Critical factors for disaster resilience in the context of sustainable development – lessons from the 11 March 2011 disaster in Tohoku, Japan.

Many significant lessons can be learned from sudden, high-impact events such as the disaster in Japan in 2011. Among the valuable lessons learned from research and discussions after the disaster the following points stand out in terms of sustainable development, good governance, and resilience:

Multi-stakeholder/multi-level governance with meaningful participation and a pro-poor and vulnerable approach for agile, flexible and effective social/political support through better coordination, utilisation of social ties and local knowledge, and access to information and information sharing.

Decentralized governance and diversified infrastructure which empowers people to make decisions based on expertise – especially in the critical response phase. This requires support for capacity development to enable recognition and response to emerging risks and sudden events, and to support continuity of critical systems such as energy, water and transportation as appropriate to the context.

Financial support for risk reduction, vulnerability alleviation, and disaster recovery
Insurance, recovery funds, and access to resources in an emergency require for timely and effective recovery from disaster and the building of a resilient society.

(Hayashi et al. forthcoming)

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Rio+20 Towards and Beyond

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IGES Proposal for Rio+20

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Building resilience and reducing risk from natural disasters: Essentials of 21st century sustainable development

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Key Messages

01 Developing resilience to disasters needs to be at the forefront of sustainable development, and is a subject that will take on ever increasing significance in the shadow of ongoing urbanisation, unsustainable resource use and development patterns, and a changing climate.

02 Resilience to natural disasters can be enhanced by addressing the underlying factors that contribute to vulnerability – namely poverty, inequality, and environmental degradation, and by preparing for and reducing the potential impacts.

03 Economic development alone does not lower the level of vulnerability or risk, while damage from disasters in the context of climate change and unsustainable development threatens development gains, particularly among the most vulnerable populations.

04 Incorporating resilience thinking into sustainable development planning will better prepare societies to mitigate, prepare for, and respond to disasters. In order to build back better recovery should be aligned with development plans which include risk reduction, thereby mitigating exposure to future hazards; in reality this unfortunately does not often occur.

05 Local level stakeholders must be actively engaged and accorded responsibility in disaster risk reduction, crisis management and developing recovery plans – ideally before a disaster occurs. In terms of sustainable development this aligns with the subsidiarity principle, and is based on multi-stakeholder and multi-level governance with meaningful participation and access to information.

Resilience in the International Framework for Sustainable Development

As a contribution to the Rio+20 process this Issue Brief highlights *resilience* and sustainable development by drawing on the knowledge on natural hazards and disasters gained from governments, researchers and other stakeholders.[*1] The terms *resilience, vulnerability* and *adaptive capacity* are used daily, but take on specific definitions and functions within the social and natural sciences. Our approach in this Issue Brief is to cast "resilience" in a socio-political light within the context of sustainable development, as in the Hyogo Framework for Action 2005-2015 (the only international agreement on disasters and risk): *"[Resilience is] the capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organising itself to increase this capacity for learning from past disasters for better future protection and to improve risk reduction measures[*2]"*. Other international processes have also embraced resilience as a critical concept for sustainability, notably the IPCC in their approach to climate change adaptation[*3]. In the discourse under the international framework for sustainable development, resilience and the associated concept of vulnerability have been increasingly used as tools to decipher the complex relationships between social and ecological systems, as well as reveal connections between diverse topics – particularly in the context of hazards and disasters. In other words, the concept of resilience has become a lens through which we can better view how aspects of natural and social systems interact to enable sustainability[*4]. However, despite this recognition by high-level institutions, it has spawned little real action in policy and practice at the national and local levels[*5].

Given our understanding of climate change and the effects it has on the environment and society, alongside ongoing environmental degradation and the realisation that disaster-related damage is rising as a by-product of development[*6], it is important for the significance of resilience to be fully realized at all levels, both for sustainable development and within the context of the Rio+20 process.

Resilience, disasters, and the sustainable development process

Resilience has become a useful concept for describing the components that support the sustainability of social, environmental, and economic systems in the face of sudden shocks and prolonged stresses.[*7] Within social and economic systems, resilience can be enhanced by reducing risk and the underlying factors that contribute to vulnerability – in particular poverty, inequality, and environmental degradation, preparing for and mitigating the potential effects of disasters, and supporting a timely recovery[*8] that builds back better.

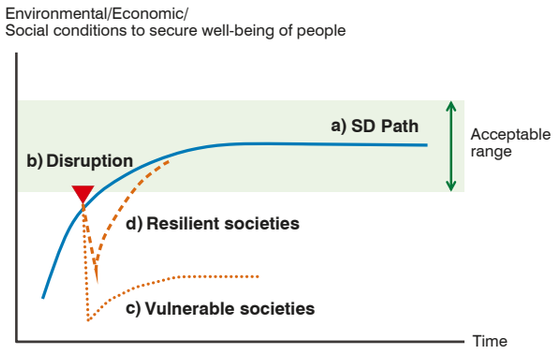
Resilience thinking also means creating the enabling conditions for addressing vulnerability and capacity issues while providing effective financial and political support for emergency responses and recovery.

IGES Position on Resilience and Sustainable Development

A resilient society has the adaptive capacity and robustness to absorb shocks and stresses while maintaining functionality, and over time staying on the path to sustainable development. Sudden extreme events can squander past achievements and delay sustainable development.

Being a richer or rapidly developing society does not necessarily mean reduced vulnerability, and it's always the poor that are saddled with a disproportionate share of risk. Vulnerability is not necessarily mitigated simply though economic development. In the context of globalisation climate change and unsustainable development will contribute to increasingly frequent extreme events with deepening global implications in the form of natural disasters and economic crises. A resilience mindset needs to take root simultaneously within national development plans and through community engagement, local empowerment, and meaningful public participation.

Source: Based on Institute for Global Environmental Strategies (2011). "The IGES Proposal for Rio+20 –Version 1.0." Inputs to the compilation document of the outcome document of Rio+20. Hayama, Japan.



a) SD Path aims to attain acceptable conditions of environment/ economy/society.
b) Disruption from a natural or manmade hazard to development gains.
c) Vulnerable societies are more severely damaged, and are difficult to recover.
d) Resilient societies mitigate shocks, and smoothly recover.

Developing resilience alone does not insulate sustainable development pathways from disasters, but it does reduce risk and enables a swifter response and recovery which will better secure development gains and protect lives.

As with sustainable development, for any measures taken to be truly meaningful and sustainable they inherently rely on good governance principles, and in the context of natural hazards and disasters—in particular as demonstrated by IGES research on northern Japan following the magnitude 9.0 earthquake and tsunami in 2011[*9]—critical factors enabling resilience, especially recovery, can be found by looking closely at how national and local level systems cooperate, and just as importantly, the interrelations existing at the local level.

If we consider policies on disasters, which normally comprise the elements of (1) risk reduction, (2) preparedness, (3) response, and (4) recovery, over the past decade they have shifted towards emphasizing (1) — *risk reduction*. In many cases (1) has proven to not only be achievable but also cheaper than the cost of response and recovery, (3) and (4)[*10]. While traditionally there was an overreliance on preparedness and response to disasters, changing the focus to risk reduction and developing resilience does more to prevent potential hazards from becoming disasters. Aligning the recovery phase (4) with development planning and risk reduction measures further strengthens the affected society to future hazards. *Redundancy* is another key player in social systems—multiple components within a system fulfilling a similar function reduce the risks inherent when one solitary component crashes. For example, multiple options for generating or accessing electricity or water after a disaster enables stakeholders to much more quickly and smoothly respond and recover. Recovery from a disaster can be delayed due to protracted relief operations, which can also undermine resilience. Avoiding temporary relief conditions from becoming the long-term norm requires linking recovery with development and disaster reduction strategies[*11]. This accords with the "build back better" principle, to which we can add recovering functionality as a core component.

Recovery and resilience: *Housing and debris management in Tohoku, Japan and Port au Prince, Haiti*. For a society to be considered resilient it doesn't need to have the ability to withstand every disaster; it should, however, be able to recover functionality quickly, and ideally also reduce the vulnerabilities that resulted in the disaster's initial occurrence. Even with the help of hi-tech infrastructure and warning systems to reduce casualties, in the aftermath survivors are often not able to quickly rebuild their livelihoods. For Japan, technology and preparedness alleviated much of the infrastructural damage and casualties, but the lack of capacity to cope with the resultant debris – in particular those affected by nuclear radiation - and replacement of livelihoods exposed vast holes in the system of governance. Haiti lacked both advanced infrastructure and sufficient governance, and two years later is still only slowly being rebuilt.

Governance and resilience

Synergies between good governance, sustainable development, vulnerability, and disaster risk reduction are well known[*12], and to bolster resilience as described in this paper this means multi-stakeholder[*13] and multi-level governance with meaningful participation from the local level[*14] and access to information[*15]. *Local* refers to not only governments but also community leaders and organisations that can be engaged for disaster risk reduction, crisis management and developing recovery plans – ideally before a disaster occurs. In terms of sustainable development this aligns with the subsidiarity principle, with governance arrangements and responsibilities directed towards the lowest or least centralised competent authority. In a disaster situation the primary response is from local-level actors as they are also most likely to understand the needs and the extent to which they can be met by the available capabilities. The central government's role is to construct a supportive policy framework and handle tasks that sub-national or local levels cannot take on, such as coordination and communication with domestic and international stakeholders before and during a disaster, as well as develop capacity and support up-to-date information sharing and multi-level responses. In this way the central government plays a supportive role to the local level rather than trying to make up for a lack of community capacity during a disaster[*16]. Redefined, this system of governance is less centralized, more flexible and more capable - crucial aspects to the adaptive capacity of societies and their long-term resilience[*17]. Nurturing these traits within a given governance system requires honest appraisals of institutional arrangements based on sound research and analysis. Given that climate change will "turbo-charge the disaster risk–poverty nexus, drastically increasing disaster impacts on the poor and resulting poverty outcomes"[*18], developing resilience to disasters needs to be at the forefront of sustainable development, and is a subject that will take on ever increasing significance in the shadow of ongoing urbanisation, unsustainable resource use and development patterns, and a changing climate.