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Pathways to Sustainability

Contribution to GTI Forum Technology and the Future

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This important discussion has already and rightly buried the illusion that technology will solve the great challenges of unsustainability and inequality. Technological fixes, so beloved of policy, business, and scientific actors, and enmeshed in so much contemporary public discourse, are undermined by the myth not just of technological determinism, but of solutionism itself (that environmental and social ills are problems to solve, rather than manifestations of deeply rooted socio-natural and political-economic structures and processes). Technological innovation is not scalar—as in narratives of “more,” “bigger,” “better,” or indeed linear progress—but, always and everywhere, directional.

The latter view underlies the conceptual framework that STEPS Centre colleagues and I first offered more than a decade ago.¹ Our “pathways approach” envisages complex, dynamic social-technological-ecological systems unfolding along trajectories of intervention and change, shaped by politics and power. Such systems (including but not only their technological elements) are subject to social construction, in the sense that different actors define, bound, and value systems and change in different ways. Thus, to take just one example, an agricultural seed system in highland Kenya might be understood and interpreted very differently from the perspectives of small-scale farmers and their livelihoods (and differently depending on whether women or men), Kenyan national food security planners, biotechnology firms, commercial crop exporters, or others. GMOs might (or might not) have a valued place in any of these constructed systems, but will carry very different meanings and implications depending on the system in which they are embedded.

Thus for any given issue, a simple heuristic would lead us to ask about four Ds:²

- What *Directions* are different pathways headed in? What goals, values, interests, and power relations are driving particular pathways, and how might they be re-oriented?
- Is there a sufficient *Diversity* of pathways? Are these diverse enough to resist powerful processes of lock-in, build resilience in the face of uncertainty, and respond to a variety of contexts and values?
- What are the implications for *Distribution*? Who stands to gain or lose from current or proposed pathways, or alternatives? How will choosing between different pathways affect inequities of wealth, power, resource use, and opportunity—whether across gender, ethnicity, class, or place?
- What are the implications for *Democracy*—broadly understood to encompass equity of opportunity for voice and inclusion, and processes that enable and enhance this, whether formal or informal?

Considering manifest or potential innovations and applications of digital, energy, carbon, or AI technologies in this way helps highlight opportunities and threats, ways in which technologies could be part of a great transition—but could also block, deflect, or destroy. Thus, digital phones and drones could, possibly, become part of pathways in which precision-farming complements agro-ecology for farmers in the Global North and South, supporting creative responses and future livelihoods amidst climate disruptions. But they are also embroiled in concentrations of power in capitalist agribusiness and—frighteningly—in surveillance and security applications that run shockingly against great transition values. Geoengineering technologies include, at one end of a spectrum, carbon capture through biochar applications that mimic, build on, and support Amazonian and African farmers' indigenous soil improvement techniques. But the spectrum is dominated by hubristic attempts to engineer planetary systems through techniques such as solar radiation management, whose dangers, ungovernability, and distraction from fossil fuel reduction give them no place in pathways to sustainability and social justice.

In understanding how different pathways (and the technological elements within them) come to emerge and interrelate, power becomes critical—in terms of both material political economy and

the politics of knowledge—concerning whose perspectives and interpretations come to count. Plurality emerges as a key principle, both in urging recognition that there are no singular roads to progress (and no single definition of the latter), and in operating as a countervailing force to locked-in powerful pathways that lead in problematic directions, or seek forms of control that, amidst the disruptions and uncertainties that pervade current and future worlds, are illusory and dangerous.

Put another way, and to extend the pathways metaphor more optimistically, system transformation can happen through myriad footpaths and bush paths, some coalescing into highways that might over time divert problematic motorways, while others pursue their own contextual, convivial routes that respect the diversity of humanities and socio-natural relations. Technologies—old and new, current and future—always have been and always will be part of such pathways, but in interaction with social and political processes that can spiral in multiple directions. Appreciating this may help in the task of building and enacting a politics of technology that is both more respectful of distributed agency and deliberation, and better connected with the politics of transformation more broadly.

Endnotes

1. Melissa Leach, Ian Scoones, and Andy Stirling, *Dynamic Sustainabilities: Technology, Environment, Social Justice* (London: Earthscan, 2010); Ian Scoones, Melissa Leach, and Peter Newell, eds., *The Politics of Green Transformations* (London: Routledge, 2013).

2. These originally appeared as 3 Ds in *Innovation, Sustainability, Development: A New Manifesto* (Brighton: STEPS Centre, 2010). The fourth D for democracy now seems too critical to ignore.

About the Author



Melissa Leach is Director of the Institute of Development Studies (IDS) at the University of Sussex. She co-founded and co-directed the STEPS (Social, Technological and Environmental Pathways to Sustainability) Centre from 2006 to 2014. A social anthropologist, she has served as vice-chair of the Science Committee of Future Earth from 2012 to 2017, lead author of the World Social Science Report 2016 on Challenging Inequalities, and a member of the International Panel of Experts on Sustainable Food Systems (IPES-Food). She is now working on COVID-19 as co-lead of the Social Science in Humanitarian Action Platform and the Wellcome Trust-funded Pandemic Preparedness Project. She is a Fellow of the British Academy and in 2017 was awarded a CBE for Services to Social Science. She holds a PhD in social anthropology from the School of Oriental and African Studies at the University of London.

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