TRANSFORMATIVE RESILIENCE
A response to the adaptive imperative

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Based on papers written for the Carnegie UK Trust,
Investigations of the International Futures Forum
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Contents

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"By 2030 the demand for resources will create a crisis with dire consequences. It's a perfect storm. There's not going to be a complete collapse, but things will start getting really worrying if we don't tackle these problems."

<div align="right">

Professor John Beddington
Chief Scientist
UK Government

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"Humankind is on the cusp of a planetary emergency. We face an ever-greater risk of a *synchronous failure* of our social, economic and bio-physical systems, arising from simultaneous, interacting stresses acting powerfully at multiple levels of these global systems."

<div align="right">

Thomas Homer-Dixon
Author: *The Upside of Down*

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"The few things we do know about the response of the Earth to our presence are deeply disturbing. Even if we stopped immediately all further seizing of Gaia's land and water for food and fuel production and stopped poisoning the air, it would take Earth more than a thousand years to recover from the damage already done, and it may be too late for even this drastic step to save us."

<div align="right">

James Lovelock
Author: *The Revenge of Gaia*

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"I think the odds are no better than 50/50 that our present civilisation will survive to the end of the present century."

<div align="right">

Sir Martin Rees
Astronomer Royal
Author: *Our Final Century*

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In 2008 a small group of RSA Fellows and friends met occasionally in an Edinburgh apartment to discuss the question "what if we are already too late in mitigating anthropogenic climate change, and what might be the consequences?" This led to the recognition that there was an *adaptive imperative*. This does not mean that efforts to head off more than a 2 degree rise should be displaced by adaptive planning. It does mean that we will be mistaken in assuming that there will not be some drastic changes in the condition of our planetary home.

Further discussions led to the idea that one aspect of the adaptive imperative is that communities, even whole societies, will need to become more resilient in the face of changes, both anticipated and surprising. Unfortunately the globalised techno-economic society we now have is, in out view, fundamentally brittle and unadaptive. In that respect it became clear that 'bouncing back to normal' will just not be good enough when conditions become more extreme. We need a 'new normal' at a much higher level of resilience. This thinking led to the convening of the seminar reported on here.

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[1] This document is based on papers written by Anthony Hodgson (IFF) as a contribution to the Carnegie UK Trust Rural Programme, conversations on the theme of the Adaptive Imperative with RSA Fellows in Scotland and the proceedings of seminar hosted jointly by the RSA and the IFF in December 2009

1 INTRODUCTION

In response to the challenge of climate change the main response has been mitigation, that is conceiving of and taking action to limit the increase in average global temperature to around 2 degrees. Recent studies clearly indicate that such a rise in global average temperatures would be catastrophic. Researchers at Princeton and Harvard predict that increases beyond 1.5 degrees could result in a sea level rise of six to nine meters. [2]

As we can see from the outcome of the Copenhagen conference the aim to prevent global average temperatures from rising by no more than 1.5 degrees is no easy matter and, despite best efforts, there is doubt as to whether this can and will be achieved. Without wishing to in any way reject these efforts, a small group of RSA fellows, members of the International Futures Forum, and colleagues held some conversations around the notion of an *adaptive imperative*. This proposes that we would be remiss not to make preparations to survive shocks and surprises that will disrupt the status quo as a result of direct and indirect impacts of climate change.

Further consideration of this issue in the context of the IFF *World Model* made it clear that climate change is only one of at least a dozen major areas of human viability out of which may emerge shocks and surprises. This complexity of converging and potentially coinciding disruptive scenarios has also been called *synchronous failure*, a threat greater than any one single major discontinuity (Homer-Dixon, 2006). Confrontation with the real and present danger of synchronous failure led us to the proposition that adaptation would need to be more than a capacity to rapidly get things back to normal. It questioned the whole basis of the future viability of "normal".

Further research and reflection led to the recognition of the importance of resilience. This topic has rapidly entered the agenda of many groups, from government to alternative communities. Resilience thinking takes many of its ideas either from ecology and human ecology where the observation of cycles of emergence, growth, collapse and renewal are normal phenomena or from civil contingency planning. However, ecological cycles are essentially about the inevitable and natural decay and renewal of specific ecologies. While it is possible for an ecosystem to shift from one dynamically homeostatic domain to another in response to severe environmental stress, the new state may become one of reduced biological diversity and impoverished conditions for the community of life.

Resilience thinking applied to socio-ecological systems, that is to say human social systems understood with regard to the carrying capacity of particular ecosystems or the planetary biosphere, is a relatively new science. The complexity of possible change states within the overall system increases drastically once we include the dimensions of social, psychological, and societal change that sometimes cause and sometimes react to environmental change.

There appeared to be no studies of the idea that with regard to socio-ecological systems resilience thinking needs to be at a new level, in a new paradigm, so to say. The idea came up, and was put to the Scottish RSA Venture Fund, that an interdisciplinary seminar on these

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[2] (Kopp *et al.*, 2009). For full reference see:
http://www.nature.com/nature/journal/v462/n7275/full/nature08686.html

questions would be worthwhile. Accordingly a seminar in the form of a workshop was convened with an invited group of people from a fairly diverse set of backgrounds all, however, having an interest in the question of resilient communities.

This report is a digest of the key ideas and observations to emerge from this process. Although strongly based on the deliberations of the seminar it contains antecedent material that hopefully makes the account more complete and coherent. The report is not, however, a set of answers to enhanced resilience. Rather it is a set of ideas and possibilities that are worthy of further and fuller consideration and research. The account here, though based as faithfully as possible on participants' contributions is, nevertheless my own, and will reflect in its editing my own quest to understand what came to be called on the day, *Resilience 2*.

2 THE IDEA OF NON-NORMAL RESILIENCE

Severe challenges may lead to collapse, to defensive entrenchment, to saving the wellbeing of some at the expense of others but can also stimulate the resilient response in communities. This can be summarised as follows.

> **A resilient community is one that takes intentional action to enhance personal and collective capacity to sustain the good life in the context of turbulence and disruption to its optimum living arrangements.**

Because the "life as usual" no longer has the degree of resilience required, we need to be clear about levels. *Level 1- Status Quo Resilience* is the capacity to recover from disruption back to the "life as usual" level. *Level 2 – Transformative Resilience* is the capacity to shift to a new system capable of absorbing and bouncing back from more disruption. This is a new level of adaptive capacity which becomes possible when human communities re-inhabit their specific localities with a new sensitivity to the unique ecological conditions (opportunities and limits) of *place*.   Transformative resilience is about intelligent, humble, and scale-sensitive co-creation between human communities and the wider ecological communities they inhabit.
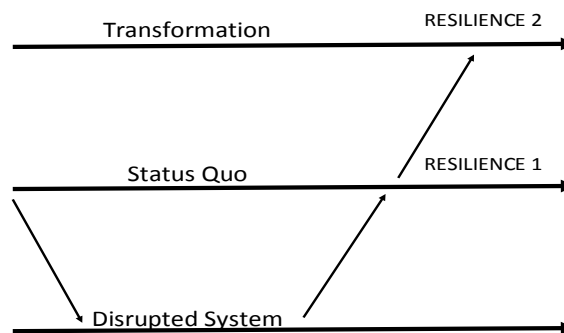

Figure 1 – From Status Quo to Transformative Resilience

The point of inserting the term "good life" in the above definition is that our views and experiences of the good life become completely and subconsciously enmeshed in our daily lives so that we are unaware of our assumptions. This is exacerbated by vested interests of the dominant commercial and political paradigm equating the good life with factors like consumption, accumulation of monetary wealth, and convenience processed food. This means that, when confronted by the need to change these assumptions, people feel aggrieved that they are being required to give up the good life. *What is actually needed is to reframe the essence of the good life in a new system of living*. Evidence is accumulating that changes towards greater resilience actually increase the experience of the good life.[3]

3 DIFFERENT LEVELS OF RESILIENCE

In order to understand transformational resilience we need to build it up through different kinds of resilient structure. There are basically four levels. The first is the kind of resilience that engineers design in mechanistic systems. The system is designed so that when it is disrupted from a steady state it will return to that state as quickly as possible. In this way the efficiency of the system is maintained in changing circumstances. This kind of resilience has limitations on the degree of disruption it can stand. For example a building designed to withstand earthquakes will have some degree of flexibility built in to absorb the shock. It will not be built in a brittle way. However, there could be an earthquake of a magnitude that breaks those limits and the building does not recover or even collapses.

The second kind of resilience we see more in basic ecological systems which are more complex and interactive than mechanistic systems. They have an inherent capacity to restore themselves after shocks. For example a biome might be temporarily flooded in extreme weather but rapidly recover its equilibrium when the flood subsides. Ecological systems also have the capacity to evolve towards higher levels of complexity and resilience. Human attempts in desert restoration accelerate and aid the natural process of succession by introducing systems enhancing species that in turn attract flora and fauna that were not previously present in that environment.

The third kind of resilience shows itself in ecological systems over longer cycles of change which enable the system to constantly renew itself. This kind of system is not only able to absorb disturbances but also goes through a recurring renewal cycle. The cycle has four main stages. As the diverse species in the ecosystem adapt to the opportunities presented by different ecological niches of their environment and their individual populations grow; they reach certain limits, for example space and nutrients, and enter a conservation phase when the flow of available nutrients and other

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[3] "The good life, however, is not a product of the market place, but of deliberate and collective decision. It is a task for thoughtful citizens and statesmen, and not simply the sum of millions of separate and amoral 'consumer preferences'." From the Preface to *Economics and the Good Life* Bertrand de Jouvenel.

resources through the ecosystems is organized by a complex web of interactions within and between tropic levels and very little resources are freely available; this eventually collapses and releases the concentrated materials in the system and breaks much of the coupling (eg. complexity of the food-web); out of the release stage a reconfiguration is possible that more or less re-establishes the original vitality. This cycle has been called panarchy (Gunderson & Holling eds., 2002) and will be covered in more detail later.

The fourth kind of resilience, which is the one we are interested in from the perspective of the adaptive imperative, is a very specific kind of socio-ecological system: a human-ecological system that has transformative capacity. This system not only absorbs and adapts to disturbance but can *anticipate* future impending disturbances and reconfigure itself to increase its capacity to bounce back after shock. This transformation also follows a panarchic cycle of growth, conservation, retraction and reconfiguration. The difference is that in the reconfiguration stage, innovations are introduced which change the nature of the system. This means that the next growth and expansion stage is taking place on different foundations. *Transformative resilience*, then, requires some capacity to anticipate future events, or at least the capacity to see the implication for the future of unexpected disruption. It does not fall into the pattern of "when things return to normal" but rather creates a new normal.

Transformative resilience therefore has a number of characteristics. It enables

- Adaptation to irreversible changes
- Core restructuring processes at different levels
- Gaining needed resources from multiple sources
- Increase of variety and diversity in the system
- Generation of wide range of options
- Having a sustained memory of the past and a consciously created "memory of the future"
- Scale-sensitive linkage of its own subsystems and to wider linkages with larger systems in its environment that contain it
- Accumulating the surplus energy to make a leap to a different level of 'normal'

This last point can be illustrated from an idea from complexity science. A stable condition of normalcy can be represented by a sphere in a pocket (See Figure 2). When the ball is knocked out of centre, it will naturally tend to gravitate to its usual position. However, a major disruption may dislodge it into a lower state. For example, a flooding disruption could immobilise normal functioning for a period. Effort must go in (for example through emergency services) to recovering the situation which will (a) prevent further disruption and (b) restore things to how they were.

If, however, the disruption is to be a stimulus to being able to ride over and be little affected by flooding, a whole new design and reconfiguration of society will be needed.

The first level response may lead to flood barriers but the second would lead to infrastructure redesign and relocation, for example. This is the highest valley in the conceptual landscape in Figure 2. In this diagram there are three 'valleys' Normal society is the central valley. A disruptive shock may propel the system over the retaining peak on the left and plunge to a more fragmented state. *Restorative* resilience efforts aim to push the system back up the slope and return things to 'normal'. We named this *Resilience 1*. It is, for example, the role of civil contingency operations. However, if resilience efforts are *transformative* they may push the system up into the higher valley. In this state the same disruptive shock is contained within the valley and the system absorbs the shock and returns to the 'new normal' more easily and with less effort. This higher state of the system we refer to as *Resilience 2*.
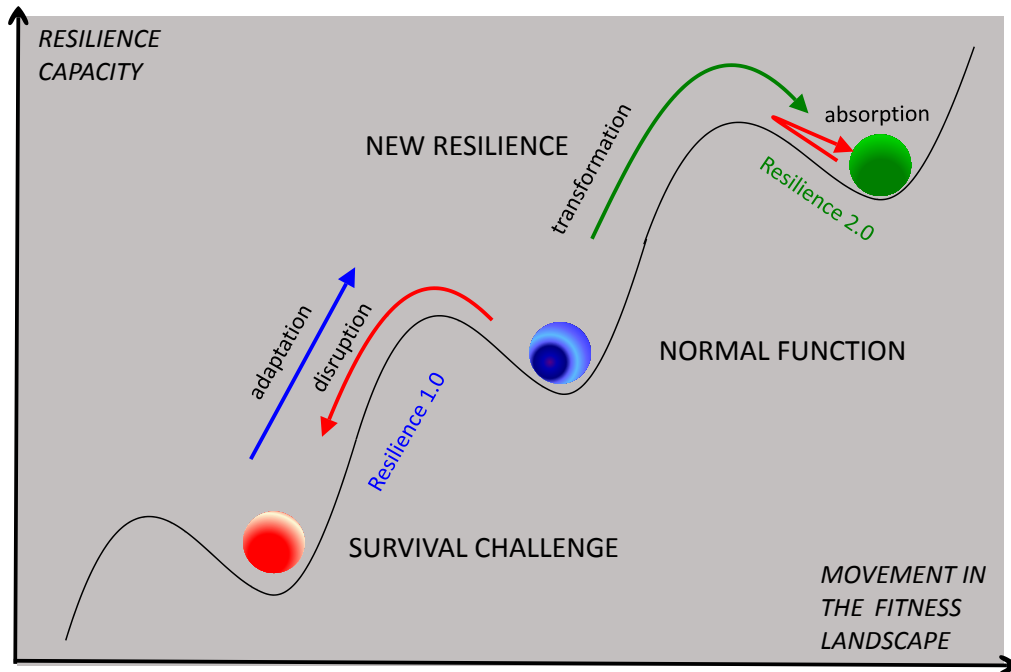

Figure 2 – Resilience 1 and Resilience 2 in a Fitness Landscape

4 EXPLORING RESILIENCE 2

The next step in our investigations was to explore what the nature of *Resilience 2* might be. In order to do this some ways of systems thinking were introduced as a way to enhance the current ways of thinking about community resilience. Two main conceptual areas were introduced; firstly the idea, from cybernetics, of a generic model of a viable system and secondly the idea of panarchy from the field of ecology. The essential character of these ideas is outlined below.

The Viable System Model

This model can be considered as a systems archetype of any living system that can maintain its identity under changing environmental conditions. Although the original model is quite complex [4] the basic structure has some essential and irreducible features which we can transfer to the nature of a viable community. The connection with our theme here is that viable systems are resilient within certain boundary conditions. With a better model of viability we are making a step to understanding resilience. The simplification shown in Figure 3 shows the five interconnected capacities of the viable system as it might apply to a social organism.

First some general observations about this model system: the whole system has properties and behaviours that cannot be attributed to any of the individual capacities or even the addition together of its constituent cap-acities. Resilience is one such property. Nevertheless each capacity contribut-ing its role is essential for the wellbeing of the whole system.
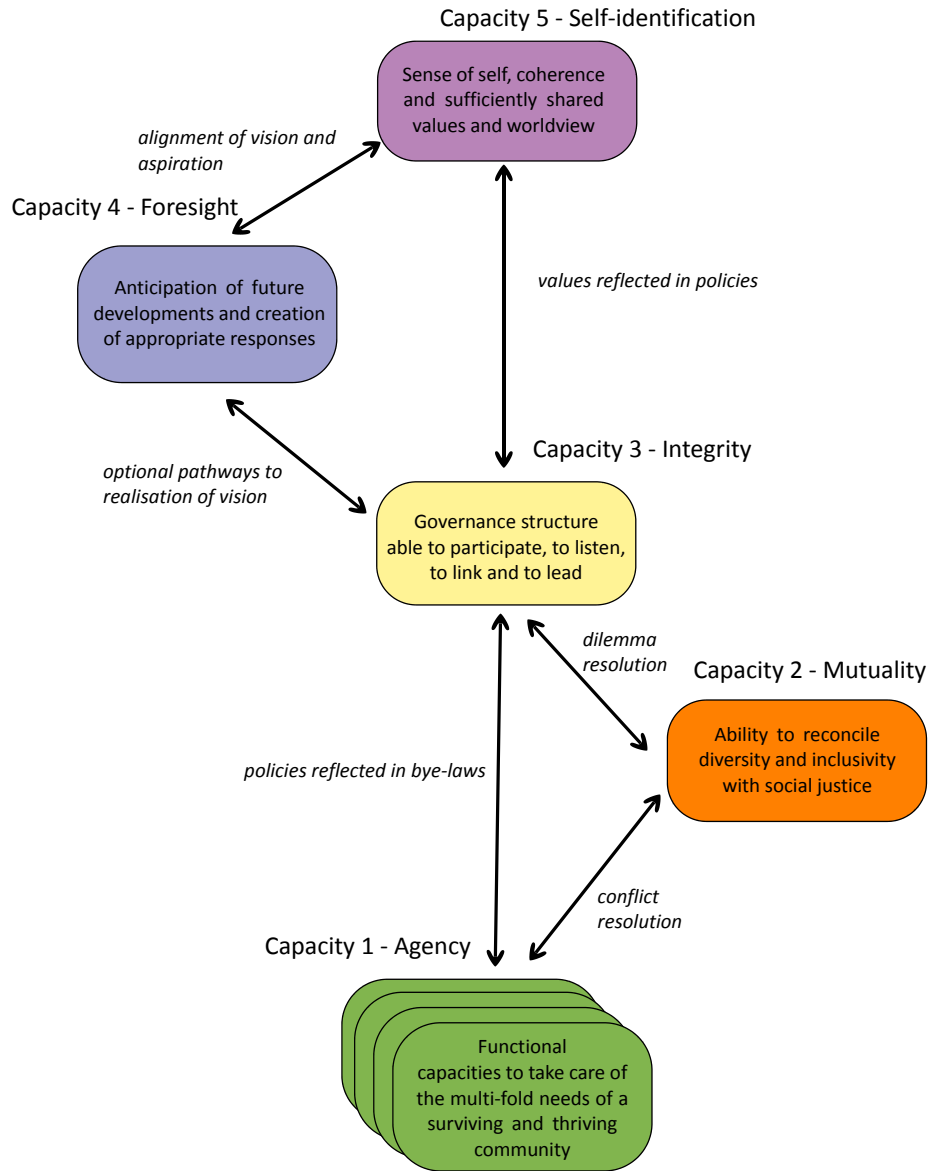
Capacity 5 - Self-identification

Sense of self, coherence and sufficiently shared values and worldview

alignment of vision and aspiration

Capacity 4 - Foresight

Anticipation of future developments and creation of appropriate responses

values reflected in policies

optional pathways to realisation of vision

Capacity 3 - Integrity

Governance structure able to participate, to listen, to link and to lead

dilemma resolution

Capacity 2 - Mutuality

Ability to reconcile diversity and inclusivity with social justice

policies reflected in bye-laws

conflict resolution

Capacity 1 - Agency

Functional capacities to take care of the multi-fold needs of a surviving and thriving community

Figure 3 – The Viable System of a Community

4 See *Diagnosing the System for Organisation* by Stafford Beer Wiley 1996 ?

The relationship between the components is critical. Each relationship is reciprocal such that changes in any one component effect responses in all other components and especially the ones which are directly connected in the diagram. It is perhaps easier to see this by considering what happens to the system as a whole if:

★ there is a weakness or even absence of one of the capacities
★ there are weak or non existent linkages between the components
★ there are counterproductive linkages between the components.

In all these cases, if one of the component capacities is impaired, the total system capacity is impaired. Resilience is a higher level emergent property of appropriate interactions between and participation of the five VSM component capacities. Thus, if the total systems capacity is impaired, systemic resilience will decrease.

The five component capacities are:

1 Agency
Functional capacities to take care of the multi-fold needs of a surviving and thriving community. The IFF World Model indicates that there are at least twelve critical functional components of a sustainable community. These are described in section 11.

2 Mutuality
Ability to reconcile diversity and inclusivity with social justice. In any community there are differing opinions, skills, and positions that need constant rebalancing and new learning. This is above all a facilitation capability, a kind of community lubrication.

3 Integrity
Governance structure able to participate, to listen, to link and to lead. Without an appropriate governance structure the community cannot achieve a coherent response that combines common purpose with individual initiative.

4 Foresight
Anticipation of future developments and creation of appropriate responses. This capacity is a combination of horizon scanning of the external environment and internal modelling of how new challenges can be met.

5 Self-Identification
Sense of self, coherence and sufficiently shared values and worldview. In primitive society this is essentially tribal membership. In modern society it is often made more evident by shared crises but is stronger if sustained by shared values.

As pointed out above, the interactions between these components are equally critical to understanding the systems and to guiding appropriate participation in the system. Living the good life in a sustainable way, draws on all those modes of participation which meet individual and collective needs without impairing the viability of the system. Maintaining systemic health and resilience are key characteristics of appropriate

participation. So let's take a closer look at some important connectivities in the VSM model! The six major connectivities are:

1 Agency	2 Mutuality	Conflict resolution *Governance decisions cannot take into account all the realities 'on the ground' and so tensions arise. [1] informs [2] of these and [2] facilitates resolution*
2 Mutuality	3 Integrity	Dilemma resolution *Governance [3] is faced with dilemmas in which incompatible aims are both necessary. The role of [2] is to foster innovative solutions that meet both requirements*
1 Agency	3 Integrity	Policies reflected in bye-laws and customs *The more consistent the behaviour and decision making at both levels [3] and [1] then the stronger the community will be. Such consistency can be reflected in codes and cultural mores.*
3 Integrity	4 Foresight	Optional pathways to realisation of vision *It is hard for operational day-to-day governance to be free minded enough to think ahead but it is essential that there is a strong dialogue between [3] and [4].*
3 Integrity	5 Self-identification	Values reflected in policies *The governance structure [3] itself is a servant of the values and aspirations of the society as a whole [5]. Where this link breaks down then neither democracy nor autocracy can work well.*
5 Self-identification	4 Foresight	Alignment of vision and aspiration *Foresight [4] has the role of both alerting [5] to oncoming conditions and listening carefully to the value shaping of [5].*

A further crucial principle of viable systems is the recognition that viability must operate at all levels. A living organism cannot be made up of dead cells and a thriving community cannot exist without lively individuals and groups. This is referred to technically as the *principle of recursion*. A simple form of this is portrayed in Figure 4.

In this example the highest level of recursion is a bioregion. This could be a river valley or a river plain or a coastal strip, for example. Alternatively it could be a city region. In

social ecological terms it is also a broad level of interdependency. For example there are communities that depend on fishing in coastal coral regions. Their viability and the viability of their human society are highly interdependent. Another unit at this level might be a city region. This requires viable functions which could take the form of villages or city districts. It will have its own level of regional governance and capacity to anticipate and to facilitate. The next level is where the functioning units, such as villages, are themselves treated as viable systems. Then, within those, there are viable system units for such things as food, transport, trade and so on.
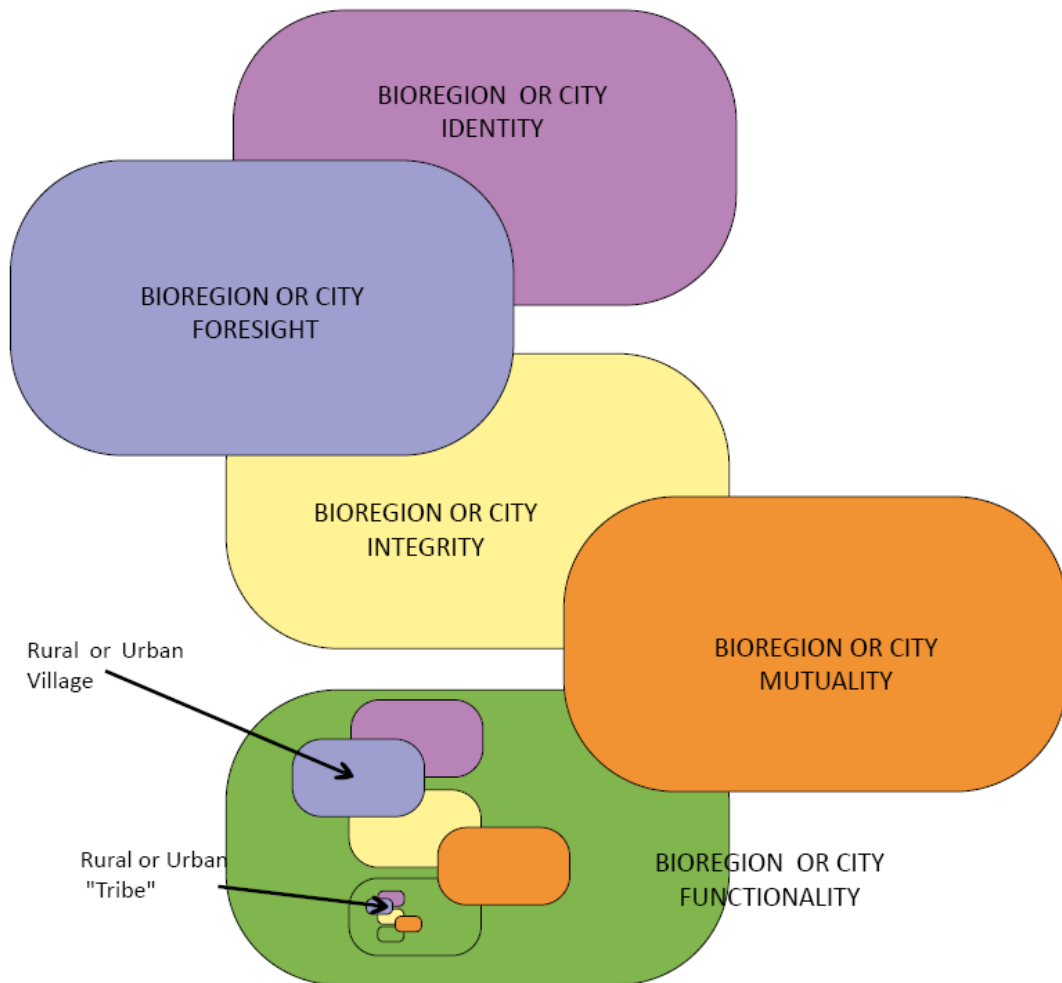

Figure 4 – Recursive levels of viability

There is a close connection between the notion of resilience and the 'pattern of health' that needs to pervade a resilient society. There is a need for relative self-sufficiency at each level of the scale-linking holarchy that is in direct balance with a certain degree of interconnectedness and cooperation with higher and lower levels. In other words, the health of individuals depends on family health, community health, ecosystems health, bioregional health, and on planetary health (see Wahl, 2006). Building more resilient communities, cities and bioregions requires salutogenic design at the whole systems level. The framework of Viable Systems Modelling and the principle of recursion can inform us how to create health holons that is highly resilient at each level of recursion.

The second main concept to bring in at this point is panarchy. This derives from the application of the theory of complex dynamic systems to the field of ecology and is now being extended into social ecology particularly for better understanding of resilience. The concept is a way of revealing an inherent structure in nature where growth is not the linear process we are accustomed to imagine in the worlds of mechanics and money. Nothing lasts forever and whole ecologies, such as forests, have to go through a regenerative cycle if they are to endure. The cycle is portrayed in Figure 5.

Panarchy is a representation of the interplay between change and persistence, between the predictable and the unpredictable. If we think of the often quoted wisdom attributed to Heraclitus that the only constant in life is change, we can begin to understand that resilience at its core is about how systems stay flexible, diverse, adaptable, and healthy enough to continuously transform as the wider system they are part of changes around them. The cycle begins with an exploitation of a zone by a pattern of life that comes to dominate and grow while the resources needed for that growth are still relatively abundant. Fertile connections develop but at a certain point when resources are becoming more scarce there is a potential for the system to become over-connected. Such a system becomes brittle and is vulnerable to change, from either fast or slow variables. Collapse or creative destruction occurs and the resources that were previously locked up within this over-connected system are released rendering them free for new emergent re-organisation. Adaptation occurs and the viability of the system is restored. The cycle persists but with new variations.

The theory of complex dynamic systems describes this periodic dance between order and chaos as a fundamental pattern of self-organization in complex systems. As any system begins to mature, there is an accompanying increase in fixed ordered patterns of interactions and resource flows. The system becomes over-connected such that it inhibits the formation of new and creative pathways that might be needed for the systems overall adaptation to outside changes. Eventually this leads to rigidity within the system, and it becomes brittle and susceptible to disturbances from the outside and inside the system. What results is a breakdown of the old order and structures, as the system moves closer to 'the edge of chaos'. The reorganization of resources and of the quality and quantity of interconnections within the system at this point creates a crisis that can be turned into opportunity. At the edge of chaos, complex dynamic systems

are at their most creative (Kaufman, 1995). In the panarchy cycle, the edge of chaos is reached during the beginning of the 'release' phase and left at the end of the 'reorganization' phase (see Figure 5).
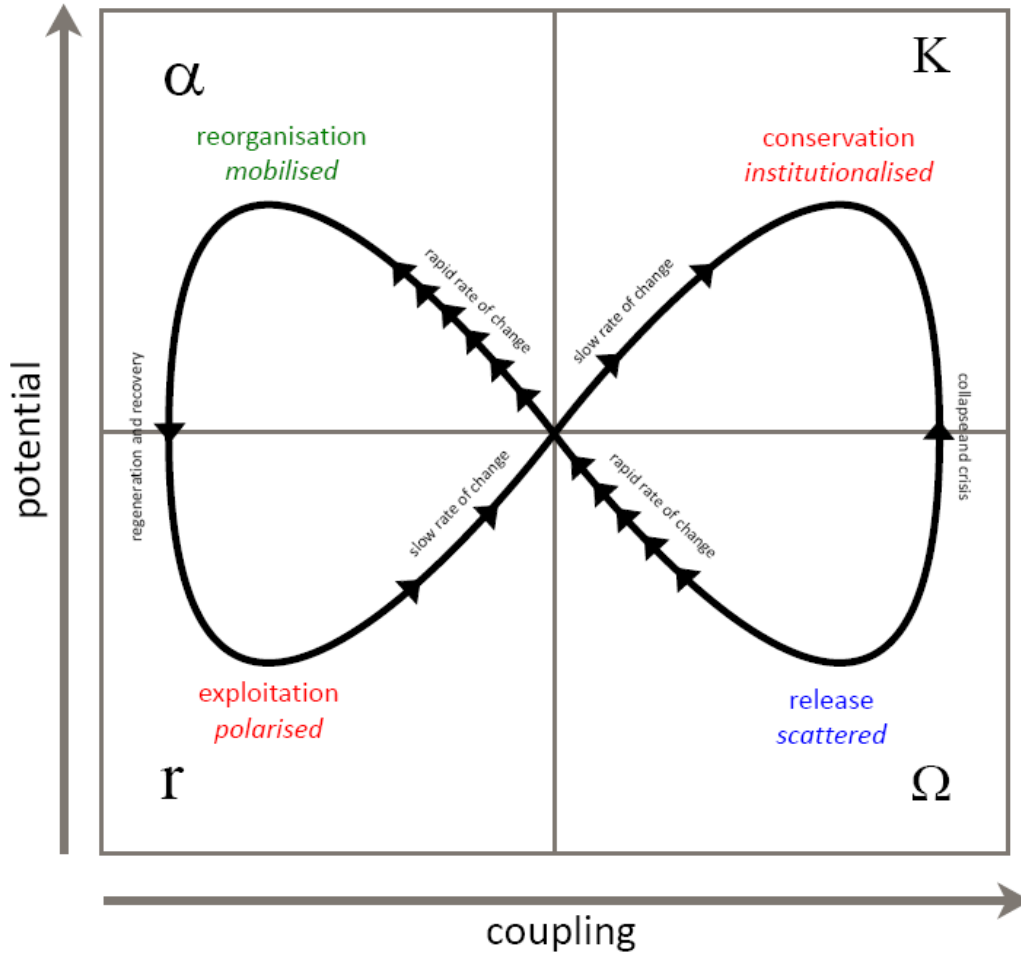

Figure 5 – The basic panarchy cycle.

The figure of eight loop represents the growth and collapse trajectory of the ecosystem. This goes through four phases.

r – a specific pattern of life has established a secure hold in its environment and captures more resources (tighter coupling) and converts its kinetic energy into potential energy as biomass. This is the growth and exploitation phase, where the system is still taking advantage of the widely available resources and the most successful agents within the system are small and capable of using those resources for rapid growth.

K – the growth continues at a slow pace and eventually tails off as the ecology reaches its maximum exploitation, after which it begins to degenerate converting potential back to kinetic energy. The most successful agents in the system during this phase are slower growing and live longer. They tend to become dominant, leaving little room of opportunists as all the available resources are in circulation among those dominant agents. In this conservation phase, the energy that circulates in the system is used to maintain existing structures rather than building new structures.

Ω - the structure disintegrates or is even catastrophically destroyed (for example, a forest fire) and the material scattered. As the 'old' structure degenerates and falls apart, the components become decoupled leaving room for new combinations. This phase of creative destruction raises the potential again for new possibilities in the form of different qualities and quantities of interconnections among a wider diversity of agents.

α - as a new match occurs between the system and the environment a regeneration has occurred and the new variation recommences the growth. Some of the agents previously released out of the rigid organizational structure of the K phase are now re-integrated into new patterns of interconnection and interaction, but possibly in a very different way. With systems boundaries less clearly defined many new agents may enter the system at this stage, and creativity and innovation is at is height.

The rate of change is slow on the ascending curve from left to right but relatively fast on the ascending curve from right to left.

In a system of human ecology, the creativity and social innovation may lead to a new identity of the system rather than a persistence of the old. It may also render the system vulnerable to capture by forces aiming to capture the resources of the system. As an illustration the words in italics in the four quadrants are cast more in the language of society than the language of ecology.

In ecological systems the panarchy cycle is usually associated with a regeneration of the roughly the same. For example, a forest will grow, mature, burn down and regenerate basically the same forest.

In more general terms the panarchy dynamics of consecutive adaptive change cycles can either lead to patterns that are very similar from one cycle to another, or they can shift into a new attractor and look drastically different. The omega phase, creates the 'edge of chaos' conditions that allow for reorganization in a new alpha phase and a new adaptive cycle. The potential for regime shift of transformational change is highest at this point. The challenge in considering a transformation from *Resilience 1* to Resilience

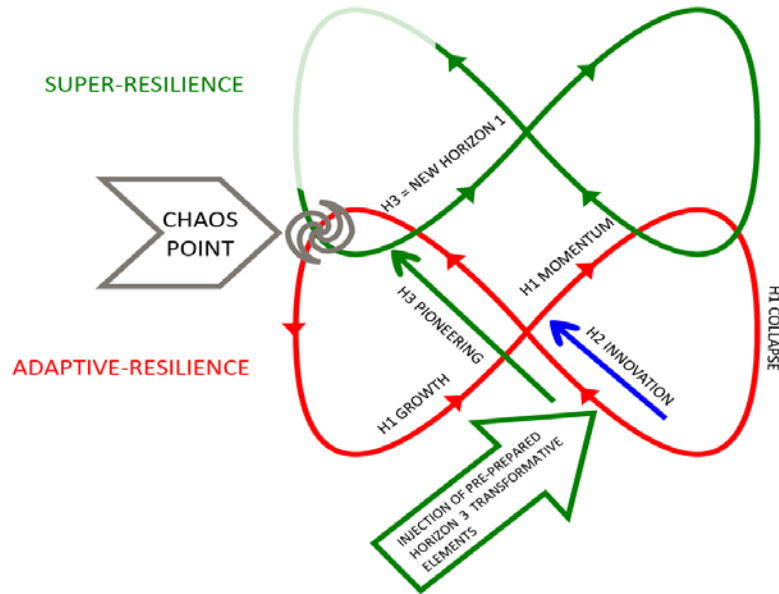2 is: how does the transformation occur? An attempt to portray how this could work is shown in Figure 6.

Figure 6 – A transformative panarchic cycle.

The red cycle is a renewal at the level of adaptive resilience or *Resilience 1*. To shift to the level of super-resilience or *Resilience 2* there is a relatively short window of opportunity for something to emerge or be injected (probably a combination of both) that kick starts the next cycle at a higher level. In the panarchy diagram, of course, the convention of time as a chronology depicted from left to right is not used. To picture this transformative shift it is useful to use the three horizon model as shown in Figure 7.

Horizon 1 shows the viability of Resilience System 1. As the environmental and contextual challenges increase it loses its capacity to recover its vitality.
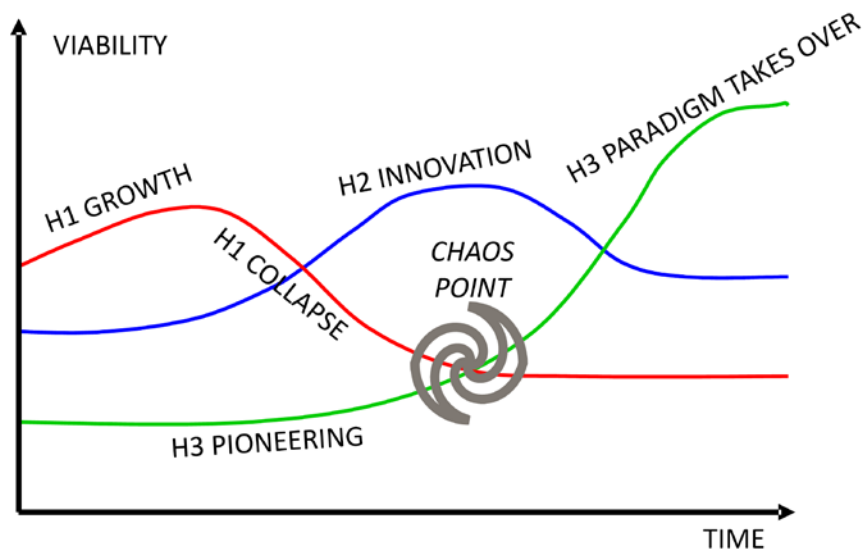

Figure 7 – The shift to new panarchic cycle represented as three waves of change

The pioneering experiments in Resilience System 2 are taken up at the transition or chaos point and, supported by healthy innovation, enable a leap to a new level of viability better able to cope with the changed environment and context. The chaos point is that sensitive region where the system will either revert to the original attractor (in the complexity science sense) or flip to a new level with a different attractor. [5]

5 APPLYING THE CONCEPTS

The workshop held to develop thinking based on these formative ideas was structured around a set of broad themes. Four perspectives were chosen that covered a broad range of disciplines (see Figure 8), so that the range of factors considered in exploring the possible nature of *Resilience 2* could be large. Small groups initially considered the potential impact and
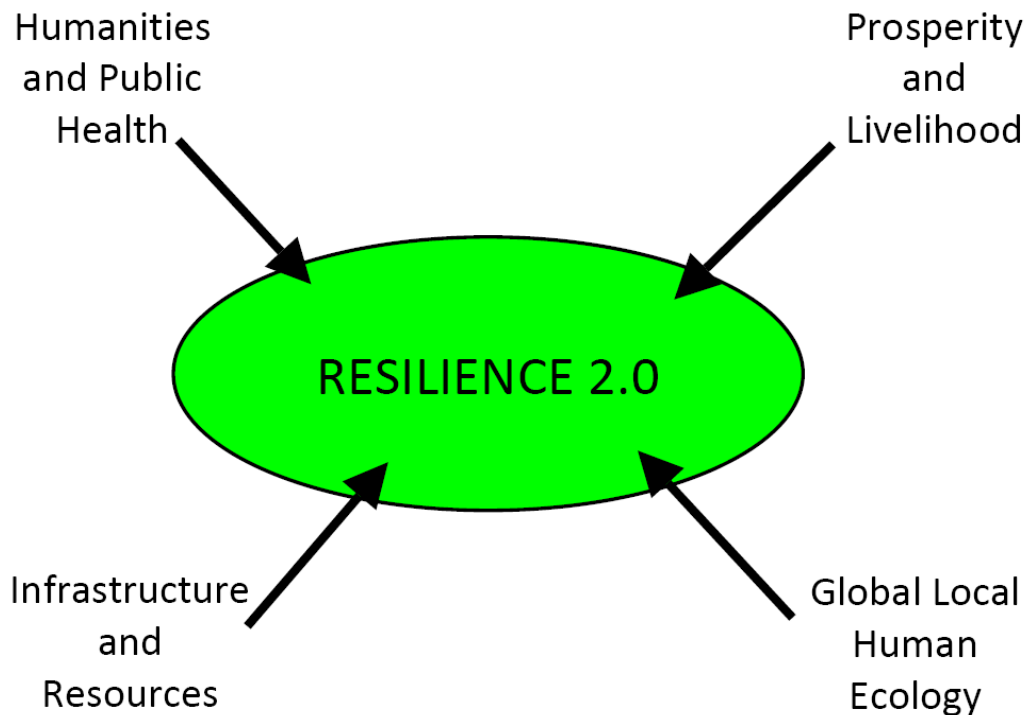
Humanities and Public Health

Prosperity and Livelihood

RESILIENCE 2.0

Infrastructure and Resources

Global Local Human Ecology

Figure 8 – Four perspectives on Resilience 2

importance of resilience thinking and *Resilience 2* in these four broad areas. In a further session three groups were assembled which mixed people together from each of the four areas. They were challenged to weave together their different perspectives and summarise their deliberations in the context of viable systems and the three horizon version of transformation.

The mix of factors subsumed into each of the four areas is indicated in the questions that appear below under each of the headings. The notes reflect the highlights that emerged around that perspective but are not a detailed account of the conversations.

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5 See Ervin Laszlo *The Chaos Point* (2006) Piatkus, for a more complete discussion of this dynamic

6 HUMANITIES AND PUBLIC HEALTH

The question posed to this group was:

> How far might resilience thinking challenge and inform exploration of themes like *psychology of resilience*, *supportive social conditions*, *public health*, and *the role of the arts and spirituality*?

The group included a public health director, an addiction recovery researcher, a church leader, a government resilience unit director, a child welfare specialist and a consultant in civic learning.

Some of the considerations that would support *Resilience 2* that were deliberated by the group were

★ The importance of relationship and love as contrasted with loneliness and fear
★ Shifting the focus of health from treatment to human growth and maturation
★ The need for integration against a background of a lack of communication and learning
★ Humanity needs to be more 'with itself' caring more about selves rather than things
★ The importance of happiness and wholeness – especially in children
★ Sustaining hope for 'amazing creation'
★ Accommodating sufficient variety and diversity yet with connectedness and wholeness
★ Going beyond the NHS medical intervention model to include health promotion, holistic and complementary health care and cultural interventions including the arts and contact with nature

Two diagrams were sketched that summarized some of the principles discussed.
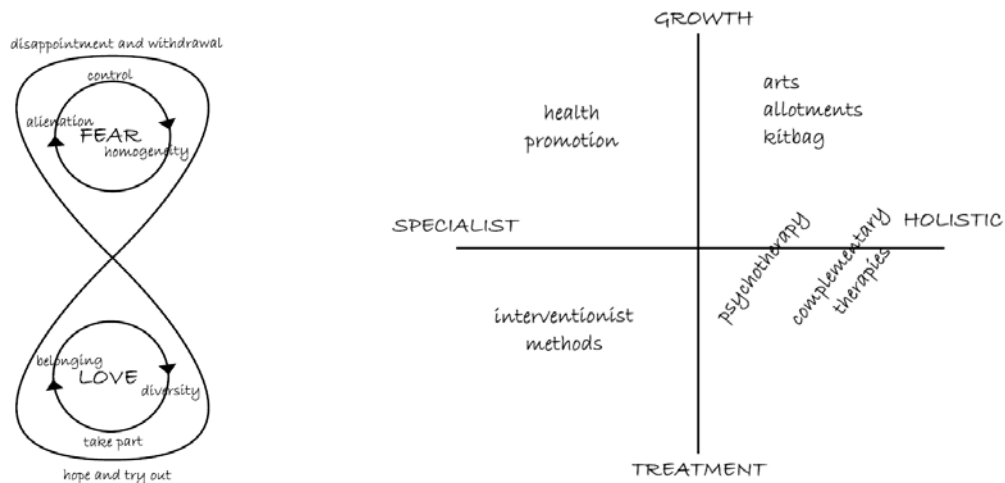

Figure 9

The first diagram describes the interplay between participation and control and the accompanying psychological drivers of love and fear. Since resilience requires collaboration it requires the motivation of love. The paradox is that under situations of threat the dominant response is the ineffective response of fear. However the dynamic perhaps needs fear as an initial trigger in the process of becoming alert to disruptive events and love as the conscious response to deal with it. The second diagram maps the space of society's approaches to health and well being. These tend to be specialist and fragmented: the left hand side of the diagram. But there are increasingly holistic treatments (treating the whole person). And the goal of inner growth and capacity (top right hand corner) is certainly needed for greater resilience.

7 PROSPERITY AND LIVELIHOOD

The question posed to this group was:
> How far might resilience thinking challenge and inform exploration of themes like
> *prosperity without growth, steady state economy, relocalisation of economies* and
> *wealth as a multi-dimensional condition not reducible to money*?

The group included a member of the UK sustainable development commission, a businessman, a council official, a theologian, a systems thinker and a management consultant.

Some of the considerations that would support *Resilience 2* that were deliberated by the group were

★ Important to democratise the economy
★ Reduce the gradients of competition – we cannot fight our way out (this will more rapidly exhaust resources)
★ Equality of access to value – reduce stress and conflict in community
★ Increase the non-economic value of work – reduce social conflict
★ Recognise mutual dependency at all levels and foster common wealth
★ Encourage diversity
★ Recognise the contentment of simplicity

The core notions that emerged from the discussion are shown in Figure 10.
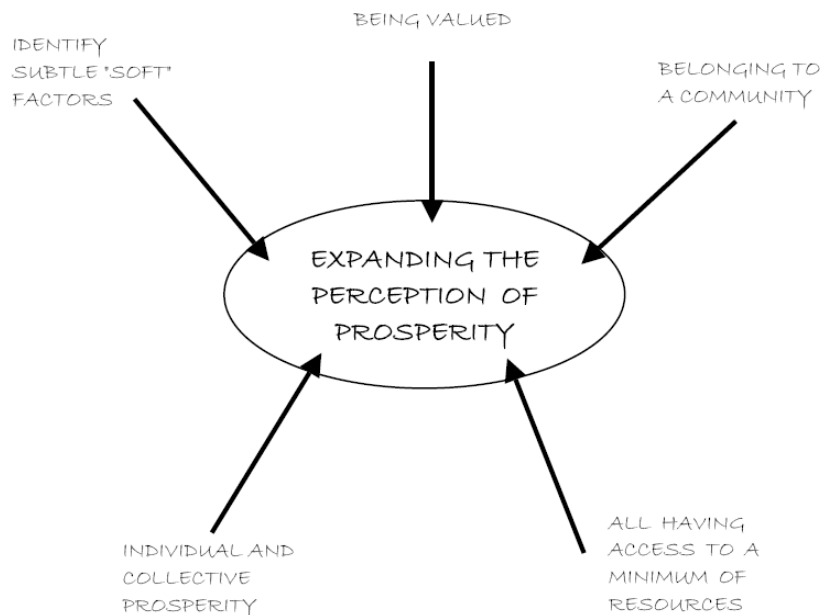

Figure 10

It is interesting to consider that the transformation to *Resilience 2* requires a societal reframing of the nature of prosperity from a "hard" monetized model to a "soft" quality of life model.

8 INFRASTRUCTURES AND RESOURCES

The question posed to this group was:

How far might resilience thinking challenge and inform exploration of themes like *habitat and settlement structures*, *energy*, *utilities*, *materials*, *construction* and *mobility*?

The group included a research director in alternative technology, a think tank director, a researcher in sustainable design, and a community activist.

Some of the considerations that would support *Resilience 2* , especially in the face of major disruption, that were deliberated by the group were

★ Building greater local autonomy in any scenario is more robust
★ But integration on a larger scale is also necessary – the idea of *heteronomy*
★ Infrastructure enables collective choices
   o e.g. social security system
   o But the bigger it gets the more brittle it becomes
★ Efficiency is trumping redundancy (requisite variety) therefore leading to brittleness (a more resilient system would have higher levels of redundancy)
★ What are the infrastructure and resources for?
   o Infrastructure of emergency planning and preparations put in place
   o Personal resilience and resourcefulness as part of infrastructure (social capital)
   o Combining emergency relief preparation and transition
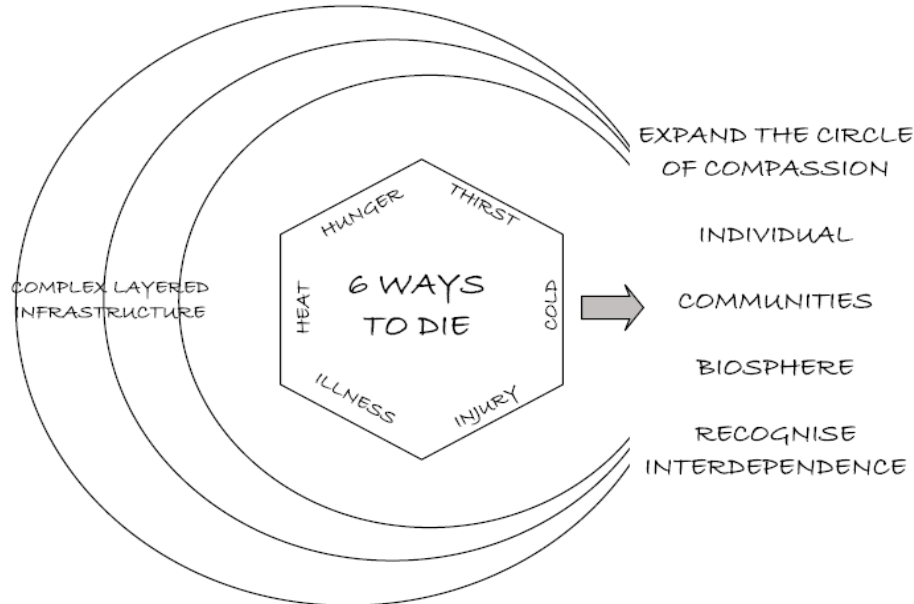   o Values and worldviews infrastructure – role of faith organisations

Figure 11

A core notion was that of concentric circles around a basic core of survival as avoiding the 'six ways to die' (Vinay Gupta's model for disaster relief) as shown in the diagram**.**

A prepared resilience response can have two basic outcomes depending on the level of disruption. On level 1 there is an emergency response and recovery. On level 2 the response is overwhelmed, people suffer but society adapts. The risk is that this adaptation could be toxic – local militias for example. However, an exceptional response can be a reconfiguration of society around new values and priorities. This must incorporate a new answer to the question as to what and who resources and infrastructure are for. This new answer will arise from a parallel narrative around transition to a *Resilience 2* society.

9 GLOBAL LOCAL HUMAN ECOLOGY

The question posed to this group was:
> How far might resilience thinking challenge and inform exploration of themes like *climate change, ecological health, species extinction and habitat destruction and preservation*, and *natural hazards*?

The group included a wild lands protection specialist, a consultant in human ecology, a police manager of emergency response, a university researcher in ecology and a community activist.

Some of the considerations that would support *Resilience 2*, especially in the face of major disruption, that were deliberated by the group were:
* ★ The issues of human ecology are fundamentally spiritual
* ★ This leads to the recognition of deep ecology as well as instrumental ecology
* ★ Grounding in nature is the basis of realpolitik in this area
* ★ People build walls around themselves for protection
* ★ Ways of adaptation must speak to many people from many perspectives
* ★ Resilience must arise from hope and energise the 'bounce back'
* ★ It also requires enlightened self-interest, the courage to be vulnerable (e.g. the risks of rescue, the courage to ask for help)
* ★ An acceptance of 'this is why I am here'
* ★ All this requires new ways of knowing (cognition)
* ★ For the future this must develop in secondary schooling
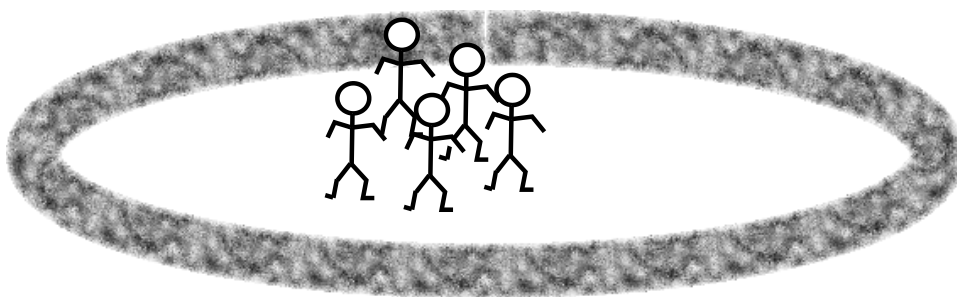* ★ It requires embodied experiential learning.

Figure 12

A key idea from this group was that, in a world of climate change and other massive changes the walls of our stockades to protect ourselves cannot be big enough. We need to move from fences and walls to more organic and adaptive systems of living that are more closely woven into the fabric of nature.

10 WEAVING THE STRANDS TOGETHER

Three mixed groups from the four perspective worked in parallel on how their combined deliberations might feed into, and be organised by, the viable system model. The analogy used was the weaving together of the four strands, health, prosperity, resources and ecology. Then the output of the three groups was combined and gave the picture shown in Figure 13.
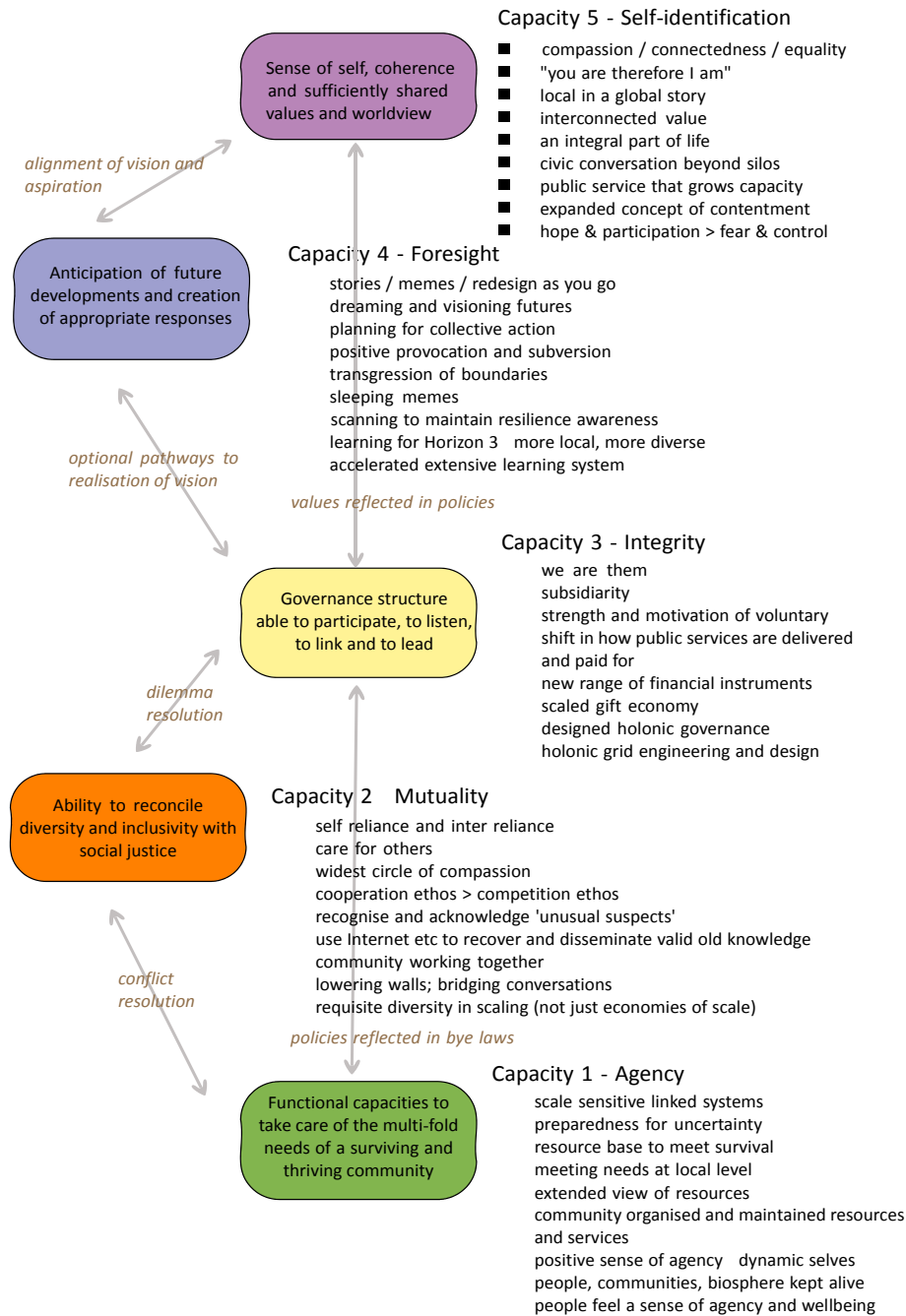
Capacity 5 - Self-identification
- compassion / connectedness / equality
- "you are therefore I am"
- local in a global story
- interconnected value
- an integral part of life
- civic conversation beyond silos
- public service that grows capacity
- expanded concept of contentment
- hope & participation > fear & control

Sense of self, coherence and sufficiently shared values and worldview

alignment of vision and aspiration

Capacity 4 - Foresight
stories / memes / redesign as you go
dreaming and visioning futures
planning for collective action
positive provocation and subversion
transgression of boundaries
sleeping memes
scanning to maintain resilience awareness
learning for Horizon 3 more local, more diverse
accelerated extensive learning system

Anticipation of future developments and creation of appropriate responses

optional pathways to realisation of vision

values reflected in policies

Capacity 3 - Integrity
we are them
subsidiarity
strength and motivation of voluntary
shift in how public services are delivered and paid for
new range of financial instruments
scaled gift economy
designed holonic governance
holonic grid engineering and design

Governance structure able to participate, to listen, to link and to lead

dilemma resolution

Capacity 2 Mutuality
self reliance and inter reliance
care for others
widest circle of compassion
cooperation ethos > competition ethos
recognise and acknowledge 'unusual suspects'
use Internet etc to recover and disseminate valid old knowledge
community working together
lowering walls; bridging conversations
requisite diversity in scaling (not just economies of scale)

Ability to reconcile diversity and inclusivity with social justice

conflict resolution

policies reflected in bye laws

Capacity 1 - Agency
scale sensitive linked systems
preparedness for uncertainty
resource base to meet survival
meeting needs at local level
extended view of resources
community organised and maintained resources and services
positive sense of agency dynamic selves
people, communities, biosphere kept alive
people feel a sense of agency and wellbeing

Functional capacities to take care of the multi-fold needs of a surviving and thriving community

Figure 13 – A Resilience 2 community as a viable system

11 SOME PROVISIONAL CONCLUSIONS

A *Resilience 2* society will require a profound transformation of the humanity on the planet. Changes will need to occur at a local, regional, national and international scale and will affect all aspects of our material infrastructure, as well as, food, health, energy, transport, economic, and governance systems. There will also need to be profound psychological changes. The dominant worldview will need to shift towards greater human solidarity, cooperation in the process of reintegrating of human systems into the life-sustaining cycles of the biosphere.

Facilitating the emergence of *Resilience 2* is about seizing the opportunity presented by the fact that we are at the end of the K phase in the current adaptive cycle. The twoliked adaptibve cycles in Figure 6 suggest that we need to be ready with powerful "sleeping memes" to use the opportunity in crisis presented by the crumbling of old structures and 'business as usual' to affect a shift into a *Resilience 2* society. Prolonged attempts of propping up the current system by encouraging *Resilience 1* and a return to 'business as usual' are only likely to contribute ultimately to a slip down to a radically impoverished planetary system with humanity confronted with multiple global and local crises.

The five perspectives (component capacities) of the viable system show an interesting convergence in terms of the qualities of community that were considered to be most conducive to a new level of resilience. At this stage of the investigation, we are more interested in *what* rather than *how.* If we consider how to achieve greater resilience before distinguishing the differences between *Resilience 1* and *Resilience 2* then we may simply reinforce the status quo.

A comparison of principal characteristics of viability at the two levels is shown in the table .

Viable System	Resilience 1 (from observation)	Resilience 2 (from the seminar)
Subsystem 5 SELF	People who see themselves as separated into social structures around vested interests which are not the whole, finding it difficult to communicate across boundaries and with large differences of values; yet they are – on occasion - able to unify to some degree in the shock of an emergency	People who see themselves as connected diverse equals, an integral part of life holding civic conversation with compassion and with an ethos of public service and a capacity to be growing with hope and participation
Subsystem 4 FORESIGHT	People who assume that the current operating system and infrastructure is OK and is taken care of by somebody else including public services in case of emergencies and contingencies; little interest or awareness in the future but may be quick to adapt given no choice	People who are 'dreaming' their future, alert to the trends and possible disruptions, who plan and learn for collective action and prepare latent capabilities ('sleeping memes') that can be rapidly activated when needed
Subsystem 3 GOVERNANCE	People who live within the dominant political system and accept leadership as the domination of one set of views over another as to how things should be managed and resources allocated; participation is likely to be limited to protest	People who see leadership as service with a strong voluntary component, a participative approach to public services, and who enable a local economy based on new systems of exchange and holistic design; subsidiarity is empowering appropriate participation at a local, regional, national, and global scale.

Subsystem 2 MUTUALITY	People who easily fall into conflict situations, especially when times are hard and lack the skill and intentions of reconciliation and harmonisation; under stress they may rally for the greater good	People who care for others with a wide circle of compassion extending to all of humanity and the whole community of life; an ethos of cooperation with bridging conversations between different aspects of community life constantly resolving tensions
Subsystem 1 AGENCY	People who between them cannot cover all the essential functions of a thriving society and depend on large institutions of government and commerce to supply needs and services; nevertheless there may be untapped reserves of 'make do and mend'	People who between them are able to operate the main functions of a flourishing society in terms of skills and capabilities so as not to be fatally dependent on the wider pattern of dependencies if and when they are disrupted by challenging events

The above table concentrates on the human quality as the strongest determinant of greater resilience. Personal, psychological or inner resilience in the face of profound environmental and systemic change, is a precondition for individuals and groups to be able to sustain the kind of culturally transformative, social and societal acupuncture efforts that will catalyze the transition towards a Resilience 2 society. However, there are also quite challenging technical issues for Resilience 2. which bring advantages over *Resilience 1*. Some of the highlighted ones are:

- Developing a psychology of transformation beyond the neurosis and psychosis of current everyday life
- Creating a capacity and skill in practical futures thinking and planning
- Improving horizon scanning for communities and by communities
- Moving social learning to a new level of effectiveness
- Innovating methodologies to access collective intelligence
- Developing a new range of financial instruments and institutions
- Transforming the purpose and nature of the economy
- Creating scale linked semiautonomous infrastructures
- Creating new modes of participative governance (beyond democracy)
- Skills in balancing self-reliance with inter-reliance
- Skills and methods of civic conversation, collaborative design, and community teamwork
- Harnessing the internet to make lost valuable old knowledge available
- The design of scale-sensitive and scale-linked systems of cooperation
- Enabling creation of resilience buffers in resources and capabilities
- Achieving distributed rather than centralised viability systems
- Ensuring communities live in harmony with the total earth

Although some of these technical capabilities gravitate around one or another of the five subsystems, they are as much part of the web of interconnection that mediates one part of the system with another. This mediation is essential to achieve both adaptive capacity to change and homeostasis (persistence in the face of change).

The above preliminary analysis offers possibilities as a diagnostic and programmatic development tool. Some of the key diagnostic principles are:

A. a weakness or failure or disruption in any subsystem will have interactive repercussions across the whole system and at several levels
B. the coherence of the system (community) as a whole (for example, its overall health and resilience) depends on the quality and appropriateness of the interconnections. Not only failure but also seeming success in one subsystem can have deleterious effects in other subsystems, for example in the form of a hypertrophy.

It is clear from the above analysis that Resilience 2 communities are not currently in existence (although certain aspects are present in isolated cases). The groups in the seminar also considered what the pathways might be from today. What occurrences or developments would identify that a transformation was taking place? How might this transformation be intentionally stimulated? This was aided by using the three horizons of transformation framework that has been developed by IFF and colleagues.

The output of the three groups has been combined in Figure 14. In reading these results, keep in mind that Horizon 1 (the red line) represents 'world in crisis', Horizon 2 (the blue line) represents 'world in transition', and Horizon 3 (the green line) charts the emergence of a 'viable world'.

Figure 14 – Three Horizons from Resilience 1 to Resilience 2
(on the next page)

THE THREE HORIZONS TRANSITION
TO RESILIENCE 2.0 -
CONSOLIDATED SEMINAR SKETCHES

RESILIENCE CAPACITY

DRAFT

TIME
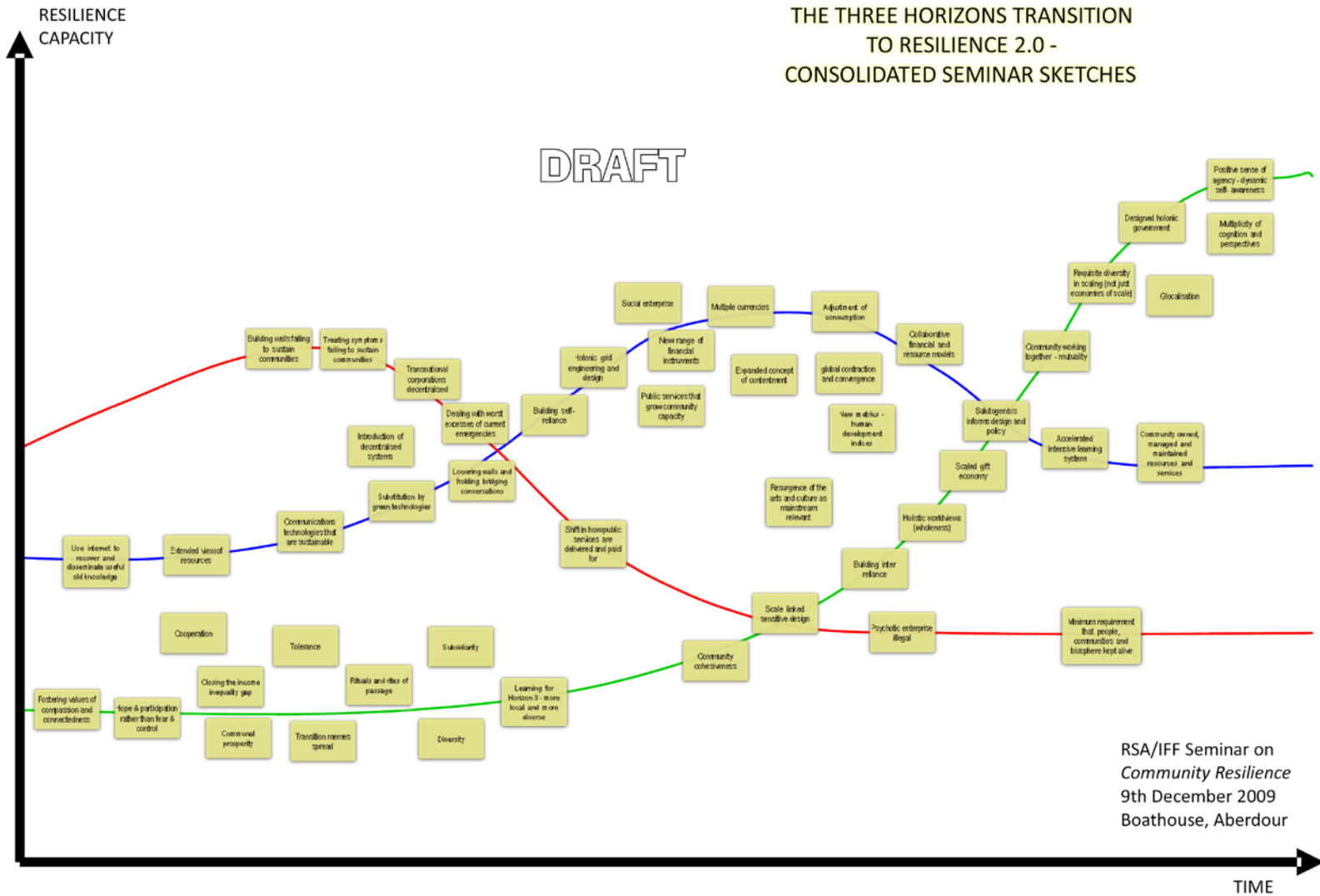
RSA/IFF Seminar on
Community Resilience
9th December 2009
Boathouse, Aberdour

12 A MODEL OF PRIMARY COMMUNITY FUNCTIONS

The customary division of function as reflected in governments and local authorities is very much embedded in assumptions of *Resilience 1*. In this dominant model different requirements (health, transport, infrastructure, social services and so on) are set up as distinct functions and operated largely independently of each other. In a stable environment with few shocks and surprises this kind of disciplinary or departmental isolationism can work pretty well. In the eventuality of shocks it is supported by a range of emergency services that restore normality as soon as possible.

This way of designing community structures is, however, inadequate to consider the real dynamics of Resilience 2. This needs a more systemic and, in a significant way, more grounded model of functionality. The IFF World System model provides such a concept to consider the range and nature of fundamental functions for a viable community. In the context of the previous discussion of the viable system, this model can provide one way of looking at Subsystem 1: Agency. The model proposes that there are twelve basic functions that need to be in Subsystem 1, and that each of these 12 functions needs to be a viable system in itself.

1 Wellbeing and Health	7 Water and Hygiene
2 Food and Agriculture	8 Habitat and Infrastructure
3 Trade and Commerce	9 Wealth and Livelihood
4 Energy and Resources	10 Governance and Management
5 Climate and Atmosphere	11 Community and Learning
6 Biosphere and Terrain	12 Worldview and Beliefs

12 WHERE THIS WORK NEEDS TO GO NEXT

Reflection on the results of the seminar strongly suggests that there is potential in the idea of resilience 2. The study has shown that the right level of distillation and simplification of complex ideas like viable systems modelling (VSM) and panarchy do have some value in provoking new angles on looking at the nature of resilient communities. This analysis has not gone so far as tackling the implications for policy and action of these ideas. At this stage it is important to create a firmer intellectual base for studying resilience, both in the field and in theory.

However, any programme of taking this further should have a component of questioning current practice and suggesting changes that will improve current *Resilience 1* and trying out steps towards a new level of transformative resilience which we have called Resilience 2. The original adaptive imperative study suggested that without a major shift in the viability of communities, society could be at considerable risk from synchronous failure. Perhaps the emerging conditions will not be serious enough to warrant such a radical proposition but, just in case the prognosis is valid, it is important for someone to take a deeper look at it.

The IFF/RSA 'Research Seminar on Community Resilience" was held at the beginning of the UN conference on climate change in Copenhagen, and the results were compiled for this paper in the wake of the historical failure of this conference. It is important to emphasize a critical relationship in the dialogue on climate change mitigation and climate change adaptation. It is more than likely that the adaptive, on-the-ground measures that would support a transition to a Resilience 2 society, are also the most effective measures for rapid and immediate climate change mitigation. Creating more resilient communities and bioregions in the face of climate change, peak oil, and many other scenarios that could trigger synchronous failures, is simply a necessary survival response.

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