

Response to the Request for Information to

# Support the Development of a Federal Environmental Justice Science, Data, and Research Plan

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**Submitted to:**

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## Introduction

By creating a science, data, and research plan in response to Executive Order 14096 that encourages participatory and meaningful engagement of communities, the Office of Science and Technology is taking a critical step in its efforts to advance environmental justice. Some communities suffer a greater burden than others from environmental issues such as floods, drought, wildfires, and poor air and water quality. Helping to directly engage these communities as valued collaborators in or drivers of research that aligns with and emphasizes their interests, needs, and values is critical. Implementing collaborative, participatory methods with communities can actively disrupt the status quo often experienced by the people and communities being studied ([Gonzalez et al. \[2022\]](#)) offers an example of a framework designed to do this).

Too often, research does not include community members and, as such, is missing key voices; the common approach has been to conduct research that happens *to* communities and not *with* them ([Chicago Beyond 2019](#); [Cornwall and Jewkes 1995](#)). The approach has often been one of ignoring or marginalizing the affected community, denying its members access to the decision-making process and conveying a message of “[your voice, needs and interests do not matter.](#)” Without incorporating community voices, research can reinforce deficit narratives, biases, or long-standing structural inequities that ultimately harm communities. On the other end of the engagement spectrum (see inset), the aspirational approach is to defer to community ownership and foster equity through community-driven solutions. By drawing on the community’s strengths throughout the research process, teams can design more responsive approaches that promote action and produce findings that lead to more effective and sustainable programs, policies, and practices and, ultimately, better outcomes. Organizations that are intentional about engaging the community members who are the focus of activities throughout the research process produce results that are more just, valid, and useful for all involved ([Schnarch 2004](#)).

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The Spectrum of Family Engagement for Educational Equity is based on the Community Engagement to Ownership Spectrum, created by the Facilitating Power & Movement Strategy Center to chart a pathway toward racial equity and environmental justice. The stages in the spectrum include **ignore, inform, consult, involve, collaborate, and defer to.** ▲  
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Mathematica is a nonpartisan research and data analytics organization with a mission to improve public well-being. As we strive to center equity in our work, we too focus on engaging with the affected communities as participants and partners in the research. We strive to work alongside diverse communities to support and facilitate equitable research as communities take the lead. As our understanding has evolved about the value gained from and ways to support participatory approaches, we have developed tools, trainings, approaches, and guidance to support our efforts. Some examples of these tools include [When Communities Lead](#); [Understanding the Interconnected Nature of Social Systems Is Key to Advancing Equity](#); and [Engaging Communities as Research Collaborators](#). We have developed and applied these lessons in numerous settings and to conduct research on a variety of policy issues. As a result, we bring a wealth of potential applications, understanding of challenges, and strategies to draw on.

## Item-by-Item Response, Part 1

To support the development of the Federal Environmental Justice, Science, Data, and Research Plan, we offer information in response to **Topic #3: Encouraging Participatory Science and Meaningful Engagement for Communities**. We first describe in detail our approaches in response to the following two subquestions within this topic (a response to an additional subquestion appears later):

**F. What practices could ensure that effective, respectful, and meaningful public engagement is built into the research process?**

**G. What methods, processes, or structures do you know of for respectfully collecting, maintaining, and analyzing information with communities?**

We describe our practices and approaches to meaningful community engagement in response to both subquestions f and g in two parts: (1) an initial phase focused on developing a plan for community engagement; and (2) approaches to each of the six phases of the research life cycle, which includes collecting, analyzing, and disseminating information. We then briefly consider the implications for participatory science in the context of environmental justice.

### Developing a community engagement plan

To foster respectful and meaningful engagement with communities, we recommend beginning with developing a community engagement plan. Doing so is important because it challenges and changes the common frame of research from one that is carried out *to, about, or for a community* to one that is *with or by* community members. Before approaching the actual research, it is critical to establish trust among all parties.

Mathematica has developed a tool that offers concrete steps to ensure we build effective, respectful, and meaningful public engagement into the research process.<sup>1</sup> This Community Engagement Planning Tool provides a guide for conceptualizing, planning, implementing, and improving efforts to involve, and ideally collaborate with, community members in research and evaluation projects. The tool offers topics and questions for consideration, tables to organize thoughts and ideas, and additional resources for reference. Community engagement planning generally occurs in four phases:

*Phase 1: Establish community engagement goals and parameters.* This initial phase entails establishing the goals of the community engagement effort in the context of the project and considering the resources available and the parameters established by the project's funder or sponsor. This process might include discussions between the research team and the funder to clarify expectations, align goals and resources, and identify what community engagement effort is feasible for the project.

*Phase 2: Map the community.* Project teams develop an understanding of the community or communities involved. This includes defining the community, understanding the structural and historical factors that shape their experiences, mapping the different actors or groups

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<sup>1</sup> This planning tool is not yet available publicly but is available for staff use in community engagement activities.





affected, and identifying who can represent them. It also includes identifying the community’s assets, needs, and priorities. The community mapping process should be completed together with the community to build trust and relationships. A trusted intermediary who represents the community can help facilitate a project team’s understanding of the community. A community advisory board could also serve this purpose.

*Phase 3: Develop a community engagement strategy.* Project teams develop a strategy to advance the goals established in Phase 1 and engage the community representatives identified in Phase 2. The strategy specifies the community engagement level(s), methods, and activities to implement throughout the project’s life cycle. The strategy also details the supports, facilitation practices, conflict management strategies, and monitoring tools needed.

*Phase 4: Implement, monitor, and adapt.* Project teams implement the community engagement strategies identified in Phase 3. This includes documenting experiences, monitoring progress toward engagement goals, practicing internal reflection processes, and adapting plans as needed.

It is important to acknowledge that creating a community engagement plan involves challenges. We share some common challenges and approaches we have implemented to address them (Figure 1).

**Figure 1. Challenges and approaches in creating a community engagement plan**

Challenge	Approaches
 <p>Competing demands on community partners’ time</p>	<p>Engage in dialogue early (program- and budget-wise); researchers must understand the unique challenges of the particular community partners and find creative ways to conduct research and minimize time disruption, time commitment, and expenses. Community partners have to communicate to researchers how to be respectful of their work and their challenges.</p>
 <p>Lack of community infrastructure or capacity to conduct research</p>	<p>Assess the capacity the community organization has to conduct research. Understand power differentials. Work with research-ready organizations and offer training or technical assistance to clinics and organizations that might need capacity-building and are willing to learn how to do research.</p>
 <p>Previous bad experiences with researchers in community-placed studies</p>	<p>Build trust with communities early, before research begins. Invest in the communities and exploit relationships. Get into the community early and warm it up by participating in community events and activities. Also, have research staff who are representative of the communities.</p>
 <p>Approaching community organizations after research ideas are already developed</p>	<p>Approach the community at the inception of an idea and engage community organizations as true partners. Involving end users at the very beginning will improve recruitment of participants and acceptance of research methods in participatory science projects. Doing so can also produce beneficial modifications, address concerns about and/or allow for training on various technologies and communicate intentions to support both implementation and the impact of the research results.</p>

### Approaches to each phase of the research life cycle

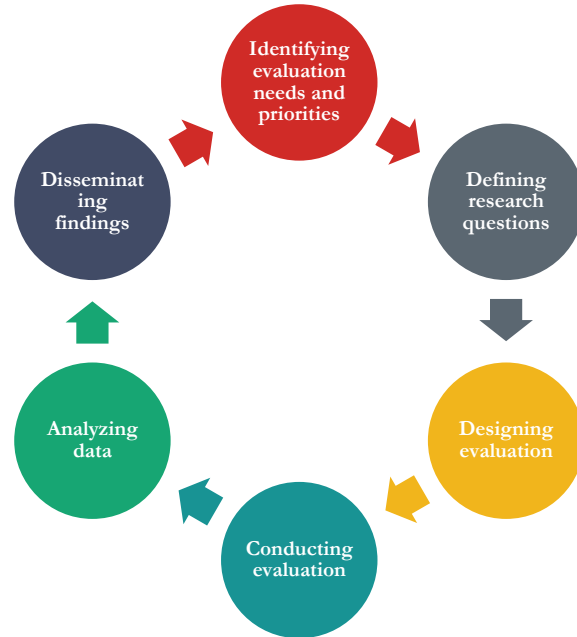
There are six phases of the research life cycle, each of which must be grounded in approaches to effectively engage the community (Figure 2). We offer the following recommended approaches to ensure that effective, respectful, and meaningful public engagement is built into the process at each phase:

**Phase 1: Identifying evaluation needs and priorities.**

**Recognize the community as experts.**

It is vital to recognize as experts those who have experienced environmental injustice and service providers directly involved in the work. When developing evaluation needs and priorities, it is important to collaborate with the community to ensure the evaluation aligns with the needs of those affected. One method to ensure collaboration is to conduct focus groups with community leaders and members of the affected community to understand needs and priorities from their lived experience. Another method is to conduct a group mapping exercise with a diverse range of the community of interest to identify needs, priorities, assets, and challenges.

**Figure 2. Research life cycle**



**Phase 2: Defining research questions.**

**Ensure the needs and interests of the community drive the research questions.** Forming research questions should be a collaborative effort with the community. This process builds rapport for the research process and amplifies community voice. One approach is to convene an advisory group that involves a diverse representation of the affected community to brainstorm research questions. Mathematica has successfully convened expert panels of people with lived experience in the justice system, including current practitioners in employment-focused reentry programs, to inform or refine research questions.

**Phase 3: Developing a research design.**

**The research design should be developed in collaboration with members of the community.**

Community members have an in-depth understanding of their needs, challenges, and assets. Therefore, engaging them in the research design process is important. Members of the community likely have valuable insights on the feasibility of different research designs. For example, communities affected by environmental disasters such as floods or hurricanes might advise against a randomized controlled trial due to inequities that exist within the community. One strategy to engage community members in the research design process is to hold facilitated collaborative discussions around the pros and cons of different approaches. Mathematica has developed a tool for [Advancing Equity to Mitigate Power Dynamics in Data Collection Teams](#).

#### Phase 4: Conducting the evaluation.

**Test the survey questions in the field to make sure the questions are clear, culturally appropriate, and necessary.** When creating instruments, it is important to test questions with potential research participants to get their feedback. This process can help pinpoint problem areas such as questions not being culturally relevant, questions that are jargon-heavy, and whether the length is appropriate for the target community.

**Collaborate with stakeholder groups to ensure methods are culturally appropriate for the intended communities.** It is also important that data collectors receive training in cultural context and have contextually relevant experience. One way to ensure we collect data in a respectful and meaningful way is to debrief regularly among the research team to determine the need for any changes to data collection process. For example, members of the research team might discover that people struggle with survey responses due to barriers such as language and accessibility.

#### Phase 5: Analyzing data.

**Analyze data and interpret findings through an iterative process.** Collaborating with members of the community to analyze and interpret data contributes to meaningful and authentic findings. Mathematica has developed a guide to support community-engaged data analysis: [The Guide to Equitably Co-interpreting Data with Community Collaborators](#).

#### Phase 6: Disseminating findings.

**Tailor the content and format of dissemination products to the audience's needs and preferences.** Disseminating findings to a variety of audiences can reduce the gap between research and practice. Often, dissemination products of research findings are not easily accessible to the community where the research was conducted. Consider nontraditional forms of dissemination such as a [podcast](#) and [webinars](#). When members of the community serve as co-facilitators, such efforts can ensure meaningful and respectful deliverables.

### Considerations for environmental justice

The approaches to community-engagement are easily transferable across different contexts. However, there can be specific considerations for environmental justice. Here we suggest a few:

**Consider the physical risk of community engagement.** Some environmental disasters such as floods, hurricanes, and wildfires might pose hazardous risks. Therefore, it is important to consider the potential of physical harm when conducting research in such environments.

**Collaborate with community-based organizations that already do the work.** Communities that have experienced environmental injustice might not have the emotional capacity to engage in research. Therefore, it is important to collaborate with community-based organizations and other leaders within the community that already do the work.



**Understand historical context.** It is important to understand the historic marginalization and oppression of communities affected by environmental injustice. This can help their increase buy-in to the research process, instill trust, and intentionality around not perpetuating injustice.

## Item-by-Item Response, Part 2

Under **Topic #3: Encouraging Participatory Science and Meaningful Engagement for Communities**, we describe in detail approaches in response to the additional following subquestion within this topic:

- E. What recommendations do you have for encouraging, implementing, and institutionalizing community and/or participatory science, such as research or data collection undertaken by communities or the public, and, as appropriate, integrating such science into agency decision-making processes?**

### Encouraging communities to undertake participatory science

Encouraging communities to undertake participatory science requires carefully considering context and history. Research has a history of exploiting and coercing communities most affected by systemic inequities and racism, creating deep-seated mistrust of the research process. A core way to encourage and support participatory science and meaningful community engagement is to provide communities with specific tools that help illuminate conditions or circumstances. As research partners, opportunities exist for us to support the work communities might want to undertake by providing such tools. Often, communities do not have the ability to create these tools themselves, so they face barriers to fully investigating social needs. By providing tools that then create the means for community-based autonomy and ownership, researchers and communities can work together to accomplish shared goals. Mathematica has developed a number of tools to encourage participatory science and meaningful community engagement; Figure 3 provides several examples.

**Figure 3. Tools to support community leadership in participatory science**

Tool	Description	Applicability
<a href="#">Community Connector</a>	An open-source tool that summarizes a community’s demographics and social needs in one fingerprint and identifies communities with similar fingerprints. Researchers can use this information to compare and explore similar communities that have had success addressing social needs and improving health and well-being.	Enable localities to search for similar counties.
<a href="#">Climate and Weather Analytics, Trends, and Community Health (ClimaWATCH)</a>	The tool synthesizes and visualizes multiple data sources to make it easy to explore relationships between exposure to heatwaves, vulnerability to climate hazards based on social and environmental factors, and heat-related health issues for Medicaid beneficiaries.	Help anticipate surges in health care use, identify who is most at risk, adapt planning to address health inequities, and target resources to communities most at risk.
<a href="#">Wastewater Testing</a>	The wastewater testing tools translate lab results into insights that officials can use for public health responses.	Assess pathogens and chemical exposure among thousands of people in the community.



## Integrating participatory science into agency decision making

Clients, funders, and organizations are typically on a spectrum of participatory science (Figure 4). The spectrum ranges from a resistance to engagement in participatory work to fully embedding it into practice. Often it might not be the client or funder per se who creates obstacles to a more participatory approach, but the procurement process itself. For example, when we frame research questions in advance and don't modify them based on community input, then projects face from the outset one of the core challenges noted earlier (Figure 1).

As a starting point, it is important to identify where clients or funders sit on the spectrum and to determine what the *next step up* in the spectrum might be. For agency decision makers, it can be helpful to consider questions that encourage expanded approaches that move up the spectrum of participatory science:

- **From Inform to Consult:** How can we add a community perspective to an existing technical working group? Can we hold one or two community listening sessions?
- **From Involve to Collaborate:** How can we ensure the community has equity in the research process?
- **From Collaborate to Co-lead:** How can we bring our community partners into more tasks or elements of the project?

Figure 4: The spectrum of community engagement methods



The methods shown are not used exclusively at the level of engagement under which they are listed.

## About Mathematica

Mathematica is a research and data analytics consultancy of nearly 2,000 professionals driven by a mission to improve well-being for people and communities around the world. We innovate at the intersection of data science, social science, and technology to translate big questions into deep insights for public and private sector partners that count on our expertise and commitment to equity. Equity is central to our work at Mathematica, and we understand that we do not have all the answers. But we know we can discover more equitable outcomes when we include the

communities we serve in our work and look to them for guidance. Whether those communities are families with children, indigenous peoples, Black and Latino students, or the disability community, we strive to work hand in hand to apply research, analytics, and technology in ways that enhance well-being.

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