

Chapter 6

Emergency Response: Clustering Change

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Abstract Truth is always concrete, as are emergencies. If truth and reliability of good decisions is what, in general, nourishes change and the readiness of people to trust in transformation, emergency response should be at the heart of this. Responding to emergency situations is about immediate decisions and action. If carried out incorrectly or badly performed, it not only fails in substance, but is likely to destroy and delegitimise any further attempts to transform constraints and contingencies which have caused the emergency situation in the first place.

Neither the recent debates on international environmental governance nor those focusing on the multilateral governance framework for sustainable development, emphasise the issue of emergency response. This reluctance is most likely due to the fact that dealing with emergency control is still regarded as a strictly national task. This article believes that this approach is inadequate. It argues that the character of emergencies is changing. Whereas conventional emergencies are mostly local, it is clear that limited and calculable nuclear accidents and the adverse effects of climate change, demonstrate that the modern generation of emergencies has the potential to surpass geographic limits, national borders and to be long term. Therefore, this article argues that emergency control may have an important role in clustering change processes and transition efforts, at least under certain conditions and whilst framed by the concept of transgovernance.

6.1 Emergency Response: Triggering Change?

We may speak of an emergency when a situation or a disastrous event cause great damage, destruction and human suffering, and overwhelms local capacity, necessitating a request to national or international emergency response capacities.

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A disaster is often caused by nature (blizzard, hurricane, floodings, earthquake, tsunami, drought), but can also have human origins (e.g. chemical spills, nuclear incident, climate impact irregularities and climate engineering), and in particular the emergency implications of a disaster are increasingly determined by social and economic factors and the vulnerability of human settlements. The emergency itself is of unforeseen and often of a sudden nature. The extent to what the emergency has been unforeseeable in substance and in process is subject to scientific and social debate, but is not substantial for the definition.

If successfully carried out, emergency response delivers ‘hard’ solutions while the ‘sustainable development’ delivers ‘soft’ aspiration and bearing points in a broader sense. Both are connected. This connection is neither merely circumstantial nor is it hard wired. It is rather a soft binding or coupling, making the connection by learning and accepting (or opening) new choices and new lines of responsibility through knowledge based informed debates. If however this reflexivity cannot be achieved, action might fail both regarding the aspect of the practical problem on the ground as well as the wider aspect of building societal values towards a sustainable future.

Sustainable Development is a societal aspiration which invites and involves people to share their values and to empower their abilities and competences for a better future. However, it can never be as concrete as the striking problems which it sets out to remedy. There is a two anchor process of change: the first is driven by the urgency of today’s problems and those of the foreseeable future, whilst the other is enforced by the aspiration of people and their thinking with regards to fundamental issues of human life, nature and prosperity.

Emergencies have the potential to play a major role in change processes. This assumption sounds strange, at first glance.¹ Change processes often rely on design whilst emergencies do not. Emergencies happen haphazardly and at random, not by design. Change is perceived as a rather long term lineup of a multitude of steps whilst emergencies involve individuals. Change and transition are often perceived as a function of time. They assume at least some kind of stretched time line or even linearity. Emergencies on the other hand, with their emphasis on the ‘now and here’ are quite the opposite. In terms of governance issues, change is seen as something which one can manage (you can manage what you can measure, or: what you can measure gets done). In trying to define the rationality of change processes, development is often back cast when focus is on these characteristics. Emergencies, however, do not fit into this kind of rationale.

¹ Of course, any disaster, whether natural or human, certainly creates opportunities for change. The question always as to what is the power angle of change and who is benefiting from it. The power aspect of disasters is very well discussed by Naomi Klein (2007: 558). The book elaborates on the assumption that the radical neoliberal free market policies, in some countries, were pushed through while people were scared by disasters or upheavals. The author implies that lobby groups may have intentionally created some of these man-made crises in order to push through unpopular economic reforms. I mention this book as a reference to the change-agent-character of emergencies although I see it oversimplifying the case. One may not too readily see conspiracies where all-too-human pattern of confusion and helplessness, good intentions and greed may as well give a sound explanation.

Whether or not they contribute to change processes depends on how societies react to emergencies. Any society perceives risks as the realisation of possible future emergencies which should be avoided at all costs. The way societies assess these risks is not a matter of physical patterns alone, nor are they the most important part. Technical and social factors are interwoven. Most important is whether a society sees alternatives – technical and social – to avoid or mitigate these risks. The existence of alternatives is fundamental for the scale and extent to which risks are perceived.

Modern emergencies mean that this relation becomes increasingly complex. Emergencies which result from risks and challenges in modern societies, are beyond those which can be pre-calculated. An example of this type of emergency would be a major nuclear accident. They are without pre-set geographic limits and their materiality may easily develop un-predictable (and most probably unmanageable) features. What is more, geographic distances do not translate into social distances; with the opposite more likely to be the case. All of this is demonstrated by the German case in dealing with the Fukushima meltdown.

Another feature adds to this perception of risks and emergencies. It comes with the era of sustainability as policy concept and refers to the character of information and values. The contemporary context seems to accept social values only if they imply a shared meaning (and risks are perceived as something which bear a collective meaning beyond the actual physical impact). Information, in this respect, is only then socially accepted as information if it is based on open sources. If this is not the case, information is simply data and its relevance to public decision-making is denied or under doubt (in 't Veld 2010). Successful emergency response is deemed to be based on open-source information.²

Amidst the wide array of environmental and social problems – both global and regional – emergencies call for immediate action and the ethics of help, remedy and facilitation of new thinking. They do not necessarily call for textbook solutions. Emergency response is designed to manage the unexpected, and if this does not happen, then it has failed. Occasionally, the urgency of the situation at hand requires taking action which may contradict the usual logic of procedures without waiting for decisions to be taken by the regular chain of command. Whether this works out or not, is subject to the situational intelligence of those in command. Whether decision routines, both in the public and private sector, are ready to perform transformative action, is characterised to no small extent by the after-event reaction of the governance routine: will it punish or learn? Will it punish those in charge for any mistakes or inappropriate behaviour which might have caused or influenced the situation? Or will it use mistakes in order to learn how to perform better in times of stress, and how to make better use of the knowledge

² In Germany, the Fukushima event caused meaningful political decision taking. The report Ethics Committee which was in the process of being established right after the initial nuclear accident in Japan, built its report on the facts elaborated here. Most important was the checking of scientific facts and figures which could only then be operational for building consensus when information is based on open sources. Non disclosed information will fail even if the data turns out to be adequate (Ethik-Kommission Sichere Energieversorgung 2011).

available for disaster control, forecast and precaution action? Will it develop reflectivity or prolong any command-and-control mechanics which it had in place before? Would the dominant reaction display a reflexive or a compressed attitude: readiness to u-turn and change mode as opposed to the fortress attitude of simply building higher walls when under attack? Will it emphasise openness and reflexivity in a time of knowledge democracy and second modernity, or will it devalue and discourage change?

6.2 Differentiating Change, Transition and Transformation

The discourse on sustainable development seems to use the terms transition, transformation and change more or less synonymously. A more differentiated view however, might help to understand the different characteristics of events and what transformative governance is (or could be) about.

From the above mentioned terms, change is the least specific. It is used to signal that there is something happening, that we know about this, and that we should take action to better understand what is going on. An example of this is climate change or demographic change. Change can mean anything; this term does not denote going in a direction which is better or worse. Sometimes, the term change agent is used to characterise an attitude of people. An example of this would be in the business sector or in a civil society which empowers other people to act in their own, unrestricted way, but along the pre-set and collective lines.

Transition, I suggest, should be used for pre-defined processes which are designed to lead from A to B. The access of countries to the European Union is a good example. A full acceptance of the Aquis Communautaire, the rules and regulations the European Union has built up, can only be accessed during a (from country to country different) certain period of time. This time can be called transition time. Transition is a regulatory administrative action, driven by targets and timetables (tartim).

Transformation is a term we may speak of when point A is concretely known, whereas the goal in point B cannot be described in the same concrete way. Quantitative targets are used as orientation and benchmarks; the most high profile objective being to keep the global climate change lower than an additional 2°C in global mean temperature (WBGU 2011). There is also no clear final end or stage of transformative action. Action is mostly driven by programs and measures (promes). Another example is the current world's financial debt crisis combined with destabilising characteristics of the global financial market which are out of control. Added to these is the transformative process which the globally leading currencies find themselves submitted to. Another example is the so called Green Economy. This is part of the private sector which is deliberately changing the business case by taking up sustainability solutions, changing gear and performance, or even developing completely new business models (World Business Council for Sustainable Development 2010). It is characterised by the fact that the green part of the economy is increasing, but remains far too small to exert dominating power.

Conversely, the conventional part of the economy is still in command although does not seem to be in a position to deliver ways and means which could respond successfully to the crisis of a non sustainable globalised economy.

In other words, change is what we find ourselves in, more or less constantly, without being formally invited. A transition is something which is set up to technically manage a process in order to get from A to B. Transformation marks a way for society to reflexively monitor opportunities and urges in order to formulate decisions. Emergencies may be conceived as a lens which is clustering all of these processes, bringing about a repertoire of action that takes choices and has the openness to change the logic of action.

6.3 TINA Is Not a Friend

From a governance point of view, the most problematic notion is expressed by the acronym TINA. It means 'There-Is-No-Alternative'. The German debate on whether and how to phase out nuclear energy, in essence, is a debate on the choices the society must make in order to come up with alternative, safe energy supply structures (including the demand side, the grid, and most certainly including the informed debate of conflicts of interest regarding costs, climate emissions, dependencies, and so on).

Political decisions can hardly rely on textbook protocol-type solutions if being taken in times of crisis. Obviously, there is a certain urge to defend decisions by arguing that there is no alternative. The no-alternative narrative nourishes the popular expectation that 'things have to go on', and however disruptive an impact might have been, it will not disturb the way of life. This has recently been used in the course of the financial and economic crisis when decisions regarding bail-out options had to be taken (too-big-to-fail or too-big-to-save?). TINA pretends linear steadiness where there is substantial change. Thus, the notion of 'there is no alternative' reproduces its own precondition, defines everything else as not realistic, and accepts this makeup reality as a limitation on development. Most of the governance features which are in operation today are TINA-related. They are designed for permanence in a non-disruptive development. Even the specific governance elements recently called upon by political strategies towards sustainable development are characterised by linearity in this respect. These elements consist of management by quantitative objectives, verification by indicators, management rules, and involvement of stakeholders. They are characterised by an understanding of 'time' as a steady and linear resource. There are no provisions made for sudden and unexpected breaking up of social structures, or emergencies. While these governance features are both necessary and relevant in order to respond adequately to the systemic pressure of non sustainable trends, they are incomplete because they deny the existence of change clusters.

Besides the continued pressure from long term systemic patterns of non sustainable production and consumption or from the emission of green house gases, other sources of pressure might add to change clusters. In particular, environmental,

nuclear, or financial emergencies are clustering change: all of a sudden they are erratic, discontinued, and forcefully sporadic, with turnover capacity. From the European industrial transformation period of the nineteenth century as well as the realm of the environmental agenda since 1972, we have seen many examples of accidents, unforeseen impacts, chemical spills, and contaminations. The images of burning landfills, oil on rivers with fish stock floating belly up, abandoned industrial sites, cut away rain forest, arable land turned into desert and soil loss, carry with them iconographic power. Equally powerful are the metaphors of silent spring, the ozone hole, or the extinction of species.

Major disasters and emergencies underline the fact that nothing is without an alternative. The 2011 nuclear accident in Fukushima reminds us that unexpected events and irregularities can happen even if they are clearly beyond what a 'rational' risk calculation can predict. Nuclear accidents and meltdowns are peak events, but basically, they represent a number of emergencies which high-tech societies find themselves confronted with.

In order to sustain a planet with nine billion people who stress the environment and the natural resources, mankind must invent a number of alternatives. While the pursuit of the old myth of economic growth is deteriorating societies and the ecology, the alternative is not. The greening of society is a license to growth, provided growth strategies are informed and guided by the notion of sustainability. Learning from emergencies should enrich the governance debate on how to achieve sustainability.

6.4 Conventional Versus High End Emergencies

The first industrialisation has brought about many emergencies such as explosions of steam machines, railway disasters, mining catastrophes and technical dysfunctions of all sorts. The 'frontiers' (Osterhammel 2010) have been exploited as an unlimited reservoir of resources, both in the 'new world' and in the old world. The notion that the extent of danger and risk can be calculated and reduced to the minimum, is still true for commonplace accidents such as exploding steam machines or discharges of hazardous substances. During the industrialisation, these conventional types of accidents and emergencies led to an incremental improvement of technologies and to advancing liability schemes and concepts for insurance coverage. Unconventional 'high end' emergencies however, such as adverse effects of climate change and geoengineering, ocean degradation, or nuclear meltdowns, are impacting man and nature. There seem to be no immediate limits on these emergencies which have irreversible impacts and the potential to develop follow up impacts beyond control. These emergencies do not stop at borders, they are not linear, and they are beyond the scope of existing governance.³

³The contingency of emergencies is being neglected by mainstream research into governance. It should be noted that one won't find the term 'emergency' on <http://bit.ly/rUTSsY>

Table 6.1 Types of emergencies

Nineteenth and twentieth century style emergencies	High end emergencies
R-2-C (Ready to Control), accessible for insurance	S-b-L (Systemic beyond Limits), not pre-calculable
Triggering selective learning (if not wasted to oblivion)	Clustering collective change processes (if not wasted to oblivion)

However, a crucial but absent measure is an analysis of how irregularities as expressed by emergencies relate to the governance of change and transformation. An example of this would be during the time of the first and second industrialisation (Brüggemeier 1996).

Today, we are faced with the increasing probability of environmental emergencies. However, these are different to the emergencies which we have come to expect. The industrial style emergencies of the nineteenth and twentieth centuries were ready-to-control, in the sense that the impact could be contained and controlled. In the following years machinery was improved and procedures adapted.

While conventional emergencies still occur in contemporary times, another type of emergency is characterised by non-controllability. Examples of such emergencies are the impacts of nuclear hazards, climate migration, or food disasters. In addition, the examples of major flooding show that the increased vulnerability of human settlements tends to develop natural disasters into social emergencies. It is debatable whether a financial mega crisis such as the financial meltdown of 2008/2009 can be categorised as a high end emergency. Ulrich Beck analyses the delimited and social character of risks in what he calls the second modernity (Beck 1986, 2009).

The definition of risk as a product of likelihood of occurrence and scale of damage is conventional. There are risks (and emergencies) which are beyond this definition, because they are highly complex, the magnitude of impact is beyond being calculable and/or they are on a global scale. This challenges the conventional concept of risk and the way these risks have been dealt with. Not knowing (in the sense of absence of positive information) as well as deliberate ignorance and denial are forming part of modern risks (Table 6.1).

The appearance of extended risks alone is an important change of course. Adding to this, a growing number of emergencies can be expected in the future stemming from the fact that more and more people live in areas which are subject to extremely vulnerable conditions. Another contributing factor is the deteriorating pressure on food and ecosystem services, a factor which is on the increase. Another reason comes with the embedded runaway risks of accidents in nuclear facilities. As demonstrated in Fukushima, a major nuclear dysfunction may cause response action which is far beyond that which is expected and possibly far beyond what is eco-nomically and ecologically maintainable.

It must be understood that not each and every environmental problem causes an emergency. In legal terms, a situation is called an emergency when it places man and nature at immediate harm or a risk, which is not tolerable. This impact is of such a dimension that it must be immediately addressed regardless of whether it is expectable, foreseeable or otherwise predicted or not predicted.

The term emergency is special because of its legal consequence. As it has thus far been applied, it legitimises and enforces ‘illiberal’ intervention. An emergency legitimises (and requires) governments to directly and immediately intervene. Emergency response will not worry about vested interests such as property rights or facility permits. There is always a momentum of urgency involved. A good role model is the Emergency Response Action carried out under the US Superfund legislation. There are also emergency response routines in Europe which are mostly carried out on the national level by police or army, and by specialised branches of the fire department.

The term emergency is often synonymously used with the concept of ‘danger’. This is relevant in a broader sense. Some environmental damages stipulate a danger for humans; others do not (yet). Globally, the man-earth system and the biocapacity are under stress. Increased stress means that the occurrence of emergencies is more probable. Thus, deteriorated and restricted or even denied access to fresh water, fish stock, or food security, and a depletion of sources, may develop into regional emergencies. This assumption is based on knowledge. There is no point in ‘crying wolf’ or producing gloom and doom messages, but there is also no point in denying this trend.

6.5 Framing Future

The year 2050 is near. Those who will occupy your positions and assume your functions as leaders in sustainability are sitting in our schools and universities. The 40 years leading up to 2050 will mark 40 years of their lives as active members of society, of their business and family life, and of their life in social and local communities. By 2050, the world will look very different, with nine billion people living on it, all with high consumption standards. This world will be resource-constrained, carbon-constrained, and will exhibit profoundly changed geopolitics. It is abundantly clear that governance will be key. The more this is the case, the more the world will care about how to share the ever-increasing wealth of available scientific knowledge. Knowledge and democracy – along with accountability and transparency – are the building blocks for governance.

The European approaches (EU COM 2011) currently brought into play in preparing the 2012 UNCSO, reflect the political dynamics of the European project. For hundreds of years Europe was a byword for permanent war. The European Union, emanating from lessons learned, is a peace project. It is run on a machinery of hard and soft regulation, and builds administrative institutions in collectively-shared responsibility. Still, it is incomplete, and the project continually struggles with how to free up multilateral action and how to link national and European action. In a sense, the story of Europe can be seen as the story of how to integrate diverse views, habits, drivers and cultures.

Europe has learned that ‘integration’ does not work because good instruments are in place, but instead works on a ‘must do’ basis designed to achieve collective goals and objectives. The enlargement of the European Union and the specific

processes of accession are a good case in point. The European carbon reduction objectives and the long-term goals of the European Union are further examples. They work through strong administrative arrangements, be them legal or communicative, enforced or implemented, voluntarily or on the basis of persuasive instruments. Having established this, it will likely come as no surprise to learn that the EU and Germany, of course, are strongly supportive of the idea of upgrading UNEP and promoting UNEP to the status of specialised agency. In a wider sense, it seems necessary to realign the performance of the UN system with the agenda of sustainability. An umbrella organisation approach seems to be reasonable. The underlying understanding of this position is one of integration and the role that organisation building can play in this respect.

In the UN system, an upgraded UNEP would have to serve as a core element in order to re-integrate environment. International environmental governance, after Rio 1992, seems to have been running in disintegration mode. Additional tasks have been implemented by adding new organisations to the existing ones. The re-unification of the environmental case resembles a piece of homework that is needed to reach out and improve the integration of the environment in the wider task of sustainability and into the Bretton Woods instruments.

- In this respect, the Green Economy poses particular challenges and opportunities. Environmental policies must and can deliver benchmarks and guidelines for roadmapping the green economy. Roadmaps are required and must be moulded into new governance instruments. They are needed in order to tackle upcoming agenda items such as the launch of a recycling exercise for those materials which today are not recycled at all (e.g. rare earth, industrial metals). Roadmaps provide an opportunity to design solutions beyond one-point-regulations.
- Best practice examples may create new ways of thinking and reach agreed objectives (EEAC 2011). Award schemes are best suited to provide a competitive level playing field that may serve for collective sharing of approaches avoiding window dressing from happening and delivering benchmarks for progress (Deutscher Nachhaltigkeitspreis 2008–2011). Peer Review processes may help to benchmark best practice approaches, and to prevent the green economy from developing into exclusive partiality.
- Enforcing capacity building (sustainability skills) and the involvement of the private sector. Business and civil society already play important roles in the transition process towards sustainable development. There are good examples for changing gear, developing new business models, and re-arranging the supply chains by taking sustainability criteria on board. It is for civil society and politics to draw the line and to make progress and success towards the green transition more tangible. Councils for Sustainable Development can make a difference, as demonstrated by the German example of awarding sustainability performance, ranking efforts, and the dialogue-style elaboration of a German Sustainability Code (Rat für Nachhaltige Entwicklung 2011).

A more visioning governance debate should also cover the aspect of fiscal sustainability, an aspect which all-too-often is completely neglected. However, without any (near-stable) fiscal sustainability, virtually none of the remaining

approaches to sustainability will ever come to fruition. By the same token, implementation of a green economy must prove that it will deliver innovation and decent jobs as well as qualitatively justifiable growth, and that it can alleviate poverty (Bachmann 2010).

Change rarely comes from within organisations. This, at least, is true of the concept of organisations as we have come to know them. In addition, it is undoubtedly true that the UN system has so far, not been able to mainstream the sustainability task.

For this reason, the governance debate should highlight the nexus between national and multilateral action. With regard to making the nexus between national and sub-national levels viable, and working towards promoting sustainable development action, National Sustainable Development Councils in European Member states have proven very meaningful and have enabled a broad set of different procedures in governance, and between the public and private sector. For this, multi stakeholder bodies are a good proxy. 'International Environmental Governance' and 'Institutional Framework on Sustainable Development' should encompass also the private sector. If the notion of Green Economy is to be taken for real the governance debate should reflect this. Judging from the German experience, the corporate community (the most advanced part of it, that is) already displays a number of approaches and governance features designed to mainstream 'Sustainable Development' into corporate performance and to distinguish those efforts from mere window-dressing.

In general, the governance debate may gain momentum when it begins to combine administrative, corporate governance, and the governance of social responsibility, and when it takes trajectories into account that are driven by emergency responses. With the concept of the green economy, this step seems compulsory.

6.6 Emergency and Emergency Response

6.6.1 *A Knowledge Case*

The notion of an environmental emergency associates a knowledge base with the legal right (and contingency) which allows for an enlarged set of interventions, a so called emergency response. The conceptual framework of environmental policies is deeply rooted in dealing with and learning from emergencies, although systematic descriptions of environmentalism tend to dismiss and replace event-enforced learnings by more theory grounded cases of environmental policies (Speth 2005; WBCSD 2010; Radkau 2011). Historically, emergency response action was one of the prime 'sources' of environmentalism, some of those emergencies have been of national significance and required extensive coordination among government agencies in order to prevent, prepare for, and respond to emergencies.

Mostly, responding to emergencies requires immediate action such as shutting down ongoing operations, on site access to facilities and (mostly) emissions

discharges and any other law enforcement activities. Emergency response allows for the most effective action providing it is bound to the goal of taking control of an otherwise harmful situation. These actions may deliberately not be constrained by any previously issued emission right or discharge permission. In an extremely dangerous situation there must be no legal limit to site access.

What qualifies as an environmental issue, to be handled as an emergency, is subject to intense debate and profound scientific research. In the context of human toxicology for example, the research focuses on dangerous substances, hazardous substances, exposure pathways, dose–response systems, interpolation from test data and field evidence, and linkages with human disposition.

The notion of emergencies stipulates a burden of proof. It must be proven that a dangerous situation can lead to concrete harm for people or the environment. Furthermore, the dangerous situation may not be ‘only’ some kind of general (abstract) event which may or may not put people and the environment at unacceptable risk. There are different metrics being used to prove this, all of which are linked to high-end scientific measurement and verification of the evidence:

- Direct measurements (if direct measurement is ethically acceptable and technically possible, however this is seldom the case);
- Epidemiological proof (given the population at risk is large enough in number to calculate the statistics [and to separate a concrete add-on harm from what is perceived as circumstantial or normal risk given the way of life, the terms of operational security, or the ubiquitous background situation]);
- Extrapolation from appropriate field experience given that there is an analogy in the first place;
- Circumstantial evidence such as open burning of hazardous material, evidence of uncontrolled explosives, dead fish stock.

The use of a single metric may not be ruled out. However, it is safe to assume that a combination of these metrics is often used (Bhopal, Love Canal, cases of dioxin spills, children’s blood lead levels associated with urban outdoor activities, major cases of groundwater pollution in the US and in Germany, the dangerous exposure to toxics in residential areas that have been built right on top of hazardous waste dumpsites). Combining metrics is a clear choice whenever uncertainties are great, predicted costs for remediation are high, and more people are directly affected (health, mortality).

6.6.2 The Metrics of Adverse Effects and Danger as Scientific Challenge

Environmental governance as expressed by, for example, international regulations and discourse on the International Environmental Governance, has not yet profoundly touched on the case of emergencies. Emergency response action is left to

national governments. Following this subsidiary approach, the otherwise well designed research into climate forcing and environmental depletion is not yet linked to the work profile of emergency response and its operational engineering expertise where they exist.

- The most important indicator characterising the state of climate change is given as global mean temperature. Being highly aggregated, it cannot stipulate or even trigger any emergency response measure which responds to the regional impacts of dangerous climate change. This is not coherent.
- What is globally modeled and predicted (the global mean temperature, the global biocapacity, food supply) is not connected to emergencies clusters which require evidence, measurement, reporting, and verification.
- The term ‘damage’ as in damage thresholds, has been defined in many respects as public health policies⁴ and environmental protection. The Commission on the Measurement of Economic Performance and Social Progress, the so-called Stiglitz-Sen-Fitoussi Commission, prominently supports this point (Stiglitz et al. 2009; Rat für Nachhaltige Entwicklung, Geschäftsstelle 2010). The Commission believes that it is necessary to have indicators that designate thresholds which, when exceeded, give rise to concerns that harmful environmental damage will occur. In particular the Commission emphasises a need for a clear indicator pointing out dangerous levels of environmental damage.

Fundamental questions of knowledge, certainty and burden of proof arise in this context. They demand scientific research into the effects of environmental pollution as well as on the political and conceptual approach to evidence-based decisions.

The definition of a danger correlates to damage. Damage is not a given minor impairment, disruption or inconvenience, but is a serious and unacceptable impairment or burden which is currently happening or for which there is sufficient probability that it will occur. Sufficient probability does not in itself denote a certainty that damage will directly occur; then again, the mere abstract possibility of damage occurring does not warrant the fundamental assumption of danger. Instead, there must be a well-founded concern that the danger will materialise, for example by virtue of a dangerous situation arising if existing trends are allowed to continue unhampered.

⁴For example in assessing dangers to public health or human working conditions the critical end point is seen as being an adverse effect that can be traced back to the exposure to a specific contaminant. The damage threshold is largely uniformly defined at the international level. It is determined by impact-related body doses that indicate either no-effect levels, no-observed adverse-effect levels, the lowest observed adverse effect level or any other (barely) tolerable, reabsorbed doses of pollutants. In terms of their definition, methods for derivation and interpolation and the level of protection associated with one of the levels those reference levels are largely stipulated by the World Health Organisation (WHO) or other organisations such as the Environmental Protection Agency in the USA. With regard to carcinogenic effects, statistical probabilities of occurrence are generally considered to be the threshold values (Eikmann et al. 2010).

Warding off danger is linked to the idea of preventing emergencies from happening. This is the purpose of the precautionary principle.⁵ As the guiding principle of international declarations such as the 1987 Montreal Protocol, the third North Sea Conference of 1990, as well as the Rio Earth Summit (UNCED) of 1992 the principle is also entrenched in the EU's legal basic documents and various European action programmes. The aim of the precautionary principle is to conserve natural resources and livelihoods in order to preserve their value, efficiency and functions in the long term. A key characteristic of precautionary measures is that often, neither the probability of occurrence nor the extent of damage is specifically known or quantifiable. The IPCC introduces the terminology 'robust findings' (IPCC 2007) and 'key uncertainties', in order to ascertain how much secured knowledge (certainty) is available on the impact of the damage. In other words, how reliably a detrimental impact threshold in a protected property is indicated (forecast).

6.6.3 *The Case of Climate Emergency*

In 2011 the Security Council finally issued the long debated statement on the possible security implications of climate change.⁶ The Security Council notes that in matters relating to the maintenance of international peace and security under its consideration, conflict analysis and contextual information on, *inter alia*, possible security implications of climate change is important, when such issues are drivers of conflict, represent a challenge to the implementation of Council mandates or endanger the process of consolidation of peace. The Security Council expresses its

⁵ In German environmental policy, this concept has been broached by introducing a soil protection law (*Bodenschutz-Recht*) (Cf. German Government 2000).

⁶ At the 6587th meeting of the Security Council, held on 20 July 2011, in connection with the Council's consideration of impact of climate change under the item entitled 'Maintenance of international peace and security', Ambassador Peter Wittig as acting President of the Security Council made a statement on behalf of the Council on the substance of security implications of climate change. Beforehand, the Security Council debate had not reached a consensus. In April 2007, the British government initiated a Security Council debate on climate change as a security risk. If climate change was a threat to international security, intervention by the United Nations should be legitimate. While the British initiative was supported by the European Union and the majority of its Member States, the U.S., G77, China and Russia opposed it. Especially India expressed its worries fearing that acknowledging climate change as a security risk would open the floodgates for industrialised countries to circumvent the sovereignty principle of the UN Charter. In particular they opposed any attempt to widening the interpretation of the application of Chap. 7 of the Charter. The definition of emergency seems to be a crucial argument anyway. The representative of Russia to the UN appealed to 'avoid panicking and overdramatising the situation' and the representatives of Brazil, Pakistan, and China emphasised that climate change is foremost a sustainable development issues. Thus, sudden emergencies due to climate change are meant to be kept outside of the political debate.

concern that possible adverse effects of climate change may, in the long run, aggravate certain existing threats to international peace and security such as water scarcity, desertification of arable land, food crisis and flooding. The Security Council also expresses its concern that possible security implications of loss of territory of some States caused by sea-level-rise may arise, in particular in small low-lying island states.

With this statement, the Security Council recognises the potential threat of climate change to international peace and security. In this regard, the Council requests the Secretary-General to ensure that his reporting to the Council contains such contextual information, in particular on climate change and its possible security implications and future generations, connecting to recent academic debates. Defining emergency in the context of climate change is crucial for political action. The debate thus far reveals both scientific and political uncertainty regarding climate change impacts. ‘Trans-governmental’ approaches are needed to assess and handle climate emergencies. This is the point that the following case scheme seems to suggest.

Climate protection has been the subject of lengthy discussions. It is agreed that greenhouse gas emissions shall be reduced to such an extent that the global mean value of global warming does not rise by any more than 2°C as compared to the pre-industrial level. This threshold is the response currently given to the question arising from the objectives of the UN Framework Convention on Climate Change:

human activities have been substantially increasing the atmospheric concentrations of greenhouse gases [...] and that this will result on average an additional warming of the Earth surface and atmosphere and may adversely affect natural ecosystems and humankind.

Consequently, the question is: where is the limit that differentiates harm and harmful effects from undesirable, but not yet harmful effects? In the context of climate protection, the so-called 2°C target represents a preliminary response (Luhmann 2010). The term ‘emergency’ has only surfaced in the last 2 years, with its main purpose to underscore and legitimate the 2°C goal as a critical level. Once surpassed, this level is believed to trigger all kinds of follow-up reactions which can lead to all kinds of adverse impacts. There are difficulties and uncertainties in determining sensitivity,⁷ regional impacts, vulnerability and long term impacts.

⁷ Weitzmann especially argues that it remains difficult to narrow-down the probability density function of climate sensitivities. In this context, climate sensitivity is understood as ‘the equilibrium mean surface temperature response to a doubling of atmospheric CO₂’. As a consequence, Weitzmann emphasised that ‘some very few but very important real-world situations have potentially unlimited exposure due to structural uncertainty about their potentially open-ended catastrophic reach’. (Weitzmann 2009). In order to circumvent the difficulty in determining the exact correlation of mean global temperature, climate sensitivities and emergency situation, the point of intervention could be shifted to multiple interventions on a regional level. This could not only strengthen national and regional acceptance for climate policy. It could also be more adequate to prevent DAI.

In politics, the 2°C target is conceived as a mostly scientific finding; scientists treat this objective as a mostly political matter (Müller-Jung 2009).⁸ A comparable, concretely defined damage threshold for other problems such as soil, nutrition basis, natural resources and biodiversity is not yet available.

The objective of the UNFCCC 1992 is to prevent dangerous anthropogenic interference (DAI).⁹ Article 1 speaks of the ‘adverse effects of climate change’ meaning changes in the physical environment or biota resulting from climate change. The legal language of UNFCCC refers to a level of climate change which may have significant deleterious effects, and establishes the ultimate goal of the international community to prevent dangerous anthropogenic interference from taking place.

The mean global temperature is the one and only point of intervention¹⁰ that the international climate policy community has agreed upon so far. This does not match the requirement of UNFCCC to show an adverse effect and help to prevent DAI. Preventing DAI from occurring will require more than just one point of intervention because disruptions and catastrophes are bound to the regional and local level. A multi-point intervention approach would better match the regulatory requirement. It would endorse a set of national/regional points of intervention which would refer to factors such as permafrost and glaciers, regional concentration of black carbon, and changes in natural habitats (migration of vegetation zones) which are faster than natural attenuation.¹¹

The question of which impact might qualify for a DAI has not yet attracted enough attention, neither in the sector of policy making nor in the scientific discourse. The language found in key papers on climate research varies a great deal and does not provide clear terminology. The terms ‘adverse’, ‘dangerous’, ‘significantly deleterious’, ‘serious and/or irreversible consequences’ and ‘harmful’, are used synonymously. This may be interpreted as blur. In its Third Assessment Report, the IPCC acknowledges the difficulty to define a DAI:

The basis for determining what constitutes ‘dangerous anthropogenic interference’ will vary among regions, depending both on the local nature and consequences of climate change impacts. (IPCC 2001; Schneider et al 2007; Weitzmann 2009)

⁸ Translation from ‘*Politiker haben es (das 2°C-Ziel) wie ein wissenschaftliches Ergebnis behandelt, Wissenschaftler als eine politische Angelegenheit*’ by Jaeger, Carlo and Julia Jaeger; as cited by Joachim Müller-Jung: *Warum sollten maximal zwei Grad die Welt retten? Die große Zielmarke der Umweltpolitik ist keine Erfindung der Klimaforscher. Ihre Erfindung kam eher zufällig zustande und liegt drei Jahrzehnte zurück. Potsdamer Forscher erzählen erstmals die Geschichte* <http://bit.ly/ohP8hV>

⁹ Article two of the UNFCCC sets out the Convention’s objective.

¹⁰ A point of intervention is defined by an environmental quality that ultimately signals that action is required. Examples: lead levels in children’s blood (1980th), PCB in arctic wildlife birds’ egg.

¹¹ It is well understood that this indicator alone has to be well referenced, which is not the purpose of this paper.

It is debatable whether an aggregated indicator such as a global mean temperature can possibly be used as a trigger for emergency response measures.¹² These impacts, however, react to significantly different vulnerabilities. Large-scale, irreversible and systemic changes in geophysical systems may vary in kind, geographic dimension, and time.

Key security risks are pointing to indirect reinforcing effects of climate change, namely border disputes and migration due to incrementally changing landmasses, energy supply due to increases in competition over scarce energy resources, increased shortages of other resources such as freshwater supply, and societal stress through an aggravation of poverty and inequalities through climate change or even unforeseen impacts of deliberate climate engineering. One key security risk relates to humanitarian crisis in the case of extreme weather events and sudden disruptive climate change. The Hyogo Framework for Action 2005–2015,¹³ provides some guidance as to the actions which should be taken in response to major natural disasters.

All countries fear that unilaterally defining emergency will undermine their sovereignty. In general, differentiating ordinary problems and accidents from dangerous effects and even from emergencies, is an open question. This is true for climate change as well as for nuclear meltdowns, and the social and infrastructural impacts which may follow from major natural disasters. What is the degree of evidence that is substantial enough to legitimate any external intervention? Is there such a degree anyway? Who would be in the position to clarify different viewpoints?¹⁴ Who would be legitimised to check data, to detect undisclosed data, and to ask for missing metrics? How do independency, reliability, and (!)

¹² In the Fourth Assessment Report of the IPCC this is especially dealt with in Chap. 19 of WG II where it says: ‘A significant category of key vulnerabilities is associated with large-scale, irreversible and systemic changes in geophysical systems. [...] central to nearly all the assessments of key vulnerabilities is the need to improve knowledge of climate sensitivity – particularly in the context of risk management [...] where the greatest potential for key impacts lies’ (IPCC AR4, WGII, Chap. 19: 804).

¹³ The Hyogo Framework for Action is the main document resulting from the World Conference on Disaster Reduction in January 2005.

¹⁴ Detached from the debate in the Security Council, there exists the idea to widen the interpretation of Chap. 7 of the UN Charta by establishing the ‘responsibility to protect’ (R2P) as legal norm in international law. While the concept has been on the agenda for some time now, an initiative by the former Secretary General of the UN, Kofi Annan, to establish the R2P was not entirely successful. The International Commission on Intervention and State Sovereignty (ICISS) argued from the perspective of the concerned population. They recommended establishing the following criteria to legitimate intervention: ‘right intention’, ‘last resort’, ‘proportional means’, and ‘reasonable prospects’. However, the World Summit in 2005 including the high-level preparatory panel took up a different perspective. To them, the main purpose of R2P was to strengthen the international security systems (instead of taking the perspective of the concerned population). In the final document, R2P was taken up. But it was not attached to any criteria. Especially the US wanted to keep a leeway for wide interpretation of intervention. However, intervention was limited by the definition of four cases of application, namely genocide, war crime, ethnic cleansing, and crime against humanity. Crisis due to natural disasters have deliberately been excluded. While ‘responsibility to protect’ has been confirmed in the sense it was already established in international law, no ‘right to protect’ has been established.

effectiveness in handling data build up credibility? Is the process of verification part of the solution or part of the problem?

6.7 Transformation and Governance

The term transformation often suggests big machinery and rightly so. The term associates itself with big challenges and ‘thinking-big-solutions’. Its agenda is bigger than life. It forces the followers to be part of something bigger. People generally like this as it does not contradict with what they would do anyway.

The term is used in singular form since it has been used by Polanyi (1978, 1944). This evokes the idea of a simple solution (a pass-partout thing, a one-way option). The term somewhat excludes those who are actually carrying out transformation. It invokes passiveness. A rhetoric example: If there is a revolution, there are revolutioners. This is not the case with transformation. Who would actually do the transformation? Transformationers? A Transformateur?

The term suggests, in a way, some kind of ‘Big – Bang-ism’ where development constantly needs and provides a sense of scale (something is scaling up). The era of sustainability proposes proportionality rather than scale as major references. Transformation, probably, has no scaling mechanism at all. Learning from historical analyses of the first and second industrial revolution one may extract some features of transformation that might give an idea of what the world is running into with thriving towards nine billion people with increased life support systems (Osterhammel 2010; IASS 2011). Discontinuity, purposelessness, locality seem to be such kind of patterns. There are specific elements of transformation which we must know about and must accept: how to enhance credibility? There is no way to force other stakeholders (those responsible) to do something without the next step being performed by the original self (there is no free meal). How to build trust into ‘green economy’ when there is no trust in economy? How to ensure the reversibility of the good action?

6.8 Transgovernance

Ulrich Beck’s concept of second modernity expects the old institutions, enterprises and players to remain in place while the new happens. Change, in this sense, is not sequential but rather happens through parallel channels and competitive structures.

There is little doubt that the occurrence of emergencies will increase. Indeed with up to nine billion people living on a planet with carbon constraints and restricted resources, in 2050 the human settlements will be more vulnerable. As a runaway problem with a ‘fat tail’ the climate change will cause a number of emergency situations. Nuclear facilities are also a potential threat. The recent nuclear meltdown in Japan has prompted profound and renewed thinking about

the ethics of how much risk a society can bear and whether the idea of risk is still adequate if no society is in the position to simply absorb social distortion by evacuating densely populated areas, dealing with contaminations and, last but not least, with an un-clearly lurking emergency situation arising from not controlling the nuclear power plants.

This think piece is not setting out to emphasise emergencies *per se* as some kind of change making mechanism. Emergencies may catalyse change as they can lead to stand still behaviour. Their political impact is open ended, and we can see examples which have stirred a renaissance style follow up, when the way an entity (society, enterprise, organisation) 'digests' an emergency is trying to rest orate behaviour. Change is not symmetric in time or thoroughness. Rather, it is asymmetric, and this is why there is the case for advanced studies to better understand change and the change as clustered by and in emergency situations. This depends on the responsiveness of democracy and how democracies digest knowledge, in general and under the concrete contingency.

A preventive democracy, in fear of populist and the public debate demagogically destroying forces, may choose to hide itself behind a shade of rules and 'ever existing' procedures denying open political access and fighting change clusters as irregularities which might pass by anyway if not given attention. It would choose to rely on elitist groups of experts legitimised by function and routines. It will hardly accept the perspective of transgovernance.

A flat democracy allows and invites social media and networks of all kinds to directly influence decision-making schemes. It is amorphous and will refrain from taking sides. 'Flat' means that, technically, access is granted to everyone. It may not be media-controlled in the sense of the private sector owning newspapers and tv-channels. It may rather invite market players and especially consumers to act as a crowd and to use demand side power in order to enforce sustainability features in production, product and consumption. Key words and concepts are 'responsible consumption, lifestyle-of-health-and-sustainability, political consumption, carrot mobs, green procurement'. While these elements may enlarge and improve democracy, a flat democracy is likely to create the notion that those in charge are increasingly alienated from those who run the action on the ground, and maybe this is really the case (Friedman 2008). Seen from a governance perspective, a flat democracy may tend to let governance structure fade away. It replaces procedures by presence. Procedures with checks and balances would then be replaced by the direct influence of leaders who may have no legitimate voice other than through the web-crowd. A flat democracy may even choose to deliberately discard legitimised representative procedures (and their legal derivatives, the sitting and permitting procedures) by allowing and enforcing social networks and populist 'leadership' appearances. A transgovernmental perspective will probably be seen as something that is alienated from the flat democracy.

A representative parliamentary democracy that would increase its responsive and participatory lay out options could be called 'transdemocracy'. Building on both procedures and preferences it would count on the democratic lifestyle and social responsibility of people and institutions. It would enlarge legal procedures not by consuming even more time and resources, but by making legal access easier

and legal procedures faster. It would clearly not be fail-proof, but by not wasting mistakes for the incremental improvement of the governance approach it will build fire walls against the democratic fatigue and as far as transformation is concerned, against disappointment as well. This concept of democracy will most likely use transgovernmental concepts to better deal with the unpredicted.

In this respect, governance issues, and transgovernance in particular, should also cover the private sector. The corporate community displays different governance approaches for the implementation of sustainability management schemes and addressing social responsibility. Indeed this is a long standing agenda which the private sector and the civil society including the nongovernmental organisations, have in common.¹⁵

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References

- Bachmann G (2010) Vision: Wissen, Angst, Wagnis. Impuls-statement anlässlich der 14. Benediktbeurer Gespräche der Allianz Umweltstiftung zum Thema 'Früher war selbst die Zukunft besser' (Karl Valentin) – Wirtschaft, Politik und Wissenschaft präsentieren Visionen für eine nachhaltige Zukunft.' am 29 und 30 Apr 2010. <http://bit.ly/n8cK1E>. Accessed 17Aug 2011
- Beck U (1986) Risikogesellschaft. Suhrkamp, Frankfurt/M
- Beck U (2009) World at risk. Polity Press, Cambridge
- Brüggemeier FJ (1996) Das unendliche Meer der Lüfte. Luftverschmutzung, Industrialisierung und Risikodebatten im 19. Jahrhundert. Klartext Verlag, Tübingen
- Deutscher Nachhaltigkeitspreis (2008–2011) <http://bit.ly/miB67q>. Accessed 17 Aug 2011
- EEAC (2011) Challenging, encouraging, innovative: addressing the Green Economy agenda in the context of SD. Learning from long-standing and diverse experience: institutional framework for SD at national level. Statement by the Working Group on Sustainable Development of the European Environmental and Sustainable Development Advisory Councils Network (EEAC): Wroclaw and Brussels, online document to be found on <http://www.eeac-net.org/>. Accessed 18 Sep 2011
- Eikmann T, Heinrich U, Heinzow B, Konietzka R (eds) (2010) Gefährdungsabschätzung von Umweltschadstoffen. Loseblattsammlung. Erich Schmidt Verlag, Berlin
- Ethik-Kommission Sichere Energieversorgung (2011) Deutschlands Energiewende. Ein Gemeinschaftswerk für die Zukunft. Berlin. Erstellt im Auftrag der Bundesregierung und vorgelegt am 30 Mai 2011. <http://bit.ly/oPO531>. Accessed 17 Aug 2011

¹⁵ This is especially true on the UN level of decision taking. So far, there is a lack of effective formats for the private sector to discuss and develop governance strategies in relation to multi-lateral governance issues. The World Economy Forum and other project level approaches such as Peer Reviews for the purpose of sustainable strategies might be good examples.

- EU COM (2011) 363 final, communication from the commission to the European parliament, the council, the European economic and social council and the committee of the regions: Rio + 20: towards the green economy and better governance. Brussels, 20 June 2011. <http://bit.ly/r7k3vo>. Accessed 17 Aug 2011
- Friedman TL (2008) Hot, flat and crowded. Why we need a green revolution and how it can renew America. Farrar, Straus and Giroux, New York
- German Government (2000) Gutachten des wissenschaftlichen Beirats Bodenschutz beim BMU: Wege zum vorsorgenden Bodenschutz. Fachliche Grundlagen und konzeptionelle Schritte, Deutscher Bundestag, printed matter 14/2834
- IASS (in prep) (2011) Learning from historian analyses of the industrial revolution for the great transformation as we see it today. Workshop document. IASS, Potsdam
- In 't Veld RJ (2010) Knowledge democracy. Consequences for science, politics and media. Springer, Heidelberg
- IPCC (2001) Climate change 2001: synthesis report online document. <http://bit.ly/oUIPT5>. Accessed 17 Aug 2011
- IPCC (2007) Summary for policymakers. In: Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt KB, Tignor M, Miller HL (eds), Climate change 2007: the physical science basis. Contribution of working group i to the fourth assessment report of the intergovernmental panel on climate change. Cambridge University Press, Cambridge/New York. Online document. <http://bit.ly/pU2K4e>. Accessed 17 Aug 2011
- Klein N (2007) The shock doctrine: the rise of disaster capitalism. Metropolitan Books/Henry Holt, New York
- Luhmann HJ (2010) Auf welche Wissenschaft beruft sich die Politik beim Zwei-Grad-Ziel? Gaia, München: Oekom Interdisciplinary Journal 19 (2010), 3, see: <http://bit.ly/p5zm5J>. Accessed 17 Aug 2011
- Müller-Jung, J (2009) Warum sollten maximal zwei Grad die Welt retten? Online article of Frankfurter Allgemeine Zeitung. <http://bit.ly/oyXbWK>. Accessed 17 Aug 2011
- Rat für Nachhaltige Entwicklung (2011) Der Deutsche Nachhaltigkeitskodex. Online documentation on <http://bit.ly/gn0M0A>. Accessed 17 Aug 2011
- Rat für Nachhaltige Entwicklung, Geschäftsstelle (2010) Nachhaltigkeits-Indikatoren zur Messung der gesamtwirtschaftlichen Entwicklung. Gutachten an den Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung zum Bericht der Stiglitz-Sen-Fitoussi-Kommission, online document. <http://bit.ly/o8Tlpm>. Accessed June 26 2012
- Osterhammel J (2010) Die Verwandlung der Welt. Eine Geschichte des 19. Jahrhunderts. C.H. Beck, München
- Polanyi K (1978,1944) The great transformation. Politische und ökonomische Ursprünge von Gesellschaften und Wirtschaftssystemen. Deutsche Übersetzung der Originalausgabe von 1944. Suhrkamp Taschenbuch Wissenschaft, Frankfurt
- Radkau J (2011) Die Ära der Ökologie. C.H. Beck Verlag, München
- Schneider SH, Semenov S, Patwardhan A (2007) Assessing key vulnerabilities and the risk from climate change. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE (eds) Contribution of working group ii to the fourth assessment report of the intergovernmental panel on climate change. Cambridge University Press, Cambridge/New York, pp 779–881
- Speth GJ (2005) Red sky at morning: America and the crisis of the global environment, 2nd edn. Yale University Press, New Haven
- Stiglitz JE, Sen A, Fitoussi J-P (2009) Measurement of economic performance and social progress. Online document <http://bit.ly/JTwmG>. Accessed June 26 2012
- WBCSD (2010) Vision 2050. The new agenda for business. World Business Council for Sustainable Development. <http://bit.ly/q6Qb5U>. Accessed 17 Aug 2011
- WBGU (2011) Welt im Wandel. Gesellschaftsvertrag für eine Große Transformation. WBGU, Berlin
- Weitzmann M (2009) Additive damages, fat-tailed climate dynamics and uncertain discounting. Economics 3(39)