



Talking Points



Development in the Anthropocene

The role of resilience

GRAID
At Stockholm Resilience Centre

Funded by the Swedish International Development Cooperation Agency (Sida)
through GRAID at Stockholm Resilience Centre

GRAID talking points series May 2016 – Development in the Anthropocene: The role of resilience

A publication of the Stockholm Resilience Centre

This report has been produced as part of the Guidance for Resilience in the Anthropocene: Investments for Development (GRAID) Programme funded by the Swedish International Development Cooperation Agency (Sida).

Cover image: T. Hermansson/Azote

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Development in the Anthropocene: the role of resilience

A new paradigm: the Anthropocene

The scale of the human enterprise on Earth is now so large that a growing amount of scientific evidence indicates that Earth has entered a new geological epoch, the Anthropocene. The Anthropocene – the age of humans – signals a major shift in the Earth system, where we, humanity, now constitute the largest force of change on the planet. A wide range of social, ecological and economic measures show an exponential increase in social and economic development on one hand and environmental impact on the other, largely since the 1950s – a single human lifetime. This has become known as the Great Acceleration of the human dimension on Earth.

The Great Acceleration has generated phenomenal social and economic development and significant improvements in human wellbeing for many, yet poverty and increasing inequality continue to be a major challenge. Moreover, this gain in wellbeing and development has come at an increasing cost to other aspects of our planet, including our oceans, the climate, water quality, and the operation of the biosphere as a whole. The pervasive imprint and the speed and connectivity of human actions is now so great that critical planetary boundaries are being challenged. Beyond these boundaries lies a greater risk of crossing tipping points in the Earth system. If crossed, this will severely challenge future development for humanity and possibly the stability of the Earth system as a whole.

What does the Anthropocene mean for development?

The Anthropocene changes how we must think about our world and the planet we live on. It has profound implications for development. These implications are emerging rapidly as we understand the full scale of human dimension, long-term consequences, and risks to Earth's biosphere – the living part of Earth within which humans and our societies are embedded. Recent evidence has highlighted three novel challenges that the Anthropocene introduces: (1) *Complexity*: a new level of truly intertwined and inseparable social and ecological systems, (2) *Teleconnections*: people are increasingly connected from local to global scales, and (3) *Surprise*: rapid, widespread and often abrupt change dominates the planet.

The Anthropocene truly represents a full world, where everyone is in everyone else's backyard, and where changes in one part of the world ripple quickly and slowly through regions, connecting across scales and often landing in far distant places. Examples of this ripple effect were evident in the global and regional consequences of Arab Spring, the impacts of El Nino, and the recent global financial crisis. The Great Acceleration has resulted in an interconnected global culture with new cross-scale interactions connecting people and places in new ways. Social conditions, health, culture, democracy, power, justice, equality, matters of security, and even survival are interwoven with the biosphere – in a grand panorama of local, regional and worldwide dependencies. This is the Anthropocene Effect and ignoring it is one reason development projects fail.

In the Anthropocene, escalating ecological changes interact with the large social and economic changes driving feedback loops, triggering abrupt change, turbulence and increased exposure to risk. Examples of interactions include ecosystem degradation and climate change impacts on human health; or shifts in climate and agriculture and their resultant impacts on rural exodus and urbanization. Such complex interactions may result in surprises - situations in which the behaviour in a system, or across systems, differs qualitatively from expectations or previous experiences. The Anthropocene will increasingly be characterized by surprise and turbulence. These dynamics and changes are linked to rapid shifts e.g. coastal storms or political turbulence, as well as gradual changes like the accumulation of pollutants, habitat loss or behavioural change.

These gradual changes are critical as they often accumulate and once past a certain point can lead to tipping points with rapid and often irreversible change. The gradual changes tend to go unnoticed until the actual shift happens, often occurring as a surprise without the possibility of early warning or mitigation. Examples of surprises include sudden droughts or pest outbreaks that challenge food and water security, as well as forced environmental migration and zoonotic disease emergence and re-emergence.

Despite humanity's increasing cognitive disconnection from the natural environment, our dependence on the environment remains inseparable, deeply intertwined and complex. From basic resources, like food and water, to the spiritual, aesthetic, and cultural dimensions of our commune with nature, the planet's forests, oceans, coral reefs, grasslands and other ecosystems continue to underpin our future in the Anthropocene. However, the Earth's ecosystems have started to show signs of fatigue, not only at local levels, but regionally and globally. More than half of the planet's ecosystem services that support human well-being have been assessed as degraded or used unsustainably. The scale, connectivity, and speed of human actions is challenging the resilience of the biosphere that we are part of and dependent on for human wellbeing.

Addressing poverty and inequality, and advancing human well-being remains a major ambition and challenge for the 21st century, but it now needs to take into account that development needs to happen in the context of the Anthropocene – an increasingly complex, dynamic and hyper-connected world characterized by accelerating climate change, political turbulence, financial instability and growing pressures on fisheries, forests, freshwater, other natural resources.

Resilience as an emerging avenue

The concept of resilience is increasingly seen as a possible avenue to address development in the Anthropocene. Resilience is receiving interest across a number of communities and sectors. From psychology and human development to ecology and ecosystem science, resilience is found in studies on technology, networks, the welfare state, regional development, globalization, international relations, politics, organisational development, social innovation, management, education research, communication, building research, planning and urbanization, crime, health, risk and disaster management, national security and climate change.

Resilience has become part of practice, policy and business across the world, ranging from poverty alleviation to political frameworks and business strategies to anticipate and respond to change and crisis, not only to survive, but also to evolve. For example, resilience approaches have played a central role in the governance of the Great Barrier Reef, Australia and in assessments of the future of the Arctic. Resilience is part of stewardship of diverse landscapes and seascapes from water managers and farmers to municipalities and urban planners.

In some fields the term resilience has been used in a narrow sense to refer to the return rate to equilibrium upon a perturbation. These fields tend to interpret resilience as bouncing-back after disturbance, or recovery to what you were before in more general terms. Viewed from this lens, there is often an implicit focus on trying to resist change and control it to maintain stability, to maintain status quo. The resilience approach used at the Stockholm Resilience Centre is more encompassing. It deals with complex dynamics of social-ecological systems and true uncertainty and how to learn to live with change and make use of it.

In popular terms, resilience is having the capacity to persist in the face of change, to continue to develop with ever changing environments. Resilience includes both adaptation, which refers to human actions that sustain development on current pathways, as well as transformation, which is about shifting development into other emergent pathways and even creating new ones. This approach is the focus of GRAID and other programs housed at the Stockholm Resilience Centre, emphasising the dynamic and forward-looking nature of the concept.

The role of resilience in development

The role of resilience in development is a rapidly expanding arena. New knowledge, evidence and methods are still evolving, driven by programs such as the Global Resilience Partnership and GRAID. A number of key features of resilience as an approach to development are emerging through work at the Stockholm Resilience Centre. They have a role to play in informing innovations and new frontier programs such as the Global Resilience Partnership.

Resilience adds to the current thinking and frameworks used by sustainable development programs and investments in three key ways:

Beyond sustainability

While sustainable development recognizes three pillars of sustainability: social, economic and ecological, it still largely treats these as separable – maximizing socio-economic development on the one hand, while minimizing environmental impacts on the other. This approach of impact minimization, optimization and efficiency will no longer suffice in the Anthropocene where social and ecological systems are intertwined and connected across scales, where gains in one part of the system can rapidly lead to losses in other parts or times. There is a need to move beyond the reductionist understanding of one way flows of benefits or costs between the environment and society, towards a more intertwined understanding of co-evolved social-ecological systems, their dynamics and feedbacks and their relevance to the development agenda. In the Anthropocene, biosphere-based approaches – approaches that account for the interplay of the human dimension and the global ecological system – are a prerequisite for directing development towards sustainability.

For example food is not merely a flow of calories from soil to mouth but a co-evolved interplay of human preferences, diversity of food sources, strong socio-cultural ties to landscapes and food varieties, food prices and global economic dynamics. Ignoring these complex links. If ignored, these links become decoupled and production goes awry leading to obesity and health challenges threatening some of the recent gains of development.

In fact development should not only not be bad or neutral for the biosphere. Development in the Anthropocene must be good for the biosphere (since we are part of it) – restoring and improving it to increase the opportunity space for development to help a growing population weather future storms. In the Anthropocene, wellbeing, poverty alleviation and global sustainability are intrinsically linked.

Beyond local

Development is no longer about the local scale, as it shifts to recognize, relate to and govern the pervasive cross-scale dynamics of an intertwined planet. Local development is a part of and linked to global dynamics. In the Anthropocene people interact and connect with each other often in unpredictable and unplanned ways and from such interactions broader scale patterns with new properties emerge, which then feeds back on the system and influences the interactions of people.

The resilience of individuals, groups and communities is tightly coupled to global scale drivers and dynamics such as migration, emerging disease, biodiversity loss, climate change, finance flows and trade. In this situation, the focus of development efforts to enhance human wellbeing and overcome poverty need to expand from the poor in local situations in low-income countries to also account for and govern cross-scale and global scale forces shaping development interventions and their outcomes at the local scale. And in turn we need to account for the impacts of development interventions as they ripple across scales and regions.

Beyond persisting

While there is a broad recognition of the need for a new development paradigm that is more universal, sustainable and global (as articulated in the SDGs), much of this work appears to tinker at the edges making small changes and adaptations to current development practice adding to rather than rethinking the development paradigm in the Anthropocene. It is becoming increasingly apparent, however, that improving human wellbeing for all in the Anthropocene in a sustainable manner will require more radical and transformative forms of change. We need to start thinking about development in new ways, beyond coping with and adapting to the changes inherent in the Anthropocene, to capacities to *transform* and actively shape change and thrive from change.

Transformability has been defined as “the capacity to create a fundamentally new system when ecological, economic, or social structures make the existing system untenable”¹. Transformability is about shifting development into new pathways and even creating novel ones. Crises can open up space for transformations, for new ways of thinking and operating.

The resilience approach to transformations is less about planning and controlling, and more about preparing for opportunity or creating conditions of opportunity for navigating the transformations. This approach allows the identity of the new social-ecological system to emerge through interactions of individuals, communities, and societies and their interplay with the biosphere at different scales. It concerns encouraging arenas for safe-to-fail experimentation, facilitating transformative experiments at small scales and allowing cross-learning and new initiatives to emerge and spread across levels and scales. Such initiatives should be constrained only by avoiding undesirable trajectories, especially those with known or suspected thresholds that challenge the capacity to sustain societal development and human well-being as part of a dynamic biosphere.

¹ Folke, C., S. R. Carpenter, B. Walker, M. Scheffer, T. Chapin, and J. Rockström. 2010. Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and Society* 15(4): 20. [online] URL: <http://www.ecologyandsociety.org/vol15/iss4/art20/>

Opportunities in the Anthropocene

While the Anthropocene certainly poses several challenges for development, it also offers many opportunities for addressing many of the urgent development and sustainability needs facing the planet. The shift from perceiving people and nature as separate parts that occasionally interact, to seeing them as intertwined social-ecological systems, sometimes across the whole planet, provides exciting opportunities for development in tune with the biosphere – a biosphere-based development paradigm. Similarly, adopting a transformations lens focused on finding ways to erode pathological system trajectories, and target the roots of the problems and not only their symptoms, offers pathways to properly addressing poverty and inequality problems that continue to exist in the Anthropocene.

GRAID - Guidance for Resilience in the Anthropocene: Investments for Development is a programme hosted by the Stockholm Resilience Centre and is funded by the Swedish International Development Cooperation Agency (Sida).

The Stockholm Resilience Centre advances research on the governance of social-ecological systems with a special emphasis on resilience - the ability to deal with change and continue to develop.

The Stockholm Resilience Centre was established on 1 January 2007.

The centre is a joint initiative between Stockholm University and the Beijer International Institute of Ecological Economics at The Royal Swedish Academy of Sciences. The centre is funded by the Foundation for Strategic Environmental Research, Mistra.

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