# Make supply chains climate-smart, Nature Commentary says

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Extreme weather events like super-typhoon Haiyan and hurricane Sandy can have major negative impacts on the world economy. So far, however, the effects on global production and consumption webs are missing from most assessments. This is a serious deficit, argues Anders Levermann from the Potsdam Institute for Climate Impact Research: "World markets as well as local economies are highly interlinked and rely on global supply chains—adaptation therefore requires a global perspective, not just a local one."

In a *Nature* Commentary he proposes a community effort to collect economic data on the new website zeean.net. The aim is to better understand economic flows and to thereby induce a transformation of our supply chains into a stable, climate-smart network that renders our societies less vulnerable to future climate impacts.

"Storms, floods or droughts in one place can have considerable effects all around the world," Levermann explains. "Take for instance the devastating flood in Thailand in 2011: The local impact was calamitous. Its effect on hard-disk production made it also a global event causing a worldwide shortage for months afterwards." Flows of materials, communication and energy, their interactions and market dynamics can be subject to climatic extremes – directly but also indirectly via their supply chains. "If the associated risk and vulnerability to climate impacts is to be included into the planning of companies or public institutions, the first step is to identify the vulnerable bottlenecks of our global supply networks," Levermann says.

# Open data and open source algorithms

With the newly launched website zeean.net Levermann aims to kick-start a community effort to generate a global economic networks database of unprecedented comprehensiveness. In order to study the impact of climate extremes, highly detailed information is needed. Similar to the architecture of Wikipedia, any registered and vetted user of zeean.net can enter data about flows between different regional economic sectors, while each piece of information posted will be cross-checked and validated by other users to assess the input quality. The idea is to instigate a community that creates a system of checks-and-balances towards high accuracy of the data. Only open sources will be used and only open source algorithms and analysis tools will be employed to ensure maximum transparency and traceability.

So far, only few research groups around the world compile and use supply chain data. Zeean.net will built on the work of Australian researchers from the University of Sydney, providing information on economic flows between 26 sectors in 186 regions of the world during the past 23 years. With each piece of valid information added, zeean.net will become more accurate and comprehensive, while users see a network evolving that depicts the connectivity of supply chains and enables to identify fragile links. Eventually, the economic data is to be combined with probability assessments of future climate extremes from global and regional climate impact models.

"Our growing insight into climatic extremes needs to be complemented with increasing knowledge about the flows of resources, goods, energy and information that keep our societies running", Levermann says. "Making this information public might induce self-organized dynamics in our global supply network and will hopefully make our economies more resilient against future climate extremes."

**More information:** Levermann, A. (2014): Comment: Make supply chains climate-smart. *Nature* 506, 27-29.

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