

Introduction: Science, Technology and Human Rights: Lessons Learned from the Right to Water and Sanitation

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The original papers in this Special Section emerged from a meeting of the American Association for the Advancement of Science (AAAS) Science and Human Rights Coalition on the topic of Science, Technology and Human Rights.¹ The Coalition provides a forum for scientists and engineers to engage with human rights advocates and explore emerging issues at the intersections of their respective areas of practice. As the authors of the papers and commentaries highlight (Hall et al. 2013; Marks 2014; Meier et al. 2014; Satterthwaite 2014), this type of cross-disciplinary convening of scientists, engineers and human rights practitioners is increasingly relevant to the work of researchers, policymakers, and most importantly, to the communities affected by human rights abuses. In some cases, these dialogues initiated out of necessity, but as the papers articulate, current trends and new opportunities are encouraging institutionalized collaborations between scientists, engineers and human rights advocates. In Satterthwaite's words, "these networks of transnational experts are forging new approaches to making rights real."

The papers in this Special Section address a human right not explicitly mentioned in international treaty law, but now accepted by the community of nations—the right to water and sanitation. It is this right, together with the rights to health and food, and the emerging right to the Internet, which have pushed the human rights community to start exploring issues related to science and technology as they relate to human rights. These papers, therefore, offer a case study of some of the opportunities and challenges posed by international human rights law in offering

¹ American Association for the Advancement of Science (2012). *AAAS Science and Human Rights Coalition Meeting Report* 17 July 2012. <http://www.aaas.org/page/coalition-meeting-july-16-17-2012>.

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practical solutions and providing meaningful positive change for individuals and communities around the world.

Themes emerging from these papers include the process of norm creation and definition in the international arena, particularly the United Nations; the unique challenges of articulating the meaning of economic and social rights; the tangible applications of economic and social rights; and the ways in which scientific methods and technology can be used to support human rights implementation. The lessons learnt in the articulation of the right to water and sanitation and the challenges in its implementation can inform broader efforts to define the right to science and to positively exploit the connections between science, technology and human rights.

A History of Shared Values

The links between science and human rights go back at least as far as the Enlightenment of the eighteenth century—when the *French Declaration of the Rights of Man and of the Citizen* was adopted. Just as the proponents of the Enlightenment sought to apply the methods learned during the scientific revolution to social challenges, so too the principles of freedom and equality contained in the *French Declaration* found their justification in reason rather than tradition. It took another 150 years for the explicit connections between science and human rights to be articulated, coinciding with the birth of the modern human rights movement.

On December 10, 1948 the United Nations General Assembly adopted the *Universal Declaration of Human Rights* (UDHR), the first comprehensive international statement of human rights. The impetus for the UDHR was the atrocities of the Second World War and a desire among nations to foster a new world order in which peace and security were paramount, and States were committed to respecting and protecting the dignity of the individual. The UDHR addresses both civil and political rights (e.g., the rights to vote, to a fair trial, to information and to freedom of expression) as well as economic, social and cultural rights (e.g., the rights to education, to food, and to employment). Though the situation has since changed, at the time the UDHR was drafted, governments in the East and the West were unable to agree on whether both civil and political as well as economic, social and cultural rights should be recognized as legally enforceable and the subject of government obligations. As a result, when the opportunity arose to develop a binding treaty, two separate instruments were adopted.

The UDHR, in Article 27, recognizes the right to “share in scientific advancement and its benefits.” This right was carried over and expanded upon in the 1966 *International Covenant on Economic, Social and Cultural Rights* (ICESCR). Article 15 of the ICESCR states, in part, that governments have the responsibility to recognize the rights of everyone to “enjoy the benefits of scientific progress and its applications.” The Article adds, that governments also have a responsibility to conserve, develop and diffuse science; to respect the freedom indispensable for scientific research; and to encourage international contacts and cooperation in science. What this right means in practice is the subject of increased

debate and attention within the UN, among relevant non-governmental actors, and a growing constituency of scientists and engineers.

In addition to this explicit recognition of the right to science, international human rights law recognizes many other rights of particular relevance to the practice and conduct of science, and the protection of the rights of scientists. These rights include: the rights to information and to movement; to freedom of expression and association; to education and to work; and to health. As the authors in this Special Section address, international law now also explicitly recognizes a right to water and to sanitation.

Science, Technology and Human Rights: What are the Connections?

Based on the aforementioned international treaties, it is possible to discern at least five connections between science, technology and human rights:

1. *Scientists and engineers have human rights*: these rights include the freedom to associate with others in their profession, to conduct research (responsibly), to access and communicate scientific information, to move within and outside their country, and to cooperate internationally. Whether in their attempts to prohibit publication of information about the HIV virus, the silencing of climate scientists or persecution of medical doctors providing care to anti-government protesters, both open democracies and repressive regimes have demonstrated their capacity to violate these rights, sometimes in the name of national security, to protect elites or to silence politically embarrassing or uncomfortable truths.
2. *Science and technology can be applied for human rights purposes*: since at least the 1980s scientists and engineers have been developing and applying tools and methods that have strengthened human rights work, unearthing new truths, validating findings and providing the credibility of robust empirical data to support claims. Examples include the analysis of geospatial images to document mass human rights violations in remote or dangerous parts of the world, soil and water contamination analysis to determine the human rights impacts of mining on local communities, and the forensic examination of video evidence of chemical weapons attacks.
3. *The conduct of science and the applications of science and technology can have negative human rights implications*: following the atrocities of the Second World War, concerted efforts have been made through legal proscription and institutional oversight mechanisms to ensure against unethical practices and human rights violations perpetrated by scientists, engineers and health professionals. Yet, examples persist of the practice and applications of science and technology negatively impacting human rights. Emerging technologies, including those with dual military and civilian uses, are raising particular concerns and have sparked a debate about the ethical responsibilities of the scientists and engineers involved.
4. *International human rights law recognizes a right to science*: the right, as articulated in the ICESCR and described above, has important implications for

the scientific endeavor, including education, funding, and peer-review, as well as for access of the general public to scientific information and products.

5. *Scientists and engineers can be a constituency for human rights*: from the American Association for the Advancement of Science to the Committee of Concerned Scientists, Physicians for Human Rights and the International Council for Science, increasingly scientists and engineers are bringing their voices to human rights issues of relevance to their work and discipline, not just as individuals with a personal passion for human rights, but as members of large professional and scholarly societies that recognize a role for scientists and engineers in human rights.

These connections between science, technology and human rights are only recently being explored and positively exploited. There are several reasons for that, including the initial reluctance on the part of most Western nations to acknowledge economic and social rights as human rights imposing legal obligations on the State; the general separation of human rights practitioners from the scientific community, in principle and in practice; and the absolute failure of any interested party to explore and articulate the practical implications of the right to science. However, this has started to change.

Conclusion

Together the papers and commentaries in this Special Section highlight two trends that have dovetailed to encourage new partnerships between the scientific and human rights communities. Advocates for evidence-based policies to protect human rights have increasingly looked to empirical evidence as an important part of their documentation and monitoring efforts. At the same time, scientists and engineers have become more aware of the important social implications of their work and the ways in which a rights-based approach can increase the impact of their research.

The paper and commentary authors see this trend continuing in the context of transnational efforts, such as the United Nations post-2015 development framework, as well as the increasing attention to economic, social and cultural rights. It is in this context that the articles in this Special Section discuss tackling the obstacles to successful partnerships, such as understanding of each other's working languages, analytic frameworks, and goals. The authors also emphasize the challenges involved in implementing global norms as local policy and recommend that these partnerships be more inclusive of the communities affected by human rights concerns. The experiences of those involved in articulating the right to water and sanitation provide an important foundation for future efforts to take advantage of the five connections between science, technology and human rights.

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