data fails to yield low-arsenic groundwater. Dissemination of public health messages and exchange of arsenic data via mobile phones are key components of this approach.

Winkel *et al.* indicate, somewhat wistfully, that there is an urgent need to intervene and test shallow tubewells in the high-risk areas delineated by their map of Myanmar. But the recent response of the government of Myanmar to a natural hazard of a different nature, cyclone Nargis, suggests that a public information and testing campaign about arsenic in groundwater is unlikely to take off any time soon, even after more pressing issues are addressed in the Irrawaddy delta. And compared with the six mobile phone operators serving over 42 million mobile subscribers in Bangladesh, the single state-controlled mobile phone operator with a few hundred thousand subscribers in Myanmar provides nowhere near the same infrastructure for public information.

A modified approach worth exploring in Myanmar might be for non-governmental organizations to forge links with the numerous small teams of drillers who are contracted by households to install a well within a day. A key feature would be to widely distribute one of several suitable field kits for testing arsenic levels[8] to drillers and to train them to take advantage of patterns in the local depth-distribution of arsenic[9,10]. At the same time non-governmental organizations could inform households of the health hazards of arsenic exposure, creating an incentive for drillers to provide an improved service by offering the installation of low-arsenic wells.

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CLIMATE SCIENCE

Take the long view

STEVE AIREY

In the current crisis of credits and house prices, property owners with a mortgage may find a future commitment of over 25 years uncomfortably long. But a quarter of a century is nothing compared to our future commitment to climate change. Already on track to rising temperatures and sea levels, we need an idea of where we are heading.

Gian-Kasper Plattner and colleagues (*J. Clim.* **21,** 2721–2751; 2008) provide at least a broad sense of direction by simulating our commitment to future climate change with eight climate–carbon cycle models of intermediate complexity, assuming a number of different scenarios for future carbon dioxide emissions. In all the scenarios, atmospheric carbon dioxide concentrations are either constant or in decline after the end of the 21st century, providing us with an idea of how long the effects of carbon dioxide emissions will linger after atmospheric concentrations have stabilized.

Perhaps the most striking result is that the year AD 3000 — the time limit of the simulations — is apparently too close in time for a full assessment. Even in the highly unlikely event that anthropogenic emissions stop in the year 2100, 15–28% of the carbon dioxide emitted through human activity since the industrial revolution will still be airborne 900 years later. For a stabilization of atmospheric carbon dioxide concentrations at 750 p.p.m.v. — a goal that looks achievable if not desirable from today's point of view — temperatures start declining fairly soon after stabilization, but they do so very slowly. Even worse, the sea level rise resulting from thermal expansion alone (that is, not taking into account meltwater from the Greenland ice sheet or elsewhere) does not come to a halt by the year 3000 in some of the models.

These findings reflect the huge inertia of the climate system. The rapid change in the composition of the atmosphere over the past century has shaken the system out of equilibrium. The slower components, such as the oceans, will catch up only in the long run. Eventually, the global carbon cycle will redistribute the carbon (if the carbon dioxide doesn't keep coming faster than it can be mopped up), but it may take thousands if not tens of thousands of years.

Getting the carbon cycle right in the models is therefore crucial for investigating climate change on a long time horizon. Unfortunately, important details are still under debate. The uncertainties associated with different but equally plausible assumptions, for example regarding carbon cycle–climate feedbacks and terrestrial fertilization of plants by atmospheric carbon dioxide, significantly affect the quantitative outcomes of the simulations.

In addition, it is impossible to predict which way technological development will take us over the next century or so: who, in 1908, would have thought that carbon dioxide emissions from automobiles would present a problem in 2008?

It is therefore hard to say how long it will be until sea level rise means that the Thames Barrier (see image) cannot protect London from flooding any more. When the time comes, house owners in the lower reaches along the Thames will have to fear for the value of their property once more. The impacts in less wealthy parts of the world will be far more severe.

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