

See discussions, stats, and author profiles for this publication at: <http://www.researchgate.net/publication/238722280>

Climate Change and the Global Financial Crisis

ARTICLE

CITATIONS

2

DOWNLOADS

58

VIEWS

37

3 AUTHORS:



[Robin M. Leichenko](#)

Rutgers, The State University of New Jersey

46 PUBLICATIONS 1,505 CITATIONS

[SEE PROFILE](#)



[Karen O'Brien](#)

University of Oslo

53 PUBLICATIONS 2,336 CITATIONS

[SEE PROFILE](#)

[William Solecki](#)

City University of New York - Hunter College

84 PUBLICATIONS 1,283 CITATIONS

[SEE PROFILE](#)

Climate Change and the Global Financial Crisis

Robin Leichenko, Karen O'Brien and William Solecki

Key words: climate change, globalization, financial crisis, double-exposure

Climate change and globalisation are weaving together the fates of households, communities, and people across all regions of the globe. Both processes are creating growing risks and uncertainties about the future. Both are also enhancing connections across space and time, such that actions taken in one locale have increasingly visible effects on other locales, often in ways that are hard to predict. This article explores connections between these two global processes through an investigation of linkages between climate change, world financial markets and the current financial crisis that emerged with the collapse of the global housing market in 2008.

Building from the framework of double exposure (see Leichenko and O'Brien 2008), we show how the fallout from the financial crisis has intersected with climate related risks in many areas. In particular, we explore how the globalisation of financial markets and climate change are intersecting to create new types of inequalities and vulnerabilities, undermining local capacity to adapt to climate change. Yet while interactions between climate change and globalisation are creating new threats to human security, they may also be creating new opportunities for action (Leichenko and O'Brien 2008). In the case of the financial crisis, we show how responses to this crisis can open up new opportunities for positive actions that reduce risks associated with both the process of climate change and the globalisation of financial markets.

We first describe the basic elements of the double



Copyright Locksley.net.com

exposure framework and consider how the framework may be applied to assess interactions between the global financial crisis and climate change. We then highlight the implications for climate change vulnerability and adaptation, concluding with a discussion on how the recognition of the linkages and feedbacks between the two processes can contribute to a more resilient and sustainable future.

The Double Exposure Framework

As described in Leichenko and O'Brien (2008), the double exposure framework provides a general approach for the analysis of many types of environmental change and globalisation interactions. The framework's premise is that multiple global change processes are occurring both simultaneously and sequentially, creating either negative or positive outcomes for individuals, households, communities and social groups. Within the framework, global environmental change and globalisation manifest as either gradual or sudden changes such as stressors or shocks, that have differential effects across a particular exposure frame. Depending of the focus of the research, an exposure frame might be, for instance, a spatial, political or ecological region, an economic sector or a network of institutions. Exposure results in measurable outcomes, which may, in turn, affect the processes as well as the context in which future changes are experienced.

In each case, exposure to global change processes is influenced by the characteristics of the change (direction, rate, magnitude, intensity, and spatial extent) and by factors in the contextual environment (institutional, economic, social, political, biophysical, cultural and technological conditions). Responses, which may include actions taken either in anticipation of exposure or following it, are conditioned by factors in the contextual environment as well as by the individual attributes of each affected actor (wealth, political access, social capital).

Outcomes depend on both the degree of exposure to each global process and on the response taken by the affected individuals or other actors (see Leichenko and O'Brien 2008 for a full description of the framework and terminology).

Figure 1 provides a simple illustration of the main components of the double exposure framework.

Processes of global environmental change and globalisation are represented as partially overlapping triangles, which manifest in a specific contextual environment, portrayed as an oval. The extent or magnitude of exposure to the processes is depicted as the intersection between the triangles and the oval.

Responses to the processes are represented by an arrow leading from the contextual environment to a square representing outcomes. Outcomes, in turn, are depicted as separate from the contextual environment to emphasise that any outcome reflects measurable conditions at a specific point in time.

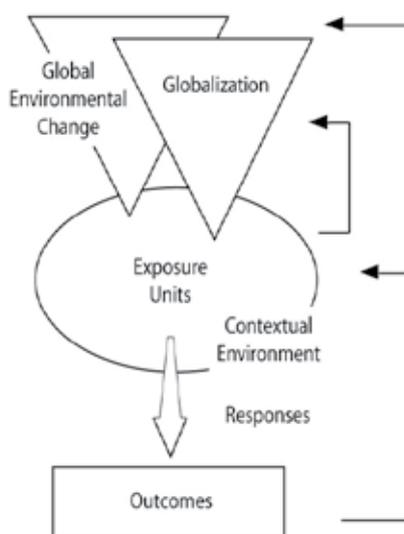


Figure 1. The Double Exposure Framework (adapted from Leichenko and O'Brien 2008)

The framework also incorporates dynamic linkages between the components, for processes may alter the contextual environment, responses may affect the processes, outcomes may affect responses, and so forth. Dynamics are also incorporated in the framework through the recognition that processes and outcomes are often reflexive. Within the figure, these types of circular linkages, which we term “feedbacks”, are depicted by the arrow leading from responses and outcomes back to the process triangles. Although the figure focuses on a single exposure frame, it is important to note that outcomes and responses occurring within one exposure frame may have widespread influences on other exposure frames both across space and over time. By emphasising the dynamic interactions between processes, responses, and outcomes, the framework aims to elicit new insights and research questions beyond those associated with separate framings of each global change process.

The Global Financial Crisis and Climatic Risk

The interaction between the current, ongoing global financial crisis and different types of climatic risk provides a useful example, illustrating some of the key facets of the double exposure framework. The financial crisis, similar to most large scale disaster events, reveals underlying conditions that were hidden prior to the event, along with conditions that were quite apparent, albeit only in hindsight to some. The crisis began as a result of high rates of loan default among subprime mortgages within selected United States housing markets, but quickly spread to other locations and sectors. As with most disasters, the financial crisis can be attributed to multiple factors. There was undoubtedly human error and bad judgment involved, and perhaps even criminal behaviour. Nevertheless, the globalisation of financial markets, the deregulation of the financial industry and the global marketing of mortgage-backed securities were key factors that promoted these risk taking behaviours. This transfer of financial risk across both space and time created a pathway for the crisis to extend beyond the confines of any local, regional or national origins.

Is it possible to identify numerous connections between the climate crisis and the global spread of financial risk. For example, the globalisation of finance contributed to increased availability of low interest rate loans, or “cheap” money, which in turn promoted urban development and automobile oriented urban sprawl in environmentally sensitive areas throughout the world (Leichenko and Solecki 2005; Leichenko and O'Brien 2008). These types of development pat-

terns not only contribute to accelerated rates of greenhouse gas emissions, but also increase vulnerabilities to many types of extreme climatic events including hurricanes, wildfires and droughts. Although climate variability, in itself, is considered a ‘normal’ risk, increasing global temperatures are likely to lead to increased climate variability and more extreme events, including a lessened predictability of weather and more droughts, storms and floods in some areas.

Another type of link between the financial crisis and climate risk is manifest through changes in the property insurance industry. Areas that are subject to hurricanes, fires and other weather related risks face higher premiums or a complete elimination of private coverage options. These changes in insurance practises may create new types of risks and uncertainties, which, in some cases, may require new responses and tools on the part of households, communities and local governments. We further illustrate some of the connections between climate change and financial crisis in the brief example below.

Climate change vulnerability and the financial crisis: California’s Central Valley

California is the largest farm producer in the United States, producing nearly half of the country’s fruits, nuts and vegetables. According to Roland-Holst and Kahrl (2008), the agricultural sector, including the direct, indirect, and induced linkages, contributed to an estimated 6.5 percent of the state of California’s value added in 2006. Most high value agriculture in California requires irrigation although much of the state is subject to drought. In the case of California’s Central Valley, a three-year drought has recently devastated many agricultural communities. Farmers have responded to the lack of rain and to limited availability of other state or federally supplied water by fallowing fields and planting low maintenance, low labour crops (McKinley 2009). The drought has contributed to unemployment and increased food prices.

Among the most vulnerable to the negative economic impacts of the drought are field workers, processing handlers, food packers, truckers and those working in services linked to agriculture as well as the local businesses that serve on these various groups. Although the drought is not necessarily reflective of climate change, it is nonetheless representative of the types of conditions that may occur more frequently as the climate changes. Broadly speaking, the implications of climate change for water availability in California and the US Southwest are not promising, and it is likely that agriculture in the Central Valley will have to adapt to new and more complex conditions (Roland-Holst and Kahrl

2008). In many instances, climate change adaptation is likely to require financial resources that go above and beyond ‘normal’ maintenance expenses. This is especially true in the case of water infrastructure, where adaptation requires increasing the resilience of water supply systems to extreme climate events. Other options, such as more efficient water allocation, will require a review of regulatory approaches, including systems of legacy entitlement and public/private cost sharing (Roland-Holst and Kahrl 2008). Yet drought and climate change are not the only crises facing farmers in the Central Valley. The collapse of the housing sector in the Central Valley as well as other parts of the state has directly impacted credit markets and local economies, contributing to a state-wide financial crisis.

Many households and communities in the Central Valley are “double exposed” to both climate extremes and financial shocks, with the outcomes of the two shocks reflecting far more than just additive effects.

The state has a limited capacity to intervene, both because it cannot raise property taxes due to institutional and legal constraints and because there are few funds available for social services that might benefit vulnerable populations. In the Central Valley, median sale price of homes has plummeted, and there are thousands of foreclosures on the market. Local housing markets are not expected to recover until these foreclosures have been absorbed (Streitfeld 2008). Many households and communities in the Central Valley can be considered “double exposed” to both climate extremes and financial shocks, with the outcomes of the two shocks reflecting far more than just additive effects. The interactions between the two processes that are highlighted by the double exposure framework include:

- Overlapping outcomes, for example, households are impacted by unemployment and higher food prices linked to drought, as well as to a loss of shelter and equity linked to the housing and financial crises;
- Changing contexts for responding to shocks, for example, farmers are unable to borrow money from banks for investments in high value, drought-tolerant and water efficient crops, and homeowners are unable to find second jobs to meet higher mortgage payments due to unemployment;
- Feedbacks between the two processes, for example, the economic impacts of drought exacerbate the effects of the financial crisis and vice versa.

Conclusion: Identifying Positive Synergies

Although the double exposure framework shows how the environmental change and globalisation interact to increase inequality and vulnerability, it also suggests that there may be synergies between the two processes. The potential for positive connections between responses to the financial crisis and the climate crisis have not gone unnoticed. There is increasing recognition, articulated by US President Barack Obama, UNEP Executive Director Achim Steiner, journalist Thomas Friedman, and others, that the solution to the financial crisis and climate crisis go hand in hand. Efforts to transform energy systems and dramatically reduce greenhouse gas emissions can create new jobs and a better environment. With reference to the social and economic programs enacted by Franklin D. Roosevelt during the Great Depression of the 1930s, the idea of a Green New Deal has been sounded as a way to simultaneously address the financial crisis, the climate crisis and the energy crisis. One specific solution offered by the UK based Green New Deal Group (2009) calls for reregulating finance and taxation while at the same time drastically reducing the use of fossil fuels.

Efforts to transform energy systems and dramatically reduce greenhouse gas emissions can create new jobs and a better environment.

In the UK, decarbonising the economy involves increasing energy efficiency while developing combined heat and power systems and renewable energy for millions of homes and buildings. Such efforts would need to be backed by a strong legislative framework and price signals from the market that accelerate the development of low-carbon technologies, such as through the retrofitting of buildings to improve energy efficiency and the development of alternative energy sources.

The idea of simultaneously addressing both the financial crisis and climate crisis through a combination of government regulation and free market incentives is aimed at both transforming energy systems and creating new jobs. As such, it represents an innovative and transformative strategy. However, what is left out of this Green New Deal is attention to the myriad of underlying factors that make people vulnerable to the interacting shocks in the first place. The concept of adaptation, which involves strategies or behaviours that reduce the impacts of a particular shock or stressor, is generally absent from “green new deal” or “green revolution”

thinking. The social programmes that went hand in hand with economic programmes during the Great Depression, for example, are necessary to increase resilience to both financial and climatic changes, but are not addressed through the currently proposed solutions.

Both economists and climate scientists warn that dramatic changes are underway, and that many individuals, households, communities, sectors, and regions will be confronted with impacts in the future, whether through shifts in investments and sectoral upheaval, or through more extreme weather events. The double exposure framework shows that addressing the processes by, for example, controlling global financial markets with regulations and incentives or reducing climate change through a reduction in greenhouse gas emissions, is necessary but not sufficient. There is an urgent need to address the underlying context that makes people vulnerable to shocks and to simultaneously deal with the uneven outcomes that contribute to increasing inequality.

AUTHORS

Robin Leichenko, Associate Professor and Graduate Director, Department of Geography, Rutgers University, Piscataway, New Jersey, USA
rleichen@rci.rutgers.edu

Karen O'Brien, GECHS Scientific Chair and Professor, Department of Sociology and Human Geography, University of Oslo, Oslo, Norway.
karen.obrien@sosgeo.uio.no

William Solecki, Professor, Department of Geography, Hunter College, New York and Director, CUNY Institute for Sustainable Cities, NY, USA.
wsolecki@hunter.cuny.edu

REFERENCES

- Green New Deal Group. 2009. A Green New Deal: Joined-up policies to solve the triple crunch of the credit crisis, climate change and high oil prices. First Report of the Green New Deal Group. Available online at <http://www.neweconomics.org/gen/uploads/2ajogu45c1id4w55tofmpy5520072008172656.pdf>
- Leichenko, Robin and Karen O'Brien. 2008. Environmental Change and Globalization: Double Exposures. New York: Oxford University Press.
- Leichenko, Robin and Solecki, William D. 2005. Exporting the American Dream: The Globalization of Suburban Consumption Landscapes. *Regional Studies* 39.2: 241-253.
- McKinley, Jesse. 2009. Drought Adds Hardships to California. *New York Times*, February 21, 2009.
- Roland-Holst, David and Fredrich Kahl. 2008. California Climate Risk and Response: Executive Summary. University of California at Berkeley. Report available at www.next10.org.
- Streitfeld, David. 2008. In the Central Valley, the Ruins of the Housing Bust. *New York Times*, August 24, 2008.