

Engaging Communities

As you plan to implement research translation projects, one of the most critical components to consider is the extent to which and methods by which you engage communities. While research translation and community engagement do not have a single prescriptive approach that works in all cases, we feature tips and examples of partnerships and international programs from the experiences of Indiana University–Purdue University Indianapolis (IUPUI) Professor of Earth Sciences Gabriel Filippelli. We hope this will assist you in effectively engaging local community stakeholders in your projects, as applicable, to ensure both the impact and sustainability of partnerships.

Background

Public participation in research offers opportunities for researchers to explore society at a much more granular level than in traditional research, and then to build influence through relationships. Meanwhile, it offers communities increased knowledge of the issues affecting them and pathways to solving these. Community engagement in participatory research is on a spectrum from passive participation in data collection to active participation in the research process (Figure 1). Communities can be involved solely in data collection, consulted early in defining the problem at hand, active across the entire research process, and assist with the uptake of the findings. Effectively, this can permit community involvement to evolve toward deeply embedded partnerships that benefit *both* researchers and communities. By creating sustainable, bi-directional partnerships and engaging non-university partners with the processes and outputs of research projects, **knowledge transfer moves both ways** and communities can be engaged in framing research questions, collecting and analyzing data, and developing tools that make sense for communities involved.

Part of this motivation to pivot to a new model of research engagement has arisen from the tensions and distrust in previous approaches, where research was done *on* instead of *with* communities. This provided little lasting benefit to the communities themselves while explicitly benefitting the researcher side of the relationship. Participatory approaches do not preclude researchers from doing what they do best—conducting research, publishing in specialty journals, and building research reputations—but they do ensure that the research products reach community members where they can inform practical and locally relevant solutions.

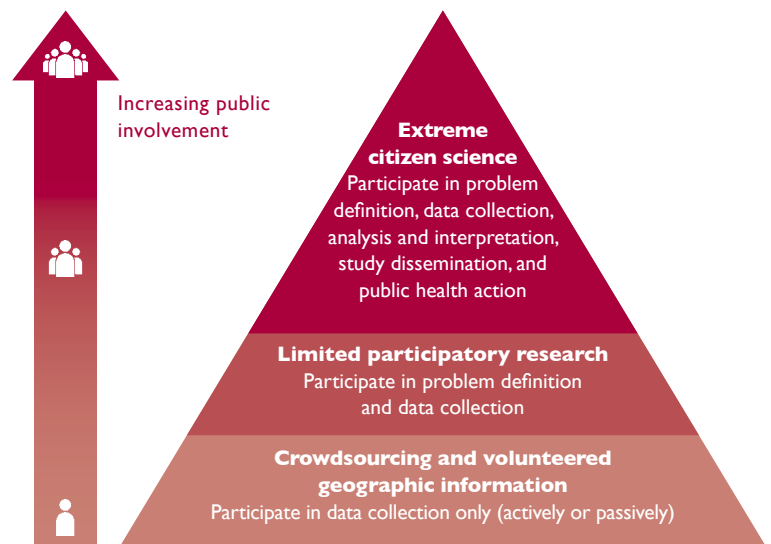


Figure 1: Pyramid of participatory research approaches (English et al. 2018)

Components of Successful Community–Researcher Partnerships

While understanding the context of participatory research is critical to ensure successful collaboration, there are four key components of successful community-engaged research partnerships:

Mutually Beneficial. Partnerships should generate benefits for both community and the researcher partners. The community partner should benefit in the ways they find appropriate and valuable, such as analytical support, solution-building, or technology transfer. The researcher gains data and access to resources that they would not otherwise be able to obtain, and uses these for knowledge creation and to expand the resource base for continued discovery.

Respectful and Reflective of Local Knowledge. Traditional knowledge in international partnerships includes community-based knowledge that has been accrued over decades or even generations that would be impossible for an outside partner to build in the span of a research partnership. For example, research projects on climate change in the Arctic have involved the multi-generational perspectives and observations of indigenous peoples, which have proven critical where scientific climate monitoring was incomplete (Golden et al. 2015).

Bi- or Multidirectional in Communication and Engagement. Partnerships succeed when lines of communication or engagement between the partners are well developed, and when the expertise of both sides is respected and built into the structure of the partnership (Figure 2). When these lines of communication are perceived as isolating, unresponsive, or biased, the trust in the information received and the motivation to act on this information is threatened. The key to building bidirectionality is to integrate communication between the two sides throughout the project to ensure perspectives are reflected in research procedures.

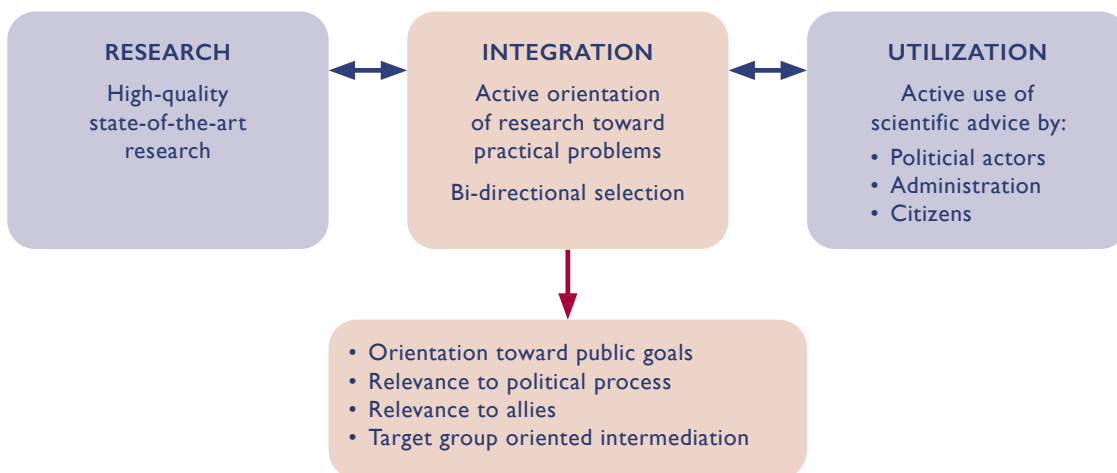


Figure 2: RIU model of bidirectional knowledge transfer between researchers (left) and practitioners (right). Adapted in Do (2019) from Böcher and Krott (2014 and 2016).

Sustainable as Partnership Evolves. The key to a sustainable partnership is to regularly explore whether the partnership is meeting the needs of each partner, whether the partnership needs to change direction in light of priorities and/or funding, and when parties need to move in or out of the partnership to meet their needs. An effective partnership should be able to evolve over time through continued work, additional funding, or joint opportunities for different collaborations. Partnerships that reflect the above components are more likely to be sustainable.

Overcoming Obstacles to Building Lasting Researcher–Community Partnerships

There are a variety of barriers to building lasting researcher–community relationships. However, through active consultation and mutual respect, partners can work to overcome obstacles.

- 1. Lack of incentives to engage at the university level.** Generally, researchers are not well recognized for the effort that is involved in building impactful and sustained community-engaged research programs. For example, a researcher may spend ample time developing deep and meaningful community contacts toward an impactful engagement program but is not rewarded by promotion and tenure committees for doing so.

Overcoming the obstacle: Build university capacity to recognize the value of community-engaged research, both to the research enterprise and the general community. Expand the definition of service to include service to community.

- 2. Lack of sustained leadership at the community level.** Partnerships with communities are often catalyzed by individuals within the community who have a passion to make changes, or by organizations that have a mandate to achieve. When that catalyzing individual moves on or organizational priorities change, the partnership with the university may become less of a priority to successors.

Overcoming the obstacle: Build multiple bridges to a single organization and/or partnerships with multiple organizations whose missions are complementary, providing a fallback option should one organization change priorities.

- 3. Lack of trust among partners.** The history of scientific research on human subjects and communities is rife with issues. Institutional review boards have effectively eliminated the most egregious of these abuses, but more subtle issues persist, such as not considering community perspectives and benefits, or failing to fulfill promised deliverables.

Overcoming the obstacle: Build value and mutual respect through a series of participatory workshops with all partners, opportunities to learn from communities and reflect on the partnership, recognition of community contributions through co-authorship, and commitments to extending the partnership beyond one project. Consider with your partners how you can document and measure partnership and engagement to ensure shared accountability for researchers and community partners (Luger et al. 2020).

- 4. Lack of funding avenues to support the partnership.** For both universities and communities, obtaining sustained and consistent funding to support a community-engaged program is challenging. University partners typically seek research funding from federal sources that may not have local community support as a key priority and that does not extend for long durations. Similarly, community organizations seek funding from federal, state, or private foundation sources that may not fund original research but instead focuses on community action.

Overcoming the obstacle: Simultaneously develop multiple complementary funding streams. For example, a researcher pursuing federal grants to research water resource changes could interleave this with a foundation grant with a local partner for water security and access. Indeed, such efforts often add credibility and show capacity for both federal and foundation reviewers. In addition, researchers can target a growing number of funding opportunities that prioritize community engagement.

Overcoming Obstacles and Making Impacts: An Example in Safe Urban Gardening

Building meaningful sustained partnership takes time, but a key starting point is engaging early, often, and equally. The structure of these engagements can be formal or informal, but they must always start by sharing individual values and goals, and learning from each other in such a way that a sound partnership can be built. The common obstacles to this process can be overcome, with intentional and measured program development, which by necessity must evolve to fit the changing needs of partners and funding sources. Below is an example of successful program development between researchers and communities.

Safe Urban Gardening Initiative, Indianapolis, Indiana, USA

The Safe Urban Gardening Initiative began as a project to map the distribution of harmful lead contamination in cities, involving basic sampling in legal rights of way and parks. To expand sampling, the team partnered with a local inner-city high school science teacher who wanted a hands-on and relevant project for his students. The students were trained in sampling and subsequently sampled in their own neighborhoods. Their findings showed shockingly high values in an area around an old lead smelting facility.



Figure 3: The Safe Urban Gardening Initiative, a partnership between the Center for Urban Health at Indiana University–Purdue University Indianapolis and several community partners in Indianapolis, Indiana.

Identifying and Empowering New Community Partners

The researchers used these findings to partner with a local environmental justice initiative and a local children's health organization to obtain an EPA Environmental Justice grant, designed to expand the citizen science sampling of yards by residents. Upon realizing that the burden of lead contamination was not just in streets or parks, but also in homes and backyards, the team proposed the Safe Urban Gardening Initiative to sample properties in central Indiana. It designed a guide on safe urban gardening (Figure 3) to distribute to homeowners' organizations in the region to provide communities with solutions to deal with and mitigate lead contamination.

The research team then received a community engagement grant designed to transfer much of the sampling, education, and stakeholder engagement to youth development programs already running in three partner organizations. This resulted in many innovations, including door hangers in advance of an in-person visit, a simpler risk communication system, and a youth-initiated mulching campaign in neighborhoods with likely lead hazards. Instead of researchers presenting the data, youth groups created a video about how to test soil for lead. While researchers achieved hundreds of previously inaccessible samples, communities obtained valuable information on existing lead contamination and how to garden safely.

Project Iteration and Sustainability

The last evolution of the program involved moving indoors, with community members collecting dust from vacuum containers and sending them for laboratory analysis of indoor risks. This program eventually went international through [an interactive web-based portal](#) for information, sampling instructions, and results reporting.

Currently, the MapMyEnvironment program provides interactive tools to explore the environmental conditions in neighborhoods, request testing of individual household samples, and learn about exposure hazard risks and mitigation.

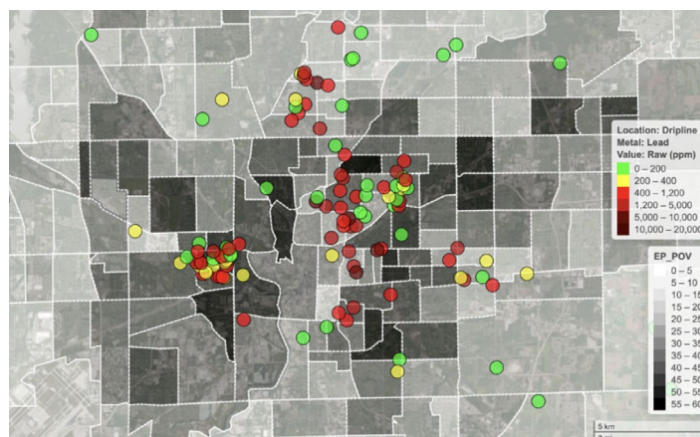


Figure 4: A MapMyEnvironment image of Indianapolis, where contaminant lead in soils (colored circles) is depicted alongside communities' economic status (percent of poverty, in gray).

Takeaway Points

In the course of a decade, what started with minimal engagement from the research team in taking soil samples to find hot spots in lead poisoning led to a larger-scale community engagement program, and eventually to a multinational research enterprise to understand the drivers of environmental health and key mitigation factors around the world, involving a diversity of partnerships.

Components of a successful community–researcher partnership



Mutually beneficial



Respectful and reflective of local knowledge



Bidirectional in knowledge transfer



Sustainable as the partnership evolved

To reflect on the four components of successful community–researcher partnership, this example was:

- ③ **Mutually beneficial.** Researchers obtained access to backyards and gathered rich soil data that resulted in 10 publications. The community obtained results to identify areas of major concern and, in one case, a neighborhood conducted a free mulch drive to mitigate the immediate problem of lead exposure.

- ③ **Respectful and reflective of local knowledge.** Youth leaders in the program had a strong sense of the most problematic areas in the community and how to conduct testing appropriately with respected community members. The community also heard a young local voice delivering the message about contamination and mitigation.
- ③ **Bidirectional in knowledge transfer.** In addition to researchers transferring knowledge on contamination hotspots and mitigation efforts to communities, communities transferred knowledge to researchers on how to communicate with vulnerable populations. This was facilitated by close collaboration and frequent communication with community representatives. Youth community members became empowered action drivers to do and communicate science.
- ③ **Sustainable as the partnership evolved.** The partnership grew and expanded appropriately over time through central Indiana, including long-term relationships with community organizations and the private sector. The partnership eventually evolved into an international program to gather citizen science information about environmental hazards and communicate results that have local impact, expanding beyond lead to heavy metals, allergens, per- and polyfluoroalkyl substances, and antimicrobial resistance.

Overall, the program learned that community input can have unintended benefits for long-lasting research partnerships. A key lesson learned was that researchers should engage in deeper and more meaningful ways to focus on sustainably building capacity within vulnerable communities to address community needs through community channels.

Next Steps and Resources

The models and example presented can guide your work to effectively engage communities in a variety of settings for research translation. As you build your partnerships and engage communities in research translation toward development impact, remember to construct your engagements in ways that are mutually beneficial, reflective of local knowledge, bidirectional in communication, and sustainable as partnerships evolve. Alongside your partners, consider how you can measure engagements across these different dimensions at the start to allow for and encourage mutual accountability.

For additional reading on the strategies outlined here, please see:

- ③ [Map My Environment](#)
- ③ [Citizen Science Association](#)
- ③ [Community-Based Participatory Research Program](#) (National Institute on Minority Health and Health Disparities)
- ③ [All of Us Research Program](#) (National Institutes of Health)
- ③ [Community-Engaged and Community-Based Participatory Research](#) (CITI Program)

References

- Böcher, Michael, and Max Krott. 2014. The RIU Model as an Analytical Framework for Scientific Knowledge Transfer: The Case of the ‘Decision Support System Forest and Climate Change.’ *Biodiversity and Conservation* 23: 3641-3656. <http://dx.doi.org/10.1007/s10531-014-0820-5>.
- Böcher, Michael, and Max Krott. 2016. The RIU Model as an Analytical Framework for Scientific Knowledge Transfer. In: *Science Makes the World Go Round*. Springer, Cham. http://dx.doi.org/10.1007/978-3-319-34079-1_2.

- Do, Huong, Nataly Juerges, Max Krott, and Michael Böcher. 2019. Can Landscape Planning Solve Scale Mismatches in Environmental Governance? A Case Study from Vietnam. *Environment and Planning E: Nature and Space* 2 (1). <http://dx.doi.org/10.1177/2514848618822510>.
- English, PB, MJ Richardson, and C Garzón-Galvis. 2018. From Crowdsourcing to Extreme Citizen Science: Participatory Research for Environmental Health. *Annual Review of Public Health* 39: 335-350. <https://doi.org/10.1146/annurev-publhealth-040617-013702>.
- Filippelli, Gabriel M, Martin Risch, Mark AS Laidlaw, Deborah E Nichols, and Julie Crewe. 2015. Geochemical Legacies and the Future Health of Cities: A Tale of Two Neurotoxins in Urban Soils. *Elem Sci Anth* 3: 000059. <http://doi.org/10.12952/journal.elementa.000059>.
- Golden, Denise M, Carol Audet, and MA (Peggy) Smith. 2015. 'Blue-ice': Framing Climate Change and Reframing Climate Change Adaptation from the Indigenous Peoples' Perspective in the Northern Boreal Forest of Ontario, Canada. *Climate and Development* 7 (5): 401-413. <http://dx.doi.org/10.1080/17565529.2014.966048>.
- Hendricks, Deborah, Amy Shanafelt, Sheila Riggs, Kathleen Call, and Milton Eder. 2019. Proceedings of Advancing the Science of Community Engaged Research (CEnR): Innovative and Effective Methods of Stakeholder Engagement in Translational Research: Abstracts. *BMC Proceedings* 13 (2). <https://doi.org/10.1186/s12919-019-0163-z>.
- Israel, Tiffany, Helena Farrow, Yvonne Joosten, and Yolanda Vaughn. Community Engagement Studio Toolkit 2.0. Vanderbilt Institute for Clinical and Translational Research. https://www.meharry-vanderbilt.org/sites/vumc.org/meharry-vanderbilt/files/public_files/CESToolkit%202.0.pdf.
- Luger, Tana M, Alison B Hamilton, and Gala True. 2020. Measuring Community-Engaged Research Contexts, Processes, and Outcomes: A Scoping Review. *Milbank Quarterly* 98 (2): 493-553. <https://doi.org/10.1111/1468-0009.12458>.