Special topic: Identifying, disentangling and reflecting on traditions in science communication

Cultures of Science

Reconnecting society and science: Trajectories of the knowledge democracy movement

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As interrelated global wicked problems increasingly engulf all sections of life on this planet, searching for knowledge solutions to address them has become urgent. While scientists in modern science establishments (labs) are busy finding answers to COVID (and other pandemics) and climate disruptions, communities and societies continue to struggle and use their own wisdom and capacity to find meaningful measures for local adaptations.

This disconnect between societal actors and science has become critical. So, professional science communicators have critical responsibilities for rebuilding mutually respectful connections between society (and its diverse actors) and science.

How can science communicators play such important roles in bridging society and science? Let me illustrate the ways it is being attempted in diverse contexts.

1. Lab-to-land

The most common approach to 'science communication' described in public programmes can be summed up as 'lab-to-land'. Scientific knowledge for improved agriculture was being made available to farmers right after World War II, so that improvements in practice could take place. Many governments and international agencies (such as the International Fund for Agricultural Development) promoted this in the developing world.

From the 1960s onwards, science-communication strategies in myriad forms began to promote new scientific innovations for new varieties of seeds, chemical fertilizers and pesticides. Named as 'the green revolution', such new agricultural practices produced significant improvements in agricultural productivity, prevented famines in many parts of the Global South, and increased the domestic supply of basic food grains in countries like India, as in many other countries with significant numbers of rural agriculture-dependent people. The green revolution began to spread rapidly around the world, largely due to very successful science-communication initiatives. It changed farmers' behaviour and consumers' behaviour too.

But the new science from the labs to farmers' lands began to show some unanticipated impacts. There were implications for reduced soil fertility, water contamination and impacts on human health from all those myriad chemicals that were used in fertilizers and pesticides.

These implications were emerging from the first decade after the war (Woodwell et al., 1971), and new research about the dangerous implications for human beings and for agriculture and water was available publicly from the mid-1970s. Yet the communication campaign promoting the green revolution continued.

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Did the professional science communicator fraternity pause to reflect on future consequences of their work in promoting the green revolution, despite contradicting evidence?

Let us take another recent illustration. In recent COVID times, a massive global science-communication effort took place. Scientific committees of the World Health Organization and national governments were unanimously giving two significant pieces of advice to everybody around the world:

- Wash your hands frequently.
- Maintain 2 metres of physical distance.

In most informal urban poor settlements in Global South countries, neither was there enough water available to wash one's hands frequently, nor was there any physical space to remain 2 metres from others in densely populated homes and neighbourhoods. While scientific advice was communicated quickly and strongly in myriad forms and channels, science and scientists did not realise this reality for vast human populations in the Global South.

Was it a failure of science or was it a disconnect of science communication? Did professional science communicators not communicate new knowledge from the ground back to scientists and science establishments?

The above two illustrations pose certain questions for the profession of science communicators, young professionals, teachers and designers of curricula for the profession.

The message in the early days of the green revolution was from (science) lab to (farmers') land. The lab was where science was produced, and science communicators took those messages of labs to the land where water and land were being contaminated. Are the purposes of science communication and the role of the communicator only one-way, from the lab to the community? Is the aim to use the knowledge that scientists produce in labs to influence and shape the behaviour of people outside? Or is there another role for science communicators? Can science communication be two-way also? Can the emerging messages (the evidence, the disconnect, the lack of physical space or the contamination of water) return to the scientists and challenge them to think afresh? Is this not the role of science communication? In this one way, the science-communication profession may well be called a marketing profession; it is promoting science, and products based on that science, to expand the markets and thereby the profits of corporations.

Communication professionals are taught that no communication is sustainable without mutuality; and mutuality requires returning the messages to the lab or the scientists in the lab and challenging them, based on what we are learning from the communities, which are the targets of those communications. The profession of science communicators can become a two-way bridge between scientists (labs) and society (communities), and embed their profession with values for the well-being of all living beings on the planet.

2. Closed *or* open science?

In addition to labs, where else do science communicators access knowledge for their profession? From books, journals, digital platforms and related spaces, mostly. Figure 1 is a weighted map of refereed journal and book publications around the world. It shows that the majority of the knowledge is produced in the Global North America and Europe. It also shows that there is not much knowledge production in Africa and the Global South.

Does this represent the totality of knowledge available to human civilisation today? Or does this represent only those pieces of academic knowledge that are published in refereed journals and books, controlled by a global oligopoly of northern publishers and published mostly in European languages, largely in English and French?

This is *closed science*! In this representation of scientific knowledge, non-European/American knowledge is ignored, not included. If the origins of humanity began when our ancestors walked from the plateau of Ethiopia to the rest of the world, then surely Africa and African people have a body of knowledge that this closed science does not represent. The case for inclusive African knowledge for the future development of Africa was eloquently made at a UNESCO and African Union conference held in Ethiopia in October 2024.[1]

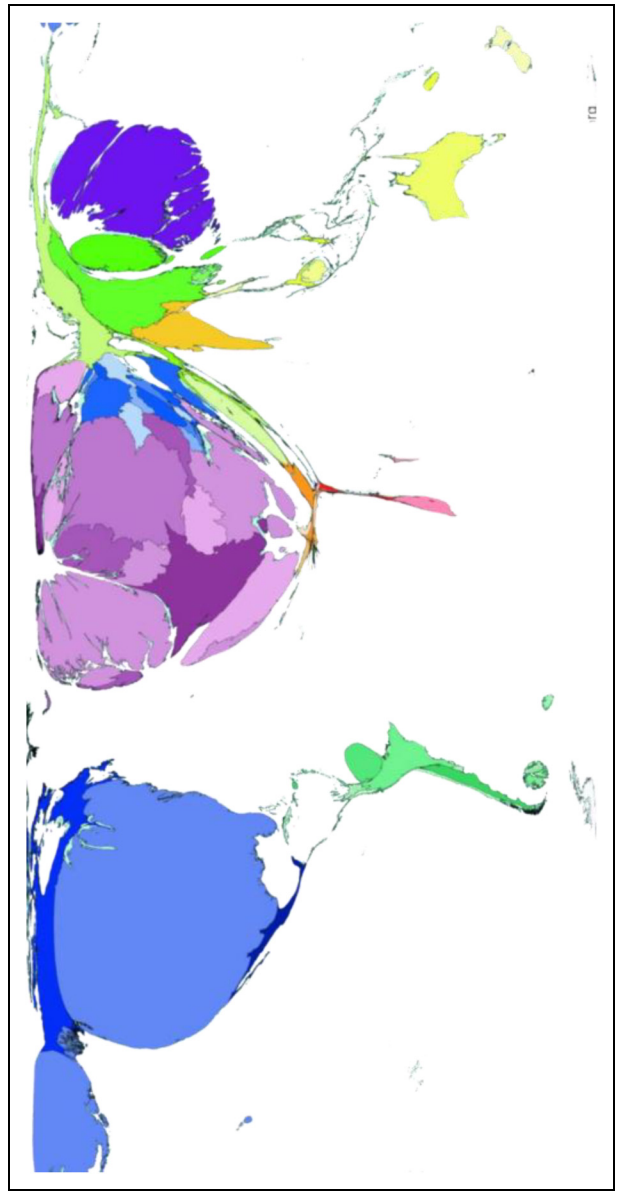

Figure 1. Closed science (Czerniewicz, 2015).

3. What is open science, then?

The *UNESCO Recommendation on Open Science* was adopted by all member states of UNESCO in November 2021 (UNESCO, 2021). Figure 2 explains that framework.

Open science has four pillars. First and most understood is open data and open access to scientific data: **the green quadrant**. The second **pink quadrant** focuses on open scientific infrastructure; it is commonly understood as the sharing of labs, digital science platforms, and so on.

Professional science communicators may also know about the third quadrant in **yellow**, called open engagement. Many science establishments are beginning to design strategies and recruit professionals for public engagement. This is being increasingly recommended by research funders. Public-engagement professionals are being formally trained to perform such roles well. This approach to connecting science with society through public engagement has gained increasing attention from universities and research institutes. Until now, such involvement of professionals in public engagement to connect with society has mostly been practised in Europe and North America. Many national science and research councils are including public engagement in their policies, although actual practices are slowly developing in the Global South. But much of public engagement is one-way: from science to society. Many research funders are now promoting such an engagement, called 'Science for Society'. Scientific knowledge is communicated to the public in this approach (the third quadrant). This approach is somewhat inadequate because the connections between society and science are one-way, not mutual. 'Science with Society' research programmes of the European Union have promoted this approach.

It is the **fourth blue** pillar of open science recommendation that focuses on 'openness to multiple epistemologies', to different knowledge systems hitherto excluded:

> Open dialogue with other knowledge systems refers to the dialogue between different knowledge holders, that recognizes the richness of diverse knowledge systems and epistemologies and diversity of knowledge producers in line with the 2001 UNESCO Universal Declaration on Cultural Diversity. It aims to promote the inclusion of knowledge from traditionally marginalized scholars and enhance inter-relationships and complementarities between diverse epistemologies, adherence to international human rights norms and standards, respect for knowledge sovereignty and governance, and the recognition of rights of knowledge holders to receive a fair and equitable share of benefits that may arise from the utilization of their knowledge. (Chan et al., 2020)

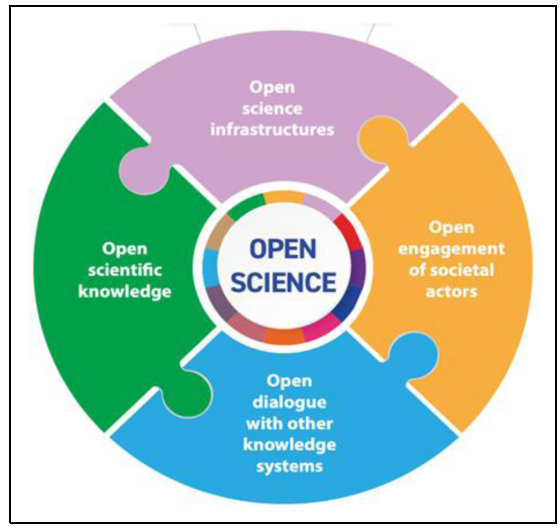

Figure 2. The open science framework.

This declaration provides a mandate and a framework, at the global level, to begin to examine knowledge holistically. Since science is about producing new knowledge, the fourth blue pillar of the UNESCO recommendation invites science to rediscover and reconnect with that knowledge, which is produced and validated through non-Western methodologies.

The science-communication profession needs to embrace all four pillars of open science, not merely the popular first two. The profession needs to figure out how public engagement, the third pillar, can include the fourth pillar, too. One-way dissemination of university research science needs to come to terms with community knowledge and research,

as recommended in the fourth pillar. How does the profession recognise the value of such knowledge in its engagement with publics? How does the profession develop its own 'openness' to the diversity of knowledge cultures?

4. Knowledge democracy

The movement of knowledge democracy began 50 years ago with the practice of and experimentation in *participatory research* (Hall, 2005).

The phrase 'participatory research' was first used by Budd Hall (1975). He described his experiences as an adult educator and education researcher in Tanzania as an integrated methodology of research, education and action. Around the same time, my field research in southern Rajasthan began to create dissonance in using the research methodology I was trained in. With a group of similarly 'ruffled and curious' researchers interested in bringing about social change, we began an ambitious initiative called the 'International Network of Participatory Research'. I began to 'network' in Asia, based in Delhi. With a small group of like-minded researchers and practitioners, Participatory Research in Asia (PRIA) was set up in February 1982. During the early 1980s, PRIA promoted reflections on and the systematisation of lived experiences as a starting point for participation with the motto 'Knowledge is power'. The international network developed strong linkages with social movements and community organisations of workers, peasants, tribal peoples, women and other marginalised sections of society internationally. New interpretations of the core ideas began to evolve, such as participatory action research, participatory rural appraisal and others.

By the mid-1990s, participatory research had made inroads in international development programmes worldwide. In this period, most academic researchers in India and around the world considered 'participatory research' as a method of promoting community participation in socio-economic development projects. Its toolkits were taught to practitioners of development in government and non-governmental organisations, staff of international agencies and students in some professional courses (such as social work). Over the first 25 years, participatory research was not taken seriously by academia and professional research funders. Early shifts began to occur at the turn of the millennium, as academic research in partnership with local 'beneficiary' communities emerged in some universities of North America and Europe. As practices of 'co-construction' of knowledge became somewhat widespread and 'entered' universities of the southern countries, innovative research methods of community-based participatory research began to be deployed.

The key features of the knowledge democracy framework have evolved to include:

1. understanding of and engagement with a diverse plurality of epistemologies
2. respecting the gendered dimensions of knowledge production
3. respecting community knowledge cultures (which are distinct from the academic knowledge culture)
4. recognising that community and indigenous knowledges are created and shared using creative social learning methods, including ceremony, ritual, theatre, the arts, social-media clips and more
5. recognising that multiple and holistic modes of enquiry recognise thinking, feeling and acting as equally legitimate modes
6. acknowledging that place-based, contextual and actionable knowledge entails community framing of research questions
7. understanding that theorising from lived experiences implies respecting local cultures and languages
8. noting that ethical practices go beyond formal, written pre-research consent protocols
9. being clear that knowledge mobilisation, translation and dissemination to multiple publics and stakeholders entail forms of communication beyond academic publications and conferences
10. respecting that ownership of knowledge may be shared for future uses through a process of co-determination with community partners.

As practices of the co-construction of knowledge gradually spread, several ethical issues are also

emerging. When communities (indigenous and others) share their knowledge in a co-construction research project, how is this knowledge credited? Who has ownership of this knowledge? How and by whom is its data stored? What arrangements for benefit-sharing of applications from this new knowledge should be devised?

5. The UNESCO recommendation in one of its pillars: 'Learning to attend and care'

The 'CARE Principles for Indigenous Data Governance' involve collective benefit, authority to control, responsibility and ethics (Carroll, 2020). Such efforts acknowledge the rights of indigenous peoples and local communities to govern and make decisions on the custodianship, ownership and administration of data on traditional knowledge and on their lands and resources.

A recent international study examines lessons from 10 community/indigenous research projects that have made some impacts on policy for and/or practices of climate resilience. Located in Arctic Canada, Brazil, Bolivia, Colombia, Ivory Coast, Tunisia, Uganda, Malaysia and India, the DECODE project demonstrates how bridging knowledge cultures between the community and academia is synergetic.[2] Using participatory research, especially arts-based research, safe spaces for dialogue across the two epistemologies are facilitated.

Decolonised research entails producing knowledge that is context-specific and actionable and addresses specific local problems. The decolonised methodology uncovers culturally embedded rituals and linguistic expressions of community knowledge and enables interactions with more universal academic concepts.

DECODE findings provide lessons for the teaching and training of professional science communicators. The focus on community-led research reinforces diversity and ecologies of knowledge (Lepore et al., 2024).

Finally, what is the purpose of science, research and knowledge? The answer is societal well-being. Thus, science, research and knowledge should be treated as public goods, not private goods. Only then would all of humanity have access to COVID vaccines and be healthy. Private ownership of knowledge and its means of production make it impossible to pursue the well-being of all living things on the planet. It is this private control over knowledge that is driving trillions of monopolies in digital spaces. Should such a reflection be a part of the discipline of professional science communication?

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2. The DECODE research project is led by UNESCO Chair in Community Based Research and Social Responsibility in Higher Education. See details at: https://www.decodeknowledge.org/case-studies.

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Author biography

Rajesh Tandon is an internationally acclaimed leader and practitioner of participatory research and development. He founded Participatory Research in Asia in 1992 and continues to be its chief functionary. He is also Co-Chair of the UNESCO Chair in Community-Based Research and Social Responsibility in Higher Education. An engineer in electronics from the Indian Institute of Technology Kanpur, holding an MBA from the Indian Institute of Management Calcutta and PhD in Management from Case Western Reserve University, USA, Dr Tandon left his teaching job at IIM Calcutta to support and champion the cause of building organisations and capacities of the marginalised through their knowledge, learning and empowerment. A pioneer of participatory research, he has given new meaning to academic research by redefining the relationship between the researcher and the researched. Dr Tandon has been contributing to the emergence of several local, national and international initiatives to promote authentic and participatory development of societies. He has authored more than 100 articles, a dozen books and numerous training manuals. He was inducted to the International Adult and Continuing Education Hall of Fame (class of 2011).