Thoughts on Addressing Short-term Pressing Needs in a Dynamic and Changing Climate

By Gary Yohe, Woodhouse/Sysco Professor of Economics, Wesleyan University

Commentaries were commissioned by the World Resources Report to react to the Expert Perspectives series. This commentary responds to **Question 2: How can we balance today's pressing needs with long term risks?**

I write in response to five papers that were, in turn, written to respond to a specific but very broad prompting question:

How can public officials, especially in low income countries, address today's short-term pressing needs while preparing for tomorrow's climate-related impacts and surprises?

Taken together, the papers offered a wide range of perspectives. Detlef Sprinz offered an international adaptation court as the implementing agency for a transparent program to develop political, social and economic infrastructure that would be funded on the principle of responsibility (for climate change). Carolina Zambrano-Barragán outlined a framework that would be flexible, based on improving knowledge and information, would consider portfolios of options and employ strong leadership to implement favored responses to short-term issues as long-term context evolved. Ajaya Dixit focused on Nepal and, among other things,

highlighted that Nepal is an IPCC "white spot" for which data and scientific studies of observed and future climate change are scarce. Mutasim Bashire Nimir and Ismail Elgizouli offered a similarly focused essay for the Sudan; they concluded that tenuous reliance on agriculture given water shortages could be weakened by climate change, but they also warn that other social and economic problems could dominate the future. Andreas Spiegel elaborated on the value of spreading risk through economic mechanisms like insurance and re-insurance, but noted that problems of pricing coverage appropriately were sources of concern, especially in developing countries where resources are scarce.

Unfortunately and with the possible exception of Zambrano-Barragán, none of the authors really confronted the prompting question head on. It therefore seemed appropriate to begin my comments by reflecting on a list of the underlying determinants of adaptive capacity that first appeared in Yohe and Tol (2002). It was offered then as a means to help scholars and practitioners organize their thinking about adaptive capacity at any one place and time. Here, it strikes me that it can help sort through the implications of where these papers might inform a more thorough discussion of the prompting question. The underlying determinants highlighted there include:

1. the range of available technological options for adaptation;
2. the availability of resources and their distribution across the population;
3. the structure of critical institutions, the derivative allocation of decision-making authority, and the decision criteria that would be employed;
4. the stock of human capital including education and personal security;
5. the stock of social capital including the definition of property rights;
6. the system's access to risk spreading processes;
7. the ability of decision-makers to manage information, the processes by which these decision-makers determine which information is credible, and the credibility of the decision-makers, themselves; and
8. the public's perceived attribution of the source of stress and the significance of exposure to its local manifestations.

Spiegel's contribution clearly focused on promoting strength in providing access to risk-spreading mechanisms and offered a description (though not necessarily a complete description) of a global insurance program. Dixit, in noting the "white spot" problem, highlighted the signal to noise issue that weakens decision-makers' abilities to act on credible information and probably severely limits the collection of

available adaptation options (because it is difficult to design suitable responses in an environment for which available data provide neither a signal nor some noise). Nimir and Elgizouli tried to bring national programs targeted to vulnerable sectors to the fore, but the broader context of multiple stresses and interconnectedness through social and human capital was missing. Sprinz fundamentally focused on the budget constraints that developing countries face as they make their development and adaptation decisions. He suggested that investments in programs or projects that have long time horizons will fade on the vine without aid from abroad. Only Zambrano-Barragán offered a framework that spanned many of these determinants.

This relatively stark conclusion about limited coverage across the five papers begs the "So what?" question. I would submit that narrow coverage of the broad context matters quite a bit. Yohe and Tol (2002) drew their list of determinants for adaptive capacity (and mitigative capacity, for that matter - see Yohe (2001)) from the Smit, et al. (2001) assessment of the adaptation literature available at the time of the Third IPCC Assessment. They then extended organizational structure into the more practical realm of the prompting question by conjecturing that the adaptive capacity of any system would, for all intents and purposes, be a function of the weakest of these underlying determinants (or the weakest determinant from any other list of alternative determinants that might be more appropriate for a different context). They recognized that the determinants identified on any such list would not be independent of one another. Nor would the determinants be mutually exclusive; at the very least, they would frequently be highly collinear. Nonetheless, the idea behind the "weakest link" conjecture was attractive. It seemed to make sense that a significant weakness of any single critical component of a system's capacity to cope with the manifestation of an external stress, whether it worked to undermine the strength of a single element on a list of determinants or to undercut the strengths of multiple determinants on such a list, would be the limiting factor of that system's ability to respond to climate change.[1]

Ambiguity across the elements on the list creates problems when it comes to empirical estimation of vulnerability, but it does not undermine the possibility that such a weakest link might describe much of reality. Indeed, it highlights the fundamental reason why the prompting question is so difficult and why providing a holistic answer of the sort offered by Zambrano-Barragán is so important. The suggestions offered by the other authors may increase the strength of one or two

specific determinants, but those efforts could be fruitless if, as may be the case in many circumstances, the weakest link lies elsewhere in governance issues or in the preservation of social or human capital, for example.

More recent analyses of the adaptation problem have added another wrinkle that none of the authors noticed (except Zambrano-Barragán, again, to some degree) by highlighting the obvious conclusion that all responses to climate change will necessarily be iterative "“ that is, they will be adjusted periodically to accommodate new information about the climate system, the efficacy of global mitigation efforts, and the links between climate change and associated climate variability. IPCC (2007) made this point abundantly clear when it concluded in its most recent assessment that "Responding to climate change involves an *iterative* risk management process *that includes both adaptation and mitigation*, and takes into account climate change damages, co-benefits, sustainability, equity and attitudes to risk" {pg 22; my emphasis}.

So how does the integration of pressing short-term needs fit into the modern view of iterative responses to the uncertain manifestations of a dynamic climate, particularly with regard to adaptation? Many recent assessments (e.g., NPCC (2009) and NRC (2010)) offer visions of a circular process within which each cycle begins with current knowledge of existing risks and projections of future potential and ends with monitoring and assessment of the success of implemented programs, the implications of new science, and the ramification of global decisions on, for example, mitigation. Figure 1 replicates the seminal version that appeared first in a 2009 report by the New York City Panel on Climate Change, and all five of the papers can find homes in one step in the process depicted there. Dixit's "white spots", for example, cause trouble beginning in step 1 and continuing through step 3. Resource issues of the sort addressed by Sprinz impose (or release) constraints on step 4. Spiegel's ideas about insurance surround one of many options that are considered step 4. Programs of the sort described by Nimir and Elgizouli and the framework offered by Zambrano-Barragán seem to describe one vision of how to work through steps 1 through 4.

It is disconcerting, though, that none of these papers worked through the complete circle; and so none get to the parts where answers to the prompting question might have emerged "“ step 5 (identify opportunities for coordination with other programs targeted at other issues which support adaptive capacity or would face increasing

challenges in an altered climate) and step 6 (inserting responses to climate into capital investment planning to exploit synergies and ameliorate conflicting aims). It is even more disconcerting that need for constant monitoring and the necessity of mid-course corrections (in steps 7 and 8) were never mentioned.

Having criticized the authors of these five papers for having failed to address the prompt, I must end by criticizing myself for not being specific in that regard, either. The truth is that concerns about responding to risks associated with climate change and changing climate variability have not been given the same attention in the literature as concerns about how, when and where to reduce greenhouse gas emissions. There is little hard evidence about mainstreaming adaptation and development plans, but there are some "thought-organizing" frameworks of the sort described here to try out. These frameworks will evolve iteratively as we learn more, to be sure; and their current structure certainly supports one fundamental conclusion "“ the prompting question is exactly the question that we should be asking now. That current answers are not very good (or incomplete) simply means that we have a lot of work to do. So, to the organizers of this exercise "“ ask the same question in five years to five different people and see if anything has changed.

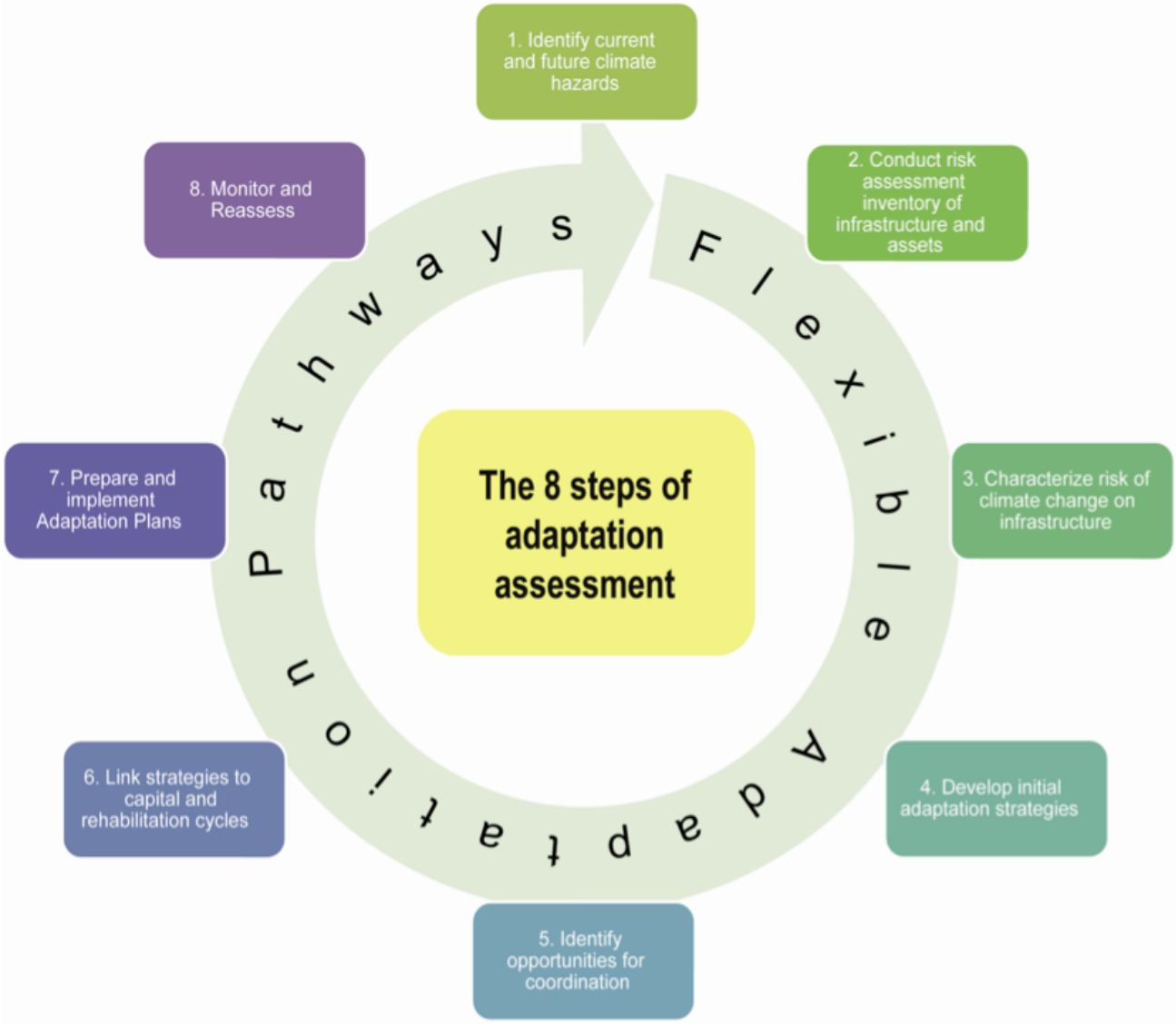

Figure 1: An iterative process for adaptation

The process includes the construction of Infrastructure Questionnaires in step 2, Risk Matrices in step 3, and a Strategy Framework in steps 4 through 6 that were intended to be general enough to be useful for a range of jurisdictions and infrastructure sectors, yet specific enough to serve as the template for developing and implementing a sector's adaptation efforts. Source: Figure 1.5 in *Climate Change Adaptation in New York City: Building a Risk Management Response* (NPCC 2009).

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[1] The validity of this hypothesis was supported by analogy with the "precursors for prevention" from the public health literature in Yohe and Ebi (2005) and supported empirically (to a varying degree depending on the specific determinant) in Tol and Yohe (2007).

WORLD RESOURCES INSTITUTE

10 G Street NE Suite 800, Washington, DC 20002, USA
Phone +1 (202) 729-7600
Fax +1 (202) 729-7610