SHINK & Swim: Exploring the Link between Capital (Social, Human, Institutional, Natural), Disaster, and Disaster Risk Reduction¹

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1.2

Summary

Groups of people – neighbours, extended family members, members of faith communities and other civil society organizations – can be very active in their own interests when facing the possibility or reality of an extreme natural event. Little of this knowledge, skill, sharing of knowledge and material goods, mutual aid, emotional support is visible to government planners and most researchers, and much less is valued in economic terms. Yet the complex interactions among these so-called capitals (social,
human, institutional, natural) may have critically positive outcomes for preventing
disasters triggered by extreme natural events or at least mitigating the loss they cause, for
preparing for such events, for warning and immediate relief. It is well known in disaster
relief circles that the vast majority of people rescued during short onset, acute disasters
(e.g. earthquakes, landslides, flash floods) are saved by non-professionals: loved ones,
neighbours, and passers-by. The complex of social capital and knowledge (human
capital) is also critical in the longer term recovery period, where their interactions with
the state’s institutional capital may be positive or lead to negative outcomes.

This background paper attempts to demonstrate the interconnections among social capital
(SK), knowledge and skill (human capital, HK), and institutional capital (IK), and natural
capital (NK). It reviews treatment of social capital in the economics literature and
provides case studies that reveal a range of outcomes.

In strictly economic terms, the argument is advanced that under most circumstances
investments in strengthening and preserving social capital and in human capital (e.g.
education and health care) provide a “two-for” or win-win situation. These investments
are likely to increase productivity in normal situations and provide for more resilience at
the local level in cases of extreme natural events. Where the locality and local livelihood
systems are more resilient, the state is relieved of costly increments of relief and recovery
expense.

**Acronyms**

- DRR = Disaster risk reduction
- HFA = Hyogo Framework for Action
- NGO = Non-governmental organization
- ICRC = International Committee of the Red Cross
- SK = Social capital
- HK = Human capital
- IK = Institutional capital
- NK = Natural capital
- SHINK Complex = the four sets of relations
defined by SK, HK, IK, and NK taken as one interacting
and mutually determining set of relations.
1.2.1 Core Problem

As support for a thorough exploration of the economics of disaster risk reduction (EDRR), this conceptual background paper will be discuss (a) the impact of disasters on social and other capitals and (b) the interactions between this variety of “capitals” – social, human, institutional, and natural (SK, HK, IK, NK). This is an area that is not much covered much in literature of economics, though parallel research in such disciplines as geography, anthropology and sociology helps to clarify the overall EDRR project.

2. Background

2.1 Definitions

I take social capital (SK) to consist of informal social relations and networks operating locally and at a distance that provide the basis of common understanding of the world and action in the world. It is the matrix within which such action takes place and a field within which information is exchanged. Trust in several forms not limited to the inter-
personal is one, but only one component or characteristic of that matrix or information field.

I define human capital (HK) as formally and informally learned skill and knowledge in folkloric or traditional, standardized and external, blended or hybrid forms. This subsumes social, economic, and political knowledge as well as technical and artisanal skills, and knowledge of natural and mechanical processes that facilitate use of natural capital, but human capital is not limited only to this latter kind of capability and certainly not simply identical with labor power.

Institutional capital (IK) should be understood as the formal arrangements and legal structure within which local representatives of the state perform governance and interact formally with citizens as professional administrative staff – the people and facilities that provide governance that affects a locality and the arrangements that in turn regulate their deployment, allocation, function, and accountability.

Finally, natural capital (NK) is considered in this background paper to comprise natural assets or natural resources: soil, water, climate, natural flora and fauna, minerals, and energy sources which are affected – directly and indirectly, intentionally and unintentionally – by management of stocks and flows for purposes of production and reproduction.
Most authors treat these four sets of relationships as distinct from each other, I find it more accurate at several places below to treat them as one interacting complex, which I call the S,H,I,N-K or SHINK Complex.

2.2 Capitals and Livelihoods

The notion of an array of capitals derives from livelihood analysis (Chambers and Conway, 1991; Carney, 2002; Cannon et al., 2003). This is a method for understanding the structural (exogenous) and situational (endogenous) determinants of both rural and urban household income, expenditure, and welfare from a multi-faceted perspective that takes into account access to and use of SK, HK, IK, NK – the primary sets of relations that are the focus of this background paper -- as well as financial capital (FK) and instruments of production or physical capital (PK) (see Figure 1).

Another source for the view of household livelihood as a web of various capitals interacting is the literature on entitlements and asset based understanding of poverty (Sen, 1981; Dreze and Sen 1989; Ribot, 1995; Ribot et al., 1996; Bebbington, 1999; Siegel, 2004).

**Figure 1:** An Overview of the Livelihoods Framework at the Household Level

Scope of Work

2001; Siegel and Alwang, 1999). The last authors cited provide a list of assets (p. 10):

“Assets can be tangible such as land, labor, capital, savings (i.e., natural, human, physical, and financial assets), or intangible assets such as social capital, proximity to markets and health and education facilities, and empowerment (i.e., social, location and infrastructure, and political and institutional assets). Most economic analyses focus on productive tangible assets and how they generate returns. Sociologists and anthropologists often focus on intangible assets. However, there is growing consensus that both tangible and intangible assets, and their interplay, are important, especially in the context of risk management of vulnerable households.”

The SHINK Complex weaves together tangible and intangible assets. Loam soil or a plough are useless unless knowledge of their use is present and a social network is available within which tools such as the plough can be repaired, and more importantly discussed, and perhaps upgraded. The human knowledge of soil characteristics also is dynamic and social. Changes in soil quality are discussed, and changes in agronomic practice follow. In a similar way, credit is of less value absent knowledge of the reliability of the lender, and this, too, is a social judgment subject of revision over time, although in the end a final decision may be taken by the borrower.
This background paper will expand on this understanding the livelihood framework and how capitals or bundles of assets interact during normal conditions and apply them to the question of disaster and disaster risk. How is the normal function of the SHINK Complex change when under stress? Do some configurations of capitals provide more resilience to livelihoods than others? Table 1, taken from Siegel & Alwang (1999: 11), will help explain our approach to these questions.

Table 1 suggests that asset bundles have important spatial and temporal dimensions. They are not present once and for all in some simple way as if they were contained in a basket (although unfortunately the “basket” is a frequently used metaphor in asset and livelihood studies). The conditions for effective use of assets and their reproduction are both internal and external to the household, and these conditions may change over time. Much risk faced by the household takes the form of sudden or slow but dramatic changes in these conditions. Jean-Christophe Gailliard, a French geographer researching in the Philippines captures how such changes contribute livelihood stress and marginalization (Figure 2).

**Table 1:** Household Level Assets & Links to Other Levels
In fact, in most cases extreme natural events do not result in extremes of destitution and marginalization. This background paper will explore what it is about the spatial and temporal scale dependency of the SHINK Complex, as well as the interdependence of the elements in the complex, that makes may reduce these negative impacts of hazard impact and allow for recovery. For example, Box 1 gives an example where social capital seemed to provide resilience at a time of great stress.

**Figure 2**: Possible Disaster Impacts on Livelihood Capitals

<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Household (HH) Level</th>
<th>Community Level</th>
<th>Extra-Community Level</th>
</tr>
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<tbody>
<tr>
<td>Natural</td>
<td>&quot;Private&quot; land, pasture, forests, fisheries, water: quality and quantity</td>
<td>&quot;Common&quot; land, pasture, forests, fisheries, water</td>
<td>National and Global commons, rivers and watersheds, lakes, seas, oceans, air</td>
</tr>
<tr>
<td>Human</td>
<td>HH composition and size</td>
<td>Labor pool</td>
<td>Labor markets</td>
</tr>
<tr>
<td></td>
<td>Health and nutritional status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education and skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>Productive assets (tools, equipment, work animals)</td>
<td>Productive assets (communal and private)</td>
<td>Productive assets (rental markets)</td>
</tr>
<tr>
<td></td>
<td>Household assets (e.g. housing, household goods and utensils)</td>
<td>Stocks (e.g., livestock, food)</td>
<td>Stocks (e.g., buffer stocks)</td>
</tr>
<tr>
<td></td>
<td>Stocks (e.g., livestock, food, jewelry)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial</td>
<td>Cash, savings, access to credit and insurance markets</td>
<td>Cash, savings, access to credit and insurance markets</td>
<td>Finance and insurance systems Access to international finance</td>
</tr>
<tr>
<td>Social</td>
<td>HH social ties and networks</td>
<td>Community social ties and networks</td>
<td>Extra-community social ties and networks</td>
</tr>
<tr>
<td></td>
<td>Intrahousehold dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location and Infrastructure</td>
<td>Proximity and access to water and sanitation, education and health, marketplace, storage, roads</td>
<td>Water and sanitation, schools, health centers, marketplace, storage facilities, roads</td>
<td>Distance to markets, transportation, communication, information systems Health and education infrastructure</td>
</tr>
<tr>
<td>Political and Institutional</td>
<td>Participation in household decision-making (including power relationships related to gender and age)</td>
<td>Participation in community decision-making Governance Security of person and property</td>
<td>Political stability Political participation Effectiveness of collective action Governance Human rights and security of person and property</td>
</tr>
</tbody>
</table>
Thus social capital could be said to have a pivotal role as “first among equals” in a interdependent complex. But as the example in Box 1 suggests, political power and institutional capital are also critical. The ‘Household Asset Base’ box in Figure 1 does not list institutional capital. This is often the case with livelihood frameworks. They tend to focus on the household while assuming the existence of an environment within which legal and other necessary conditions for daily life are met. Thus one must be careful in using livelihood frameworks that one understands such exogenous conditions and is aware of change and the potential for change in them. The version of the livelihood framework used by Wisner and his co-authors, called by them the ‘access model’ includes this specific reminder (Wisner et al., 2004: 104-105), where the ‘social
relations’ and ‘structures of domination’ are explicitly invoked as providing access to resources, information, and markets during normal times and are both themselves modified by crisis and change access conditions, in turn.

2.4 Complex Interactions among SK, HK, IK and NK

Social capital interacts with other forms of capital (human, institutional, natural).

Analysis reveals interdependencies, i.e. complementarities and substitutability of various capital stocks with each other (See Table 2 & Box 2 below). The seminal *Quality of Growth* publication by the World Bank in 2000 discussed some of these interdependencies (Thomas et al., 2000).

A framework that focuses attention on the SHINK Complex is consistent with the literature reviewed above concerning the ways to unblock economic growth. The question remains, however, if such macro level models and frameworks, derived from and arguing about society and economy during normal times have something to say about the resilience of livelihoods during times of crisis.

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**Box 1: Micro-credit and Social Capital under Stress in Indonesia**

The economic crisis that gripped Indonesia and other Asian Tiger economies in 1997-98 produced what the livelihood framework presented earlier would call an external shock (see Figure 1). Using a national data base, Ha (2008) tested whether villages with more social capital were more likely to develop micro-credit schemes (rotating credit). He measured social capital by using simple indicators: number of religious institutions, number of cooperatives, and number of other government supported clubs and institutions. His findings are intriguing.

“...[V]illages with government sponsored institutions such as youth club, women’s group and boys scout and villages with more cooperatives are more likely to engage in community-level crisis coping. Density of religious institutions in a village only significantly increases its probability of having charity contribution. The effect of social capital on the trend of those informal coping strategies during the year after the crisis compared to the year leading up to the crisis is more mixed. Villages with more cooperatives are more likely to experience a jump in ROSCA activities and charity contribution.”

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Figure 3: Quality of Growth Framework
(Source: Thomas et al., 2000: 33)

The rest of this background paper will argue that yes, indeed, there are parallels between the emerging consensus about trust and growth and what is required actually to implement the UN-ISDR’s Hyogo Framework of Action (HFA) and produce what is lyrically referred to as a ‘culture of prevention.’ The key to my argument is that livelihoods depend upon the smooth and adaptive functioning of dynamic system composed of social, human, institutional, and natural capital. To attempt to study or to intervene with policy or projects without taking into account the whole of the SHINK Complex is bound to produce frustration and failure. The reasons are manifold.
Consider the following interactions among the ‘capitals’ under consideration in this background paper (Table 2).

**Table 2: Some Interdependencies among Capitals**

<table>
<thead>
<tr>
<th></th>
<th>NK</th>
<th>HK</th>
<th>SK</th>
<th>IK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NK</strong></td>
<td>Local knowledge and skill required to utilize NK</td>
<td>Conservation of NK often depends on informal social networks as does the exploitation of NK</td>
<td>Formal governance institutions may affect access to and conservation of NK through specific regulations and, more generally, by provision of infrastructure (e.g. roads, markets) and technical extension training and possibly credit</td>
<td></td>
</tr>
<tr>
<td><strong>HK</strong></td>
<td>NK access often a factor in household income and hence ability to educate children</td>
<td>HK depends on inter-generational transmission of knowledge and skill and, more broadly, is socially constructed and language dependent</td>
<td>HK is partly dependent on national and local governance as regards access to school, health care, food security, personal security, and other factors that facilitate or discourage learning in a young person</td>
<td></td>
</tr>
<tr>
<td><strong>SK</strong></td>
<td>SK networks may develop over time as people in a locality have to cooperate in utilizing and protecting NK</td>
<td>SK depends on each generation’s taking roles in informal networks and accepting the credibility and authority of these social relations,</td>
<td>SK network activities may be fostered or discouraged by formal governance structures</td>
<td></td>
</tr>
<tr>
<td><strong>IK</strong></td>
<td>Local governance institutions may self-finance by levying fees for access to some NK or engage in joint-ventures.</td>
<td>The quality and creativity of local governance institutions depends on education levels at tertiary level in the country</td>
<td>In parts of the world where “indirect rule” was practiced in colonial times, as elsewhere, formal governance is often extended and augmented by the activity of</td>
<td></td>
</tr>
</tbody>
</table>
One must conclude that both ‘normal’ development of productive activity and the reproduction of the livelihood strategy in crisis-resistant, resilient forms are dependent on the whole of the SHINK Complex. Box 2 provides a concrete example.

Box 2: Example of Interdependencies
Restocking after drought kills livestock may be done using variations on traditional animal loan systems. A pregnant female animal (cow, camel) is loaned, the beneficiary keeps the young and either returns on passes the female animal to someone else in need. SK is essential in this case – trust as well as the available network and communication within the network. HK is required as such customs are passed on intergenerationally, and HK is also needed in the care and management of livestock. IK may approve or disapprove of such an arrangement, may wave transaction charges or spatial quarantines, or not. Pasture and water are required, of course, on the side of NK, but an additional benefit from soil enrichment may result.

2.5 Point of contact between governance and household
The box in Figure 1 called ‘Shocks/ Changes – External’ contains processes that mark the interface between household and governance – ‘changes in institutions,’ ‘changes in policy environment,’ and, depending on the degree of market regulation by the state, also ‘changes in markets and prices.’ While this much of the box’s content will intermittently affect households on a routine basis, the item named ‘natural calamities’ may be the point of exceptional contact with the state apparatus, and if the state is proactive about disaster risk reduction, contact at this point would be more frequent (e.g. early warning drills, proposed adoption of drought resistant crops, etc.). Indeed, much of the UN-ISDR’s Hyogo Framework of Action is about ways in which a ‘culture of prevention’ can be
mainstreamed into routine development activities (UN-ISDR, 2005). Taking the ‘mainstreaming’ point of view, clearly household potentially meets the developmental state in other boxes: ‘Shocks/ Changes – Internal’ and ‘Household Livelihood Strategy.’ For example, primary health care is highly relevant to that the former box telegraphically labels ‘change in household composition’ as would be an efficient and equitable allocation of livestock health care and other extension services. However, as one sees in failed states such as Somalia and Zimbabwe, one can not assure the existence or functionality of such normal state services. At best in many countries a large proportion of extensionist time is devoted to a small minority of the wealthiest farmers.

2.6 Livelihood Strategy and Resilience

The box in Figure 1 labelled ‘Household Livelihood Strategy’ contains typical range of agronomic and other economic activities. It is worth looking more closely at that content:

- farming: crops and livestock for home consumption + sale
- non-farm activities
- use of natural resources
- other: remittances, pensions
- coping/adaptive strategies.

The important point to stress is that each of these require knowledge and skill as well as labor power (HK), and HK is produced and reproduced socially (not springing full grown from the forehead of Zeus or falling from the heavens). Access to natural resources, is
also negotiated socially, even when some (e.g. land) is subject to market exchange. In other cases some resources (e.g. water, deadfall wood for domestic energy) may be available as common property. Whether or not common property resources exist or have been privatized, whether the road to market is all weather, etc. is a function of local governance (IK). In other words, successful rural livelihoods demand the use of the whole SHINK Complex.

A smoothly functioning SHINK Complex during normal times is more likely to be able to absorb a shock (external or internal) and re-establish its former level of functionality with less outside assistance from humanitarian agencies or the state.

2.7 Non-Materiality and Resilience

Beliefs and cultural practices may play a role in preserving group solidarity in times of stress. For this reason elderly women in Sierra Leone told anthropologist Paul Richards that boiling stones was an important thing to do within a community that faced a food emergency (Richards, 1986). Stones are not edible no matter how long they are boiled, yet by maintaining routine such as this ritual, a sense of normality and group solidarity was preserved that allowed for other, more biologically and economically effective actions.

Immaterial culture may take on material form – such as a place of worship, a burial ground, or a memorial. These sites and spaces may themselves anchor a group's identity and may be much more valuable than their mere bricks and mortar precisely because
repair or reconstruction of such sites following disaster gives affected people a feeling of normality (Wisner et al., 2008; Wisner and Adams, 2003: chapter 5).

2.8 Limitations on Resilience, Coping, and Adaptation

The argument of this background paper is not that the SHINK Complex is a panacea or wondrous cure-all that only needs to be put on by vulnerable groups like a suit of armour. One needs to recall that all livelihood systems are grounded in the relations among elements in the SHINK complex. It is the normal way that *homo sapiens* has organized their production and social reproduction for millennia. Many extreme circumstances that afflict humans also may distort or degrade the functionality of the SHINK Complex. War and other forms of violent conflict, involuntary population displacement, epidemics may have such effects. Taking each element in turn one can clearly see extreme situations that would degrade its contribution to the complex (Table 3).

**Table 3**: Limiting Factors Affecting SHINK Complex Functionality

<table>
<thead>
<tr>
<th>SHINK Element</th>
<th>Disturbing Extreme Event</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social capital</td>
<td>Violent or extreme fission in previously interactive social whole (e.g. communal riots in India; Fiji; Solomon Islands)</td>
<td>Market disruptions, skilled labor shortages, credit flows all may be permanently affected and destabilize livelihoods and firms</td>
</tr>
<tr>
<td>Human capital</td>
<td>Loss of productive &amp; knowledgeable cohort due to epidemic (e.g. HIV-AIDS) or mass migration</td>
<td>Difficulty transmitting local knowledge to successive generations, thus limiting HR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In ability peacefully to maintain property and market relations,</td>
</tr>
</tbody>
</table>
3. **Social Capital as Treated in Key Sources in Economics**

3.1 Prologue: Centrality of Social Capital among Inter-connected and Inter-dependent Capitals, and its Role in EDRR

Robinson Crusoe knew a great deal when he found himself cast away on an Island. The island was rich in natural resources, but the knowledge and skill he used to clothe, shelter, and feed himself was learned from others as a child and youth at home in England and during voyages his fateful shipwreck. Even in his extreme state of isolation, Man Friday appears, thus providing an “other” against which the protagonist survivor defines himself in ways that maintain his sanity.\(^2\) The central insight here, both philosophical and practical, is that social capital is a lynchpin or first among equals when considering the way in which humanity utilize nature, knowledge, and artefact to satisfy its needs. Unsurprisingly economists have written a good deal about social capital, and this section will review some principle things they have said.

While the argument of this background paper is that social capital (SK) can not be considered alone in an assessment of disaster and risk reduction, it is nevertheless critical

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\(^2\) Published in 1719 by Daniel Defoe.
in several ways in that assessment. These will be discussed more fully later, but in overview they are the following:

- Implementation of any policy, no less policy focused on risk reduction, requires the trust, understanding and cooperation of people whose lives are organized socially and spatially in ways that have internal logic and cannot be ignored.

- Within limitations, mutual aid, trust-based relations, and sharing of knowledge within social groups provides the basis for some degree of local resilience to extreme events and shocks; appreciation of and support for local coping, adaptation, resilience is an inexpensive way for governments to implement DRR.
• When government policy (or lack of it) allows or encourages destruction of social capital, local vulnerability to severe economic disruption, loss of assets, injury, and even death often increases, and the resulting situation either requires costly intervention by the state or, if unattended, may contribute to social unrest and loss of credibility of the state.

3.2 Social Capital through Economists’ Eyes

A convincing case has been made by a number of authors that trust and trustworthiness have a significant relationship with economic growth. However, from the point of view of this background paper, this result must be considered of marginal interest. The reasoning behind my statement is the following. I will go though each element in detail, but in brief:

• Trust is only one aspect of social capital, and from the point of view of DRR, not the most important one.

• Inter-personal trust is what the economics literature has most often investigated, and in cross cultural situations such as in rural East Africa, where I have a good deal of experience, other forms of trust are more important.

• In any case social capital must be seen analytically case overlapping with human and to some extent institutional capital and cannot be treated separately in the context of DRR.

Firstly, trust is only one aspect of social capital. Of more importance for the ability of local livelihoods to behave with resilience in the face of extreme events, of more interest
is the social nature of land use and the use of natural resources. I would define social capital for purposes of investigating its role in DRR as a *matrix for the effective application of knowledge and skill in dynamic environments*. The issue of interpersonal trust is relevant but not decisive in understanding how this matrix operates.

Secondly, the social capital as matrix or field of action implies overlap with what economists call human capital, and I refer to here as knowledge and skill. A crude distinction might be made between “local knowledge” of soils, vegetation, fauna, water resources, market conditions, availability of productive assets for borrowing or for hire, etc. and “outside knowledge.” However, much geographic and anthropological field study suggests that there is often a blending of “local” and “outside” knowledge. Such practical knowledge bears directly on DRR because it generally includes options for modifying land and resource use in response to environmental extremes. These practices are usually called “coping” or, in the context of climate change, “adaptation.” In addition, there are some routine practices such as building houses on mounds or stilts in some flood prone parts of the world which are “traditional” and are to that extent hard wired into the cultural system. Much such knowledge is tacit. It is embodied in practices that are passed on from generation to generation (with some modifications) and not consciously recognized as coping or even as local knowledge. They are simply, “what we do.”

Trust enters into this fusion of social and human capital in several ways. Where outside and local knowledge is blended, the source of exogenous innovation has to be thought to
be credible, and its source trustworthy. However, this is not the same kind of inter-personal trust discussed in such sources as Glaeser et al. (2000) who conduct experiments with money and review social survey data. All over the world there are sub-populations that have histories of oppression and exploitations at the hands of dominant groups or at least perceive themselves as having such histories. James Scott has classically described what he calls “weapons of the weak” in a series of important books (1985; 1990; 1998). Colonized people and those in post-colonial yet still sub-ordinate positions, as well as other marginal groups use many forms of passive resistance to defend what they see as their interests from alien authority. DRR knowledge and practice coming from “top down” sources in such situations are unlikely to be seen as credible. This, however, has little to do with the kind of inter-personal trust measured by Glaeser et al. In fact, counter-intuitively and against the results reported by economists writing about the role of a narrower concept of inter-personal trust, it could be that mistrust of outside authorities is an important ingredient in group solidarity, identity, sharing of local knowledge, and common efforts at local risk reduction.

There are, in short, complex interactions among SK, HK, and IK that influence how NK is used in routine or normal circumstances and in extreme events. The notion of SK utilized in economics papers discussed below is both a narrow one, focussed usually on a Westernized notion of inter-personal trust, and a concept that isolates SK from the other “capitals.”
3.3 ‘Measuring Trust’ by Glaeser et al. (2000)

As I noted above, ‘trust’ is only one aspect of social capital, and in my own work in Africa, Latin America, Asia, as well as in my reading of others’ research in these non-Western circumstances, other forms of trust beyond the inter-personal are more important. Among these I should highlight inter-group trust. By this I refer to attitudes toward the inferred motivations and reliability of people who identify with another tribe, clan, or religion. Glaeser et al. capture a hint of this in their finding that there seemed to be less trust in one of their money-based experiments when people of different racial groups were partners (pp. 814-815).

However my main critique of this approach to ‘measuring trust’ is that social capital is (a) reduced to trust and (b) that social capital is treated in isolation from other non-material/financial assets. In particular, the literature cited with approval by Glaeser et al. that finds that “increase in trust increases judicial efficiency by 0.7 standard deviation” (p. 811) and similar assertions to be hopelessly acontextual. Surely institutional capital needs to be considered at this point, and not merely social capital! And institutions have a history and life of their own. In addition, the way that children are educated about the governing institutions to which they are subject affects the way that trust in these institutions is reproduced (and changes) from generation to generation. Thus human capital is also a part of this picture, and not simply social capital.

\[\text{Other studies have used a more complex definition of trust, but none that I am aware of deal with the credibility of government and national economic elites, especially in post-colonial state situations, and non with inter-tribal or inter-faith trust relations. See Paul Whiteley (2000), who used a broader trust measure, composed of trust in family, fellow national citizens, and people in general.}\]
I admire the attempt by Glaeser et al. to clarify one aspect of social capital and to combine experimental and survey methods to tease out social correlates of trust. However, frankly, this work does little to inform the developing country situations in which I work. What I am able to take away from this work is the general point that in the experiments Glaeser et al. produce evidence that there is expectation of reciprocity, modified by what they define as inter-personal trust. At that general level I recognize the behaviour described. For example, in my earlier field work in Tharaka, eastern Kenya (1970-1976), I found that extended family members with access to farms with heavy black soils (depressions called mbuga) that were able to support short cycle crops even during a drought allowed their extended family member to use some of that land rent free. This turned out to be a significant drought coping mechanism that was significantly associated with whether or not a family was able to support the nutritional health of children under 3 years of age during the drought (Wisner, 1978). Note that this has to do with millennia-long evolution of bonds and expectations among extended family members, not with the expectation of immediate reward or reciprocity. Yet the behaviour is also not altruism (benevolence shown toward a stranger) because the essence of kinship in eastern Kenya is generalized expectation of help in times of misfortune.


Bjornskov provides an excellent, non-technical review of the studies since Kenneth Arrow’s classic study in 1972 that investigate the relationship between various components of social capital, especially trust, and economic growth. As I noted in the introduction to this section, the consensus is that a strong positive association exists
between trust and economic growth. Table 4 reproduces Bjornskov’s summary of such studies (p. 10; see Bjornskov’s original paper for bibliographic details).

Bjornskov also reviews criticisms of this macro level empirical research (pp. 10-13), but himself finishes up with the statement that “one must admit that even though we as a profession know – or at least strongly suspect - that social trust causes economic development, the question of exactly how this effect comes about is one that we are only beginning to explore.” (14) The rest of his paper concerns possible mechanism for connecting social capital (and trust in particular) to economic growth. I find this discussion highly relevant to my background paper because he seems, as I do, to link up institutional capital, human capital (via education), and social capital. It is thus that I bundle the ‘capitals’ together and argue that from a livelihood resilience and DRR point of view one must deal with the whole of the SHINK Complex. Below I reproduce Bjornskov’s summary diagram.

**Figure 4:** Possible Transmission Channels linking Social Trust and Growth

(Source: Bjornskov, 2007: 16; original in Bjornskov, 2006; NOTE: solid lines are causal linkages found by Bjornskov, whilst dotted ones are those asserted by earlier authors)
Table 4: Studies Inquiring into Relationship between Social Capital and Growth

<table>
<thead>
<tr>
<th>Study</th>
<th>Published in</th>
<th>Controls</th>
<th>Growth effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hellwell (1996a)</td>
<td>NBER working paper</td>
<td>-</td>
<td>0 %</td>
</tr>
<tr>
<td>Knack and Keefer (1997)</td>
<td>Quarterly Journal of Economics</td>
<td>Education, investment goods, prices, initial GDP</td>
<td>56 %</td>
</tr>
<tr>
<td>La Porta et al. (1997)</td>
<td>American Economic Review</td>
<td>Initial GDP</td>
<td>20 %</td>
</tr>
<tr>
<td>Whiteley (2000)</td>
<td>Political Studies</td>
<td>Investment, education, initial GDP</td>
<td>40 %</td>
</tr>
<tr>
<td>Zak and Knack (2001)</td>
<td>Economic Journal</td>
<td>Investment price, education, initial GDP</td>
<td>60 %</td>
</tr>
<tr>
<td>Beugelsdijk et al. (2004)</td>
<td>Oxford Economic Papers</td>
<td>Robustness analysis</td>
<td>58 %</td>
</tr>
<tr>
<td>Beugelsdijk and van Schaik (2005)</td>
<td>Eu. J. of Political Economy</td>
<td>Investment, schooling, agglomeration, initial GRP</td>
<td>0 %</td>
</tr>
<tr>
<td>Berggren et al. (in press)</td>
<td>Empirical Economics</td>
<td>Robustness analysis</td>
<td>36 %</td>
</tr>
<tr>
<td>Boukla et al. (2006)</td>
<td>Conference paper</td>
<td>-</td>
<td>16 %</td>
</tr>
<tr>
<td>Bjørnskov (2006b)</td>
<td>Working paper</td>
<td>-</td>
<td>54 %</td>
</tr>
<tr>
<td>Roth (2006)</td>
<td>Working paper</td>
<td>Education, investments, pop. growth, initial GDP</td>
<td>-</td>
</tr>
</tbody>
</table>


This is an elegant and philosophically sophisticated paper with a serious policy punch. Consider this passage from its introduction:

“We show a ... low-trust poverty trap exists for the model in this paper. If trust is too low in a society, savings will be insufficient to sustain positive output growth. Such a poverty trap is more likely when institutions – formal and informal – which punish cheaters are weak.” (p. 296).
As I will show in the case studies below and have mentioned earlier, trust in government is often very low in some of the countries most prone to natural hazards. This can lead to rejection of DRR innovations and even hazard warnings. I was present in 2000 with the volcano to the southeast of Mexico City became active. Farmers on the volcano slopes refused to heed evacuation orders. They argued that the last time they had left their farms the police and army stole their animals and other goods. The government had to make special appeals that specifically emphasized that it was a newly elected government and that changes had been made, so the farmers need not fear theft.

As a geographer and social scientist, I am unable to comment on the technical details of the model Zak and Knack develop or on the literature they cite. I think, however, that the inefficiency they identify is perhaps the tip of an iceberg. It is not just inability to enforce contracts in a low cost manner that leads to low growth. It is failure of farmers and urban dwellers to heed recommendations concerning land use, house construction, livestock health, water conservation, farming methods, etc. that leads to avoidable loss and harm due to landslides, floods, droughts, storms and other extreme natural events. This scepticism about what the government has on offer as innovation and risk reduction is based on mistrust of government and is not irrational. It is reasoned scepticism based on past experience. The challenge of DRR is thus to convince donors and others with leverage that only be making government trustworthy will trust follow.

The indicators chosen by Zak and Knack to populate their model could be used to test whether implementation of the Hyogo Framework of Action (HFA) is dependent on the
level of trust in different nations. Currently two evaluations of the HFA and should be available by June 2009. One is top down and depends on whatever national focal points report to the UN-ISDR. Diplomatic constraints mean that no quality control or fact checking will be conducted by UN-ISDR, so the results may not reveal more than verbal commitment to the HFA’s five sets of priority actions to be implemented. However, an international network on NGOs for DRR is presently at work doing a complementary survey of HFA implementation from the bottom up. An excellent study could be conducted seeing if the indices of trust developed by Zak and Knack explain nation to nation variation in real implementation of the HFA. The indicators chosen by Zak and Knack include an index of property rights, index of contract enforceability, index of corruption perception, and an index of investor rights (p. 311).

3.6 ‘Does Social capital have an economic pay-off? A cross country investigation’ by Knack and Keefer (1997)

Knack and Keefer also find that trust and civic cooperation are associated with economic growth, using economic data and data from the World Social Survey for 29 market economies. This is not surprising. What is more of a surprise, and reinforces the point I took from Zak and Knack above is that “trust and norms of civil cooperation are strongest in countries with formal institutions that effectively protect property and property rights.” (p. 1252). So the EDRR project faces a difficult and delicate political question. If punishing ‘cheaters’ in government and the economic elite and establishing formal institutions to protect property and contract rights are prerequisites not only for growth, but for the trust required for ordinary people to believe government recommendations
about DRR, does the EDRR say so? Fortunately the World Bank has already been quite outspoken about good governance and the bane of corruption for a number of years, so perhaps it will not be as difficult an editorial decision for those controlling the EDRR project as one might think.

4. Case Studies

The following case studies reveal a range of complex relations among the elements in the SHINK Complex before, during, and after exposure to a natural hazard. They are presented pair-wise, with one case in each pair being characterized by more highly functional SHINK complex and the other less functional.

4.1 Resilience to Drought in Kenya and Somalia

4.1.1 Drought in Eastern Kenya

Smucker and Wisner combined their data and were able to study changes in household level coping with drought in eastern Kenya over a 30 year period (Smucker and Wisner, 2007). During this period the Kenyan state successfully introduced private ownership of land in the study area where clan based usufruct had been the dominant land tenure relation. Previously access to natural resources (pasture and water for livestock, land for farming, common land in which to gather wild fruits and to hunt) had been governed by informal social relations. Since the introduction of individual tenure, access rules had become formalized and governed by the market. This change in the relative importance of social capital and the market in regulating access to natural resources and wild food radically changed the pattern of drought coping among the study population. Far fewer
households sought out wild foods or hunted because common property resources zones had been reduced. Livestock became a less important part of the livelihood system because general access to pasture and water had been reduced (Table 5).

What was also striking is that fewer households reported seeking loans and gifts from relatives and more said they relied on emergency food provided by the government. This last result may reflect a deeper erosion of social capital as a further result of privatizing land tenure. However, it could also point to increased spatial and political access to government services, including emergency assistance, due to another of the major changes over 30 years – elevation of the status of the study area from a remote subdivision of an administrative district to that of a full district, with full time government officials living there and financial resources allocated specifically to this new district.

Thus over time institutional capital in the form of government professional services had become more important in the SHINK Complex, while some aspects of local knowledge and skill (e.g. hunting and gathering of wild foods) had declined in importance. Social capital nevertheless remained important as the researchers found that emergency food assistance provided by the government were quite widely shared despite the fact that bureaucratic rules governing eligibility would have excluded some and targeted others.

**Table 5: Percentage of Households Adopting Drought Response by Wealth Group**

<table>
<thead>
<tr>
<th>Year</th>
<th>Wealth group as percent of total sample</th>
<th>Group 1 (N=26)</th>
<th>Group 2 (N=68)</th>
<th>Group 3 (N=20)</th>
<th>Group 1 (N=108)</th>
<th>Group 2 (N=231)</th>
<th>Group 3 (N=45)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>20</td>
<td></td>
<td></td>
<td>18</td>
<td>28</td>
<td>60</td>
<td>12</td>
</tr>
<tr>
<td>2001</td>
<td>60</td>
<td>18</td>
<td></td>
<td>28</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Use of Social and Natural Environment

<table>
<thead>
<tr>
<th>Activity</th>
<th>96</th>
<th>67</th>
<th>85</th>
<th>0</th>
<th>14</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move livestock</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ask for help from family</td>
<td>88</td>
<td>85</td>
<td>90</td>
<td>20</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Ask for help from government</td>
<td>12</td>
<td>12</td>
<td>20</td>
<td>47</td>
<td>39</td>
<td>26</td>
</tr>
<tr>
<td>Hunt or fish</td>
<td>80</td>
<td>67</td>
<td>70</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Collect bush food</td>
<td>69</td>
<td>72</td>
<td>85</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

### Use of Market

<table>
<thead>
<tr>
<th>Activity</th>
<th>100</th>
<th>85</th>
<th>80</th>
<th>10</th>
<th>52</th>
<th>68</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell livestock *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sell charcoal *</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>14</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Sell firewood *</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>8</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sell handicrafts *</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>23</td>
<td>22</td>
<td>17</td>
</tr>
</tbody>
</table>

### Labour for Wage or Food

<table>
<thead>
<tr>
<th>Activity</th>
<th>80</th>
<th>69</th>
<th>70</th>
<th>26</th>
<th>10</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local wage labour</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out-migration in search of wage labour</td>
<td>46</td>
<td>39</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work for food locally *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Data not collected by Wisner (1976)

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**Box 3: Famine and the Break Down of Social Capital**

The preceding case study demonstrated the positive role of social capital or, as I have been calling it, the SHINK Complex in coping and recovering from drought as example of slow onset hazard. There are many documented cases of successful SHINKing in the face of drought (Richards, 1986; Wisner, 1988; Corbett, 1988; de Waal, 1989; Devereaux, 1993a). What they all have in common is a situation in which while extreme, drought was not unknown and a repertoire of coping mechanisms existed. The livelihood systems had developed under conditions of climate variability, and in the absence of further stress, they were able to cope with an extreme.

However, there are also cases where other stresses such as violent conflict, complete absence of the state, and market breakdown produce conditions in which known or remembered coping is not applicable. Under extreme conditions, indeed, the SHINK complex may break down. The United Nations and humanitarian community refers to these situations as complex humanitarian emergencies. Indeed, social breakdown has often been sited by historians of famine as an integral part of its definition (Sen, 1981; Walker, 1989; Devereux, 1993b; Buchanan-Smith and Davies, 1995; Cuny, 1999).

The role of violent conflict and internal displacement of populations as additional stresses on the top of drought may be seen in the case of Darfur (Edwards, 2008) and Somalia (Agence France-Press, 2008).

However, it isn’t only violent conflict that is capable of shattering the SHINK Complex and dramatically pushing large numbers of people from food crisis into famine. Alex de Waal suggests that HIV-AIDS in Africa may have a similar effect (de Waal, 2002). He is explicit as I have tried to be about the close connection between SK and HK. For de Waal the failure of transmission of farming knowledge from parents to children constitutes a critical erosion of the ability to cope with drought and other extremes. In the face of high parental mortality, the grand parents – often a single grand parent – caring for orphaned children are too hard pressed making ends meet to pass on critical knowledge.

Such “new variant” famine is a slow motion disaster, as described recently by an official of the World Food Program (Fletcher, 2008): “Poor rural and urban African families who were not getting enough nutrition in their diets, because of conflict disrupting their lives, natural disasters or high prices putting food beyond their budgets, were seeing their immune systems weaken. … “This made them more vulnerable to HIV/AIDS and tuberculosis. The deaths from disease of family bread-winners or members of collective workforces were draining the economic lifeblood from individual households and whole economies.”

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### 4.1.2 Drought in Southern Somalia

Through the late 1980s the south-central zone of Somalia had been a bread basket. There were irrigation schemes and banana plantations, and small holders managed in most years to make a living by combining livestock income from local sales and long distance.
trading with moderate yields of sorghum and cow peas. Tied-ridging to harvest and conserve rainfall and choice of drought resistant seed were among the skilled practices that were widespread (Wisner, 1994). Droughts and floods occurred, but most people managed to cope most of the time.

Since 1991, violent conflict and repeated displacement has undermined this marginal but reasonably secure livelihood system. In mid-November 2008, international food aid was going to more than 400,000 people in this south-central region. Tens of thousands had been displaced from their homes and were living in camps across the border in Kenya and in Somalia (ICRC, 2008). The SHINK complex that had sustained rural people previously had relied on a support network of neighbors, kin and clan members, local knowledge of soil, water, crop, and animal management, institutions that provided reliable security when travelling and functional local and more distant markets. All this has changed with the deteriorating security situation and displacement. Even access to land and water is now dependent on whatever warlord is dominant in an area.

A post harvest assessment by the multi-lateral Food Security Assessment Unit in February 2009 characterized the situation as follows: “43% of the total population of the country, or around 3.2 million people, in need of emergency livelihood and life-saving assistance at least until June 2009. A failed state since the early 1990s, Somalia has had recurring humanitarian emergencies over the last 18 years and is a country characterized by chronically high rates of acute malnutrition above emergency levels, and chronic levels of food insecurity among the rural population. The ongoing humanitarian crisis, however, is unique in that the crisis is widespread; not only are 1.2 million rural people in
crisis, nearly two-thirds of those in crisis, or 2 million people, are urban poor and internally displaced populations (IDPs).” (FSAU, 2009).

4.2 Hurricane Impact in Cuba and Haiti

4.2.1 Hurricane Impact in Cuba

Cuba has an extraordinarily positive record at protecting human life during hurricanes that seasonally affect the Caribbean and cause much higher mortality on other islands and in Central America (Wisner, 2001; Wisner et al., 2005). In this case positive interactions among social, human, and institutional capital are evident.

A study reviewed the effectiveness of social protection during the 2004 hurricane season in Cuba, Haiti, Dominican Republic, and Jamaica (Wisner et al., 2005). In all countries reviewed the same pieces – with different names – had to come together in order to provide safety for the population during hurricanes (p. 51):

- Hurricane forecasting
- National warning
- Local government diffusion
- Civil society participation
- Popular understanding and action.

Cuba was by far the best performing of the four counties (Table 6), and the reasons found were as follow (p. 55):

- Generation of and access to excellent hurricane warning and prediction information
- A system of governance and civil protection from national to local level, which is coherent, well-coordinated, proactive, responsive and accountable
- Ongoing risk awareness, practice drills and preparations, based on universal educational access and literacy
- Close integration of the media into the warning system
• Strong neighborhood organizations and participation of youth, women’s and professional organizations

• Investment in public transport, shelters and emergency provisions.

Many of the elements of Cuban success in protecting during hurricanes are a function of the way that social capital, human capital, and institutional capital are integrated, how they are supported, and how they function. The neighborhood Committees for the Defense of the Revolution function as a primary unit for providing information on individuals at high risk during emergencies – for example, the elderly and pregnant women. Each hurricane season involves collection of such information for planning.

Table 6: Deaths from Hurricanes in 2004

<table>
<thead>
<tr>
<th>Country</th>
<th>Charley</th>
<th>Frances</th>
<th>Ivan</th>
<th>Jeanne</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahamas</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Barbados</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Cayman Islands</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Cuba</td>
<td>4</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>4</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Grenada</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>39</td>
</tr>
<tr>
<td>Haiti</td>
<td></td>
<td></td>
<td></td>
<td>1,400+</td>
<td></td>
<td>1,800+</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1</td>
<td>7</td>
<td></td>
<td>1</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>United States</td>
<td>30</td>
<td>.47</td>
<td>57</td>
<td>5</td>
<td>19</td>
<td>152</td>
</tr>
<tr>
<td>Venezuela</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>49</td>
<td>134</td>
<td>1,400+</td>
<td>13</td>
<td>2,000+</td>
</tr>
</tbody>
</table>

Note: Includes deaths directly and indirectly caused by hurricane impacts. No data means the hurricane did not hit that country, while a zero figure means the hurricane hit but no deaths were reported.
Sources: US National Hurricane Center (NHC), Governments of Haiti and Dominican Republic

at the local and provincial level. Information flows “upwards.” In addition, there is good information flow “downwards” through this nested system, and, what is more, a very well education Cuban population – due to investment in education by the state – means that citizens understand such concepts used during national broadcasts of hurricane news as the “cone of probability” – used to map likely landfall. Without romanticizing inevitable
tensions in any group such as the Committee for the Defense of the Revolution, evidence of the continuing effectiveness of the warning and shelter system during 2008s dramatic series of storms (Hanna, Gustav, and Ike) suggests that there is trust within the neighborhood system and trust in the national government’s warning system (credibility).

4.2.2 Hurricane Impacts in Haiti

In 2004 the torrential rains that Tropical Storm Jeanne poured on the northern flanks of Hispaniola funneled a deadly torrent of floodwater, mud and debris through mountain ravines and onto the plains. The coastal town of Gonaives was inundated. Witnesses reported that the flood rose by two meters in half an hour. At least 1,800 people died; another 800 remain missing. In all, 80 per cent of the town’s 250,000 inhabitants were affected (Wisner et al., 2005). The striking difference with Cuba, a nearby island also affected by this and other storms in the 2004 hurricane season is explained by differences in the functionality of the SHINK Complex in the two places. In Cuba both informal traditional and formal knowledge of storms is well developed and used. There is a social network on the basis of the neighborhood this is trusted and coordinates warning and evacuation. National and regional institutions support this social network, and the warning information sent out through this system in understood, trusted, and acted upon.

The SHINK Complex in Haiti is dysfunctional. Almost all of Haiti’s steeply mountainous territory has been deforested. Jeanne’s rains lashed nearly barren slopes, with just 1.4 per cent of their original tree cover. While flash flooding sometimes happens even on well-forested slopes, deforestation undoubtedly exacerbates the risk. In terms of human and social capital, in earlier times, local knowledge of storms, floods and
landsides existed and there was an informal local alert system. Farmers in the Arbonite Valley above Gonaives could tell by changes in the color of river water when a flash flood is coming. Remnants remain of neighborhood mutual aid arrangements that grew up in the years of ‘popular organization’ (1986–1994), during resistance to military dictatorship and the early days of Aristide’s presidency. In the past, local marketplaces have been successfully used to disseminate hurricane warnings. Even traditional experts in sending long-distance messages by blowing on a conch shell have been incorporated into local government warning schemes. So too have local Catholic, Protestant and voodoo priests. But intensifying political violence and rapid urbanization have undermined much of this local expertise.

In political and institutional terms, the storm Jeanne could not have come at a worse time. The sudden departure of Haiti’s president, Jean-Bertrand Aristide, seven months earlier had left great instability and rioting in its wake. Early warning systems require a system of local government that can prepare people for an emergency, pass on warnings from the national center, monitor events as they unfold locally, and assist in evacuation and sheltering. While in theory Haiti has such a system, during 2004’s political violence, much of it didn’t function.

Civil society and international organizations play an important role in supporting local government. For example, as Hurricane Ivan approached Haiti earlier in the 2004 season, the Haitian National Red Cross Society took primary responsibility along the southern coast for warning, evacuation and shelter. As Ivan approached, the Red Cross installed
satellite telephones in three urban centers along a peninsula in the south of the country. The United Nations Development Programme (UNDP) had partnered with the Red Cross and others to invest in public education and preparedness in the same region. However, these organizations were not active further north. So people were successfully evacuated and sheltered as Ivan passed harmlessly to the south of the island, but not when Jeanne wrought her destruction on the island’s north-western shores only weeks later. Worse still, Gonaives was an epicenter of the political violence that led to the overthrow of Aristide. Consequently, its basic services – education, health and security – deteriorated, in a country where these were already scarce. Attempts to organize local disaster preparedness had been suspended or destroyed as offices were looted and officials fled. This left the town’s people extremely vulnerable to natural hazards. Maintenance of the canals that drain the seaside town had long been abandoned. Refuse clogged them, making the flooding even more severe.

4.3 Tsunami Impact on Andaman Islands and Tamil Nadu, India & on Similieu Island and Banda Aceh, Indonesia

4.3.1 Tsunami Impact on Andaman Islands & Similieu Island

Indigenous people inhabit small islands of the east coast of India and the large island of Sumatra in Indonesia. These people were affected by the tsunami triggered by and undersea earthquake on 26 December 2004, as were their non-indigenous Indian and Indonesian compatriots. However, very few indigenous people died. The reason has to do with knowledge and the cultural matrix within with this knowledge is transmitted and held for long periods in suspension until it is activated.
The Onge tribe is composed of indigenous people who have been living on Little Andaman Island for perhaps 50,000 years (Cultural Survival, nd). Their cultural knowledge has embedded historic and pre-historic tsunami events beyond the direct experience of living generations. On the basis of this knowledge as contained in folk tales that speak of “huge shaking of ground followed by high wall of water”, the modern day Onge immediately sought refuge on higher slopes when they felt the quake. In a similar way, the Jawara people of central and south Andaman also fled into the hills. (Bhaumik, 2005)

Even more dramatic was the escape of the indigenous people of Simeulue Island, in the Indonesian archipelago, even though it was only 40 km from the epicenter. Only seven people are thought to have died on the island among a population of 183,000. Here too ancestral knowledge was triggered by the earthquake, and people rushed to higher ground. (UN-ISDR, 2008a; 2008b)

In these cases the SHINK complex exhibits a relationship between social networks transcending families and knowledge possessed passively by individuals as the deep cultural background or tacit understanding that may be transformed into life saving action. Folklore serves to link the distant past of a place and people with those alive today. This is place-based knowledge yet a common response by half a dozen indigenous groups living on islands intermittently affected by tsunami over thousands of years.

4.3.2 Tsunami Impact on Tamil Nadu and on Aceh

The majority of those killed by the tsunami in India and Indonesia were coastal residents of the state of Tamil Nadu and province of Aceh, respectively (TEC, 2006). All these
victims had as much or more warning than the indigenous people of the smaller islands just discussed. What they lacked place specific cultural roots that allowed distant collective memory of tsunamis to mobilized. Tamil Nadu and Aceh had been much more incorporated into the modernizing project of their respective nation states, migration from outside these regions was common, and livelihood opportunities were diversified.

5. Discussion: Temporal and Spatial Dimension of the SHINK Complex

5.1 Short, Medium, Long term Impacts of Disaster on Social Capital, Human Capital, and Institutional Capital

The case studies presented in Section 4 showed that the SHINK Complex is highly dynamic, and that macro scale changes will inevitably affect it. However, in the case of eastern Kenya, changes in land tenure, population growth, and governance had mixed impacts. In the case of complex humanitarian emergencies such as the combination of drought or flood and violent conflict, with or without HIV-AIDS, cholera or other public health complications, the local or even regional social, economic and administrative system may tip into irreversible breakdown such as classically described as ‘famine.’ Between these extremes relatively benign and catastrophically negative impact, extreme natural events can have a large range of effects on the social capital and the SHINK Complex. This section reviews this range of effects over the ‘short term’ (referring to the first 3-6 months following a disaster), ‘medium term’ (signifying the period from 7 months to 5-10 years afterwards), and ‘long term’ (standing for an intergenerational time scale of from 10 years upward).
5.1.1 Short Term Impacts and Interactions

Much immediate rescue and relief is carried out by the survivors themselves and nearby neighbors. Official search and rescue and relief may be delayed for days. The window of up to six months after the impact is generally characterized by a strengthening of social ties and solidarity. Geographers and sociologists of disaster have described the rise of emergent organizations and the difficulties they have integrating with official relief activities (Drabek, 1986; Saunders & Kreps, 1987; Drabek & McEntire, 2003). Coordination of government and civil society or NGO activities turns out to be a major challenge that involves differences in organization culture and structure as well as inter-organizational trust (Majchrzak et al., 2007; Wisner and Uitto, 2009).

This is also the period during which volunteerism is at its height. In some cases such as post-earthquake Kobe in 1995 and post-hurricane Katrina New Orleans, some tens of thousands of college aged people descending on the population with a desire to help. Since these volunteers are not local and often come from very different class background, their self mobilization after a disaster reflects on a different sort of social capital than local mutual aid. The motivation of these anonymous youth from distant, usually urban locations, more easily fit the description of altruism in Richard Titmus’ classic work, *The Gift Relationship* (1970). Nevertheless, this large scale and anonymous variation on the idea of social capital usually invoked in studying disasters is highly relevant at a time when privatization of social services is well established and author Naomi Klein has predicted its logical extension as ‘disaster capitalism’ – the privatization
of relief and recovery services (Klein, 2006). Thus Fontaine (2004) comments insightfully on Titmuss’ earlier work:

“...his thesis—that too much commercialism undermines the social bond—remains especially relevant in the context of the growing commercialization of social services in Western societies. In particular, in advocating ‘socialist’ social policies, which encouraged the sense of community and therefore favored positive externalities while curbing negative ones, Titmuss reminds economists of the significance of the gift relationship among the coordinating mechanisms that assure social cohesion.”

5.1.2 Medium Term Impacts and Interactions

A powerful earthquake shook a mountainous region of Sichuan Province, China in May, 2008. Seventy thousand people died, including as many as 16,000 children whose schools collapsed, 374,000 were injured, and several million people made homeless. I visited temporary housing encampments six months later, in November 2008, as part of a study tour and workshop made up of foreign and Chinese social workers, engineers, and geographers.

Interviews conducted by the Chinese speaking social workers and observations reported by volunteers who had been resident for the six months since the disaster showed low morale and depression, criticism of the government for not providing better quality temporary housing that could be heated, and little public life in the camps (no camp newspaper, few social events). These observations are consistent with survey results
following a year after the East Marmara earthquake in Turkey (Kasapoglu & Ecevit, 2003).

Due to haste in allocating survivors to temporary housing, no attention had been paid to the village of origin, and people were assigned quarters randomly. Thus social networks that had been interrupted by death were further disrupted. One sign of isolation and alienation was the near universal refusal to use communal cooking facilities made available in each block of houses. It would seem, therefore, that after the immediate upswing in sociality and connectedness following the tragedy, six months later, an unraveling of social capital was at work.

Perhaps a distinction should be made between early and later recovery periods, thus dividing ‘medium term’ into two or more sub-periods of variable duration. The erosion of social networks, low morale, and criticism of government that I have just described some six months after the Wenchuan earthquake may well dissipate with time or even season. The first winter in temporary housing is a difficult time. In addition, most people are still mourning the loss of loved ones. The government has set three years as the maximum amount of time required to provide new permanent housing. It is quite possible that with continuing attention by social workers to rebuilding group solidarity and a sense of community, by the time people move to new permanent housing, social capital – albeit comprising new networks – and confidence in the government will be restored.
5.1.3 Long Term Impacts and Interactions

Evidence of disaster impacts after ten years or more have elapsed is mixed. One thing is very clear, however. Long distance re-settlement of survivors nearly always results in destruction of social networks and the SHINK Complex that underlies successful inter-generational transmission of livelihood capabilities. Displacement of people due to investments in mega-projects such as high dams has been very thoroughly studied, and data on the effect of re-settlement is clearly relevant to post-disaster housing and recovery policy (World Commission on Dams, 2000; Scudder & Gay, n.d.; Scudder, 2006; Oliver-Smith, 2009). In its review of earthquake relief and recovery operations during 2008, the international expert group, ALNAP, included the recommendation to “[l]imit relocation to what is essential for safety” (ALNAP & ProVention, 2008: 21-22). These authors cite 13 studies of earthquake recovery operations including the Asian tsunami, and earthquakes in Bam (Iran), Yogyakarta (Indonesia), Flores island earthquake and tsunami (Indonesia). They continue (p. 21):

“Agencies should, if at all possible, support people’s desire to remain near their homes, as relocation damages social networks. However, some families may need to be resettled away from the hazard zone for safety reasons, or because they have been traumatized by the disaster.”

Human capital as an essential part of the SHINK Complex may also suffer irreversible harm in the long term. Injuries may lead to reductions in the ability to work and lead to dependency. Many spinal cord injuries and amputations were among the health problems that confront survivors of the Asian tsunami (Kumar et al., 2005) and Kashmir
earthquake (World Bank, 2008; OCHA, 2008). These people suffer reduced ‘disability adjusted life years’ (DALYs) and become an economic burden on their families and wider society. Less visible are the mental and emotional scars that people carry with them for a very long time after a disaster, especially one in which loved ones are lost and an entire village (and thus one’s ‘place’ in the world) is erased, as was the case in the Asian tsunami (WHO, 2008) and Wenchaun earthquake (Wisner and Adams, 2003: 71-82).

Children suffer from interrupted education, especially where schools are destroyed or used for a long time as temporary shelters (INEE, 2008). Against this evidence from disaster affected developing countries, an interesting study of school performance of evacuees from post-hurricane Katrina found that those leaving New Orleans school districts improved their scholastic record at their new schools (Sacerdote, 2008).

In some situations, children among populations displaced by disaster remain vulnerable for many years. A study of hurricane Katrina-displaced children living in Baton Rouge found the following three years after the disaster (Children’s Health Fund, 2008):

- 55% of elementary school age children had a behavior or learning problem.
- 42% of children three years and older needed developmental or mental health services.
- 42% of children were diagnosed with allergic rhinitis and/or upper respiratory infection and 24% had a cluster of upper respiratory, allergic, and dermatological diagnoses. These high rates of diagnoses could reflect the harsh environmental conditions at shelter, such as exposure to formaldehyde which was found to be present in the trailers.
- 41% of children under four years of age were diagnosed with iron deficiency anemia. This is twice the rate for homeless children in shelters in New York City.
and two and a half times the highest recorded by the CDC for high-risk minority populations.

- 27% were diagnosed with a hearing or vision problem.
- Nearly one-half of the children required at least one specialty medical visit and 12% required two or more specialists.

On the positive side, where in situ recovery has been successful, social capital and the whole SHINK Complex has emerged stronger. A number of such cases are documented on the ProVention Consortium’s community risk assessment tool kit (www.proventionconsortium.org/?pageid=43). These include community recovery planning after a severe winter storm in highland Peru and community-based food system resilience in southern Zimbabwe following a devastating drought. What these cases have in common is use of participatory action research methodology in the context of NGO interventions. Preliminary evaluation of case studies accumulated on the ProVention Consortium site by the author suggest that these methods produce more sustainable and resilient community-based solutions while also building self-confidence and inclusiveness in the locality and providing links to local government resources.

Box 3: Great Hanshin Earthquake, Kobe, Japan
The Great Hanshin Earthquake that devastated Kobe, Japan on 17 January, 2005 provides evidence of both the positive influence of social capital on the long run recovery process and its erosion, with tragic consequences, by poor management and planning.

On the positive side, the physical planning of heavily affected wards in Kobe involved ambitious realignment and widening of streets and the building of new apartment buildings and rental property for street level shops. It was master planning in every sense of the word. The key to its feasibility was social capital. Surviving property owners had enough confidence in each other (inter-personal trust in the strict and narrow sense discussed above) and in the government planners to allow a long and detailed process of negotiation about compensation and transfer of ownership. While not without controversy or difficulty, the process worked (Wisner et al., 2004).

On the negative side, elderly survivors where house alone and separately in temporary housing without reference to their former neighbourhood connections. Many became depressed and committed suicide. Even when permanent re-housing was implemented, they were again housed in separate high rise apartments in new buildings purpose built on new landfill in the bay, far from the center of the city. Thus even more profoundly isolated, more elderly suicides were the result. Eventually, the authorities became aware and concerned about the pattern and assigned social workers to each of the apartment buildings, and they began proactively to deal creatively with elderly isolation – for example by organizing group outings, parties, discussions, etc. (Wisner et al., 2004).
5.2 Spatial Dimensions: Remittances for Recovery in Gujarat, El Salvador, and Pakistan

Mapping the spatial extent of social capital shows that it can be highly localized and dispersed across the globe. For example, where rainfall can vary drastically over relatively short distances, mutual aid among extended family members may be rendered more effective over generational time periods by enforcement of marriage rules that spread kinship widely over a semi-arid life space (Rigby, 1969; Wisner and Mbithi, 1974).

At a global scale, family members working overseas send money home routinely. These flows may amount to more than US$120 billion a year (officially) and perhaps another US$60 billion unofficially (Woo, 2005). When a disaster occurs, these flows of remittances may increase dramatically. Overseas Indians and people of Indian origin sent donations following the earthquakes in Maharashtra (1993) and Gujarat (2001), and following the super-cyclone disaster in Orissa (1999). There exist many voluntary associations of Indian professionals and business people living abroad, and these become highly active in the relief and recovery periods following a disaster (Government of India, 2004).

Some 2 million Salvadorans work in the United States and remit routinely US$2 billion a year to their 6 million compatriots at home. This grew to US$3.32 billion in 2006 (Banco Central de Remesas, 2007). Following the 2001 earthquake, the U.S. government allowed an additional 150,000 citizens of El Salvador to immigrate specifically with the intension of sending back money for their family’s recovery (Woo, 2005).
A study of remittances from overseas Pakistanis following the 2005 earthquake reported the following key findings (Suleri and Savage, 2006):

- Remittances can make people less vulnerable to natural disasters. Households with international migrants tend to be better able to make investments that reduce their vulnerability, such as improved housing.
- Remittances make people more resilient in the face of natural disasters. It may be easier to re-establish remittance flows than other types of income and livelihoods, allowing remittance recipients to begin the recovery process more quickly.
- Remittances are shared outside of the recipient household, and may have important multiplier effects.
- Remittance flows are highly vulnerable to the infrastructure damage that occurs in disasters. Whether informal or formal, international remittances rely on telecommunications, finance systems and local transport, all of which are typically damaged in disasters; hand-carried remittances are an important way of overcoming this, and can be critical for many people.
- Remittances may be most at risk when, having returned home to help in the aftermath of the disaster, the sender may not be able to re-emigrate and re-establish remittance flows.
- Aid actors do not as yet have a strong understanding of the role of remittances in livelihoods during emergencies.

6. Conclusions and Recommendations

What lessons for the EDRR project can one draw from the preceding review of the SHINK Complex and how it functions before, during and after extreme natural events?
6.1 Achieving Balance between ‘P’s’ and ‘R’s – between Prevention/Proactiveness and Response/ Reactiveness

It is important to overcome the bias against ex-ante preventive measures at all levels and domains: individual, project, policy, donor. For so long “disaster” has been compartmentalized as something to react to, a crisis calling for response, and something that by definition is a departure from normality and “routine”, disaster risk reduction has not been seen as a part of mainstream development efforts. Fortunately at the level of national donors and the UN system the idea that disaster reduction is a development priority now seems to be catching on.

However, some believe that there is also a bias against preventive action at the individual level. This background paper argues differently. There is considerable evidence that the SHINK Complex contains established and reasonably effective risk management elements. Of course, in the face of displacement to new and unfamiliar environments, some knowledge becomes inappropriate. Also, in the face of climate change some traditional practices and early warning signs may not be as effective as before.

Nevertheless, I would recommend that:

1. The SHINK Complex and its ability to accumulate, transmit, and apply local knowledge to natural resources should be the starting point for a dialogue about individual and community risk perception.

Local governance provides the critical IK that can help local livelihood systems negotiate the challenges of accelerated change. However, there are many obstacles to effective local governance including continued centralist tendencies in many nation state systems
despite the rhetorical commitment to decentralization. Therefore I would further recommend:

2. Provision of increased continuity of service, in-service training, and incentives for local professional staff so that they are less subject to the pressures of short-termism;
3. Increased budget support for local government;
4. Adoption of longer time horizons and a more flexible and participatory approach by donors and project planners so that the full potential of the local SHINK Complex is tapped.

6.2 Account and Plan for the True Economic Impact of Disasters

The indirect costs of disaster impacts on social, human, and natural capital are not fully understood. The preceding review has established that livelihood functionality and resilience depend on the whole of the SHINK Complex. So that economic recovery depends on maintenance of the whole SHINK Complex and not just preventing damage to individual components – social relations and networks, transmission and use of people’s local knowledge and skill, land use, husbandry and resource micro-management, and positive interactions with governmental institutions. Following from this are three recommendations.

5. Preference should also be for in situ recovery, with distant re-location always considered as a last resort.

6. Participatory planning methods should be used in order to understand as fully as possible all elements of pre-disaster livelihoods in a locality and to reach a consensus with stakeholders about how to re-establish that livelihood in a more resilient form, or to come up with alternative livelihood options locally sustainable.

7. Social investments in primary health care, education, and in development venues for social interaction (e.g. women’s groups and youth groups) and joint economic activity (e.g. cooperatives and trade associations) should be encouraged as a win-win for society. They increase well-being and productivity during normal times and provide for a more resilient SHINK Complex during stressful times.
6.3 Climate, Conflict, and Urbanization are Game Changers

The preceding review showed that a vicious circle leading to displacement, destitution and even famine and social breakdown is most likely where shocks produced by natural hazard events such as drought are compounded by violent conflict. In the absence of violent conflict and pandemic disease (e.g. HIV/AIDS), evidence is strong that most rural livelihood systems contain a good deal of resilience within the SHINK Complex that underpins them. When compounding factors drive the SHINK Complex beyond its tolerance, one common response is rural-urban migration. Much urban growth is taking place in an informal manner in hazard prone locations within cities. When these cities are subject to sea level rise and flooding, there is economic and social value in providing alternatives to rural exodus (Pelling and Wisner, 2008) as well as planning to mitigate these risks. Other cities may not face sea level rise, but are nonetheless prone to climate linked impacts such as decreased water supply, colder winters and hotter summers, and other effects that threaten human health (Kovats et al., 2005; Huq et al., 2007).

Several recommendations flow from these observations.

8. Within the new regime of finance for climate change adaptation that is emerging as a replacement for the Kyoto Treaty, attention is required to ways of building on local knowledge and skill (and the whole SHINK Complex) to secure small scale, household livelihoods in rural areas and to mitigate the affects of climate-linked hazards in urban areas.

9. More attention to and support for indigenous, local processes of conflict management are required so that competition for water, pasture, farm land, forests, and fishing grounds that result from changes in climate do not escalate and become violent.

10. Support is needed for small scale manufacturing, market gardening, and petty trading that are the mainstays of the ‘informal’ economy of many cities. Too often they are criminalized or forced further underground by inappropriate attempts to
formalize and regulate them. This calls for open and democratic discussion by all stakeholders.

7. Annex: Indicators of Resilient Communities

It would be difficult to quantify the functionality of the SHINK Complex. Context, or as I have called it elsewhere, situation, is so high variable, dynamic, and contingent (Wisner, 2003). Of course, researchers have long measured aspects of the individual components of the complex – SK, HK, IK, NK. For example, economists cited in Section 3 used such measurements as number of associations present in a community as a surrogate for SK. Similarly, rural development researchers have used measures of land available per capita as surrogate for access to NK. However, even if one assumes that these sets of measures are adequate, one still has to deal with the interaction among SHINK components. Other considerations would have to be the availability of data, cost of data if it does not pre-exist in household budget surveys or other national census activity, and data comparability. Taken altogether, the obstacles to quantification of SHINK Complex functionality are very large.

Failing direct quantification of SHINK Complex functionality, an indirect approach is possible. Twigg (2008) has attempted to develop indicators of community resilience. Since I have argued that the outcome of a well-functioning SHINK Complex is resilience, it may be possible to sort communities in different parts of the world by levels of resilience and then investigate the way their respective SHINK Complexes work, looking for common features among those with higher resilience.
7.1 Indicators of Resilience

Twigg works with the following definition of resilience (2008: 6):

“Many attempts have been made to define ‘resilience’. The variety of academic definitions and concepts can be confusing. For operational purposes it is more useful to work with broad definitions and commonly understood characteristics. Using this approach, system or community resilience can be understood as:

- capacity to absorb stress or destructive forces through resistance or adaptation
- capacity to manage, or maintain certain basic functions and structures, during disastrous events
- capacity to recover or ‘bounce back’ after an event.

‘Resilience’ is generally seen as a broader concept than ‘capacity’ because it goes beyond the specific behaviour, strategies and measures for risk reduction and management that are normally understood as capacities. However, it is difficult to separate the concepts clearly. In everyday usage, ‘capacity’ and ‘coping capacity’ often mean the same as ‘resilience’.”

Twigg shapes his suggested indicators of community resilience around the five priority areas into which the UN-ISDRs Hyogo Framework of Action is divided. Table 7 shows these priority areas. In the accompanying tables, Twigg lists a total of 168 specific community characteristics in which each of the major components is broken down.

For example, Twigg breaks resilience component 1, priority area 2 down as shown in Table 8. In this case and in many others laid out by Twigg, advantages would be provided by high SK and HK as well as a cooperative relationship with local government (IK) in which local knowledge is not suppressed by outside knowledge but complements it. There seems a prima facie case for using such an approach to community resilience as a starting point for further investigation of the role of the SHINK Complex in DRR.
Table 7: HFA Priority Area and Corresponding Resilience Components

<table>
<thead>
<tr>
<th>Thematic area</th>
<th>Components of resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Governance</td>
<td>● Policy, planning, priorities and political commitment.</td>
</tr>
<tr>
<td>1 Governance</td>
<td>● Legal and regulatory systems</td>
</tr>
<tr>
<td>1 Governance</td>
<td>● Integration with development policies and planning</td>
</tr>
<tr>
<td>1 Governance</td>
<td>● Integration with emergency response and recovery</td>
</tr>
<tr>
<td>1 Governance</td>
<td>● Institutional mechanisms, capacities and structures; allocation of responsibilities</td>
</tr>
<tr>
<td>1 Governance</td>
<td>● Partnerships</td>
</tr>
<tr>
<td>1 Governance</td>
<td>● Accountability and community participation</td>
</tr>
<tr>
<td>2 Risk assessment</td>
<td>● Hazards/risk data and assessment</td>
</tr>
<tr>
<td>2 Risk assessment</td>
<td>● Vulnerability and impact data and assessment</td>
</tr>
<tr>
<td>2 Risk assessment</td>
<td>● Scientific and technical capacities and innovation</td>
</tr>
<tr>
<td>3 Knowledge and education</td>
<td>● Public awareness, knowledge and skills</td>
</tr>
<tr>
<td>3 Knowledge and education</td>
<td>● Information management and sharing</td>
</tr>
<tr>
<td>3 Knowledge and education</td>
<td>● Education and training</td>
</tr>
<tr>
<td>3 Knowledge and education</td>
<td>● Cultures, attitudes, motivation</td>
</tr>
<tr>
<td>3 Knowledge and education</td>
<td>● Learning and research</td>
</tr>
<tr>
<td>4 Risk management and vulnerability</td>
<td>● Environmental and natural resource management</td>
</tr>
<tr>
<td>4 Risk management and vulnerability</td>
<td>● Health and well being</td>
</tr>
<tr>
<td>4 Risk management and vulnerability</td>
<td>● Sustainable livelihoods</td>
</tr>
<tr>
<td>4 Risk management and vulnerability</td>
<td>● Social protection</td>
</tr>
<tr>
<td>4 Risk management and vulnerability</td>
<td>● Financial instruments</td>
</tr>
<tr>
<td>4 Risk management and vulnerability</td>
<td>● Physical protection; structural and technical measures</td>
</tr>
<tr>
<td>5 Disaster preparedness and response</td>
<td>● Planning regimes</td>
</tr>
</tbody>
</table>

Table 8: Fine Grained Breakdown of Resilience Components

<table>
<thead>
<tr>
<th>Component of resilience 1:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazards/risk data and assessment</td>
</tr>
<tr>
<td>Characteristics of a resilient community</td>
</tr>
<tr>
<td>● Community hazard/risk assessments carried out which provide comprehensive picture of all major hazards and risks facing community (and potential risks).</td>
</tr>
<tr>
<td>● Hazard/risk assessment is participatory process including representatives of all sections of community and sources of expertise.</td>
</tr>
<tr>
<td>● Assessment findings shared, discussed, understood and agreed among all stakeholders, and feed into community disaster planning.</td>
</tr>
<tr>
<td>● Findings made available to all interested parties (within and outside community, locally and at higher levels) and feed into their disaster planning.</td>
</tr>
<tr>
<td>● Ongoing monitoring of hazards and risks and updating of assessments.</td>
</tr>
<tr>
<td>● Skills and capacity to carry out community hazard and risk assessments maintained through support and training.</td>
</tr>
</tbody>
</table>
7.2 Community Level Activity Assessed by UNISDR

In preparation for the meeting of the Global Platform for DRR in June, 2009, UN-ISDR has collected national reports from 97 of the 168 countries that signed the HFA in 2005. Using this data, the UN-ISDR has drafted at Global Risk Assessment 2009 (GAR 2009). Chapter 5 of the draft, which I have reviewed, contains an assessment of HFA implementation. Of all the components of community resilience explored by John Twigg, the ones dealing with decentralization of efforts at DRR is most fully addressed by the GAR 2009. No where does non-governmental organization of other forms of social capital appear in UN-ISDRs report. Its focus is narrowly on the degree to which planning and preparedness activities have been decentralized to the local government level. Given the role for IK as part of the SHINK Complex, this data is better than nothing. However, the results are not encouraging. In the words of the draft GAR 2009, “Most local governments, however, particularly in rural and isolated areas lack the human, technical, financial and institutional capacities to address disaster risk. In Africa, for example, Comoros, Madagascar, Senegal, Tanzania, Ghana and Zimbabwe all have reported that the absence of resources at the local level is a major obstacle to be able to strengthen capacities.”

Aggregating country self-assessment scores on a scale of 1-5, 4 UN-ISDR reports progress as follows (draft GAR 2009, p. 141).

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4 Level 1: Minor progress with few signs of forward action in plans or policy.
Level 2: Some progress, but without systematic policy and/or institutional commitment.
Level 3: Institutional commitment attained, but achievements are neither comprehensive nor substantial.
Level 4: Substantial achievement attained but with recognized limitations in capacities and resources.
Level 5: Comprehensive achievement with sustained commitment and capacities at all levels.
7.3 Models, Thought Experiments, Tests, and Arguments

Many of the studies discussed in Section 3 take the form of mathematical models with independent and dependent variables. These are data-hungry exercises, and it may not be possible or cost effective when investigating the role of the SHINK Complex on DRR to obtain such data.

However, it is possible to conduct thought experiments. For example, one might consider small holder farmers on hillsides in the Northeast of Honduras and Northern Luzon in the Philippines. Holding climate, geology, soil, and slope constant, what differences does one find in the management of steep slopes with a high potential for landslide? What knowledge is required to ridge or terrace, to plough, to intercrop, to provide vegetative cover in between growing seasons? What forms of intra- and inter-household sharing of knowledge takes place? To what extent is the local government involved in land use
decision making? Some knowledge of both places suggests that in northeast Honduras farmers have only relatively recently (since the 1950s and 1960s) been forced from valley farms in the valley bottoms due to expropriation by international banana companies (Wisner et al., 2004: chapter 1). In Northern Luzon the Ifugao people have developed and used terracing systems that have allowed permanent cropping of steep slopes for two thousand years (Conklin et al., 1980; Wallace, 2005; ADB, 2003). This thought experiment suggests that the SHINK Complex is more robust in Luzon, and one should expect fewer landslides. An actual test occurs when thought experiment becomes natural experiment – if there are two landslides in two contrasting situations that can be studied in depth, some judgement about the role of the SHINK Complex is possible.

I have not had the time within the scope of this assignment to investigate whether such a natural experiment exists nor to attempt to model the impact of the SHINK Complex on DRR. I hope however, the argument I have put forward and the various forms of evidence from a wide variety of situations in different parts of the world is sufficiently convincing to influence, in a small way, the final outcome of the EDRR project.

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