	Gallup Worldview
Safe walking alone	68% yes	Gallup Worldview
Money/property stolen in past year	14% yes	Gallup Worldview
Children respected	66% yes	Gallup Worldview
Efforts to deal with the poor	49% satisfied	Gallup Worldview
Confidence in local police	52% confident	Gallup Worldview
Friends 'very important' or 'rather important'	90.7%	World Values Survey
Religion 'very important' or 'rather important'	98%	World Values Survey
Family 'very important' or 'rather important'	99.7%	World Values Survey

Sources: Gallup. *Gallup Worldview*. 2009. Web October 14 2009. <www.gallup.com/worldview>.
WVS. *World Values Survey 2005*. 2009. Web November 13 2009. <http://www.worldvaluessurvey.org/>.

It is important to note that both Gallup and World Values Survey measures of social capital are rather crude. Nevertheless, the data provide sufficient grounds for hypothesizing that their existing high levels of social capital may contribute to more resilience in their livelihood strategies, if they are augmented with "bridging" social capital, which require policy makers' deliberate action to facilitate. While the high degree of interpersonal social capital experienced by Egyptian youth may mediate the negative impact of social exclusion, young people's disconnect between their immediate networks and their state may be a source of instability.

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Natural capital:

Egypt's natural capital resources include petroleum, natural gas, iron ore, phosphates, manganese, limestone, gypsum, talc, asbestos, lead, zinc, while the lush Nile valley provides for cotton, textiles, and a variety of agricultural products. The state also exports oil and natural gas, generating substantial state revenue (CIA). Oil and gas revenues bolster the national budget, but provide economic opportunity to relatively few young people. Youth working on farms in the Nile valley generally do so as part of their familial obligation, without pay. As such, they contribute to the family's general economic wellbeing without drawing a disposable income to pursue their *individual* livelihoods strategy. Thus, capital endowments have not positively contributed to young people's search for opportunity.

Egypt's natural capital base is also shrinking. Agricultural land is being lost to desertification and urban sprawl, salination below the Aswan Dam is rendering previously fertile land unusable, and pollution from industrial effluent, pesticides and sewage are degrading the only perennial water source: the Nile (CIA). Widespread neglect of the natural environment and insufficient industrial regulation have resulted in low levels of satisfaction with environmental preservation efforts amongst Egyptian youth (39 percent) (Table 4). Environmental protection is a fundamental element of the sustainable livelihoods approach, as today's generations seek to realize their livelihood goals without compromising the ability of future generations to do the same. This is consistent with the aspirations for resilience as a basis for sustainability of both human and ecological systems.

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Table 4 **Natural capital among Egyptian youth**

Topic	Percentage	Source
Environmental preservation satisfaction	39% satisfied	Gallup Worldview

Sources: Gallup. *Gallup Worldview*. 2009. Web October 14 2009. <www.gallup.com/worldview>.

Physical capital:

Physical capital is comprised of infrastructure and the built environment, including adequate shelter, buildings, water and sanitation, tools, transport, energy and communications. Given a relative poverty rate of 44 percent, it is somewhat surprising that youth in Egypt report relatively high levels of physical capital (Table 5). While 27 percent of youths do not have adequate shelter (using the World Bank definition), and 58 percent of youths are dissatisfied with the availability of good, affordable housing, only 11 percent of youths are *dissatisfied* with their housing situation. This discrepancy may indicate a lack of applicability of the World Bank criteria to youths in Egypt, or may reflect different sampling methodologies for the two studies. Alternatively, young people's perception of 'good, affordable' housing may also be influenced by the close association between moving out of the family home and in with a spouse. Affordability may therefore be the primary issue, rather than a lack of the physical infrastructure itself.

In the majority of other physical capital indicators, Egyptian youth report high access given other considerations, such as GDP per capita. 100 percent of homes have electricity and 63 percent of all homes have at least one member with a cell phone. Access to water and sanitation is high, with only 1.6 and 1.2 percent of youths deprived of access to each, respectively. Interestingly, satisfaction with public transport is also relatively high, at 79 percent. As Egyptian youth appear to report a high degree of access

to physical capital, it behooves their government to ensure that these high levels are maintained, as budgetary resources are stretched due to rapid population growth and further urbanization.

Table 5 **Physical capital among Egyptian youth**

Topic	**Percentage**	**Source**
Satisfaction with housing	89% satisfied	Gallup Worldview
Cell phone in house	63% yes	Gallup Worldview
Electricity in house	100% yes	Gallup Worldview
Computer in house	21% yes	Gallup Worldview
Public transport satisfaction	79% satisfied	Gallup Worldview
Roads and highway satisfaction	65% satisfied	Gallup Worldview
Availability of good, affordable housing	42% satisfied	Gallup Worldview
Percentage deprived of shelter	26.9%	World Youth Report 2007
Percentage deprived of water	1.6%	World Youth Report 2007
Percentage deprived of sanitation	1.2%	World Youth Report 2007

Sources: Gallup. *Gallup Worldview*. 2009. Web October 14 2009. <www.gallup.com/worldview>.
UN, DESA. *World Youth Report 2007*. New York: United Nations, 2008. Print.

In summary, Egyptian youth seem to have access to many protective forms of capital, both mitigating their vulnerability to external shocks, and reducing their propensity to engage in destabilizing activities. However, while Egyptian youth display high levels of education and improving health, strong interpersonal relationships, and access to physical capital, their potential contribution to Egyptian society is underutilized due to low access to bridging social capital. The disconnect between the education curriculum and the needs of the labor market delay young people's school-to-work transition. This, in turn, prohibits young people from marrying, a significant rite of passage to adulthood, due to the high costs of marriage itself, and the investment necessary to establish a new, shared household. While access to financial capital is

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limited, youth in Egypt can marginally compensate for this deficiency by utilizing their strong interpersonal networks. Marginalization from official power structures leads Egyptian youth to turn to friends, family, and others to meet their livelihood objectives.

Emerging from the above analysis are two fundamental conceptual components of the Sustainable Livelihoods approach: that areas of capital are multiplicative in affecting youths' resilience, and that the attainment of resilience through capital investment may be more complex and non-linear than assumed. Areas of capital are cumulative in that the effect of attaining a given level of any two or more areas will be greater than the independent contribution of each. For example, while bonding social capital (trust and reciprocity) and financial capital (income and savings) may both have a positive impact on young people's resilience, their effect will be greater when combined. The simultaneous existence of the two capitals may lead to sharing of wealth, allowing enterprising individuals to establish a business or invest in their or their children's education. This additional benefit to resilience would not be possible in the absence of one or both of these factors. The outcomes of investments in the five types of capital may be best explained by complex system dynamics that allow for non-linear interactions.

While it may be true that increases in levels of capital promote resilience, and therefore the sustainability of livelihood strategies, what is more difficult to assess is which forms of capital have the greatest preventive capacity to the typology of a crisis at hand (Galaz, Reviewer comments). For instance, in the case of chronic drought, are interventions directed towards increasing levels of natural capital more effective at bolstering rural livelihoods than social capital? In the case of an earthquake, is an injection of financial capital more efficacious in promoting a return to 'normalcy' than

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providing physical capital, perhaps in the form of shelter or water purification and distribution systems? While these questions are beyond the scope of this article to address, they warrant careful consideration in the design of further studies focusing on the challenges faced by programmers and policy-makers in Egypt and other countries experiencing a youth bulge. The adapted Sustainable Livelihoods framework proposed here (Figure 2) is hoped to inform planning for the promotion of resilience building on existing resilient strategies Egyptian youth already employ to mitigate the challenges they face.

In conclusion, as the percentage of Egyptians under the age of 25 continues to grow, decision-makers are presented with both challenges and opportunities. On the one hand, providing Egyptian youth with the capacity to actualize their livelihood strategies and expand the range of viable and attractive choices will consolidate youth as a force of stability. On the other hand, if youth in Egypt cannot realize their livelihood strategies within the existing social framework, they may engage in maladaptive practices to meet their needs.

By designing and implementing programs to raise youth's access to previously neglected areas of capital, the youth bulge need not pose the dilemma of insecurity. Egyptian youth appear to demonstrate high levels of human, 'bonding' social, and physical capital, they face significant challenges in accessing financial, natural, and bridging social capital. Capitalizing on the youth bulge through parity-oriented implementation of the adapted Sustainable Livelihoods framework may offer lasting prospects for providing Egyptian youth with viable and attractive choices that utilize their potential to become agents of peace and prosperity.

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UNTAPPED POTENTIAL: HOW THE SPHERE MINIMUM STANDARDS FOR DISASTER RESPONSE COULD PROMOTE HUMAN AND INSTITUTIONAL RESILIENCE IN NORTHERN UGANDA

Orach Godfrey Otobi[1]

Summary

Effective disaster response is essentially influenced by people, their institutions and policies which have long-term impact on adaptation and prospects of resilience of social-ecological systems. This article employs lessons learned from Northern Uganda during 1986 to 2009 (where the author grew up and later launched his professionally career in disaster response with local NGOs and most recently as a local employee of CARE International in Uganda) in hindsight, to identify possible ways in which local and international humanitarian response could have built on local capacities/resources by recognizing and building on traditional social support systems. It is argued that if understood and implemented correctly, resilience theory and practice can inform effective disaster response strategies which safeguard the most valuable assets of affected populations: human capital and wellbeing and the natural environment, all of which promote adaptive capacities to sustain lives and livelihoods. Possible contributions to the recently announced and invited 2010 revisions of the Sphere Handbook of Minimum Standards for Disaster Response are outlined.

Background

The SPHERE project was launched in 1997 as a concerted effort by international humanitarian agencies to actively learn from past failures and establish a set of minimum standards for disaster response in the aftermath of the 1994 Rwanda genocide. What happened in Rwanda had redefined the concept and principles of universal humanitarianism, in the same way that the Battle of Solferino (1845) marked the genesis of modern day humanitarianism and the foundation of the Red Cross movement by the Swiss Philanthropist, Henri Dunant. The Sphere Project is part of the wider humanitarian reform initiatives aimed at strengthening accountability

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and improving performance in humanitarian response; and it is considered a pace-setter in the institutionalization of humanitarianism by defining the scope, and raising the bar for unorthodox individually rationalized humanitarian action.

The Sphere Handbook was first published in the year 2000, and was revised and re-issued four years later. It contains a Humanitarian Charter, Standards Common to all sectors and Minimum Standards in the form of technical specifications for five essential sectors: water supply and sanitation, nutrition, food aid, shelter and site management, and health services. The Minimum Standards prescribe the basic requirements of assistance for life with dignity, and include key indicators and guidance notes. The key indicators are quantified indices to measure fulfillment of the standards. The guidance notes in each chapter relate to specific points that should be considered when applying the standards in different situations. They offer advice on priority issues and on tackling practical difficulties, and may also describe dilemmas, controversies or gaps in current knowledge (Sphere 8).

The Humanitarian Charter is based on three key principles: a) right to life with dignity, b) distinction between combatants and non-combatants, and c) non-refoulement - that is, protection of refugees from being returned to places where their lives or freedoms could be threatened. The Humanitarian Charter posits the basic rights to assistance of people affected by disasters – the humanitarian imperative - and the duties enshrined in international law. It highlights the obligations of states to guarantee these rights. The humanitarian imperative expands the principle of humanity to include the right to receive and to give humanitarian assistance. It states the obligation of the international community "to provide humanitarian assistance wherever it is needed" (Slim 342).

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In Section 2.1 principles on role and responsibilities, the Charter states: "we recognize that it is *firstly through their own efforts that the basic needs of people affected by calamity or armed conflict are met*, and we acknowledge the primary role and responsibility of the state to provide assistance when people's capacity to cope has been exceeded" (Sphere 18). It further states that "following acute onset of disasters such as earthquakes, 85-90% of those rescued alive are generally extracted by local emergency personnel or by their neighbors and families within 24 hours. Therefore, in planning relief operation in disaster-prone regions, the major emphasis should be on preparing local population to provide the initial care" (Sphere 286). Similarly, the World Disasters Report (2004) which focused on "Community Resilience" stated in the introduction that "in the hours after sudden disaster strikes, most lives are saved by the courage and resourcefulness of friends and neighbors. During slow-onset crises such as drought, some rural societies have developed extraordinary capacities to cope and bounce back."

Key elements of human and institutional resilience such as accountability, building on local (existing) capacity and community participation in the management of disaster relief efforts are included in the Sphere Handbook. Specifically, resilience is mentioned on pages: 10, 13, 108 and 119. Related concepts like "local resources" and "local capacities" were intermittently mentioned and discussed in all the five sectors (p. 29, 30, 112, 113, 115, 165, 254, 255, 262-263). Specifically, the sections on the Humanitarian Charter, principle 2.1 on responsibilities; Participation, vulnerabilities and local capacities in the Common Standards sections of the handbook and the food security, nutrition and food aid (Sphere 108, 119) and health treated resilience relatively seriously in descriptive terms.

Sphere recognizes gender, age, disability, HIV/AIDS status, ethnic origin, religious, political affiliation, displacement as vulnerability factors which may put certain people at risk

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who otherwise would not be considered vulnerable. Practice and research alludes to these facts. This article will later draw from two studies on psychosocial resilience during disaster conducted around the same period but in two different geographical and political settings to draw similarities and differences in resilience factors: one from a western industrialized country and the other from a non-western post conflict less economically developed setting. The article uses the benefit of hindsight to reflect on Sphere (2004) with regard to the disaster response in Northern Uganda. Prescriptive modalities for building on local capacities are considered with a focus on recognizing and building on traditional social support systems. To put the discussion in perspective, some of the challenges Sphere 2004 faced with respect to resilience are examined first.

Resilience

According to Almedom and Tumwine, resilience is "*a multi-dimensional construct defined as the capacity of individuals, families, communities and institutions to anticipate, withstand, and/or judiciously engage with a catastrophic event and/or experience; actively making meaning out of adversity, with the goal of maintaining normal functions without losing identity*." Norris et al. defined community resilience as a process linking a network of adaptive capacities (resources with dynamic attributes) to adaptation after a disturbance or adversity. Thus, *"Communities have the potential to function effectively and adapt successfully in the aftermath of disasters. Community adaptation is manifest in population wellness, defined as high and non-disparate levels of mental and behavioral health, functioning, and quality of life. Community resilience emerges from four primary sets of adaptive capacities—Economic Development, Social Capital, Information and Communication, and Community Competence—that together provide a strategy for disaster readiness. To build collective resilience,*

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communities must reduce risk and resource inequities, engage local people in mitigation, create organizational linkages, boost and protect social supports, and plan for not having a plan, which requires flexibility, decision-making skills, and trusted sources of information that function in the face of unknowns" (Norris et al. 127). However, "resiliency is not a global characteristic of a system; it can meaningfully be determined only with reference to an identified system and particular challenges" (Allenby and Fink 1034).

Adopting concepts from ecological management, humanitarian response may be classified under the "messy problems" category (Walker et al. 14), an occurrence when there are large differences regarding the perceptions of the essence of the problem, the need for action, its goals, and the type of action that should be taken. Such differences arise from uncertainties in the factual knowledge base, from ambiguities in problem framing, and from diverging socio-economic interests or socio-cultural traditions and values. "In the rush to respond to the horrors of wars and disasters, humanitarians race to bring relief, but tunnel vision often leads them to overlook their own role in worsening crises and inhibits learning from past mistakes" (Weiss and Hoffman 47). The emotions, unfettered goals and obsession with the humanitarian imperative often blur critical analysis of the natural, economic and political drivers/forces around them.

The distinct groups in disaster situation are the victims, belligerents (protagonists) and humanitarians. There is a tendency to assume that humanitarians are bystanders, neutral third-party, sympathetic to victims, therefore, outsiders to the disaster affected population they are assisting. However, human societies and the ecosystem are systematically interdependent on different temporal and spatial scales (Gotts 24). By intervening in a disaster, humanitarians also become part of the social-ecological system. Their actions influence the entire adaptive cycle, with potential positive and/or negative consequences on the system. Gunderson and Holling

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(2002) citing Chase-Dunn and Hall (1997), stated that "the most important unit of analysis for the study of social change is not societies or states but the entire world-system. Changes in organization are not endogenous to individual societies. Rather, they are a consequence of complex interactions among local, regional, societal, and global processes." (507). "A world-system is not necessarily planetary in scope, but does necessarily include multiple societies or polities, with long-term, highly structured interrelationships" (Gotts 24). This calls for humanitarians to be aware of the potential and inevitable positive and negative consequences their response has on the social-ecological system.

Sphere emphasizes participation of disaster-affected population in disaster response. In simple terms, participation is the process during which individuals, groups and organizations are consulted about, or have the opportunity to become actively involved in a project or program of activity. Without active participation the people may benefit, but not develop from a project. Disaster is a catastrophic and distressful phenomenon. The majority of disaster-affected populations are predominantly rural, low socioeconomic and education status. Under the circumstances, they may not fully comprehend their roles and Sphere's mandate for them to participate actively. Besides, humanitarian assistance is a non-contractual intervention based on goodwill and compassion where recipients may be limited to have a say in how it is delivered. A common notion has it that a beggar has no choice. Bearing in mind that the minimum standards are technical benchmarks, there is no clear mechanism in place to bring the Sphere Standards down to a level comprehensible by the majority of disaster victims. It is also evident that the majority of disaster victims do not have equitable access to information and communication technology. The digital-divide further plays to the disadvantage of disaster victims.

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Undisputedly, this leaves uneven power-dynamics between humanitarians and disaster victims (Slim) making participation non-constructive.

Sphere emphasizes that humanitarian response should be built on existing resilience factors. However, "modern tactics of war seek to obscure the differences between those who fight and those who do not by camouflaging combatants within the overall population" (Van Bueren 809). "Almost all contemporary conflicts are now fought by armed groups within national boundaries and almost 90 percent of the casualties are civilians, mainly women and children" (UNSC 9) as opposed to traditional inter-state wars. The worst feature of today's war is the dual criminal and political goals of its main protagonists, as war-fighting groups and organized criminals collaborate. Civilian livelihoods, the bedrock of resilience factors have become deliberate targets of new wars. The most serious challenge facing humanitarian groups in alleviating the suffering of victims are not *technical* but *political* (Terry 23). These challenges demand creative and innovative ways to understand the pre-disaster baseline to be capable of identifying and building on local capacities. The following section will discuss findings of two studies mentioned above, how resilience can be identified and enhanced in complex disaster settings.

New York City suffered a disastrous terrorist attack in 2001 where over 3,000 people were killed and properties worth billion dollars were destroyed. A study on the role of demographics, resources, and life stress after September 11, 2001 Terrorist attack in New York City (industrialized individualistic country) revealed that, "the prevalence of resilience was uniquely predicted by participant's gender, age, race-ethnicity, and education level" (Bonanno 135). The study further attributes resilience factors to absence of psychopathology, less income loss, existence of social support networks, fewer chronic diseases, less direct impact of the

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terrorists attack, fewer recent life stressors, fewer past prior traumatic events, and not having experienced an additional traumatic event since September 11, 2001. Female gender was associated with a reduced likelihood of resilience. Ethnic minority status was reported as a risk factor for resilience. Participants over 65 years of age were more resilient and more than 3 times as likely to be resilient compared with the youngest (18- to 24-year-old). Higher levels of education were associated with a greater prevalence of resilience. Income change, social support, and the absence of chronic disease emerged as solid predictors of resilience. The absence of social support was consistently associated with Post Traumatic Stress Disorder, whereas the presence of support was found to foster recovery from trauma over time. The absence of chronic disease was strongly associated with resilience.

The other study used the use of Sense of Coherence (SOC) construct as a quantitative component of a combined qualitative and quantitative study of war-induced 'Psychosocial Transition' in Eritrea, an African post-conflict setting. Almedom et al (2007) proposed that "factors which promote resilience may be imbedded in the wider context of the culture and socio-political history of war, nation building and collective survival." (104) A comparison between urban, non-displaced and displaced study participants confirmed that displacement is detrimental psychosocial wellbeing. Displacement compromised individual and collective resilience in women whose triple (productive, reproductive, and community/public) social roles demanded more from them. This was compounded by the fact that men of productive ages stayed away from home for long period on national service. Women became the source of social support for men by building and maintaining the community. Importantly, the study revealed that women who were serially displaced were most detrimentally affected. Moreover, restriction of traditional livelihood system based on travel and trade imposed as a result of strict government

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anti-terror policies implemented after September 11, 2001 were associated with lower resilience of men whose livelihoods depended on fishing and trade in the coastal regions of the Red Sea.

Despite the contextual and cultural differences, these two studies revealed important resilience factors that trained humanitarian workers may recognize. The primacy of income generation and livelihood-supporting activities, social capital/support and community competence was also highlighted by Norris et al.

Resilience results in large part from positive social relationships initiated by communication during a crisis. It is the cognitive appraisal of a stressful event that is critical in defining how the individual copes with the event (Lazarus). Crisis communication is a central part of the cognitive type of social support (Almedom) it activates resilience and positive adaptation. Access to information promotes learning and the ability to deal with and adapt to stress and challenges. Communication provides people and communities with some sense of control, even within highly unpredictable environments. Having the information necessary to make informed decisions can negate feelings of helplessness that are common during disasters. Resilience and a sense of personal agency are critical resources for individuals and populations facing adversity.

Resilience is "activated" through three main mechanisms, each of which depend on communication and information: liminal suspension (alteration of relational structures and the emergence of new relational patterns), compassionate witnessing (noticing and feeling empathy for others), and relational redundancy (how interpersonal connections intersect and span beyond immediate social reference groups); these actions occur in parallel among individuals and across functional or organizational boundaries (Powley).

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As already noted above, most disaster affected populations are predominantly of rural, low socioeconomic and education background with limited access to print and electronic media. Besides, disruption of communication and information infrastructure is a central feature of disasters. This was typified during the September 11, 2001 terrorist attack in New York City. Establishing and utilizing locally accessible, trustworthy and reliable channels of communication potentially reinforces confidence and maintains some sense of consistency within a period of intense uncertainty. Crisis communication should clarify entitlements and services which are available (rights and obligations). Sphere being a right-based approach, information on rights and entitlements is critical among rural and poor communities who may have limited knowledge of their rights and entitlements. It helps to set a baseline upon which performance management (quality, accountability, legitimacy) and participation is nested.

By contrast, Northern Uganda is a region that has been devastated by two decades of protracted conflict between the Lord's Resistance Army rebels and the Government of Uganda. Typical of contemporary wars, at the onset of the war in 1986, the core agro-pastoralist economy, livelihoods and essential infrastructure were systematically destroyed. The once productive and self-reliant communities were herded into IDP camps (1.8 million people equivalent to 90 percent of the population), dependent on food relief (UNOCHA). The region that used to be the food basket of the entire country was reduced to beggars. In 2003, the UN Humanitarian Coordinator, Jan Egeland described "Northern Uganda to be the biggest forgotten and neglected humanitarian emergency in the world today" (DPA). A mortality survey conducted by World Health Organization (WHO) and the Ministry of Health reported that violent death rate for northern Uganda was 146 deaths per week, (0.17 violent deaths per 10,000 people per day), making it three times higher than in Iraq, where the incidence of violent death in

the period following the allied invasion was estimated to be 0.052 per 10,000 people per day. 41 per cent of all deaths in the camps were amongst children under five. The conflict has been characterized by the forceful abduction and brutal conscription of as estimated 30,000 (Fine et al) – 66,000 (Anwo et al.) children during the course of the war.

Even though the humanitarian situation in Northern Uganda only gained international recognition in 2003 following the visit by the UN Humanitarian Coordinator, humanitarian response started as early as late 1980s. The humanitarian response didn't translate into improved welfare indices. For the purpose of analogy, UNOCHA reported on their humanitarian website, Reliefweb (UNOCHA) in December 2009 that 162 organizations (59 NGOs, 41 UN and international organizations, 18 governments, 17 research and academic institutions, 16 news and media and six others) were active in Uganda in the last six months. The Consolidated Appeal Process (CAP) for 2004, at the peak of the Northern Uganda crisis had a budget tag of $128 million, equivalent to 7.5% of the 2004/2005 National (government) budget of $ 1,714 million ($ 71 per person for a national population of 24 million people, including IDPs). The Government allocated equivalent of USD 9 million (7% of CAP budget) from the national budget for post conflict recovery of Northern Uganda. The total of CAP budget plus Government's contribution translate to USD 76 per person for the 1.8 million IDPs in Northern Uganda. In quantitative terms, each IDP received USD 5 in excess of other Ugandans. But in qualitative terms, the Government's National Peace Recovery and Development Plan (PRDP) launched in 2007 acknowledged that the welfare indices in Northern Uganda remained much lower than the national average (Armitage).

Against these odds, the population demonstrated extraordinary resilience, they were not entirely dependent on relief food aid. During the conflict there were instances of good local

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harvest and World Food Programme (WFP) made local purchases. In 2007, it was reported that Uganda was the leading supplier of food to the World Food Programme in the world (The Monitor; Vision). A key livelihood and economic resource (resilience factor) in Northern Uganda is the natural endowment with good climate, vast fertile/arable soil, minerals (The Monitor) and other natural resources. There are over ten Government owned farms and ranches in the region but were all deserted during the war.

A key collective resilience factor is the collective victimization and the historical marginalization of the region, which helped to maintain cohesion-commitment (attraction to an ideal). The war was dynamically viewed as a tribal, regional and national problem; other neighboring tribes often attributed the spill-over as Acholi aggression against them but the collective victimization of the region helped to maintain social cohesion-commitment typified by block-voting trends in successive general elections (The East African) and the secession threats (The Monitor, Vision). This cohesion-commitment (community competence) is further reinforced by the collectivistic society (social capital) exemplified in Northern Uganda. Among the Acholis, cohesion-commitment is particularly reinforced by pride in the rich cultural heritage. This sense of identity is a strong cohesion-commitment. The social competence of dignity, courage, hard work and self-sufficiency is a shared core value. From the author's own accounts and association, demonization and humiliation is the worst possible outcome and is attributed to a major root-cause of the two decade war. Besides, the collective victimization, the collective experience of war (origin, leadership and the abduction of innocent children turned victim-perpetrators) served as cohesion-commitment control.

Keeping a population dependent on relief food aid in an environment naturally endowed for food production beyond one year is a tragedy. The most effective strategy in Northern

Uganda would have been the creation of jobs and access to markets for goods. The Government-owned farms and ranches needed rejuvenating to create jobs for IDPs whereby the proceeds could be ploughed back into the same community. Recent moves toward voucher and cash transfer as food assistance is commendable in the short term for strengthening local markets, enhancing productivity of small farmers and empowering beneficiaries. However, this should be simultaneously be accompanied by job creation strategies to avoid perpetuating dependence on the cash transfers. People should be encouraged to engage productively. Community-based projects can be developed around infrastructure projects such as building roads, schools, water source protection, and adult education as may be contextually applicable.

Social relationships are key to generating social capital in collectivistic cultures, and function to enhance community competence. In Northern Uganda, pre-war community institutions, policies and people were relegated and replaced with new ones in the Internally Displaced Peoples (IDP) camps. This had devastating impact on culture and the role played by both formal and informal structures (the identity of the community) in the pre-encampment setting. The role of culture was seriously down-played. "Wangoo" (evening fireplace) traditionally functioned as the institution where elders and clan leaders transmit culture through generations. The role of "Wangoo" was completely neglected. Elders and clan leaders were rendered irrelevant, many of them eventually died in frustration, seeing the community identity sink to irreparable depth. Struggle for identity and self-determination has caused major wars around the world. Humanitarian response should creatively cater for the identity of the community being assisted. Elder and clan leaders should be allocated time to interact with their succeeding generations.

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Conclusion

The primacy of social capital - culture and relationships, community competence, communication and information is clear. The concept of resilience offers profound shift in traditional perspectives, which attempt to control changes in systems that are assumed to be stable, to a more realistic viewpoint aimed at sustaining and enhancing the capacity of social-ecological systems to adapt to uncertainty and surprise (Adger et al.) As much as possible, humanitarian response should purposefully build on existing knowledge, local capacities and resources. Disaster affected population are not helpless victims, they have strong agencies and want to actively participate in restoring their lives and livelihoods with dignity. Disaster needs assessment should not focus on needs per see but what people are already doing for themselves. Signification of communication and information awareness on rights and duties should be prioritized and form an integral part of disaster response. It is the most effective way of realizing quality and accountability of humanitarian response. In its current form, Sphere still extenuates vulnerability rather than identify and/or promote resilience. The next edition of the minimum standards should treat resilience more seriously as a cross-cutting theme of practical application in policy and practice. The announcement of Sphere 2010 revisions inviting participation through the website (in January 2010) offers an opportunity for this preliminary analysis to explore how resilience might be built into the Sphere minimum standards. More targeted and iterative engagement with the Sphere project is anticipated.

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MEDITATION AND DEPRESSION: A NOVEL SOLUTION TO THE BURDEN OF MENTAL ILLNESS IN INDIA?

Alok Kanojia[1]

Summary

Treatment paradigms for mental illness tend to be developed in affluent countries, particularly in the United States and countries in Europe. These paradigms are based upon a certain level of resource accessibility as well as western cultural norms, which focus on the individual. India, with a population over 1 billion, has fewer resources per person than many countries in North America or Europe. As a result, many impoverished or illiterate Indians lack the knowledge or means for medical treatment of mental illness. This article explores a possible solution to this problem: one that is not resource-intensive and can be provided to groups, thus maintaining cultural relevance to India. The relative merits of Meditation or Mindfulness-based Cognitive Therapy (MBCT) are considered. The literature indicates that MBCT has been validated in scientific trials, and can be part of an effective treatment for depression or anxiety. In practical terms, it requires only an initial training investment to learn MBCT, after which the practitioner has free reign. MBCT is group-oriented, allowing the mentally ill to form social networks that their illness would otherwise prevent. Furthermore, mindfulness-based meditative practices may increase an individual's resilience, an important factor in combating depression. It is suggested that meditation has many of its roots in India, where it is commonly practiced widely in the general population. Due to its economic viability, effectiveness in forming social groups, mental health benefits, and cultural appropriateness, meditation may be a "novel" and yet old solution to the burden of mental illness, specifically depression in India.

Introduction

According to the World Health Organization (WHO) data-base, 13 per cent of the population in India suffers from severe or extreme depression, while nearly 50 per cent of the population harbors some feelings of sadness or depression. The impoverished or illiterate in India suffer from depression more than the affluent or educated, and have fewer resources to seek treatment (WHO). It is therefore necessary to develop a treatment

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paradigm for depression that considers the resources available to the population as well as cultural appropriateness. The purpose of this article is to explore the possibility of proposing meditation, more specifically mindfulness-based cognitive therapy (MBCT) as a viable course of treatment.

MBCT has been shown to improve generalized anxiety disorder and depression (Evans et al.). MBCT is a group-oriented practice, which allows those who participate to form social networks that can have a salutary effect on an individual's mental health (Kawachi and Berkman). Meditation has deep roots in India, with texts on the subject dating back nearly four millennia. Furthermore, meditation has been consistently practiced in the Hindu and Buddhist traditions, of which over 80 per cent of Indians adhere to. Meditative practices are often taught at temples which can be found in most cities and many villages (Brown and Gerbarg). Personal interest in meditation and its economic feasibility instigated this investigation. It is hypothesized that its potential for building social networks and thereby generating social capital, which in turn may bring health benefits, may make MBCT a novel component to a more effective treatment paradigm that can reduce the alarming rates of depression in India.

Method

Primary epidemiological data was obtained directly from the World Health Organization's web site. In addition, literature searches were carried out using PubMed and Google scholar, as well as Tufts University's Tisch Library Catalogue during the course of a seminar class on social capital and mental health including discussion and peer review of an earlier version of this article. Insights into the medical aspects of

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mental illness were gained from primary literature and discussions with researchers at Harvard Medical School's Osher Institute.

What is Depression?

What constitutes depression? While there is much debate on the precise definition, a classic study of its social origins indicated that the core characteristics of depression include: feelings of worthlessness, the outer world lacking meaning, and a hopeless future (Brown and Harris). These authors provided a new paradigm that helped medical practitioners understand the connection between the bio-physical aspects of mental health and the economic, social, and cultural context in which health in general and mental health in particular is embedded. The social and the biological aspects are inter-connected as people afflicted by depression often exhibit changes in mood, experiencing high levels of guilt or sadness. These cognitive difficulties may also be accompanied by a host of physiological and behavioral symptoms, such as, for example, depressed immune function (Coyne and Palmer).

What is it that causes these feelings of futility and sadness? The etiology of depression is not a simple one. Some patients are afflicted by an "endogenous depression" – one that manifests autonomously due to chemical changes in the brain (Chen et al.). Others have a "neurotic depression," which results from more environmental influence and behavioral features (Brown and Harris). Mindfulness-based practices induce changes in both behavioral and endogenous depression (Brown and Gerbarg). Another important variable in the manifestation of depression is the social network that surrounds an individual. Both clinical and epidemiological studies have

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shown that social factors can foster or prevent depression. Sociologists have demonstrated that it is not only the presence or lack of friends that influences an individual's depression, but rather how that individual perceives and emotionally responds to those friends (Irwin et al.).

Diagnosis of depression is based on a patient's self-reported experiences. These are assessed through checklists such as the Beck Depression Inventory or Hamilton Depression Rating Scale. While there are no laboratory tests to diagnose depression, the disease has been correlated with altered brain chemistry (Chen et al.).

Current depression therapy consists of a two-pronged approach: pharmaceuticals and psychotherapy. Pharmaceutical drugs address various physiological or biochemical factors in depression such as low levels of norepinephrine, serotonin, or dopamine (Chen et al.). Psychotherapy or counseling address deeper psychological factors, including trauma or abuse (Burke).

According to the United States National Co-morbidity Survey, 51 per cent of patients that suffer from depression also suffer from generalized anxiety disorder. Anxiety disorder is characterized by feelings of uneasiness, fear, or worry. Victims of trauma often suffer from both (Semple et al.). Social and cultural context is critical in distinguishing "normal" responses to traumatic events and/or experiences from the symptoms of debilitating illness requiring medical attention. Diagnosis of mental illness is particularly open to cultural bias and social consequences such as stigma. It is often found to be the case that fear of being stigmatized may inhibit the mentally ill from seeking treatment. Lack of access to healthcare services may also be widespread, even if stigma does not concern those who are already marginalized and rendered "untouchable."

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Healthcare Accessibility in India

While healthcare accessibility has improved due to a series of government initiatives in the early 1990's, a large portion of India's population fail to receive sufficient care ("Country Cooperation Strategy: India, 2006-2011"). The most recent compilation of World Health Organization (WHO) general and financial data concerning India was completed in 2008. WHO statistics demonstrate that India still has less than 1 health worker per 10,000 people. Furthermore, as of 2005, 94 per cent of health expenses are paid out-of-pocket by patients. Considering that 26.1 per cent of the population was below the poverty line in 2004 ("World Health Organization Statistical Information System"), it is no surprise that rural or impoverished people have trouble obtaining adequate healthcare.

While the Indian government has made major strides in improving healthcare, India remains ranked 127 out of 177 countries in the World Health Organization's Human Development Index. The Indian National Family Health Survey II conducted in 2007 showed that the 4 major diseases that Indians struggle with today are asthma, tuberculosis, jaundice, and malaria. The prevalence of these diseases, in conjunction with a large degree of communicable diseases (38 per cent of total disease), make it difficult for the Indian government to focus on mental health issues. Currently, non-governmental organizations and government initiatives are attempting to reduce mortality due to communicable diseases and improve measures such as Under 5 Mortality, which remains at 85 per 1000 live births ("Country Cooperation Strategy: India, 2006-2011").

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Depression in India

The World Health Organization published a report titled "Health Performance Assessment" in 2003 containing a significant section on affective disorders in India. This is the most recent thorough exploration of mental health in India. Surveys conducted withnearly ten thousand subjects showed that 48 per cent of respondents had some feelings of depression, anxiety, or sadness in the last 30 days. Roughly 13 per cent were afflicted by "severe" or "extreme" feelings of sadness or depression. A slightly higher portion, ~15 per cent, felt "severe" or "extreme" levels of worry and anxiety. While this is a disturbing prevalence of depression, a closer look at social and economic factors shows a slightly different picture. Those of old age are afflicted by depression more, with 32.1 per cent of subjects over 80 scoring "severe" or "extreme", as opposed to only 13.2 per cent of subjects 30-44. This correlation between age and depression has been found other cases as well (Oxman et al.). Examining education demonstrates another disparity. Those without any formal education were twice as likely to feel very depressed as those with a standard education (10 years). The trend in education is mirrored by household income; the incidence of "severe" or "extreme" depression is over twice as common in poor or illiterate households as it is in wealthy ones (22.2 per cent vs. 9.0 per cent). It is also interesting to note that women are more likely to be affected by worry, anxiety, and sadness than men (~15 per cent vs. ~11 per cent, respectively), which has also been demonstrated elsewhere (Kawachi and Berkman). This disparity, while significant, is less of a difference than that caused by socioeconomic considerations.

The World Health Organization's report in 2003 demonstrates that depression is a serious concern in India. Beyond that, it highlights that this problem is not one

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dimensional in its effect on the populace. Depression afflicts people who are poor, illiterate, or elderly worse than it does for those who have the knowledge and means to seek help. In a situation such as India, where the number of people at risk is high, a novel solution is required that is effective at providing relief without excessive burdens.

Social Capital and Mental Health

The number and quality of social relationships have ties to mental health of an individual. People with a low level of social support or few close relationships have a higher tendency for depressive symptoms. On a similar note, strong relationships and social ties have been shown to enhance psychological well-being and mental health (Thoits). A greater understanding of the complex relationship between social capital and mental health can be gained by examining the Main Effect Model, which examines the mechanisms of interaction between the two. The Main Effect Model considers three things which social networks affect: social influence, positive affective states, and neuroendocrine responses. These can either directly improve mental health, or can illicit general health promoting behaviors, which can have a secondary effect on mental health. Being a part of a social network can produce a positive psychological state, such as providing a sense of worth or belonging (Cohen, Underwood, and Gottlieb). This positive psychological state may alter the neuroendocrine response to stress as well as enhancing general health behaviors. Finally, an important aspect of maintaining good mental health is seeking help when one needs it. Social networks can provide improved access (or desire to access) to therapy or mental health treatment. A simple "shoulder to cry on"

could prevent the exacerbation of depressive symptoms (Cohen, Underwood, and Gottlieb).

Social capital is an important variable in the equation of overcoming depression in India. The state of poor financial independence coupled with a large population create a different arena for combating depression. Luckily, exploring social capital's role in mental health in impoverished populations demonstrates that a strong support group is enough to reduce symptoms of depression. One study conducted on 155 homeless people with poor access to monetary and human capital found that religious social capital, group participation, social trust, and bridging social capital are all significant in combating depressive symptoms (Irwin et al.).

The Main Effect Model and current research show the importance of social capital on mental health. Forming a social network allows people to gain support to deal with psychological difficulties. Incorporating social capital into a treatment paradigm specific to India is key, as forming social groups can improve mental health while not excessively taxing resources.

Using Meditation to Treat Depression

Recent exploration in the medical field has yielded novel therapies to treat various ailments. One of the therapies used to treat depression is meditation. While there are many different kinds of meditation, most share certain characteristics such as mindfulness (Ospina et al.). Mindfulness is a moment-to-moment awareness which by nature, is observatory rather than judgmental. Worry and anxiety tend to be future oriented which allows techniques that focus on the present to reduce worry and anxiety. One such

technique has been shown to reduce depression is mindfulness based stress reduction (MBSR), which is an adaptation of mindfulness based cognitive therapy (Teasdale et al.). More specifically, a trial study involving mindfulness based cognitive therapy (a treatment program that incorporates MBSR) to treat generalized anxiety disorder produced very convincing results. Subjects using MBCT for 8 weeks experienced a significant reduction in tension, anxiety, worry, and depressive symptoms. Those subjects that had problems with clinical depression or anxiety disorders exhibited lower levels of symptoms after the 8 week course.

MBCT is a strong candidate for pilot programs that seek to treat depression with meditative techniques. It seems strongly suited to India in particular, as it does not require any expensive equipment, only an initial amount of training. Another of a MBCT program's strengths lies in its group oriented approach. Practicing MBSR by itself can alleviate depressive symptoms, but practicing in a group also strengthens social ties which further ameliorate depressive symptoms. MBCT may be an integral component to improving mental health in India.

Meditation's Impact on Resilience

Ancient texts of Hindu and Buddhist traditions suggest that meditation can help one buffer difficult events in life while maintaining a solid sense of identity (Brown and Gerbarg). Research into mindfulness based meditative techniques has shown that these practices are effective at helping individuals dealing with trauma or other aspects of mental health.

Mindfulness practices were taught to a group of 180 survivors following the 2004 Asian Tsunami. Symptoms of PTSD were significantly reduced according to the PTSD

Checklist-Civilian and the Beck Depression Inventory indexes. These improvements in PTSD survivors were sustained through 6 month post-study follow up (Brown and Gerbag).

As mental health issues vary amongst age groups, it is important to draw attention to child specific and old age research that explores mindfulness based research. Children between the ages of 9-13 were taught a variant of MBCT, specifically designed for children. There were significant improvements in attention problems, behavioral problems, and anxiety symptoms. These results, too, were maintained during the course of followups. Finally, children who reported clinically elevated levels of anxiety before the study gained the most benefit from the practice (Semple et al.).

Mindfulness practices have also been shown to help the elderly adapt to age-related physical and psychological changes. Reduced physical capacity and the development of chronic ailments can cause significant psychological stress. Mindfulness practices can ameliorate that stress by providing an individual with a strong sense of self, enhancing resilience (Davis et al.).

Furthermore, spiritually-focused practices such as meditation appear to act as a buffer against the stress response. They allow people, including children, to be less reactive to traumatic stress. Mindfulness practices modulate physiological stress reactions, improving the capacity to deal with psychological problems and health-risk behaviors (Burke).

While there is significant evidence that mindfulness or meditative practices enhance an individuals ability to deal with psychological stress, it remains to be seen whether MBCT is consistently effective at dealing with significant trauma. Considering

the commonalities between various mindfulness-based practices, it would be reasonable to expect that such research may prove to be a powerful tool in validating a potentially effective treatment for trauma-induced disorders such as PTSD.

Treatment paradigms tend to be developed in affluent countries, particularly in the United States and countries in Europe. These paradigms are based upon a certain level of resource accessibility as well as western cultural norms. Therefore, applying treatments developed under these conditions can be difficult in countries with different beliefs and resources. India, with a population over 1 billion, has fewer resources per person than many countries in North America or Europe. As a result, many impoverished or illiterate Indians lack the knowledge or means for proper mental healthcare. To address these complications, a solution needs to be found that is not resource intensive and can be done in groups, while maintaining cultural sensitivity. These criteria make meditation (MBCT) the perfect candidate. Only an initial training investment is required to learn MBCT, after which the practitioner has free reign. MBCT is also group oriented, which allows many mentally ill to form social networks that their illness prevent. MBCT has been validated in scientific trials, and can be part of an effective treatment for depression or anxiety.

In conclusion, mindfulness-based meditative practices may increase an individual's sense of self worth and resilience, an important variable in combating depression. As meditation has many of its roots in India, where the general population is familiar with the practice, it would be relatively easy to integrate with medical practice, particularly focused on outreach. The religious ties that most meditative practices have may make local temples, which are common in villages, a staging ground for promoting MBCT. Effective delivery mechanisms will require in-depth analysis and exploration.

Due to its economic viability, effectiveness at forming social groups, medical potency, and cultural sensitivity, meditation can be a novel component to the solution to health burden of widespread depression in India. More research is needed to determine the effectiveness of MBCT in treating different levels of severity and duration of depressive disorders.

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BOOK REVIEWS

By

Evelyn A. Brensinger[1]

Hopkins, Rob. *The Transition Handbook: From Oil Dependency to Local Resilience.* White River Junction: Chelsea Green Publishing Company, 2009. 240 pp. ISBN: 9781900322188.

The first step into Rob Hopkins' worldview as set forth in *The Transition Handbook: From Oil Dependency to Local Resilience,* is a distinctly discomforting one. As Hopkins sees it, nearly all of us are addicts. In the course of the last 150 years, the human propensity for ingenuity combined with the discovery of fossil fuels, catapulted civilization in a direction that has been both intoxicatingly productive and horrifyingly calamitous. Hopkins calls oil a "magic potion" that has allowed us to work, build and innovate more than we ever imagined possible. Our venture into the realm of unprecedented "development" has left us addicted to the potion that enabled it. This magic potion is an inherently ephemeral one. We face not only the environmental consequences of our addiction to oil, but also the reality that it will soon be exhausted.

The Transition Handbook, however, is not proposing the usual doomsday scenario intended only to scare readers into guilt-laden action. Instead, it calls for profound societal change because we are nearing the end of "The Age of Cheap Oil", and a future with dramatically reduced oil supplies could indeed be "preferable to the present, if we plan sufficiently in advance with imagination and creativity."

In the first portion of the book, "The Head," Hopkins makes a coherent case for linking the "twin drivers" of his transition concept: climate change and "peak oil" –the moment when we have consumed half of the earth's reserves. Drawing from a wealth of data, Hopkins concludes that the issue is not *if* oil supplies will peak, but *when*. We can respond to this reality by "clinging to fossil fuels at all costs," or by creating infrastructure that will support us long after the "Oil Age." In Hopkins' words, if "we see climate change as a separate and distinct issue from peak oil, we risk creating a world of lower emissions but one which is, in terms of oil vulnerability, just as fragile as today's – if not more so" as the cost of energy rises. In other words, while climate change functions to remind us that we "should change," peak oil means that we will "be forced" to change.

Borrowing from a report "Descending the Oil Peak" published by the City of Portland Peak Oil Task Force, Hopkins puts forth three options for responding to the enormous change before us: "Long-Term Transition," "Oil Shocks," and "Disintegration." The latter two involve varying degrees of price hikes and emergencies with adverse impacts on the "fabric of society," while the former involves a more gradual and planned

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transition to lower levels of consumption.

Acknowledging that the first scenario, Long-Term Transition, "requires that we have put in place more to fall back on than we have at present," Hopkins makes one of the most compelling and vital arguments in the *Handbook*: presenting people with the latter two doomsday scenarios will not inspire them to become engaged in the transition process. Quoting psychologists Kroger and Winter, Hopkins explains that "healthy functioning requires that we have faith that our needs will be met in the future; without this confidence, our trust in the world is damaged." This critical absence of trust prompts counterproductive responses, among them, depression and paranoia.

Hopkins argues that our best hope at transition will come from persuading people to see that the shift to the first scenario is an "adventure, something in which they can invest their hope and their energy." This is where Hopkins introduces resilience, the concept most central to the *Handbook*. Adopting the definition put forth by Walker *et al*., "resilience is the capacity of a system to absorb disturbance and reorganize while undergoing change, so as to still retain essentially the same function, structure, identity and feedbacks," Hopkins asserts that when applied to communities and settlements in the context of peak oil, resilience refers to "their ability to not collapse at first sight of oil or food shortages, and to their ability to respond with adaptability to disturbance."

Hopkins turns to the work of economist David Fleming to demonstrate the gains for a community with bolstered resilience: avoidance of whole-system shock when one component is destroyed, diversity and creativity of potential solutions "in response to local circumstances," and the replacement of "big infrastructures and bureaucracies" with "fit-for-purpose local alternatives," among much else.

Hopkins applies the three components of a resilient system: diversity, modularity, and tightness of feedbacks, to his concept of the resilient community. Diversity thus refers to diversity of farms, plantings, market gardens, and aquaculture. It also means that local communities develop their own unique transition solutions. For the resilient community, modularity (the manner in which the different elements of the system are linked), would be maximized via increased internal connections to reduce overall vulnerability. This translates to more local investment models and food systems. Hopkins asserts that local communities would continue to engage with the wider networked world, but would do so largely for the purpose of exchanging information and ideas, not vital goods such as foodstuffs.

Finally, tightness of feedbacks, or "how quickly and strongly the consequences of a change in one part of the system are felt and responded to in other parts," would be strengthened by shifting away from highly centralized governments towards more "localized systems" where the outcomes of individual actions are more readily apparent. In short, Hopkins maintains that "small is inevitable"; relocalization, or the process by which communities shift away from their overdependence on national and global economies to reinvest in their own

critical resources and capital, is the most logical way to rebuild their resilience.

The final portion of "The Head" of the book serves to remind readers of a more resilient past - think urban market gardens, community-grown produce, locally-owned businesses, and horse-powered economies. Hopkins also offers Britain's wartime mobilization in the 1930s and 40s as an astonishing example of the extent to which people can reform their behavior, business practices, economies and government policies– when they have a compelling reason to do so.

The middle portion of the book, "The Heart," aims to provide the reader with the intellectual skills necessary to create a new vision of the future. This section of the book is as inspiring as it is smart, thus providing even the most cynical of readers with the perspective and tools necessary to turn "bewilderment," "irrational grasping at unfeasible solutions," "fear," "nihilism and/or survivalism," "denial," "exuberant optimism, or the "'I always told you so' syndrome" into changed behavior and eventually, effective action. He backs "The Heart" up with the surprisingly and alarmingly relevant addictions research of Carlo DiClemente. DiClemente is known for inventing what he terms the "Transtheoretical Change Model" (TTM), a model founded on the basic idea that change in human behavior is not instantaneous. Rather, it unfolds in stages or increments. Appling the TTM to efforts to counter our addiction to oil, Hopkins asserts that we need to understand the psychology of change in order to practically plan for life post-peak.

To that end, Hopkins cleverly flips the standard Hubbert curve on its head and suggests that rather than seeing our consumption of oil as the curve of a mountain–the precipice of which we have spent a 150 years climbing toward– we should instead imagine that in the last 150 years we have dived deeper and deeper into a "fetid lagoon." At present, we are about to swim from the very bottom to the top where an infinitely more livable future awaits. The last portion of "The Heart" is Hopkins' own vision of what that future could look like.

The final section of the book, "The Hands," provides the reader with the tools required to move from "ideas to action." It is here that Hopkins explains what he means by a "Transition Initiative." Transition Initiatives are based on four assumptions: "life with dramatically lower energy consumption is inevitable…it's better to plan for it than to be taken by surprise;" "our settlements and communities presently lack the resilience to enable them to weather the severe energy shocks that will accompany peak oil;" "we have to act collectively, and we have to act now, and; "by unleashing the collective genius of those around us…we can build ways of living that are more connected, more enriching and that recognize the biological limits of our planet." To paraphrase Hopkins, the aim is to develop communities that are resilient and that wholeheartedly and positively accept energy descent as a desirable reality, not merely an inevitable one.

The remainder of the final section of the book advances the core principles of the transition model and how one can go about starting a transition initiative.

Hopkins provides detailed accounts of how an impressively large number of communities around the world (200 at the time of writing) have become Transition Towns/Settlements. Interspersed throughout the entire book are twelve "Tools for Transition," that serve as guides for planning productive meetings, holding successful public events, and using visioning as a tool for education about peak oil, to list a few. The appendices contain more such tools, all of which have been tested in Transition Towns.

Hopkins' emphasis on planning for the future with a view toward the rebuilding of community resilience is arguably the most significant aspect of his work. Recognizing our collective propensity to implement short-term fixes for serious environmental and social problems, he rigorously makes a case for adopting a view that addresses these challenges head-on with targeted questioning, context-specific planning, and informed optimism. Recognizing the innate human propensity for creativity and innovation, he makes an exceptional argument for applying those skills to vision our future reformed communities and embark on informed and committed change, now. Unfortunately, however, Hopkins' writing style is significantly less sharp than his ideas. Though he may have intended to make the *Handbook* accessible to a broad swath of readers, his analogies and word choices often seem best suited for a teenaged audience.

As a final note, given the unconventional nature of Hopkins' ideas, I thought it might be of interest to capture broader reactions to Hopkins' transition work. To that end, I watched his July 2009 lecture, "Transition to a World without Oil" on the California-based "Technology, Entertainment, Design" (TED), and examined the comments posted on the same page, below the lecture video. A total of fifty comments were posted by 6 February 2010.[2] At just under seventeen minutes, Hopkins' lecture could hardly cover all the concepts advanced in the *Handbook.* Accordingly, a large number of comments sparked dialogue that veered away from the focus of the lecture and Hopkins' book. However, forty-three comments within the threads raised and responded to issues of relevance to both *The Transition Handbook* and Hopkins' lecture.

Interestingly, no comments questioned the validity of fostering resilience. Viewers expressed enthusiasm for community empowerment, visioning an improved future, belief in human flourishing and creativity, and resilience as a form of good design that steers away from systems with single points of failure. A few noted and approved of the underlying message of Hopkins work, namely that our collective quality of life has arguably declined in recent decades and that efforts to cling to life as it is may prevent us from enjoying a more engaged and livable future.

A number of comments, however, expressed concerns that Hopkins might consider addressing in future work. Hopkins explicitly notes that transition communities are effective because they work from the bottom-up and create opportunities for politicians to embrace

[2] Rob Hopkins, "Transition to a World without Oil," *TED,* Accessed on 6 February 2010. http://www.ted.com/talks/rob_hopkins_transition_to_a_world_without_oil.html.

and encourage changes that have already gained popular support. Indeed, one could see how progressive communities can slowly but effectively reform local governmental and eventually even national policy. However, a number of viewers struggled to imagine how major metropolises (which undoubtedly are ever-expanding) might also become effective members of the transition movement. While the majority of the questions and concerns viewers raised in response to the lecture where addressed at length in the *Handbook*, this one in particular was not. Importantly, however, this does not detract from the overall strength of Hopkins' book as the local community is clearly its primary focus.

Watters, Ethan. *Crazy Like Us: The Globalization of the American Psyche.* New York: Free Press, 2010. 306 pp. ISBN: 9781416587088.

According to Ethan Watters, the expression of mental illness is not merely about the biochemistry of the brain; it also reflects the cultural language of the afflicted at a particular moment in time. In recent decades, Americans have taken to the rapid export of our conceptions of what constitutes mental illness. Problematically, however, we have failed to consider the broader cultural contexts into which we export our ideas. In what could only be termed hubris, we have made the critical assumption that our understanding of the relationships between the body and the mind, the conscious and the unconscious, the afflicted and his or her corresponding social designation by society, are truths backed by science that are thus untainted by the shifting norms of our own culture.

In making these assumptions, Watters argues, we have neglected to consider the extent to which our exports adversely impact the individuals and societies on the receiving end. Watters asserts that the manner in which people "think about mental illness—how they categorize and prioritize the symptoms, attempt to heal them, and set expectations for their course and outcome—influences the diseases themselves." At the center of his argument, rests the idea that in teaching the world to think as we do, we are "homogenizing the way the world goes mad" –for better and worse.

The book offers a series of case studies to elucidate his point and while doing so, demonstrates investigative journalism at its best. The first chapter, "The Rise of Anorexia in Hong Kong," explores how the public death in 1994 of a young anorexic woman, Charlene Hsu Chi-Ying, soon sparked a massive increase in reported cases of anorexia nervosa in the region. When the local media searched for explanations for the causes of her self-starvation, they turned to Western medical references. At that moment in time, however, anorexia was a rare disorder in Hong Kong that manifested in a manner quite different than that seen in the West. Those afflicted with the disorder did not report body-image concerns or fear of weight gain as the drivers behind their behavior. In fact, many attributed their food refusal to "painful digestion" or "physiological problems, such as the inability to chew." Instances of the disease were so infrequent that those with the condition often never knew the name for it. In the years following Charlene's death,

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however, the symptoms of anorexia in Hong Kong came to parallel those found in the West.

Watters goes to China's leading researcher on eating disorders, Dr. Sing Lee, and Canadian medical historian Edward Shorter, among others, to place Hong Kong's spark in eating disorders into historical context. As it turns out, the similarities in diagnosis and spread between anorexia in recent decades and hysteria in the nineteenth century, reveal a great deal about the relationship between the official diagnosis of an illness and the precise manifestation and spread of it: "people at a given moment in history in need of expressing their psychological suffering have a limited number of symptoms" from which to choose. This "symptom pool" is a "cultural template" that reflects that moment in time. Patients with psychosomatic illnesses thus take disturbing emotions and "internal conflicts" and distill them into a "symptom or behavior that is a culturally recognized signal of suffering." This process is unconscious and does not detract from the reality of the disease. According to Watters, however, the implications are nevertheless profound. Where Western science is imposed upon other cultures, the unique expression of mental illness—and thus the ability to treat the illness effectively by understanding its particular causal factors—is lost. Further, the repetition of media coverage and public pronouncements of the causes and symptoms of the disease, strengthens the "gravitational pull of the disorder" thus increasing the likelihood that a patient "would try food restriction as a method of communicating her internal distress." To that end, Watters argues that the "importation of Western diagnosis" is "not only changing the way patients and doctors" talk about anorexia, it is "changing the disease experience itself."

The second chapter, "The Wave That Brought PTSD to Sri Lanka," examines the impact of the masses of Western mental health practitioners who descended on Sri Lanka in the wake of the 2004 tsunami. Believing that psychological reactions to horrific events are "fundamentally the same around the world," these practitioners bypassed consultation with local community leaders and families and immediately set up depression and posttraumatic stress disorder (PTSD) counseling services. In accordance with current Western mental health science, practitioners maintained that the sooner Sri Lankans underwent "critical incident debriefing" and were thus prompted to "retell" and "master" their traumatic event, the sooner they would return to healthy functioning. Yet, as Watters notes, few questioned the legitimacy of imposing the Western conception of the causes, manifestations and treatments of psychological trauma on Sri Lankans.

The underlying assumption of the international aid regime in the country was that Sri Lankans were vulnerable to mental trauma—psychologically wounded in part as a consequence of the country's tumultuous history. However, little evidence existed in support of this assumption. Referring to the work of Dr. Gaithri Fernando, Watters notes that Sri Lankans may have actually "evolved a culture better able to integrate and give meaning to terrible events" *because* of their "intimate familiarity with poverty, hardship, and war." Further, Fernando's research indicated that the manner in which Sri Lankans experience the symptoms of distress is more somatic

than their Western counterparts and in general, they "tended to see the negative consequences of an event like the tsunami in terms of the damage it did to social relationships," not their internal psyche. In other words, the harm wrought by the disaster was perceived as "outside the self, in the social environment" –not internal and not as something that could be remedied by debriefing.

Interestingly, up until the mid-1980s, international disaster relief was almost entirely in the form of medical supplies, shelter and food. The mental health dimension of aid is a recent addition and Watters cites Dr. Derek Summerfield of the London Institute of Psychiatry, an expert on the topic. As Watters details the manner in which Sri Lankans were channeled into PTSD identification and treatment training workshops, entered into countless studies without knowledge that their participation was only voluntary, and handed Zoloft outside of any form of legitimate medical counsel, the adverse effects of the international response to the tsunami become increasingly apparent.

However, one of the most critical arguments that Watters makes is one that relies on less overt evidence: the act of isolating trauma as a "malfunction of the mind that can be connected to discrete symptoms and targeted with…specialized treatments," removes the "experience of trauma from other cultural narratives and beliefs that might otherwise give meaning to suffering." In short, applying "value-neutral" science to patients who maintain healthy functioning through unique cultural beliefs, adversely affects the framework through which they traditionally and effectively make meaning out of hardship.

In chapter three, "The Shifting Mask of Schizophrenia in Zanzibar," Watters seeks to understand why WHO studies from the 1960s indicate that individuals diagnosed with schizophrenia in "developing nations have a better prognosis over time than those" in the world's most highly industrialized countries. Watters argues that it is harder to pin down the precise nature of schizophrenia than previously thought: "although something approximating schizophrenia" can be "found in populations at every corner of the globe," there are "enough variations to suggest that the disease" is "shaped by something besides the purely genetic or biological."

Critically, Watters explains that the West has rationalized the biomedical approach to mental illness by arguing that the adoption of this approach reduces the stigma associated with mental illnesses; if people believe that the "symptoms of mental illness…were not the choice of the individual and did not spring from supernatural forces, the sufferer would be protected from blame…" Reality, however, is just the opposite, and Watters turns to anthropologist Juli McGruder's research on families living with schizophrenia in Zanzibar to begin to understand why. What he learns is that in Zanzibar, the prevalence of the belief in spirit possession means that those afflicted with mental illness are often assumed possessed. This shifts blame for mental illness away from the afflicted. Additionally, families with strong religious beliefs tend to accept the burden associated with care-giving as "a continuous act of penance" and the

resulting overall reduction in expressed emotion in these households, appeared to mitigate the symptoms of the disease.
Watters adeptly argues that by reducing mental illness to chemistry, we are "devaluing" the "perceptions that make up the ill individual's very sense of self" and little else could be more stigmatizing. To that end, he explains that one way to "compare cultural beliefs about mental illness" is to ask the following question: "which cultural beliefs tend to exclude the sufferer from the social group and which allow the ill individual to remain part of the group?" Here, Western mental health science falls short.

The final case study, "The Mega-Marketing of Depression in Japan," explores the efforts in 2000 of pharmaceutical company GlaxoSmithKline to develop a market in Japan for Paxil, its antidepressant pill. Problematically for the drug company, the Japanese had a strongly negative attitude toward depression as it was grouped with only the most severe of mental disorders, schizophrenia among them. Psychiatrists in Japan limited their practices to helping those with severe mental illnesses, not the "walking worried." At the time talk therapy, regardless of its prevalence in the West, had no role in Japanese psychiatry.

To address the problem, GlaxoSmithKline tapped into the research experience of internationally renowned transcultural psychiatrists in order to create and treat a Japanese market for antidepressants. Indeed, by exploiting the prevalence of suicide in Japan and terming it an "indicator of untreated depression," arguing that social stress from excessive work habits was a "sign of depression," and suggesting that Western antidepressants were effective remedies, the company redefined Japanese narratives about what constituted mental health and upended "long-held cultural beliefs about the meaning of illness and healing." Whereas the ability to "experience great sadness" was formerly not considered a "burden but a mark of strength and distinction," it was suddenly deemed an illness best treated by Western drugs.

Most troubling, are Watters' findings regarding the overall efficacy of Paxil and other antidepressants. Though drug company executives rationalize the creation and treatment of entire new markets for antidepressants with the assertion that they are bringing the best Western science has to offer to rest of the world, few studies firmly demonstrate the efficacy of these medicines, and many suggests that the side effects, suicide among them, likely outweigh the treatment gains. Watters leaves the reader wondering how societies reshaped by the marketing strategies of drug companies and Western medical conventions will cope with life's hardships when their traditional cultural understanding of illness is deemed obsolete and the pills that take its place do little to remedy their mental afflictions.

Watters is an exceptional writer and the strengths of *Crazy Like Us* are manifold. The book makes a critical contribution to our understanding of Western mental health science and the manner in which it is steadily undermining the resilience of the cultures to which we export it –as well as our own. Uniquely calling into question the value of schools of therapy that prompt us to "separate the health of

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the individual from the health of the group," Watters reminds us that the processes of globalization create deep cultural stresses that are not necessarily remedied by the export of mental health theories and treatments from the West. In fact, the export of these theories is a fundamental part of the problem. In Watters' own words: "by undermining both local beliefs about healing and culturally created conceptions of self, we are speeding along the disorienting changes that are at the very heart of much of the world's mental distress."

Crazy Like Us is not without some limitations, however. Watters attributes our preoccupation with exporting mental health science to "postmodern insecurities"; the end of the Cold War in combination with a considerable number of failed international aid initiatives in the early 1990s, left Westerners devoid of our former political convictions and excessively introspective. In search of a way to mitigate the effects of "violence and hardship in the rest of the world," we deemed "psychological assistance" the most appropriate form of aid. Watters argues that in so doing, we may have actually been "projecting" our own "insecurities." As Watters neglects to elaborate on this theory (though he refers to it on numerous occasions), it is hard to assess its merit. At face value, however, it seems rather weak; one could readily argue that Western exports of mental health science, however misguided, reflect the certitude and conceit with which we view the efficacy of our scientific conventions – not latent self-doubt.

ANNOUNCEMENT

Hold the date: March 11-16, 2011

Resilience 2011

Resilience, Innovation and Sustainability: Navigating the Complexities of Global Change

Following the highly successful Resilience 2008 Conference held in Stockholm, organized by the Stockholm Resilience Center, ASU has been asked to organize the follow-up conference in 2011. The School of Sustainability, the Global Institute of Sustainability and the School of Human Evolution and Social Change at ASU have agreed to meet this challenge.

The conference will be held at the Tempe campus of Arizona State University. Please visit resilience2011.org for complete details regarding the conference and check back periodically for updates.

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