When Technical Experts Set Out to “Do Good”: Deficit-Based Constructions of “the Public” and the Moral Imperative for New Visions of Engagement

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sometimes
the same people who claim to be
making you visible are the ones inflicting
the erasure.
sometimes “speaking on behalf of” is a
form of silencing, too.
—Tweet by South African poet Koleka Putuma, 12.29.17¹

It is an honor to be invited to write the editorial for this special issue of the *Michigan Journal of Sustainability*. I am a mother and an ethnographer who has worked extensively on the problem of lead in American drinking water. I entered the scene back in January 2004 when I, along with many other residents of Washington, D.C., learned that since 2001 our city’s taps had been dispensing excessive levels of lead, and that scientists, engineers, and health professionals in three government agencies responsible for protecting us had kept the news largely to themselves.² The

1. Putuma, K. 2017. [tweet].

2. Nakamura, D. 2004. Water in D.C. Exceeds EPA Lead Limit. *Washington Post* (1/31).

undisclosed contamination lasted roughly twice as long as that in Flint, Michigan. Lead-in-water levels were at least as high, if not far higher. Years later, scientific research confirmed what many individual families had discovered independently early on in the crisis: that, contrary to official assurances, our water had caused serious harm to young children.^{3,4} We now know that, as a result of DC's contamination, over 800—and possibly up to 42,000—toddlers in the nation's capital experienced elevated blood lead levels, and that the city's fetal death rate rose by 37 percent.^{5,6} To my knowledge, no studies have examined the contamination's effects on other age groups.

My work on lead in drinking water woke me to three fundamental realizations that apply to many environmental injustices of our time. First, that our nation's approach to this problem normalizes health harm.⁷ Second, that this normalization is made possible by a structurally manufactured ignorance, which robs communities of basic information they would need to protect themselves, participate in technical discussions, advocate for effective solutions, and hold accountable wrongdoers and harm doers.⁸ And third, that interventions privileging expert-led technical fixes over community-led technical and structural fixes often reduce complex societal problems into narrow technological ones and result in suboptimal public health protection and limited, if any, social change. Worse, they represent a form of social domination that: a) erases and appropriates community research, discoveries, and innovations; b) masks, and sometimes even disrupts, the local knowledges, networks of relationships, and resources necessary for the development of solutions that communities themselves recognize as solutions; and c) obscures ideologies that perpetuate and even rationalize the very asymmetries in power, access, and rights that allow for the problem to arise in the first place.

It thus becomes obvious that, contrary to how they are often imagined, technical interventions to “do good” do not and cannot possibly entail a simple transfer

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3. Holder, E. H., Jr. 2004. Summary of Investigation Reported to the Board of Directors of the District of Columbia Water and Sewer Authority, Covington & Burling (7/16) [report].
 4. Internal government documents pertaining to Ms. Jerusalem Bekele, Program Manager, Water Quality Division, Washington, DC Department of Health (obtained on 3/8/11 by Yanna Lambrinidou under the Freedom of Information Act) (available upon request).
 5. Edwards, M., S. Triantafyllidou, and D. Best. 2009. Elevated Blood Lead in Young Children Due to Lead-contaminated Drinking Water: Washington, DC, 2001-2004. *Environmental Science & Technology* 43(5):1618-23.
 6. Edwards, M. 2014. Fetal Death and Reduced Birth Rates Associated with Exposure to Lead-Contaminated Drinking Water. *Environmental Science & Technology* 48(1):739-746.
 7. Katner, A., K. J. Pieper, Y. Lambrinidou, K. Brown, C. Hu, H. W. Mielke, and M. A. Edwards. 2016. Weaknesses in Federal Drinking Water Regulations and Public Health Policies that Impede Lead Poisoning Prevention and Environmental Justice. *Environmental Justice* 9(4):109-117.
 8. Lambrinidou, Y. 2017. Top Ten Myths About Lead in Drinking Water. *LEAD Action News* 18(2):4-15.

of “objective” scientific knowledge from “the lab” into contested spaces of environmental contamination.^{9,10} First, environmental contamination is rarely simply a technical problem. It is well documented that social marginalization and exclusionary regulations, processes, and institutions are directly associated with toxic exposures and health harm.^{11,12} Second, environmental contamination is rarely addressed simply through technical solutions. Rooted in structural inequities, such contamination is often coupled with affected communities’ demand that their needs, experiences, and knowledges be counted, that they have a seat at the table where decisions are made, and that their right to speak for themselves is respected.^{13,14} Third, technical solutions are never simply technical. Experts’ very decision to “do good,” their vision about what this “good” ought to be, and their selection of the “good’s” beneficiaries are laden with personal, professional, and institutional worldviews, interests, and assumptions. Finally, science itself—how it is produced, what and whose questions it answers, how it is interpreted, with whom it is shared and to what degree of detail, and in what direction it steers the conceptualization and implementation of appropriate solutions—is also shaped by non-technical judgments, preferences, and priorities.

Consequently, technical interventions to “do good” *by definition* embed social values that may align or misalign with the values of the communities they are designed to help. Depending on how they are carried out, such interventions can diminish or exacerbate a community’s social marginalization, validate or discount its agency and knowledge, and enhance or further undermine its access to and influence on expert research, resources, decisions, and solutions. In the end, technical interventions to “do good” can reinforce or disrupt the hegemony of the dominant social order—an order that privileges technical experts by granting them the right, authority, and even obligation to speak *on behalf of* affected communities about

9. Lambrinidou, Y. and N. E. Canney. 2017. Engineers’ Imaginaries of “the Public”: Content Analysis of Foundational Professional Documents, *124th American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Conference Proceedings (Paper ID #18325), June 25-28, Columbus, OH.
10. Canney, N. E. and Y. Lambrinidou. 2018. Representations of “the Public” in Learning Through Service (LTS) Versus “Mainstream” Engineering Foundational Professional Documents, accepted for presentation at the *125th American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Conference Proceedings, June 24-27, Salt Lake City, UT.
11. Bruno, T. and W. Jepson. 2018. Marketisation of Environmental Justice: U.S. EPA Environmental Justice Showcase Communities Project in Port Arthur, Texas. *Local Environment* 23(3):276-292.
12. Allen, B. L. 2013. Justice as Measure of Nongovernmental Organization Success in Postdisaster Community Assistance. *Science, Technology, & Human Values* 38(2):224-249.
13. Schlosberg, D. 2004. Reconceiving Environmental Justice: Global Movements and Political Theories. *Environmental Politics* 13(3):517-540.
14. Cole, L.W. and S. R. Foster. 2001. *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement*. New York: NYU Press.

what these communities need and whether what they get is appropriate, sufficient, and effective.

I submit that for technical interventions to facilitate effective, just, and sustainable solutions, they must enable social transformation through a correction of the very ideologies behind the structural inequities that underlie environmental contamination.¹⁵ In other words, they must be conceptualized in “explicitly political terms”¹⁶ by placing questions of *equity* and *power* at the center—a process that must be led by community members who reflect the community’s diversity. Once launched, they must: function as mechanisms that communities can use to acquire any specialized tools they need; draw from infrastructures of funding, networks, and support that are usually available only to technical experts; establish their credibility; enter decision-making spaces usually reserved for experts; and challenge—as well as continuously re-challenge—the boundaries that marginalize and exclude them.

Practically speaking, transformative engagement asks of technical experts to change how they perceive, relate to, and apply their expertise. It necessitates that they:

- *Listen* in a way that acknowledges the technical and moral value of community perspectives, leaving room for the possibility that these perspectives may expand or even correct their own understandings of the problem at hand;¹⁷
- *Share* specialized knowledge and terminology in a way that empowers communities to assess, inform, expand, and challenge officially sanctioned positions while claiming technical and moral authority in their own right; and
- *Accompany* communities through their struggle for repair until such repair is deemed complete by the communities themselves.¹⁸

Foundational to transformative engagement is a conceptualization of “the public” as individuals seeking power, access, and rights in order to redress the harm inflicted on them, however narrowly or broadly they define this harm. Lack of power, access,

15. Griffin, M. and J. W. Block, eds. 2013. *In the Company of the Poor: Conversations with Dr. Paul Farmer and Fr. Gustavo Gutierrez*. Maryknoll, NY: Orbis Books [Kindle Edition].

16. Pulido, L., E. Kohl, and N-M. Cotton. 2016. State Regulation and Environmental Justice: The Need for Strategy Reassessment. *Capitalism Nature Socialism* 27(2):12.

17. Lambrinidou, Y. 2016. On Listening, Science, and Justice: A Call for Exercising Care in What Lessons We Draw from Flint. *Environmental Science & Technology* 50(22):12058–12059.

18. Farmer, P. 2011. Accompaniment as Policy [[commencement address](#)], Kennedy School of Government, Harvard University (5/25).

and rights ought not be conflated, however, with lack of intellectual, material, and social resources or the capacity to master and contribute to technical knowledge and technically sound solutions.

But how common is such a conceptualization of “the public”? In 2016, the prestigious journal *Environmental Science & Technology* published seven letters by environmental scientists and engineers discussing whether there exists an “imaginary line” between environmental science research and activism that ought not be crossed.^{19,20,21,22,23,24} This timely debate was sparked by an editorial, which proposed that such a line not only exists, but that crossing it catapults technical experts from dispassion to advocacy and risks undermining “the standing of academics as objective seekers of truth.”^{25,26} The seven authors took diverse positions on the issue, but their comments contained noteworthy commonalities. Specifically, they all asserted that environmental scientists and engineers have a commitment—if not an obligation—to protect the public’s health and welfare. They all described the manifestation of this commitment as a unidirectional delivery of scientific knowledge from technical experts (who *have* it) to the public (who *lacks* it).

Only one letter placed environmental contamination in the context of larger structural inequities, by linking technical expertise to power, gender, race, and class.²³ Its assertion that limited access to science brings disempowerment and a compromised ability to fight injustice is trenchant. Despite its crucially insightful stance, however, this letter too seemed to limit its scope to disenfranchised communities’ lack of scientific information. Although it is true that disenfranchised communities often *do* lack scientific information, this depiction can go further to acknowledge a more complex reality. Namely, that affected publics have been discovering their own exposures to environmental hazards since the onset of industrialization, generating scientific hypotheses about probable sources of contamination, conceptualizing and carrying out scientific studies to answer their own questions, contributing to scientific discovery, challenging or rejecting technological innovations and interventions, uncovering government and industry wrongdoing, holding those responsible

19. Anastas, P. T. 2017. Scientists Duty to the Truth. *Environmental Science & Technology* 51(3):1058.

20. Dzombak, D. A. 2017. Crossing Researcher-Public Boundaries. *Environmental Science & Technology* 51(3):1057.

21. Hering, J. G. 2016. Maintaining Trust and Objectivity in the Context of Use-Inspired Research. *Environmental Science & Technology* 51(3):1054.

22. Mihelcic, J. R. 2017. What Line? *Environmental Science & Technology* 51(3):1055.

23. Niemeier, D. 2017. Building a Wall on the Imaginary Line. *Environmental Science & Technology* 51(3):1053.

24. Swackhamer, D. L. 2017. There Is No “Imaginary Line”, There Is a Continuum. *Environmental Science & Technology* 51(3):1056.

25. Sedlak, D. 2016. Crossing the Imaginary Line. *Environmental Science & Technology* 50(18):9803-9804.

26. Sedlak, D. [undated]. Clarification [[blog post](#)], *Berkeley Water Center*.

accountable, driving legal and regulatory solutions, and playing a leading role in the birth and evolution of the nation's environmental and environmental justice movements.^{14,27,28,29,30,31,32,33,34,35,36}

Perhaps the most striking omission from the *Environmental Science & Technology* debate was that it was devoid of letters from members of frontline communities. Just as the Flint water crisis and the Dakota Access Pipeline controversies were drawing national and international attention, one of the world's premier environmental science journals normalized a discourse about the proper relationship between scientists and "the public" that muted voices from the very people environmental scientists and engineers are dedicated to protecting. And it deprived journal readers of the opportunity to hear from individuals confronting environmental contamination how *they* think about the "imaginary line" and under what circumstances they see such a line supporting or impeding their efforts to redress injustice.

Non-experts as "deficient" is a dominant theme in the engineering profession's imaginaries of "the public."^{9,10} "Doing good" as supplying technical expertise to those presumed to have none is a core tenet of the now discredited "deficit model" of public understanding of science.³⁷ As well-meaning as these conceptualizations may be, they feed visions of engagement that grant technical experts a) the paternalistic role of guardian of "the public good," b) near-exclusive authority to define what this "good" is, how it ought to be pursued, and if it has been realized, and c) the right to *speak on behalf of* disenfranchised communities and even *write the histories* of these communities for them. By extension, these conceptualizations perpetuate

27. Montrie, C. 2018. *The Myth of Silent Spring: Rethinking the Origins of American Environmentalism*. Oakland, CA: University of California Press.
28. King, D. and L. Levidow. 2016. Introduction: Contesting Science and Technology, from the 1970s to the Present. *Science as Culture* 25(3):367-372.
29. Hohn, D. 2016. Flint's Water Crisis and the 'Troublemaker' Scientist. *The New York Times Magazine* (8/16).
30. Heiman, M. K. 2004. Science by the People: Grassroots Environmental Monitoring and the Debate Over Scientific Expertise. In R. Eglash, et al., eds., *Appropriating Technology: Vernacular Science and Social Power*, pp. 207-223. Minneapolis, MN: University of Minnesota Press.
31. Brown, P. 1992. Popular Epidemiology and Toxic Waste Contamination: Lay and Professional Ways of Knowing. *Journal of Health and Social Behavior* 33(3):267-281.
32. Corburn, J. 2005. *Street Science: Community Knowledge and Environmental Health Justice*. Cambridge, MA: The MIT Press.
33. Brown, P. 2007. *Toxic Exposures: Contested Illnesses and the Environmental Health Movement*. New York: Columbia University Press.
34. Taylor, D. E. 2011. The Evolution of Environmental Justice Activism, Research, and Scholarship. *Environmental Practice* 13(4):280-301.
35. Button, G. 2016. *Disaster Culture: Knowledge and Uncertainty in the Wake of Human and Environmental Catastrophe*. London & New York: Routledge.
36. Musil, R. K. 2015. *Rachel Carson and Her Sisters: Extraordinary Women Who Have Shaped America's Environment*. New Brunswick: Rutgers University Press.
37. Pouliot, C. and J. Godbout. 2014. Thinking Outside the 'Knowledge Deficit' Box. *EMBO Reports* 15(8):833-835.

the systematic erasure of community voices, transgressing a foundational principle of the environmental justice movement: “we speak for ourselves.”¹⁴

Washington, D.C.’s lead-in-water contamination and the health harm it wreaked were discovered by distraught, unnamed, and unrecognized residents over two years before any technical interventions were launched.^{3,38} Independently, residents also discovered technical aspects of the contamination—like the fact that lead-in-water levels often rose while taps were running—which contradicted the prevailing scientific understanding of the time and turned out to have significant implications for public health.^{39,40} These residents’ pleas for help were ignored, their technical discoveries have still not been acknowledged, and their initiative to tip off *The Washington Post*, which made possible the paper’s historic exposé,² has been erased from dominant narratives about the case.

Flint’s water crisis was also first discovered by residents—many of whom were experiencing mysterious and agonizing ailments—soon after it began and long before the interventions that put technical experts front and center in the city’s story.⁴¹ In Flint, residents organized bottled water distribution services early on and requested urgent attention to the lead contamination that they, themselves, identified in spite of government engineers’ assurances that the water flowing out of their taps was safe.^{42,43} Yet the university engineer who eventually helped confirm the community’s findings through resident-led large-scale testing that is neither accessible nor affordable to non-scientists, assumed primary authority over technical and non-technical judgments concerning Flint’s water, effectively left out the community from his investigation into government wrongdoing, and proceeded to declare that technical experts “are the eyes and ears of the public.”⁴⁴ In turn, the American Society of Civil Engineers (ASCE) called him the “leader” of Flint’s fight, and his alma mater claimed him as *its* “hero” in Flint.^{44,45}

An exercise in power, Flint’s mythic hero narrative, although perhaps appealing to our collective imagination, stretches facts while reducing a complex and multidimensional

38. Internal documents obtained on 3/8/11 from the Government of the District of Columbia, District Department of the Environment by Yanna Lambrinidou (available upon request).

39. Washington, DC resident emails, DC Urban Moms listserv (available upon request).

40. DC City Council hearing, exchange between Councilmember Adrian M. Fenty and DC Water and Sewer Authority (WASA) chief engineer Michael S. Marcotte (2/10/04) (available upon request).

41. Ruble, K. 2016. What Released Emails Reveal About the First Criminal Charges in the Flint Water Crisis. *Vice News* (4/21).

42. Royer, J. 2014. Flint’s Emergency Water Relief ~ Site #1 at Mission of Hope [video], (8/21).

43. Fonger, R. 2016. Gov. Snyder’s Inner Circle Informed of Lead Concerns by Flint Community Members. *mLive* (5/3).

44. Walpole, B. 2016. ASCE Member Leading the Fight for Clean Water in Flint, MI. *ASCEnews* (2/12).

45. Nugent, T. and L. Silverman. 2016. Our Hero in Flint. *At Buffalo Magazine* (Summer).

mensional structural problem into a narrow lead-in-water problem. Further, it obscures residents' agency, pivotal research, technical proficiency, intellectual wherewithal to stand up to experts who fail to address their needs, and determination to find new experts until they obtain answers to their questions and achieve satisfactory solutions. Finally, it confuses experts' ability to "do good" with their ability to take control and assume ownership. This reinforces asymmetries in power, access, and rights by sanctioning expert activism over local activism, even when the former feeds on the latter and—worse—even when the former erases, appropriates, or impedes the latter.^{46,47}

Four years after the onset of the Flint water crisis, the scientific community's dominant narrative is that the city's water quality has been restored and the crisis is over. At the same time, scientific uncertainties and unknowns are downplayed or not formally acknowledged (e.g., concerning discolored tap water and significant lead-in-water contamination in homes considered low-risk); ongoing health problems remain unaddressed (e.g., concerning persistent skin rashes); key resident questions have been left unanswered (e.g., concerning non-lead contaminants in the water that the community might have been, or continue to be, exposed to); and residents themselves have been largely excluded from government forums where long-term solutions are being formed.^{48,49,50} Notably, fundamental gaps between officially sanctioned expert narratives and prevalent community narratives about matters as basic as *when* the crisis started, *what* it consisted of, *if* it is truly resolved, and *whether* the solutions in place are adequate, just, or effective have not been bridged. And, coming full circle, the voices, knowledges, and grievances of residents are once again given cursory attention and dismissed.

Responses to environmental crises that privilege expert-led technical fixes over community-led technical and structural fixes are not limited to the problem of lead in drinking water. The recent re-loss of electrical power in Puerto Rico and residents' "just recovery" movement following hurricanes Irma and Maria;^{51,52} Duke

46. Jackson, D. Z. 2017. Environmental Justice? Unjust Coverage of the Flint Water Crisis. Harvard Kennedy School Shorenstein Center on Media, Politics and Public Policy [report] (July).

47. Jackson, D. Z. 2018. The Goldman Prize Missed the Black Heroes of Flint — Just Like the Media Did. *Grist* (4/23).

48. Foote, A. 2017. HOLY WATER? City's Water Crisis Leads To Suppression Of Flint Voices [Opinion]. *Flint Beat* (10/31).

49. Johnson, J. 2018. As the Four-Year Anniversary of the Flint Water Crisis Approaches, Flint Residents Are Still Suffering, and the State Continues to Pull its Resources. *Belt Magazine* (4/3).

50. Egan, P. 2018. State of Michigan: No More Free Bottled Water for Flint Residents. *Detroit Free Press* (4/6).

51. Rogers, A. 2018. Why Can't We Fix Puerto Rico's Power Grid? *Wired* (4/18).

52. Yeampierre, E. and N. Klein. 2017. Imagine a Puerto Rico Recovery Designed by Puerto Ricans. *The Intercept* (10/20).

Energy’s mandated storage of 130 million tons of coal ash, following the company’s 2014 spill in North Carolina, that may disproportionately impact low-income rural communities;^{53,54} the physical restoration of New Orleans’ Holy Cross neighborhood, following hurricane Katrina, that has been deemed haphazard and suboptimal;⁵⁵ and the installation of technologies to push back sea level rise floodwaters in Fort Lauderdale that favor affluent neighborhoods while leaving low-income communities vulnerable to harm^{56,57} are all connected to technical solutions that marginalize, and might cause additional harm to, communities that are already marginalized and harmed.

Technical experts are in a unique position to help communities in crisis—but with new methods of engagement, collaboration, and accompaniment. And their work ought to be evaluated less on the basis of whether or not it crossed an “imaginary line” between research and activism, and more on the basis of what the community it aimed to serve says about its impact. Did it align with the community’s core values? Did its outcomes support the community’s core goals? Only after extensive exploration of these questions through diverse resident voices can technical experts have a moral foundation on which to judge the success of their engagement. In the absence of such confirmation, celebrations of technical interventions as expressions of “the good” risk inflicting further erasure and becoming—in the words of Koleka Putuma—“a form of silencing, too.”

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53. Blue Ridge Environmental Defense League. 2018. Attorney Representing BREDL Sends Correspondence to Federal Court Appointed Monitor for Duke Energy’s Probation Regarding Coal Ash Convictions [blog post] (1/8).

54. Zucchini, D. 2015. North Carolina Community Fights Duke Energy Plan to Dump Toxic Coal Ash. *Los Angeles Times* (2/1).

55. Allen, B. L. 2013. Justice as Measure of Nongovernmental Organization Success in Postdisaster Community Assistance. *Science, Technology, & Human Values* 38(2):224-249.

56. Bagley, K. 2016. Rising Seas Pull Fort Lauderdale, Florida’s Building Boomtown, Toward a Bust. *Inside Climate News* (3/3).

57. Worth, P. 2015. Where Climate Change Hits First and Worst. *Catalyst* (Fall):8-11 & 22.

this piece. I dedicate it to them and all agents of change in the next generation of technical experts. All opinions and any errors are my own.

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