Planetary Health

Biophysical Systems, Externalities and the Provision of Public Goods

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Despite unprecedented gains in human health, natural systems are being degraded to an extent unmatched in human history. Global environmental change – evidenced in climate change, land degradation, biodiversity loss, water scarcity, ocean acidification, and over-exploitation of fisheries – threatens continued social and economic progress.

Planetary health — the health of human civilization and the state of the natural systems on which it depends — goes beyond examining the mere impacts of global environmental change on human health; rather it aims to provide a framework that anchors the value of human wellbeing in the state of the natural systems around us. The emphasis is as much on the interdependence of the health of human civilization and the state of Earth's natural systems as it is on the impacts.

When Ernesto Zedillo was appointed chair of the Rockefeller Foundation Economic Council on Planetary Health in 2016, the YCSG sought early on to identify a possible framework to address questions on the policy applicability of the planetary health concept. While acknowledging the importance and value of the foundations provided in the 2015 Rockefeller-Lancet Report, *Safeguarding Human Health in the Anthropocene Epoch*, it was evident that some further conceptualization of the problems under analysis was warranted in order to address the Foundation's goal of making policymaking and economic planning relevant.

We started with the observation that while natural and life sciences are moving very fast to understand the consequences of human activities on natural systems and the consequences of the latter's deterioration on life on the planet, including human, progress towards finding global arrangements to slow down and reverse such deterioration is proving extremely difficult.

It is almost a paradox that despite science informing increasingly better about the environmental pitfalls of human activities, including the risk of tipping points involving irreversible harm, governments and societies are failing to agree on the actions needed to prevent or mitigate the disasters about which science is warning. The ongoing pandemic provides a most dramatic and painful example of the paradox of seeing a preventable disaster coming but failing to take the warranted action to avoid it. The explanation and solution to this and similar failures is not to be found in the natural sciences. These have

and will continue to do their part, in an amazing and outstanding way. Understanding and addressing the failure pertains in the main to disciplines such as economics; international law; and geopolitics and international political economy.

Externalities

Simple but fundamental economic concepts provide the lead-in to elucidate the failure. One is the notion of externality, which purports that individuals may take actions, like consumption or production of goods and services, without taking into consideration the full social cost of those actions. The concept indicates that even in conditions of perfect markets where prices account properly for private costs, there are some activities whose nature prevents those prices from accounting for the cost imposed on third parties, either at present or in the future. Externalities are a market failure, some of which can have enormously significant negative consequences for the health of humans and that of our planet.

Public Goods

Practically by definition, externalities cannot be fixed by "the invisible hand" of markets alone. Government intervention is required, in the form of either command or price regulation. These interventions constitute, typically, a public good. These are called public goods because when provided to one party, they become available to all, and consumption of the public good by one party usually does not reduce the amount available to the others to consume. Global public goods are those whose benefits could in principle be consumed by the governments and peoples of all states. Preventing pandemics, climate change, the degradation of biological diversity, and ocean acidification are examples of global public goods. Importantly, these adverse phenomena cannot be adequately addressed by individual countries acting alone; rather, collective action is indispensable. If such action succeeds in providing the needed global public good, its benefits become available to the governments and peoples of all states and consumption of the good by one state or its people in no way reduces its availability to others.

Most externalities affecting planetary health are not only cross-border or global in nature, they are also intergenerational. That is, they have an impact on people who will live in the future, not just on the present population. Obviously, this makes the prob-

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lem of fixing those externalities even more complex, not least because possible benefits obtained by some people today from the use and abuse of the earth's natural capital must be assessed against the damage caused in the life of future inhabitants of the planet. Because of this, intertemporal cost-benefit analysis, or its close relative known as integrated assessment models, constitute the standard tool to analyze this type of externality including the policy intervention needed to fix it. This framework has been most frequently applied to the economics of climate change, which among other policy prescriptions yields estimates of trajectories of taxes per unit of carbon emissions that would be needed to induce the behavioral adjustments (consumption and production) in order to mitigate climate change sufficiently.

In principle, intertemporal cost-benefit analysis could be applied to determine the optimal policies required to keep the state variables of planetary health within the safe operating space of the planetary health boundaries. Unfortunately not even the best models for such analysis can be claimed to provide fully reliable policy prescriptions. Those models may not be proficient to deal with catastrophic outcomes. As the late Martin Weitzman elegantly argued (his dismal theorem) in reference to climate change, we are facing deep structural uncertainty about what might go very wrong, with essentially unlimited downside liability on possible planetary damages. Weitzman summarized, "…the economics of climate change consists of a very long chain of tenuous inferences fraught with big uncertainties in every link…" He worried that cost-benefit analysis, while being valuable, even indispensable, as a disciplined framework to deal with the challenge of climate change, it may not be up to the extraordinarily uncertain probabilities of the phenomenon reaching catastrophic consequences.

Planetary Health and the Provision of Global Public Goods

The economics and politics of correcting the externalities hurting planetary health remain overly complex if only by virtue of entailing the provision of global public goods. These are very hard to provide. Alleging reasons of sovereignty, countries are reluctant to adopt obligations agreed at supranational instigation. Moreover, openly or surreptitiously, an individual country would try to "free ride" on others' actions to enjoy a benefit, knowing that if the global public good is produced, it would also be available to that country. Providing a global public good is much more difficult than in the case of local or national

public goods. The latter's provision can be organized by the local or national governments, with authority to regulate, tax and even legally force such provision. At the global level there is, in principle, no institution with equivalent powers. In other words, there is no world government. Therefore, the provision of global public goods demands for each case specific efforts to agree on the needed legal and institutional mechanisms.

Given the diversity in the nature and initial conditions of the problems to be tackled, there cannot possibly exist a unique blueprint for achieving every global public good. Every case must be cracked according to its specifics. However, there are three fundamental dimensions that every serious undertaking to provide a specific global public good must comprise. One is the issue of **governance** to initiate, negotiate and sustain the provision. Another is the design of the (command or price) mechanisms, or **incentives**, needed to induce the right behavior on the part of economic agents. The third one is about the arrangements that need to be in place to **monitor** rigorously the state of the problem over time, as well as the compliance by the parties of the corresponding international agreement.

It is important to pay overwhelming attention to questions of governance for addressing the externalities affecting both the planet and humanity's health. The necessity of emphasizing the governance needed to agree and supply the required public good will, in turn, make it indispensable to deal with the topics of monitoring (both of the state variables and the compliance with the agreed interventions) and the incentives required to induce planetary health-friendly behaviors.

The Yale Center for the Study of Globalization has long been engaged in the challenge of how to provide global public goods. All peoples' health, security and prosperity depend in part on the quality of their international cooperation, as does the health of the planet. Without a good international regime – with sound governance, monitoring and incentives – there cannot be adequate global solutions to truly planetary problems.