

ENGAGED SCHOLARSHIP FOR ENVIRONMENTAL JUSTICE

A GUIDE



MAY 2019

CHAD RAPHAEL
Santa Clara University

CONTENTS

Dedication

Preface

Acknowledgements

Introduction

I. FOUNDATIONS

Environmental Justice

Definition | EJ in the United States | EJ around the World

Engaged Scholarship

Definition | Roots | Benefits | Models | Citizen Science, Action Research, & Participatory Research

II. METHODS

Community Mapping

Environmental Monitoring and Biomonitoring

Analyzing Big Data

Storytelling, History, and Community Arts

Photovoice and Participatory Media

III. CHALLENGES AND RESPONSES

University-Community Collaborations

Preparing to Collaborate | Forming Partnerships | Conducting Research |

Communicating, Implementing, and Evaluating Research

Transforming Academia

Scholarship Standards | Collaboration across Disciplines | Research Ethics |

Anchor Institutions, Science Shops, and Centers | Recruitment, Tenure, and Promotion Policies |

Scholarly Communication | Training and Funding

IV. RESOURCES AND REFERENCES

Environmental Justice

History | Statements of EJ Principles | U.S. Government EJ Policies |

Recent Overviews of EJ Research | Catholic and Jesuit approaches to EJ |

EJ Archives, Tools, and Databases

Engaged Scholarship

Methods and Tools | Academic and Professional Associations | Resources for Publishing

References

DEDICATION

For Ann F. Wiener (1933-2018)
who lived for education, social justice, and environmental sustainability

PREFACE

This guide was written for distribution at the *Environmental Justice and the Common Good Conference*, hosted by Santa Clara University's Ignatian Center for Jesuit Education in May 2019. The conference convened representatives from Jesuit and other universities with a broad range of community organizations to strengthen our common understanding and advancement of community-engaged scholarship for environmental justice (EJ). Given its immediate audience, the guide focuses primarily on the U.S. context, although it also discusses the major global causes and impacts of EJ, and how Americans have been inspired by engaged scholars around the world, from whom we have much to learn.

The conference emerged from the Ignatian Center's 2016-2018 Bannan Institute, *Is There a Common Good in Our Common Home? A Summons to Solidarity*. The Institute was motivated in part by Pope Francis' landmark encyclical, *Laudato Si'*, in which the Pope called on people of all faiths to recognize that care for the environment is inextricably linked to care for people in poverty, and to work together to create a more just and sustainable world.

"[A] true ecological approach *always* becomes a social approach; it must integrate questions of justice in debates on the environment, so as to hear *both the cry of the earth and the cry of the poor*" – Pope Francis (2015, p. 35).

An engaged scholarship for EJ is part of the social project of Jesuit universities to seek truth that promotes justice in the world, to build relationships with social actors that help transform society in solidarity with the poor and marginalized. This approach encourages researchers to reach beyond the walls of their institutions and disciplines. It asks scholars to engage grassroots organizations by sharing control over the research agenda, how it is conducted, and how it informs the search for just solutions to environmental and health problems. This guide aims to help Jesuit universities to organize national

"To make sure that the real concerns of the poor find their place in research, faculty members need an organic collaboration with those in the Church and in society who work among and for the poor and actively seek justice. They should be involved together in all aspects: presence among the poor, designing the research, gathering the data, thinking through problems, planning and action, doing evaluation and theological reflection." - Former Superior General of the Jesuits, Rev. Peter-Hans Kolvenbach, S.J. (2000, p. 12).

and transnational research collaborations for EJ, in response to the call from Father Adolfo Nicolás, S.J. (2010) to build more universal and effective networks in Jesuit higher education.

ACKNOWLEDGEMENTS

Grants from Santa Clara University's Ignatian Center for Jesuit Education and from Ann F. Wiener funded this project. Christopher Bacon and Theresa Ladrigan-Whelpley were the main catalysts for writing this guide. Colleagues at Santa Clara University and beyond gave valuable input and feedback on drafts, including Millie Buchanan, Jesica Siham Fernández, Jasmin Llamas, Ed Maurer, Iris Stewart-Frey, Ted Smith, and Tseming Yang. Deja Thomas and Nicholas Spinelli contributed valuable research assistance by helping to review the literature cited here.

Cover photo: [Earth Day March for Science](#) by Amaury Laporte

Suggested citation: Raphael, C. (2019). *Engaged scholarship for environmental justice: A guide*. Santa Clara, CA: Santa Clara University.

INTRODUCTION

The movement for environmental justice (EJ) that began in the U.S. in the 1980s as low-income people and communities of color struggled to protect themselves from hazardous facilities and waste has expanded its scope considerably. It now encompasses a broad range of issues, from climate justice to food justice to green jobs and much more. It has documented how environmental and health disparities are experienced not only by people of color and of low income, but also by women, the indigenous, immigrants, the LGBTQ community, children and the elderly, and other vulnerable groups. It has built connections and solidarity with global movements, influencing worldwide efforts for sustainable and just development led by civil society and intergovernmental organizations.

Engaged scholarship, in which academic and other professional researchers collaborate with community-based organizations, has made an important contribution to EJ. Because EJ requires democratizing control over environmental knowledge and decision making, this guide argues that engaged scholarship should be the preferred approach for conducting research on environmental justice. The guide is intended for academic scholars, other professional researchers, and their community partners interested in collaborating on this kind of work.

The first part of the guide defines and describes the development of EJ and engaged scholarship, showing why they are well-suited to one another. In the process, it offers a brief summary of the major literature on both topics.

Part two offers a brief review of some of the characteristic research methods of engaged scholarship on EJ, such as community mapping, environmental exposure monitoring, photovoice and participatory video, storytelling and community arts, and more.

Part three summarizes the challenges that university-community partners face in their work together and how they can address them. It also discusses potential difficulties of conducting this kind of research in academic institutions that have yet to fully embrace engaged scholarship. This part draws on solutions developed by practitioners and suggests areas for further transformation of academia to make it more hospitable to engaged work. The final part lists useful resources on environmental justice and engaged scholarship and a list of references.

I. FOUNDATIONS

ENVIRONMENTAL JUSTICE

Research closely linked to advocacy and regulation has long played a crucial role in the struggle for environmental justice.¹ Consider some of the events at the birth of the modern environmental justice movement in the U.S. Sociologist Robert Bullard conducted the first empirical study showing that hazardous waste sites were disproportionately located in neighborhoods of color for a 1979 civil rights lawsuit in Houston, TX (Bullard, 1983). Organizing against toxic contamination in primarily African-American communities in the Altgeld Gardens neighborhood of Chicago and in Warren County, North Carolina inspired the Congressional Black Caucus to order the first federal government study of racial and income disparities in hazardous waste siting (United States Government Accounting Office, 1983). A larger study by the United Church of Christ's Commission for Racial Justice (1987) established these linkages more clearly, and found that race predicted proximity to hazardous waste facilities more powerfully than income, property values, or closeness to waste production. For many embarrassed officials, industries, and mainstream environmentalists, the report was "like a hammer falling off a table onto a bare foot," in the words of environmental health professor Michael Greenberg, and the federal government adopted many of the report's recommendations (Morrison, 2009, p. S508).

It is difficult to imagine any of these studies exerting as much of an impact on public discourse and policy as they did if they had not been closely connected to litigation, advocacy, and regulatory interest in addressing the emerging issue of environmental justice. Recalling the early days of this movement in the U.S., activist Vernice Miller Travis said:

We gave birth to a conversation that people would recognize as their own. We gave it a language, we gave it words, we gave it a science base, we gave it a public policy base, and we gave it a base that was rooted in the power and mobilization of people on the ground so it couldn't be denied (United States Environmental Protection Agency, 2014).

By integrating their studies into a public conversation that people could recognize, researchers inside and outside of academia helped to develop environmental justice's language, policy, science, and organizing. In the years that followed, many researchers began to incorporate community members themselves into the research process to build local capacities for public participation, and to accomplish more and better research.

How can scholars, activists, officials, and community members continue and deepen this tradition of engaged scholarship on environmental justice? This section begins to answer that question by defining and describing the development of environmental justice and engaged scholarship, and by showing why

¹ Portions of part one are adapted from Raphael, C. (forthcoming). Engaged communication scholarship for environmental justice: A research agenda. *Environmental Communication*. DOI: 10.1080/17524032.2019.1591478.

they are well-suited to one another. Too much has been written about environmental justice and engaged scholarship to give an exhaustive account of their histories here. Instead, my aim is to paint each in enough brushstrokes to show how they have intertwined and why they should continue to do so, while pointing to longer treatments in the literature.

Definition

While “environmental justice” emerged as a concept in the United States in the 1980s, it addresses enduring global questions that long predate contemporary environmentalism. How should humans share the benefits and burdens of nature fairly among our contemporaries and with generations to come? In doing so, what are our obligations to the land, air, water, other species, and to the divine? Who should make such important decisions and how?

At its heart, the contemporary principle of environmental justice (EJ) affirms the right of all people to healthy and livable communities, now and in the future. While there are many definitions of EJ, collectively they include four dimensions:

- *Distributive justice* - the fair apportioning of environmental burdens (such as exposure to hazardous chemicals and facilities) and benefits (such as access to clean air, water, parks and recreation, and green jobs)
- *Procedural justice* - equal or equitable protection against environmental harms through law, regulation, and enforcement
- *Process justice* - meaningful recognition of and participation in environmental decision making by all who are affected, including historically-excluded groups, and consideration of the interests of future generations
- *Restorative or corrective justice* - repair and reconciliation of past environmental injustices.²

These dimensions of EJ are interlocking. Restoring and maintaining a fair distribution of risks, benefits, and capabilities depends on equitable protection of the rights of all affected and broad participation in making distributive decisions. The ability to participate depends on gaining recognition as having legitimate interests and values at stake in these decisions.

This plural definition of EJ has developed over several decades. Initial struggles against the disproportionate contamination of low-income communities of color in the U.S. focused on the first three dimensions of EJ. Advocates demanded a more fair distribution, especially of the burdens of hazardous waste, and greater voice in the regulatory and political process for affected communities (Bullard, 1990; United Church of Christ’s Committee on Racial Justice, 1987). Greater attention to restorative justice emerged as the movement called for remediation of contaminated communities,

² This is a composite of several of the major definitions of the field, summarized at <http://deohs.washington.edu/environmental-justice>.

relocation of residents to safer ground, financial compensation for survivors, and restoration of sovereignty to indigenous peoples. Proposals for green jobs, clean energy, urban gardens and greenspaces focused new attention on the distribution of environmental benefits.

Recent thinking about EJ has expanded on the process and restorative dimensions of justice, based on promoting human rights and cultural recognition. The rights-based approach has broadened the definition of human wellbeing beyond traditional measures of income or utility to include the social and material conditions needed for human flourishing (Sen, 2010; Nussbaum, 2011). In this view, justice involves the fair distribution of *capabilities* (what we can do and be), and EJ theorists have illuminated how environmental conditions are integral to realizing our capabilities (Day, 2018). This way of thinking has influenced global development and social policy since the 1990s, most notably the United Nations Development Programme's (2018) human development indicators and indices. Calls for *recognition* highlight the importance of respecting differences in cultural practice and claims for political self-determination in EJ controversies, such as honoring indigenous groups' access to ancestral lands for spiritual activities and subsistence, as well as calls for recognizing the interests of all species and future generations in law and policy (Figueroa, 2013; Whyte, 2018). In a global context, EJ increasingly strives to encompass these multiple visions of justice among humans and between humans and the rest of the natural world (Schlosberg, 2007).

EJ in the United States

As a movement, frame, and discourse, EJ has made a significant impact on environmental thinking and policy over the past four decades. In the United States, the EJ movement emerged in the 1980s from the civil and economic rights movements of people of color, the indigenous, women, and farmworkers (Bullard, 1990; Cole & Foster, 2001; Wells, 2018). In the process, EJ reframed the environment to include our everyday cultural and physical environs: our homes, workplaces, neighborhoods, places of worship, and more (Čapek, 1993). Advocates pointed to the underlying causes of environmental injustices in the legacies of colonialism, corporate exploitation and government oppression of subordinate peoples and of nature, calling for a more inclusive environmental movement and policy process to address environmental inequities (First National People of Color Environmental Leadership Summit, 1991; SouthWest Organizing Project, 1990). As a discourse, EJ has helped coordinate and guide global environmental policy and action among movements, activists, and governments (Dryzek, 2013).

EJ now applies to a proliferation of issues and communities. The initial efforts focused on stopping the disproportionate siting of hazardous production and waste facilities in low-income communities of color mentioned above inspired broader study of environmental inequities. Today, EJ informs struggles to protect communities, workers, and consumers from exposure to pesticides (Pulido, 1996) and other hazardous chemicals (Abel & Stephan, 2018; Adeola, 2011), industrial and agricultural pollution (Taylor, 2014a), air pollution (Buzzelli, 2018), water contamination and privatization (Harris, McKenzie, Rodina, Shah & Wilson, 2018), mining (Urkidi & Walter, 2018), fossil fuel extraction and production (Bickerstaff,

2018), military toxics (Alston, 1991), lead poisoning (Kraft & Scheberle, 1995), trash incineration (Pellow, 2002; Sze, 2007), climate change and other threats (Holifield, Chakraborty, & Walker, 2018; Newton, 2009). EJ advocates have also worked for more equitable access to environmental benefits, including clean air, water, and land, urban parks and green spaces, public transportation, green jobs, safe and affordable housing and health care, reproductive health, food justice, energy security, and climate and disaster resilience (Cole, MacLeod, & Spriggs, 2019; Corburn, 2009; Davoudi & Brooks, 2012; Holifield, Chakraborty, & Walker, 2018; Jones, 2009).

EJ scholarship has uncovered environmental and health disparities based not only on race, class, and gender, but also on ethnicity, nationality, indigenous status, immigration and citizenship status, sexual orientation, age, and the intersections among these categories (Nyseth-Brehm & Pellow, 2014; Chakraborty, Collins, & Grineski, 2016; Gaard, 2018). Activists are increasingly appealing to these diverse axes of identity to mobilize broad-based organizing on environmental, healthcare, and immigration policies (Hestres & Nisbet, 2018). In the process, the EJ movement is continuing to collaborate more closely with advocates for economic justice (e.g., in campaigns for a just transition to a green energy economy) and racial justice (such as the Black Lives Matter movement to end police violence against communities of color) (Bienkowski, 2016).

The EJ movement has grown and gained initial recognition in policy circles since the 1980s. Major milestones included the First National People of Color Environmental Leadership Summit (1991), which issued a founding statement of principles for the movement, the formation of regional and national networks of EJ organizations to support grassroots organizing (Schlosberg, 1999), and the slow incorporation of EJ into the work of some of the largest environmental groups (Taylor, 2014a) and foundations (Nisbet, 2018). The formation of EJ research centers in the 1990s at Xavier (which moved to Dillard University in 2005), Clark-Atlanta University, the University of Michigan, and other schools helped to increase the movement's visibility. In a 1994 executive order, President Clinton called on federal agencies, led by the United States Environmental Protection Agency (EPA), to make EJ part of their missions. Several states and cities followed suit, especially in California, Michigan, New Jersey, New York, and Texas. During the Obama Administration, the National Institutes of Health prioritized funding for community-based participatory research and dissemination to combat health inequities (Blumenthal, DiClemente, Braithwaite, & Smith, 2013), many of which are the result of environmental causes, and the EPA (2011) adopted a strategic plan to incorporate EJ more fully into federal policy, rulemaking, and grantmaking. While progress has been slow and uneven in Democratic Presidential administrations, and stalled or reversed under Republican Presidents, EJ continues to be an important policy concern in many U.S. states and municipalities.

EJ around the World

Even if the term “environmental justice” is not as widely used outside the U.S., it has become a global concern, albeit one that is articulated differently around the world (Agyeman, Cole, Haluza-DeLay, &

O’Riley, 2009; Baehler, 2017; Walker & Bulkeley, 2006). In Europe, EJ is often seen as an extension of protections for human rights, including rights of access to environmental information, participation in decision making, and access to the courts, which are enshrined in the United Nations Economic Convention for Europe’s 1998 Aarhus Convention (Mason, 2010). In the global South, EJ issues are more often framed as matters of climate justice, participatory and sustainable development and conservation, indigenous and women’s rights, food and energy sovereignty, workplace safety and health, or the environmentalism of the poor (Carmin & Agyeman, 2011; Carruthers, 2008; Martinez-Alier, 2002; Reed & George, 2018; Walker, 2012).

Many national and transnational movements, some of which predate the U.S. EJ movement, have rallied around EJ themes to defend local peoples against the effects of deforestation, the extractive industries, climate change, hazardous waste dumping, privatized ownership of natural resources and the commons, and the like (Pellow, 2011; Temper, 2018). Examples include Kenya’s Green Belt Movement, which began by organizing women to plant trees and eventually helped uproot a dictatorial government (Hunt, 2014); the Ogoni people’s resistance to oil extraction in Nigeria (Stephenson, Jr. & Schweitzer, 2011); Brazilian rubber tappers’ defense of the Amazon rainforest against logging (Keck, 1995); and transnational movements against toxic waste dumping in the developing world (Pellow, 2007). EJ has inspired demands for climate justice, including the transfer of funds and technologies from the developed economies that are primarily responsible for historic greenhouse gas emissions to help developing countries cope with climate change (Chu, Anguelovski, & Carmin, 2016), and a just transition to a more equitable and low-carbon economy that meets all people’s needs (Bickerstaff, 2018; Coventry & Okereke, 2018; Newell & Mulvaney, 2013). EJ-related campaigns have also promoted fair and sustainable trade and employment in small-scale agriculture (Bacon, 2005), mining (Urkidi & Walter, 2018), recycling and reuse (Smith, Sonnenfeld, & Pellow, 2006), ecotourism (Lee & Jamal, 2008), and other sectors (Lewis & Potter, 2011). The U.S. EJ movement began forming transborder ties with many of these movements from the 1990s onward (Claudio, 2007).

EJ has also informed intergovernmental efforts for sustainable development. The United Nations’ (1987) three pillars of sustainability – economic vitality, environmental protection, and social development – emphasize the interdependence of environmental and social protections in broad terms. While the social development pillar has been defined very differently around the world, it has inspired initiatives to link economic and environmental wellbeing to social justice, equity, inclusion, and more responsive policy making in the U.N.’s Millennium Development Goals (United Nations, 2015a) and Sustainable Development Goals (United Nations, 2015b). In particular, the Sustainable Development Goals (SDGs) include pledges to “reduce inequality within and among countries” and to “promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable and inclusive institutions at all levels” (United Nations, 2015b).

However, we should not overestimate how much governments, foundations, businesses, and dominant nongovernmental organizations have substantively addressed EJ concerns. Endorsers of the SDGs

include governments that demonstrate little commitment to economic equity and democracy, raising doubts about whether they will permit broader participation in decision making. Especially in development and aid work, where EJ discourse has been widely and sometimes cynically co-opted, the promises of public participation and equitable outcomes are often more common than their fulfillment (Dutta, 2015; Waisbord, 2015). The U.S. government has yet to implement meaningfully the Clinton-era executive order requiring all federal departments to incorporate EJ concerns in their policies and activities, or to use federal civil rights law to counter environmental discrimination (Konisky, 2015; Yang, 2002). The leadership of U.S. environmental organizations, foundations, and government agencies remains overwhelmingly white and male (Taylor, 2014b), and few of the “big green” funders and advocacy groups devote significant resources to EJ issues. Environmental injustices continue to make national headlines, such as the recent revelations of lead-contaminated drinking water in Flint, Michigan, and resistance to the transfer of oil through the Dakota Access Pipeline across native land at the Standing Rock Indian Reservation. Globally and in the U.S., EJ advocates face an uphill struggle against entrenched economic, political, and social power.

We should also not overestimate the spread of EJ research around the world. The research cited above has begun to document inequities within countries, and between countries in the global North and South, and how they are driven by colonial legacies, corporate exploitation, governmental policies and corruption, intergovernmental agreements and organizations, international foundations, and consumer demand. However, scholars from a handful of countries account for most of this research. Of all scholarly articles published in 2009 with the keyword “environmental justice,” almost half were authored by researchers based in the U.S., 20 percent were written by authors in the U.K., and 60 percent exclusively addressed U.S. cases (Reed & George, 2011). While this distribution in part reflects global scholars’ preference for other terms for EJ issues, it should also alert us to the need to extend the scholarly community beyond dominant Anglo-American academic institutions and to address EJ around the globe. In this light, it is heartening to see chapters of a recent handbook that summarize research on EJ in almost every continent (Holifield, Chakraborty, & Walker, 2018). The development of the online EJ Atlas (ejatlas.org) is another important step forward. As of early 2019, the project has mapped and compiled descriptions of almost 2700 case studies from around the world, collaboratively written by academics and activists, with especially broad coverage of Latin America, Africa, and Asia.

ENGAGED SCHOLARSHIP

Definition

The goals of community-engaged scholarship are the generation, exchange and application of mutually beneficial and socially useful knowledge and practices developed through active partnerships between the academy and the community (Engagement Scholarship Consortium, 2018).

The purpose of the research must be to benefit society, broadly defined, as opposed to developing new knowledge solely for its own sake. The process must be collaborative, but the overall level of engagement among faculty, students and community members will vary depending on the degree of collaboration at each stage of the research. The impact of engaged research must benefit society and extend beyond making a difference only within an academic field (Campus Compact, 2018).

[Engaged scholarship] (a) focuses on significant ethical, social, and civic problems; (b) involves crafting reflexive research practices that enable collaboration between academic and nonacademic communities of practice; and (c) cocreates and coproduces knowledge through a collaborative research process between academics and nonacademics (Barge, 2016, p. 4000).

As these definitions suggest, while practitioners of ES name and construe it somewhat differently, they tend to share several common commitments (Welch, 2016). ES must be *scholarly* – based on valid theory, research and methods. ES emerges from *collaborative* relationships between academics and community partners. ES should strive to be *mutually beneficial* by producing knowledge for academic understanding that also makes direct contributions to the wider community. And ES should be *practice-oriented* by circulating knowledge not only in traditional academic venues but also through the work of partners outside the university.

Roots

Although the term “engaged scholarship” took hold in the U.S. in the past three decades, it draws on longer academic traditions in the global North and South (Munck, 2014; Wallerstein & Duran, 2017). In the North, ES emerged from diverse efforts to improve regional economic development, social services, social inclusion, and democracy. In the nineteenth century, the seeds of civically-oriented scholarship were sown by American land grant universities charged with improving their surrounding regions and by faith-based institutions pursuing their service-oriented missions (Shaffer, 2017). Later, the philosopher John Dewey (1916) applied principles of participatory democracy and pragmatism to education, arguing that schools should model the life of democratic communities, learning should be a collaborative experience among faculty and students, and formal education should connect with learning outside schools to tackle social problems. In the 1940s, Kurt Lewin (1946), the pioneering social and organizational psychologist, developed *action research*, based on designing and evaluating interventions in concert with community organizations to solve urgent social problems. His own action research, focused on reducing racism in public housing projects, inspired followers across the social sciences to apply this approach to a variety of issues and organizational contexts in the U.S., Europe, and Australia (Kemmis & McTaggart, 2005).

Many current institutional efforts to develop ES in the United States began in the 1990s. In part, they were galvanized by calls for academia to rediscover its relationship to the public good, including reconnecting academic study to “our most pressing social, civic, economic, and moral problems” (Boyer,

1996, p. 11). Advocates of ES aimed to reverse the post-World War II specialization of academic knowledge, its retreat into a stance of value neutrality and objectivity, and the reduction of universities' purposes to producing knowledge and employees for the market (Post, Ward, Longo, & Saltmarsh, 2016). Interest in ES also emerged to address academia's growing need to demonstrate its extramural contributions in response to cuts in public funding for higher education and state pressure to justify universities' tax-exempt status (Doberneck & Schweitzer, 2017). One institutional innovation was the Carnegie Foundation for the Advancement of Teaching's Elective Community Engagement Classification. Developed in 2005, the classification now recognizes over 300 universities in the U.S. that practice community-engaged education and scholarship (Carnegie Foundation & Swearer Center, 2018). In addition, universities launched place-based learning initiatives and anchor programs in their communities. These partnerships pursued two main goals: to provide opportunities for civic learning and research across the curriculum; and to strengthen community capacities to improve local education, health, services, and economic development (Hodges & Dubb, 2012; Netter Center for Community Partnerships, 2008).

In South America, Africa, and Asia, ES arose amidst twentieth century decolonization, and struggles against structural underdevelopment and authoritarian rule. Accordingly, the Southern tradition showed greater concern for emancipating knowledge and scholarship from control by foreign and local elites, and helping impoverished and marginalized peoples empower themselves to create broad social transformation (Hall, Tandon, & Tremblay, 2015). A number of approaches aimed to support democratic economic, social, and educational development from the 1960s onward. The influential work of Brazilian educator Paulo Freire (1970, 1982) and Columbian sociologist Orlando Fals Borda (1987, 2006) emphasized the role of education and research in liberating the poor and oppressed to develop critical understanding of their conditions and develop their own transformative solutions. Robert Chambers' (1997) participatory appraisal methods, used mainly in Africa, challenged top-down approaches to development and planning, instead prioritizing grassroots identification and framing of problems, and locally-generated solutions. Scholars inspired by similar aims stepped outside their universities to work directly with rural land reform movements and urban neighborhood organizations, applying indigenous and local knowledge and experience to issues of social justice.

Starting in the mid-1970s, the Southern and Northern traditions began to intertwine as academic and community-based scholars forged institutional ties to strengthen participatory and engaged research. Examples included the International Participatory Research Network (with centers in Canada, India, Tanzania, the Netherlands, and Venezuela), Australia's Collaborative Action Research Group, and the Action Research Network of the Americas. The Highlander Research and Education Center in Tennessee, which had trained organizers in the labor and African-American civil rights movements, joined with counterparts in the global South in emancipatory participatory research, adult education, and community organizing (Glen, 1996; Horton & Freire, 1990). Contemporary volumes on engaged and participatory scholarship reflect the confluence of Northern and Southern influences and practices (Bradbury, 2015; Coughlin, Smith, & Fernández, 2017a; Israel, Eng, Schulz, & Parker, 2012; Munck,

McIlrath, Hall, & Tandon, 2014; Wallerstein, Duran, Oetzel, & Minkler, 2017a). These approaches are discussed more fully below in the section on citizen science, action research, and participatory research.

The Global Movement for Responsible Electronics

The struggle for a more sustainable electronics industry offers a good example of a global movement that has promoted engaged scholarship of many kinds. Initially, this research focused on establishing evidence of the threats to health and the environment posed by computer chip production. In the late 1970s, organizers with the Santa Clara Center for Occupational Safety and Health, a community-based organization, began documenting higher than normal rates of miscarriages, birth defects, and cancers among workers in high tech manufacturing and fence line communities in Silicon Valley. The organizers enlisted academic epidemiologists to conduct the first studies of the effects of potent toxic chemicals used in semiconductor fabrication plants (for summaries, see Clapp, 2002; LaDou, 2006; LaDou & Bailar, 2007). As the industry globalized, health researchers around the world, some of whom collaborated with advocacy groups to get access to workers and information, continued to provide evidence of the harms to labor and communities (e.g., Kim, Kim, & Paek, 2014). As the movement expanded to focus attention on threats from electronics recycling and disposal, advocates continued to work with academic and independent health researchers to establish evidence of harm to e-waste workers in Asia, Africa, and U.S. prisons (Brigden, Labunska, Santillo, & Allsopp, 2005; Silicon Valley Toxics Coalition and Computer Takeback Campaign, 2003).

Advocates and academics also collaborated to map the farflung electronics industry, and to document and develop organizing strategies around the world. Scholars and activists from four continents collaborated to share their organizing experiences, campaigns, and issue framing techniques in the 2006 book *Challenging the Chip: Labor Rights and Environmental Justice in the Global Electronics Industry* (Smith, Sonnenfeld, & Pellow, 2006). Academics and students contributed to research that traced industry supply chains, supporting the movement's pressure on major brands to hold their suppliers accountable for improving safety and eliminate the most dangerous chemicals from the production process (Students & Scholars against Corporate Misbehaviour, 2013). Other scholars focused on consumer activism by organizing and evaluating the impact of Repair Cafés, which invite people to learn how to fix rather than replace their electronics, as starting points for student and community engagement with electronics issues (Kannengießer, 2017). Academics and movement leaders have collaborated to help document the movement's issue framing strategies and share them with other activists (Raphael & Smith, 2006), and to evaluate and clarify priorities for future campaigns (Raphael & Smith, 2015; Smith & Raphael, 2015).

Benefits

While other kinds of research can make valuable contributions to understanding EJ, given the benefits of ES, authors of traditional research should have clear and good answers to the questions “why didn’t you pursue an engaged approach?” and “what kinds of engaged scholarship could build on your research?” Thus, while ES need not be the only orientation to EJ research, ES should be our preferred approach because of its potential to fulfill both the demands of EJ and of sound scholarship. EJ scholars have turned to ES largely because it can strengthen the relevance, rigor, and reach of scholarship (Balazs & Morello-Frosch, 2013), as well as its reflexivity (Raphael, 2019).

Scholarly *relevance* depends not only on asking important questions but also on conducting research in ways that fit with its goals. ES aligns with the democratizing thrust of environmental justice, which aims to increase oppressed communities’ involvement in decisions that affect their health and environments. This includes involvement in decisions about scholarship. At the most basic level, inclusion depends on recognizing alternative forms of knowledge (indigenous, feminist, local, experiential) about the environment and justice (Gibson-Wood & Wakefield, 2012). It extends to full participation in setting research agendas and funding priorities, gathering and interpreting data, drawing conclusions, and implementing action in response to findings. A more inclusive scholarly process is crucial for strengthening marginalized groups’ rights to access and create knowledge that can help build their power to influence regulation, policy, and institutional practices. ES is scholarship “done with, rather than for or on, a community” (Furco, 2005, p. 10), and this is reason alone to prefer ES to other modes of inquiry into EJ.

Adopting an engaged approach is also relevant to promoting restorative justice. Equitable scholarly collaboration with communities is one important corrective to a long history of academic and government research that has ignored, excluded, or actively harmed disempowered groups’ environments and health. Most contemporary scholars are not responsible for traditional risk and development communication research, which helped promote the destruction and contamination of nature and humans, displacement of indigenous peoples, and coercive sterilization of women (see, e.g., Dutta, 2015; O’Brien, 2000; Visvanathan, Duggan, Nisonoff, & Wieggersma, 1997). Yet all scholars have an opportunity to collaborate with oppressed groups to make scholarship serve them better than it has.

ES can strengthen the *rigor* of communication research by improving study design, data collection, and data analysis. Engaged scholars have found that developing research questions and goals with community-based organizations helps to build trust that opens doors to new research sites and populations. In addition, by enlisting community members as co-researchers, scholars can reach larger sample sizes, increase survey and interview response rates, and boost participation in interventions and treatments. ES partnerships can also unlock new sources of funding. For example, in the U.S., federal and private support for ES in public health increased dramatically from the late 1990s onward (Balazs &

Morello-Frosch, 2013), and major philanthropies devoted more funding for climate communication and grassroots organizing in marginalized communities in the 2010s (Nisbet, 2018).

ES can also help research *reach* new audiences in ways that inform practice. In response to academic reward structures and disciplinary demands, many university-based scholars are “talking to ever smaller and narrower academic audiences, using a language that educated readers do not understand, publishing in journals they don’t read, and asking questions they don’t care about” (Hoffman, 2015, p. A48). In response, ES aims to disseminate knowledge to diverse audiences and translate it into useful tools for practice, policy, and organizing, as well as academia. Scholars and partners express their research in many forms, from journal articles to policy briefings, white papers, fact sheets, opinion articles, testimony in regulatory forums, activities and games in community meetings, and so on. Community partners play a crucial role in building an active audience for ES, promoting and applying its findings, and implementing or demanding responses from decision makers. Rather than publishing research and hoping it has some effect, scholars build relationships and dialogue with their audiences throughout the course of their research, increasing their reach and influence.

In addition, ES prompts researchers to practice greater *reflexivity* about the interested nature of our work, including assumptions about scholarship, who it aims to serve most directly, and the opportunity costs of choosing one topic rather than another. Research agendas and “state of the field” surveys typically focus on what scholars in a field have accomplished and what they need to do to improve the field’s understanding and influence, rather than starting from the question of what the world needs from the field. Reflexivity should act as a check on academic anxieties about scholarly identity and status, on professional and disciplinary insularity, and self-regard. Reflexivity reminds us that discipline-building – increasing access to grants, recognition, and seats at the policy table – is a means to larger ends, not an end in itself. It pushes us to worry less about whether we are *distinguishing* ourselves from other fields and more about whether we are *collaborating* well with scholars from other disciplines and with community actors to address society’s most significant challenges and imagine their solutions.

To this end, ES scholars begin by employing heuristics for reflexive research design. For example, Barge (2016), prompts researchers to clarify their:

- Purpose
- Positionality - identity in relationship to their topic and community
- Temporality - length of commitment to a project and partners
- Intended level of change – from local to global, individual to collective
- Model of change – elite-led, grassroots, etc.

Scholars also ask how they are practicing accountability to marginalized groups, not just to funders and the field. ES aims to do each of these things by establishing clear and specific agreements among academic and community partners, which spell out joint aims, complementary contributions, and shared resources. Incorporating lay people into the research team promotes deeper community understanding of and trust in the scholarly process and its conclusions (Groffman et al., 2010). ES has also formalized

reflexivity and accountability through review boards in which community members and academics work together to evaluate research proposals and publications. Some disciplines have developed standards of peer review specific to ES, which supplement conventional academic criteria with criteria such as the ability to draw on community expertise (see the section in part three on transforming academia).

None of this is to suggest that ES is easy. Not every situation is ripe for it, especially if partners are not fully aware of and committed to the principles of collaboration. (For a valuable set of questions all partners should ask themselves before embarking on a project, see Hartwig, Calleson, and Williams, 2006). ES partnerships must grapple with fulfilling the promise of community engagement amidst imbalances of resources, expertise, and power. It is challenging to produce research that is simultaneously useful to community partners, recognized as a legitimate contribution to academic

Standards for Engaged Scholarship

1. Clear Academic and Community Change Goals
2. Adequate Preparation in Content Area and Grounding in the Community
3. Appropriate Methods: Rigor and Community Engagement
4. Significant Results: Impact on the Field and the Community
5. Effective Presentation/Dissemination to Academic and Community Audiences
6. Reflective Critique: Lessons Learned to Improve the Scholarship and Community Engagement
7. Leadership and Personal Contribution
8. Consistently Ethical Behavior: Socially Responsible Conduct of Research and Teaching

See Jordan (2007) for an explanation and list of evidence of each criterion.

scholarship, and in compliance with funding agencies' goals and metrics. Severe structural impediments to ES remain within academia. (These problems are addressed in part three in the sections on university-community collaborations and transforming academia). Nonetheless, while those who conduct ES for EJ know that it involves struggle, they embrace this struggle as integral to their missions as scholars, community members, global citizens, and people in solidarity with marginalized peoples, future generations, and the natural world.

ES for EJ – A Case Study

The Northern California Household Exposure Study (HES) of indoor air pollution around the Chevron oil refinery in the city of Richmond, CA exemplifies the strengths of engaged scholarship for EJ (Balazs & Morello-Frosch, 2013). The partners included academics at two institutions (Brown University and the University of California, Berkeley), an independent research institute (Silent Spring Institute), and a statewide advocacy organization (Communities for a Better Environment). The advocacy group offered invaluable local knowledge about choosing sampling sites and methods of recruiting participants. The research institute contributed specialized knowledge of chemicals associated with oil combustion to analyze in the study. The partners' combined efforts helped the HES to document disproportionate exposure to indoor air pollution in Richmond compared with a control community without a refinery, and higher levels of multiple pollutants inside homes than outdoors.

The advocacy group partner then asked researchers to communicate individual exposure results to all study participants who wanted to know this information. Given the lack of conclusive research on the health impacts of many chemicals, health researchers typically have not reported back to participants their personal exposure levels or tried to communicate the risks associated with them. HES researchers and advocates collaborated to navigate the scientific and ethical challenges associated with this innovative kind of reporting. The team co-designed materials in Spanish and English, including visual displays of collective and individual results, scientific uncertainties, and strategies for reducing exposure. Follow-up research found this strategy increased participants' knowledge of risks, provoked changes in behavior, and supported an organizing campaign to reduce emissions from the refinery (Adams et al., 2011).

In this example, non-academic partners boosted the study's *relevance* by inspiring a shift in research practice to include personal exposure reporting. The recipients of the personal data were highly motivated to act on this information, individually and collectively, because they had invested their time in the study and learned about potential risks. Personalized reporting demanded greater *reflexivity* from researchers about the purposes of their study as they grappled with how to report individual-level risks ethically and accurately to participants. The collaboration strengthened the *rigor* of the study design, including the protocol for communicating findings responsibly. By presenting the findings in regulatory testimony and community organizing meetings, the partners also increased the study's *reach* beyond the academic literature. The HES approach inspired biomonitoring studies to report personal exposures, including a major study in 17 European countries (Exley et al., 2015).

Models

As ES has spread around the world, many different models have emerged.

Apolitical and political

One spectrum of ES stretches from relatively apolitical to political goals (Donahue, 2018; Mitchell, 2008). At the apolitical extreme, ES fosters charity, voluntarism, or a sense of personal responsibility for civic life without encouraging participants to address systemic injustices. At the political end of the spectrum, ES promotes critique of social and political structures as sources of injustice, and fosters collective advocacy and movements for social change and equity. A less stark way to frame this difference is to say that some ES focuses primarily on pragmatic efforts to solve community problems, while other ES focuses more on emancipating participants from oppressive social beliefs and conditions (Wallerstein & Duran, 2017). Many ES projects fall somewhere in between, or begin at one end of the spectrum and expand towards the other. Because of its concern for distributive and procedural justice, EJ research tends to align with political and participatory versions of scholarly engagement.

Types of development

Applying a social-economic development lens to ES, Appe and her colleagues (2017) see three broad kinds of university engagement today, each with its own goals and strategies for scholarship. A *market-oriented* approach focuses mainly on sparking economic development by fostering entrepreneurship and innovation. A *social justice* approach promotes equity via activism and empowerment of excluded groups. A *social responsibility* approach draws on the other two models to promote solidarity and sustainable development. EJ is more likely to be pursued through a social justice or social responsibility model, although it may also incorporate entrepreneurial approaches that support sustainable livelihoods for indigenous peoples on their traditional lands, green jobs for low-income people that also improve access to clean energy and transportation in underserved communities, and the like.

Types of engagement

The degree of scholarly engagement with community partners can also vary in important ways, including:

- *Breadth* - some researchers interact with a single organization or slice of a community, while others engage with a more representative collection of leaders and/or residents (Huntjens, Eshuis, Termeer, & van Buuren, 2014).
- *Depth* - transactional partnerships, involving mostly one-way outreach from universities to the community, differ from transformative partnerships, involving more reciprocal relations, in which communities play an equal role (Saltmarsh & Hartley, 2011).

- *Temporality* – some partnerships are short-term relationships, while others involve long-term commitments.

Welch (2016, p. 49) distinguishes four kinds of potentially engaged research and learning:

- *Experiential education* in labs and authentic settings;
- *Professional preparation*, such as practicums, internships, and clinical placements for pre-service teachers, social workers, and health care providers;
- *Community involvement*, such as service-learning and immersion experiences;
- *Civically-engaged scholarship and learning*, in which community members are fully empowered to co-create the goals, content, and process of research and learning with academics.

For Welch, and for most EJ communities, the last of these four types is optimal because community partners play an equal role in designing, conducting, and benefitting from the research. These collaborations tend to build deep relationships over the long-term. Similar frameworks include The Research University Civic Engagement Network's degree of collaborative processes in engaged research (Stanton, 2008), and Imagining America's continuum of scholarship (Ellison & Eatman, 2008). The Carnegie Classification provides a fully developed set of engagement measures for academic institutions as whole (Carnegie Foundation and Swearer Center, 2018).

Types of expertise

ES also implies different kinds of expertise. Marginalized communities have tended to experience scientific, technical, and policy experts as representatives of state agencies and industries that rationalize pollution, threaten displacement, and promise economic benefits that never arrive (Fischer, 2000, 2017; Liston, 2014). These communities are also wary of academics who demand their time, extract information without sharing it with the community, represent inhabitants negatively, and benefit professionally without providing tangible assistance to research participants (Munck, 2014). Given their experiences, these communities tend to have little faith that experts are objective and authoritative seekers of truth or emissaries of progress.

Karvonen and Brand (2014) describe four additional models of expertise relevant to sustainability that arose in recent decades, which can foster greater trust between EJ communities and experts. Foremost is the *civic expert*, who understands the need to enrich technical understanding with other forms of knowledge (including local, experiential, tacit, and indigenous understandings), and to share power over choices with the public, to arrive at better informed and more socially acceptable decisions (see also Stilgoe, Irwin, & Jones, 2006). These experts are adept at organizing authentic public participation in environmental (John, 1994; Shutkin, 2000), scientific (Jasanoff, 2011), and technological (Sclove, 1995) policy making and projects. Civic experts may be assisted by *outreach experts*, who provide technical and scientific information that can help boost communities' capacities to participate in EJ decisions. *Multidisciplinary experts* may help by fostering collaboration among experts from different fields to tackle complex problems, and *meta-experts* may broker novel solutions that emerge and help ensure

they are implemented in policy or practice. Within each of these models academics may play a range of roles in any given research project, such as planner, leader, catalyst, facilitator, teacher, designer, listener, observer, synthesizer, and reporter (O'Brien, 2001; Huntjens et al., 2014).

While these models are useful for guiding scholarly practice, none inoculates researchers from thorough self-questioning about the intent and impacts of their work. In a world in which the terms “participatory research,” “community engagement,” and “environmental justice” have been widely adopted and sometimes co-opted, whether a particular example of ES serves EJ depends largely on its context, purpose, and degree of collaboration (Munck, 2014).

Citizen Science, Action Research, and Participatory Research

Scholarship that most fully engages community partners often identifies itself as some type of citizen science, action or participatory research. These approaches are especially concerned with democratizing the conduct of scholarship to enhance communities’ capacities for self-understanding, problem-solving, organizing, and advocacy (Bacon, deVuono-Powell, Frampton, LoPresti, & Pannu, 2013a). As such, this scholarship aligns well with EJ’s demands for procedural and process justice, in which all people can influence decisions that affect their environment and health. These approaches to research go by many names in different countries and fields. One may hear of *collaborative action research* (especially in Australia); *participatory research* (in Latin America, the Global South, and for youth); *community-based research* (in Canada); *collaborative inquiry*; *reflexive practice*, *feminist participatory research*; *community-partnered participatory research*; *tribal participatory research*; and *street and citizen science* (Wallerstein et al., 2017a). This section compares and contrasts the major variants of this approach and their potential contributions to EJ.

Citizen Science

Encompassing the natural and social sciences, citizen science refers to “the scientific activities in which non-professional scientists volunteer to participate in data collection, analysis and dissemination of a scientific project” (Haklay, 2013, p. 106). Citizen science is less concerned with testing theory and more with forging ties between scientific institutions and their communities to democratize access to scientific resources, make the scientific agenda more relevant to the public, increase science literacy, and address local problems and questions. This approach can promote EJ’s interest in engaging less privileged communities in research and decision making about issues such as air quality, transportation planning, pollution mitigation, and access to healthy food. In the 2010s, the United States Environmental Protection Agency (2016) and European Union (De Filippo, Bautista-Puig, Mauleón, & Sanz-Casado, 2018) launched new funding programs to support citizen science tools and programs. Environmental monitoring features prominently in many reviews of the citizen science literature (e.g., Conrad & Hilchey, 2011; Haklay & Francis, 2018; National Academies of Sciences, Engineering, and Medicine, 2018; United States Environmental Protection Agency, 2015) and guides to practicing citizen science

(Harvard Law School Emmett Environmental Law & Policy Clinic, 2017; Mueller & Tippins, 2015; www.epa.gov/citizen-science)

Public participation in citizen science projects varies considerably. In crowdsourced projects, which are more typical in the natural sciences, the community's role may be limited to gathering data for researchers to analyze, while in other projects the public takes the lead on posing questions, and collaborates fully on study design, data analysis, and interpretation of results (De Filippo et al, 2018). Some corporate, governmental, and university researchers have appropriated the language of citizen science to recruit the public more as research subjects than as scientists, for example by framing the sharing of personal data such as DNA samples as a kind of civic duty (Woolley et al., 2016). EJ goals are not fully met by top-down citizen science, which simply exposes lay people to the processes of scientific research and uses them to help collect data, without sharing control over the research agenda.

Given the increasingly ill-defined and elastic meaning of citizen science, EJ researchers would be wise to take additional inspiration from the more developed and specific research traditions described below.

Action Research

In contrast to citizen science, the action research tradition is rooted more firmly in the social sciences. It has been especially influential in the U.S., Europe, and Australia in fields as diverse as education, rural development, community studies, public health and social work, organizational studies, and social entrepreneurship (Bradbury, 2015; Kemmis & McTaggart, 2005; Kindon, Pain, & Kesby, 2007; Reason & Bradbury, 2008; Warner, 2016). Initiated by Kurt Lewin in the 1940s, action research challenged positivist assumptions that researchers could study objective social phenomena distinguishable from meanings created by researchers and participants as they acted in the world, and that theory could be applied universally across contexts and separately from practice. Instead, Lewin and his followers developed applied research that aimed to solve practical social problems through an iterative cycle of planning interventions in a particular community, taking action, studying the results, and adjusting interventions accordingly. Thus, the concept of action had a dual meaning, referring both to the importance of studying social behavior in diverse real-world settings and to the goal of research improving social action (Lewin, 1946). As Lewin is often quoted as having said, "If you want truly to understand something, try to change it" (quoted in Greenwood, 2015, p. 200). Lewin (1948) prioritized a collaborative approach because he believed that community partners would be more likely to adopt changes if they had a role in researching them with academics, rather than passively accepting outsiders' findings and advice. The practical and persuasive aspects of action research have made it appealing to a broad range of organizational and social change agents, including corporations and governments.

However, democratic aspirations also motivated Lewin and many of his followers (Hansen, Nielsen, Sriskandarajah, & Gunnarsson, 2016). Seeing action research as a way to engage citizens in researching

their own problems and potential solutions, these scholars believed it to be an important contribution to a more democratic culture, workplace, and community. For them, it is “the social project of democratization that is the heart of AR” (Greenwood & Levin, 2007, p. 89). This impulse helps explain EJ scholars’ attraction to action research, as much or more than its practical bent.

Participatory Action Research (PAR)

PAR emerged in Latin America and the global South, especially in the work of Paulo Freire (1970, 1982) and Orlando Fals Borda (1987, 2006). Freire emphasized the role of collaborative research in helping people understand and transform their own conditions of poverty and oppression. To that end, Fals Borda’s (1995) guidelines for PAR scholars were as follows:

- Do not monopolize your knowledge nor impose arrogantly your techniques but respect and combine your skills with the knowledge of the researched or grassroots communities, taking them as full partners and co-researchers. That is, fill in the distance between subject and object;
- Do not trust elitist versions of history and science which respond to dominant interests, but be respectful to counter-narratives and try to recapture them;
- Do not depend solely on your culture to interpret facts, but recover local values, traits, beliefs, and arts for action by and with the research organizations; and
- Do not impose your own ponderous scientific style for communicating results, but diffuse and share what you have learned together, in a manner that is wholly understandable and even literary and pleasant, for science should not be necessarily a mystery nor a monopoly of experts and intellectuals.

PAR added to action research a stronger belief in subaltern peoples’ capacity for agency, a more explicitly liberatory goal for scholarship, and a deep respect for local, experiential, and indigenous knowledge as a source of resistance and change. It has been applied to a wide variety of EJ issues, such as urban air pollution (González et al., 2007), climate justice activism (Reitan & Gibson, 2012), and recycling co-ops (Gutberlet, 2008).

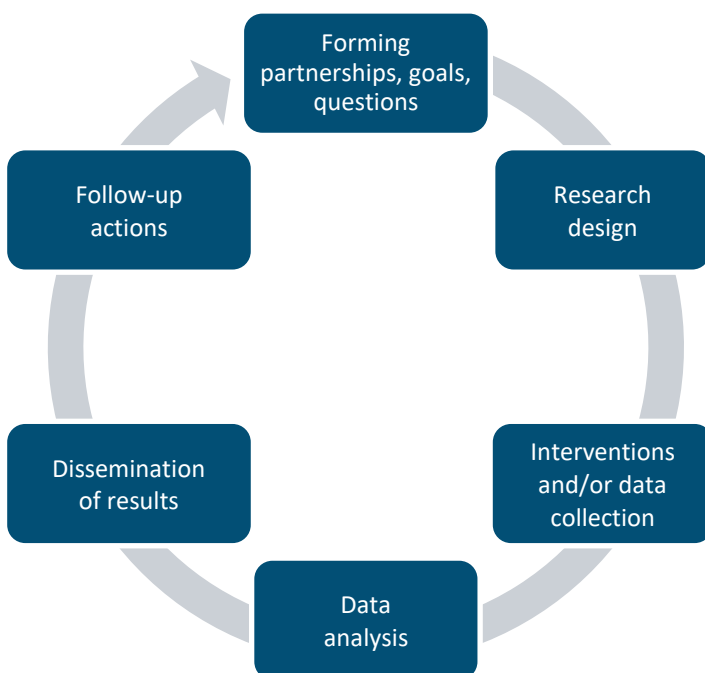
Community-Based Participatory Research (CBPR)

CBPR emerged especially in the U.S. public health community to deepen and institutionalize the earlier work of PAR and action researchers (Wallerstein et al., 2017a), including on EJ issues (Bacon, C., deVuono-Powell, S., Frampton, M. L., LoPresti, T., & Pannu, C., 2013b; Shepard et al., 2013; Wilson, Aber, Wright, & Ravichandran, 2018). CBPR is best distinguished from these earlier traditions by how it has developed and integrated them, rather than by how it has departed from them. CBPR has done so by expanding theory and practice related to involving community partners in research, recognizing community assets, bridging differences of power and identity among scholars and community partners, developing research methods, translating and disseminating research results, and supporting community organizing and capacity building. To integrate the action and participatory traditions, some scholars refer to *community-based participatory action research* (e.g., Bacon et al., 2013a).

To say that CBPR is *community-based* may mean several things (Israel, Schulz, Parker, & Becker, 1998). It may mean that researchers conduct their studies primarily in a community setting, rather than in a lab, clinic, or hospital. It may mean that community issues or problems are the focus of the research. It may mean that a community, rather than individuals, is the unit of analysis, and the community may be defined by geography, occupation, ethnicity, or many other factors (in some cultures, for example, the community may include plants, animals, ancestors, and gods). The best of this work does not assume that “the” community is a natural, unitary, or consensual entity that can be represented by a single organization or public agency, but recognizes differences of power and interest within communities, and that the least well-served members need a voice in the research.

This flexible and reflexive understanding of community is well-suited to research on EJ. Many EJ issues, such as neighborhood air pollution or workplace safety and health, pose inequitable and holistic threats to defined groups of people, rather than a more generalized threat to “the environment” or more narrow dangers posed by a single chemical. At the same time, CBPR’s focus on the most vulnerable community members helps to highlight questions of justice within as well as between communities. Because CBPR embraces multiple definitions of community, it can be employed by a wide variety of EJ

Figure 1. CBPR Process



Adapted from Bacon, deVuono-Powell, Frampton, LoPresti, & Pannu (2013a).

advocates, some of whom see themselves as intimately connected to past and future generations, and to the natural world. Like EJ, CBPR pushes us to think carefully about who is affected by a problem and how to involve those who are most affected.

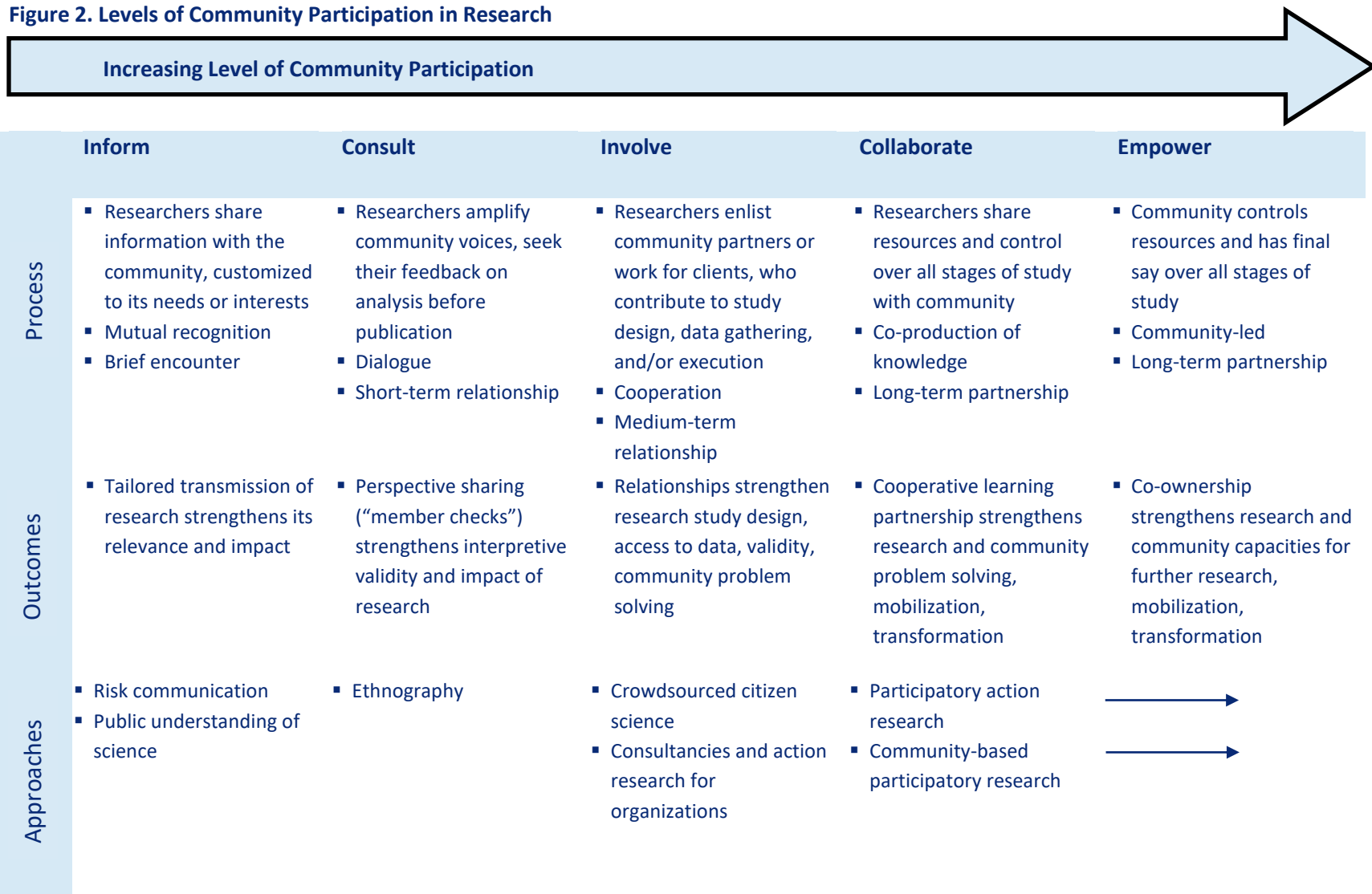
Most of all, community-based research means that scholars carry out their work *with* community members, involving them in each stage of the research process (see Figure 1). Often, this becomes an iterative cycle of collaboration to design and conduct research, and engage in follow-up actions based on the findings, which leads to new questions and interventions for future research partnerships.

Compared with most types of ES, CBPR involves greater levels of community participation by civil society, government agencies, or members of the public. Figure 2 modifies the IAP2's (2014) widely-used spectrum of public participation in decision making to present a range of engaged scholarly approaches, according to the degree of participation they typically afford community actors in research. Figure 2 locates these approaches according to the degree of participation in *most research* using each approach to date. There are individual studies using each approach that could be classified differently and future work employing all of these approaches could shift in a more participatory direction.

At present, examples of the least participatory approaches that can still meet the definition of ES include research on communicating risks effectively and enhancing public understanding of science, when they involve tailoring information to communities based on surveys, focus groups, and other means of gauging their interests and needs. Ethnography can promote fuller participation by amplifying community members' voices in scholarship and conducting "member checks" with participants to test researchers' understandings against community interpretations (although researchers exert final control over analysis). Community members can be involved more fully in crowdsourced citizen science projects, although participants usually play a bigger role in gathering data than analyzing and expressing them. In consultancies and action research commissioned by organizational clients, non-academic partners tend to take the lead on defining study goals and providing access to data, while scholars retain control over methods and interpretation. PAR and CBPR typically lend themselves to the highest levels of participation. These approaches may involve collaboration between scholars and community organizations to manage funding and other resources, and co-design and co-produce all aspects of research. Here, local community knowledge often exerts as much epistemological authority as academic expertise. In rare cases, the same approaches are used to fully empower community partners with final control over, and financial ownership of, all elements of the research. For other ways of representing the spectrum of community involvement in public health research, see Balazs & Morello-Frosch (2013) and Clinical and Translational Science Awards Consortium (2011), and in citizen science, see Woolley et al. (2016).

CBPR typically views even highly stressed and oppressed communities as possessing valuable *assets*. Whereas traditional research tends to apply outside expertise to assess and cure a community's

Figure 2. Levels of Community Participation in Research



weaknesses, CBPR identifies a community's existing strengths, sources of resilience, and latent potentials (Sharpe, Greaney, Lee, & Royce, 2000). It seeks to build on the infrastructure of schools, churches, non-profit organizations, businesses, health and social services, informal social ties, mutual self-help activities, and the like. It consults community members about their vision for growth and development, and studies interventions aimed at advancing that vision. (For example studies, see the section in part two on community mapping.) Similarly, EJ organizing must build on communal assets to envision and advocate for change.

Many CBPR researchers are not members of the communities with whom they collaborate. Some scholars see just and effective collaboration as requiring *culturally competent* researchers who:

(1) value diversity, (2) conduct self-assessment, (3) manage the dynamics of difference, (4) acquire and institutionalize cultural knowledge, and (5) adapt to diversity and the cultural contexts in which they serve (National Center for Cultural Competence, 2000).

Researchers cultivate these competencies in themselves to develop less ethnocentric and more respectful attitudes, more flexible and unbiased policies, and more culturally-congruent practices (Blumenthal, Hopkins, & Yancey, 2013). Scholars turn to CBPR partners for knowledge of their community's language, culture, values, practices, and other characteristics. Sensitivity to the complex ways in which power and privilege can affect research relationships is crucial for designing more relevant and effective EJ studies, interventions, and disseminations, and applying evidence from one setting to another.

Others suggest that scholars should strive for *cultural humility*. For Tervalon and Murray-Garcia, "humility, and not so much the discrete mastery traditionally implied by the static notion of competence, captures most accurately what researchers need to model" (1998, p. 120). Practicing humility goes beyond acquiring cultural knowledge and communication skills. It entails an ongoing commitment to personal and social transformation that redresses power imbalances between scholars and communities, and between professionals and lay people (Faronda, Baptiste, Reinholdt, & Ousman, 2016).

EJ researchers need cultural competence and humility to understand and respect community partners' understanding of their environment and health, and their visions of justice. Often, this work involves bridging divides between researchers and communities of different races and ethnicities, national origins and immigration statuses, classes, and levels of expertise (Fernández et al., 2017; Vaughn & Jacquez, 2017; Murphy, Hinojosa, & Osman, 2013). For example, a recent project developed culturally-specific principles for conducting cancer research in the African-American community, where distrust of health researchers remains high many years after the infamous Tuskegee syphilis experiment concealed subjects' diagnoses from them and left their disease untreated so researchers could examine its progression (Smith, Ansa, & Blumenthal, 2017). Other projects have enlisted community members to translate statements of CBPR principles into more clear and accessible terms to ensure that non-academics can give informed consent to help conduct or participate in research (Burke et al., 2013).

As a broad approach to scholarship, CBPR can incorporate any research methodology that meaningfully involves community members in helping to design and conduct research. Of course, training and collaborating with members of the public takes special care and skills. Thus, the literature on CBPR methodology often pays

more attention to techniques for building equitable and productive community-based partnerships than it does to methods for conducting qualitative and quantitative research (see the section in part three on university-community collaborations).

CBPR has also developed *translational research* to strengthen the application of findings to practice. This may involve speeding the movement of basic science discoveries into applied research or moving applied findings into wider practice. In the health fields, for example, systematic reviews and meta-analyses show that CBPR has proved effective at translating results of controlled trials and research on public health campaigns into real-world settings, and enhancing the dissemination and adoption of therapies and outreach efforts among diverse communities and constituencies (Anderson et al., 2015; Cyril, Smith, Possamai-Inesedy, & Andre, 2015; De Las Nueces, Hacker, DiGirolamo, & Hicks, 2012). Translational research may also inform policy advocacy, transform institutional practices, and engender follow-up research to evaluate new interventions (Coughlin & Jenkins, 2017; Smith & Blumenthal, 2013). The U.S. National Institutes of Health invested heavily in these efforts in the early 2010s through its Clinical and Translational Science Awards program, which created 60 multidisciplinary centers and institutes that included community engagement units.

Some CBPR research contributes directly to community and workplace *organizing*. For example, the San Francisco Chinatown Restaurant Worker Health and Safety Study aimed to reduce health risks and wage theft in restaurants in San Francisco's Chinatown (Islam, Chang, Lee, & Trinh-Shevrin, 2017). Researchers at two University of California campuses (UC-Berkeley's School of Public Health and UC-San Francisco's School of Medicine) partnered with the San Francisco Department of Public Health and restaurant workers affiliated with the grassroots Chinese Progressive Association of San Francisco. After the study documented widespread violations of labor law, public agencies began to verify that restaurants applying for new business licenses carried workers compensation insurance and suspended health permits at restaurants with labor law violations. The grassroots partner co-founded a new workers organization, which convinced the city to adopt an ordinance against wage theft and create a task force to monitor compliance with the new law. Several workers' campaigns ensued, including one that won a \$4 million settlement for employees at a large Chinese restaurant.

As this example suggests, CBPR can also build long-term *community capacities* for systemic and long-term change, such as organizational memberships and partnerships. In a systematic review of fifty CBPR studies across several disciplines, Drahota et al. (2016) found that 78 percent reported near-term benefits, such as exchanging knowledge, while one-third found capacity-building outcomes, such as better community care, long-term organizational collaborations, or improved community context. These capacities are vitally important to institutionalizing EJ in communities, increasing their ability to participate in decisions and to redistribute power and resources more equitably.

II. METHODS

Engaged scholarship on EJ avails itself of many methods to measure disparities, to tell the stories of EJ communities, and to empower them to participate in research. This section briefly describes some commonly-used research methods in EJ work. While space does not permit a step-by-step treatment of how to use each method, this section includes citations to relevant methods textbooks and some studies that exemplify each method.

COMMUNITY MAPPING

Engaged research frequently enlists community members in mapping their communities. These maps typically represent local environmental and health threats, social and economic vulnerabilities, demographics, disparities between communities, community assets, and changes over time. Maps are extraordinarily flexible tools that can be used for many purposes (Chakraborty, 2018; Haklay & Francis, 2018). These include:

- collecting and representing information in different ways;
- educating the community about historic and current causes of EJ problems;
- identifying and prioritizing areas and topics of concern;
- mobilizing and empowering residents to launch campaigns;
- communicating information to decision makers;
- directing resources and targeting health interventions to specific places and groups;
- and designing infrastructure.

Maps are especially useful for representing cumulative exposures and vulnerabilities, including information and relationships unknown to regulators, or not considered by them in past decisions about permitting, development, remediation, and the like. Maps can also draw connections that communities and their political representatives need to consider more fully. For example, a recent mapping project raised concerns about the political system's responsiveness to EJ by visualizing the relationship between low voter turnout in California communities and economic, educational and health problems (California Civic Engagement Project, 2016).

As Corburn and his colleagues (2017) observe, community mapping is as much a process as a product, and it should be a participatory activity:

Ensuring that map making is a democratic process owned and controlled by community members requires that local people, not outside researchers, define the geographic or other boundaries over what counts as part of the "community." The collaborative partnerships and knowledge generated through action research must be oriented toward existing community organizing goals, focus on mapping assets and hazards, and aim to highlight issues that may be ignored or given scant attention by outsiders, particularly policy makers. In this process, mapping can facilitate learning about place and health equity relationships by researchers and community members, particularly if the process is ongoing and dynamic, rather than a static, one-time effort (p. 321).

While this kind of ES approach can be pursued using commercial mapping software and regulatory data as well as community-generated data, the tools and process should align with community members' purposes.

Community mapping studies use a broad range of technologies. Geographic Information Systems (GIS) software has been adapted for public use in many projects on EJ (for examples, see Haklay & Francis, 2018; Stewart, Bacon, & Burke, 2014; Wilson et al., 2018) and public health (for examples, see Brown, 2008; Corburn, Rocha, Dunaway, & Makau, 2017; Oyana, 2017). Increasingly, communities are turning to free web-based mapping tools, such as Google Maps (maps.google.com), MapServer (Mapserver.org), OpenStreetMap (openstreetmap.org), GRASS GIS (grass.fbk.eu), and tools created by Public Lab (publiclab.org). Apps allow residents to use phones and other mobile devices to upload data that can be mapped, including information about crime (crimemapping.com), health (healthycity.org), traffic hazards and other infrastructure problems (seeclickfix.com), crises and elections (github.usshahidi.org). Other projects take advantage of tools created by government agencies for mapping cumulative exposure impacts, such as the U.S. Environmental Protection Agency's EJScreen (www.epa.gov/ejscreen) and C-FERST (www.epa.gov/c-ferst) risk screening tools, and health disparities, such as the U.S. Office of Disease Prevention and Health Promotion's HealthyPeople.gov web site (www.healthypeople.gov).

Mapping also presents some potential pitfalls that engaged research partners should keep in mind. Learning the latest mapping tools can be a seductive but unproductive use of the community's time, encouraging unnecessary deference to outside experts for training and overwhelming residents with information. Corburn et al. (2017) suggest the most successful projects "build incrementally from smaller to larger scale, from less to more complex, and from lower to higher technology (p. 333). Second, because a map is not the territory but a necessary simplification of it, communities should be thoughtful about what they choose to include and omit, and why. They also need to be familiar with potential limitations of the comprehensiveness and accuracy of their data, whether it comes from regulators, community members, or others.

ENVIRONMENTAL MONITORING AND BIOMONITORING

Many EJ studies enlist community members to conduct environmental and biological monitoring. This research has been valuable for answering residents' questions about their exposure to hazards, measuring cumulative and synergistic effects from multiple sources of pollution, and providing evidence of violations of environmental standards to command attention from polluters and regulators. Community members have collaborated with EJ organizations and researchers to document exposure to air pollution (for a recent review of the literature, see Commodore, Wilson, Muhammad, Svendsen, & Pearce, 2017), including from sources such as ports (e.g., Garcia et al., 2013), industrial hog farms (Wing et al. 2008), urban traffic and industry (Keeler et al., 2002; Wier, Sciammas, Seto, Bhatia, & Rivard, 2009), and diesel bus depots (Kinney et al., 2000). Participatory studies have also documented water contamination (for overviews, see Buytaert et al., 2014; Buytaert, Dewulf, De Bièvre, Clark, & Hannah, 2016), including from sewage (Heaney et al., 2011), landfills (Heaney et al., 2013), and multiple threats to indigenous peoples' water sources (Cummins et al., 2010; Wilson, Mutter, Inkster, & Satterfield, 2018). Using cell phones and other devices as sensors, studies have monitored noise pollution in London public housing (Haklay & Francis, 2018) and neighborhoods around Heathrow Airport (Becker et al. 2013). Engaged research has also monitored soils and other environmental media near hazardous waste sites (Brown & Mikkelsen, 1997; Ramirez-Andreotta, Brusseau, Artiola, Maier, & Gandolfi, 2015).

The availability of low-cost portable environmental monitoring devices is enabling more of this kind of collaborative research (for reviews, see English, Richardson, & Garzón-Galvis, 2018; Kim & Haynes, 2017). For example, in the late 1990s, environmental engineers hired by attorney Edward Masry (made famous by the film *Erin Brockovich*) invented simple air monitors using buckets and plastic bags to capture air samples. Global Community Monitor quickly disseminated the technology to EJ activists around the world, allowing fenceline communities to sample air near polluting facilities and send it to a laboratory for analysis. Soon, “bucket brigades” of activists were documenting short-term spikes and long-term violations of emissions limits by oil refineries and chemical plants worldwide (Scott & Barnett, 2009). The evidence helped convince officials to relocate several hundred households near a Shell refinery in Louisiana and to install air-monitoring systems in several cities (Stoll, 2017). However, while regulators granted some legitimacy to bucket brigade evidence, they have been slow to give it enough credence to change air monitoring standards (Ottinger, 2009).

This may be changing. New sensors and real-time monitoring software can measure gases, particulates, and water quality with increasing reliability. Government agencies are developing manuals for using these tools, such as the U.S. EPA’s air sensor toolbox (www.epa.gov/air-sensor-toolbox). The IVAN (Identifying Violations Affecting Neighborhoods) air monitoring system in California’s Imperial Valley (www.ivanair.org), which measures particulate matter concentrations, provides an example of how these technologies can be deployed in a more welcoming regulatory context. Community members helped identify monitoring sites and learned to maintain and troubleshoot the monitors, which were validated and calibrated to official environmental agency reference monitors for reliability. The IVAN website displays air quality data in real time and advises the public to take precautionary steps when pollution levels spike. An Environmental Justice Task Force of residents and regulators reviews the data at monthly meetings as the basis for discussing action to reduce pollution. The IVAN website also solicits and maps public complaints about illegal dumping, emissions, and other violations. The Imperial Valley program is one of eight local IVAN networks across the state.

EJ research can also ground-truth existing regulatory data that is out-of-date or incomplete, especially emissions data that is reported by industry. In addition, ground-truthing can show how environmental standards for broad geographic areas can fail to protect EJ communities from pollution hot spots that exceed those standards. In one project, researchers trained community members to gather data in six Los Angeles neighborhoods that supplemented regulators’ maps of hazardous facilities, air pollution levels, and other health risks. Residents documented clusters of potentially hazardous facilities, elevated levels of particulate matter, and associated health risks, identifying needs for regulatory and policy change (Sadd et al., 2014). Follow-up research found that errors in regulatory databases revealed by ground-truthing affected cumulative impact scores generated by an environmental justice screening tool that was developed to map the effects of air pollution and social vulnerabilities (Sadd et al., 2015).

Another study trained youth researchers to ground-truth the Alameda County Public Health Department’s database of food stores in Oakland, California (Akom, Shah, Nakai, & Cruz, 2016). The study found that most retail outlets that the database listed as food sellers were liquor stores or small corner shops, in which the main items for sale were chips, soda, candy, and processed confections. Researchers concluded that neighborhoods regulators thought were “food oases” were in fact “food deserts.”

In addition to measuring hazards in the environment, some researchers are turning to calculate exposures in the human body (in breast milk, blood, urine, or tissue) to demonstrate cumulative effects on health. Biomonitoring tools are increasingly sensitive, affordable, and accessible, allowing more researchers and EJ groups to detect the presence of multiple hazardous substances emitted by industrial operations and consumer products (Morello-Frosch, Varshavsky, Liboiron, Brown, & Brody, 2015). Biomonitoring can measure individuals' "body burden," or chemical load from the sum of exposures via all entry paths into the body (skin absorption, inhalation, ingestion) and sources (air, water, and food). This research can show persistent chemicals that have accumulated over time and immediate exposures at single points in time (Steingraber, 1998). In addition, biophysical monitors, measuring skin conductance and heart rate for example, can provide individual-level data on the effects of environmental stressors (Stahler et al. 2013).

Biomonitoring often shows that current regulations fail to prevent chronic and acute exposures and can be used to question whether acceptable exposure limits in current regulations are in fact safe. It can also demonstrate disproportionate harms to vulnerable communities. Some research combines biological and environmental monitoring, such as a collaboration among the AamJiwnaang First Nation community in Ontario, Canada, biologists at the University of Ottawa, and the Occupational Health Clinic for Ontario Workers. This study used bucket brigades and body burden testing to fill gaps in government data collection around chemical plants to build pressure for stronger regulation (Sabzwari & Scott, 2012).

ANALYZING BIG DATA

Researchers are gaining access to significantly larger data sets than in the past from a variety of sources. In addition to crowdsourced citizen science projects and newly-opened government databases, big data are generated by sources such as networked environmental sensing, web and mobile app searches and clickstreams, locational data, social media postings, scanned barcodes, and financial transactions. These data are characterized by an unprecedented *volume* of records, *velocity* with which the data can be gathered and analyzed, and *variety* of sources (such as databases, audio, photos, video, World Wide Web, mobile media, machine-to-machine interactions, sensors connected to the Internet of Things, survey and government data) (Laney, 2001). At the same time, improved tools for data analysis, such as GIS and tools for spatial analysis in statistics software, allow researchers to analyze and represent data in new ways.

These tools afford new opportunities for EJ research (Mennis & Heckert, 2018). Researchers can now conduct more specific measurements of household and individual exposures to hazards than previously (Collins, Grineski, Chakraborty, Montgomery, & Hernandez, 2015; Pais, Crowder, & Downey, 2014). Household data also enable researchers to model individual residential choices and behaviors, which can characterize causes of environmental and health disparities, not just demonstrate associations among pollution, race or income, and health conditions. Location data from mobile devices can model individual-level contact with environmental hazards or amenities better than more general and static measures of residential location, such as census-tract data, did in the past. As discussed in the previous section, wearable sensors are providing more precise environmental measures (of air and noise pollution, and other hazards), tracking of biophysical responses to stressors, and biomonitoring. These data can be gathered repeatedly, enhancing opportunities to study the

temporal dimensions of EJ and to establish environmental causation of health outcomes (Mennis & Heckert, 2018).

Data scientists can also use large data sets and algorithms to develop new measures of environmental and social inequities. For example, a team led by researchers at the University of Minnesota recently created a “pollution inequity” metric, which measures the difference between the environmental health damage caused and experienced by a group or individual, drawing on economic input-output, consumption, and spatial emissions, population, and health databases, as well as air quality modeling (Tessum et al., 2019). They spent six years applying the metric in a unique study that went beyond tracing air pollution back to production sources to attribute it to the end users of goods and services. The study showed that emissions of fine particulate matter are disproportionately caused by white Americans’ consumption and disproportionately inhaled by Hispanic and black Americans. This disparity stemmed as much from how much Americans consume as by how much pollution they inhale. Moreover, these inequities remained high even while exposures to particulates declined for each racial-ethnic group by around half between 2002-2015.

While big data offer new possibilities for environmental justice research, they also present problems of voice, speed, and expertise (Mah, 2017). First, much institutionally-gathered big data is proprietary and inaccessible to community members and researchers, and unrepresentative of marginalized populations. Researchers need to consider how to practice transparency, given that many of these data are collected not by researchers but by third parties, with minimal or no approval from data subjects, who have little control over how these data are used and interpreted to make decisions that affect subjects. Second, there is the problem of speed. While real-time analysis of crowdsourced data can help track the immediate effects of environmental disasters, it may not be as useful for documenting long-term, cumulative toxic exposures typical of many EJ issues. Third, because big data are complex and challenging to analyze well, and can present novel problems of reliability (such as depending on anonymous contributors of crowdsourced data), they require considerable expertise to interpret. Much of that expertise is concentrated in corporate, government, and academic institutions, which may be unable or unwilling to collaborate with community-based EJ organizations. EJ researchers could play a valuable role in helping to foster big data literacy by working with communities to consider how these data are gathered, demystifying how algorithms analyze data, and so on (D’Ignazio & Bhargava, 2015).

STORYTELLING, HISTORY, AND COMMUNITY ARTS

As the context in which humans make sense of themselves and the rest of the natural world, culture has been called the fourth pillar of sustainable development (United Cities and Local Governments, 2010). Advocates and researchers have long been interested in the influence of culture on EJ and in cultural strategies for promoting EJ (for reviews of the literature, see Coemans, Wang, Leysen, & Hannes, 2015; Hauk & Kippen, 2017; Mcdonald, Catalani, & Minkler, 2012; Tremblay & Pilati, 2013). EJ themes have been expressed in many genres: fiction, non-fiction, autobiography, testimony, history, and so on. Cultural research methods on EJ organize community members to represent their lives and conditions in a wide array of media, including documentary and fiction photography and film, community murals, poetry, theater, novels and graphic novels, activist media, place-based tours and walks, and public ceremonies and rituals.

Storytelling

Storytelling lies at the heart of most cultural research strategies. Narrative helps us to comprehend and navigate our lives by choosing from among available stories and inventing our own life stories (Fisher, 1987). Stories also help us to coordinate our interactions with others by forging common meanings (Pearce & Cronen, 1980). Ganz (2011) emphasizes the transformative power of our public narratives, which entail connecting a “story of self” (focused on one’s calling) and a “story of us” (linking the individual to the community’s calling) to a “story of now” (which motivates taking action on communal challenges and possibilities). Ganz’s framework has proven useful to grassroots organizers and the Obama Presidential campaign for designing their messages, and in environmental education for helping students think about how their lives might connect to larger movements (Pileggi & Morgan, 2017).

Storytelling is entwined in EJ movement practice and research in many ways (Houston & Vasudevan, 2018). EJ narratives integrate many kinds of knowledge – expert and local, scientific and political, communal and personal, theoretical and practical – into coherent accounts of justice and injustice. Toxic tours of local waste sites, community histories, and participatory research studies also link the particular and the general, and the past to the present, by showing illustrative evidence of EJ issues (Di Chiro, 2003; Pezzullo, 2007). In interviews, litigation, and oral histories, EJ storytelling is a means of gathering testimonial evidence for research and organizing (Evans, 2002). Stories are a grassroots form of making meaning that is often more accessible and immediate in its impacts than academic research, building commitment to collective action (Newman, 2012). Storytelling lends itself to communicating complex causality in a form that can be more memorable than scientific data (Griffiths, 2007).

History

History is one genre of public storytelling. Contemporary historians have produced valuable accounts of the origins and causes of environmental disparities (for a summary, see Boone & Buckley, 2018), and an excellent compilation of primary source documents on twentieth century EJ in the U.S. (Wells, 2018), but few historians have collaborated with community partners on these projects. Some researchers have incorporated oral history methods, a form of storytelling that has lasted for millennia, and which offers opportunities to involve community members’ voices. Oral histories have been used in studies of public health and Navajo uranium miners (Brugge & Goble, 2002), urban development in New York City (Gandy, 2002), conflicts over place naming among indigenous and white Australians (Bonyhady, T., & Griffiths, 2002), and the life paths of environmental activists (Chawla, 1999). Endres (2011) summarizes research employing oral history methods on environmental research, including EJ.

Oral history projects can respond directly to the needs and interests of contemporary EJ communities. For example, a community campaign to hold Monsanto accountable for PCB contamination in Sweet Valley, Alabama moved historian Suzanne Marshall to conduct oral histories of residents. After Monsanto began arguing that the industry could not be held responsible for exposing residents because it built chemical factories before residents moved into adjoining neighborhoods, Marshall conducted interviews with longtime residents and examined historical records that showed the neighborhoods were built at least a decade before

the industry arrived. An attorney for the residents used her research to refute Monsanto's claim (Marshall, Kinney, & Hudson, 2012).

The most participatory approach to oral history enlists community members in helping to design studies, gather, edit, and analyze individuals' accounts. In 2008, DataCenter and Pacific Institute, two independent research institutes, trained the Winnemem Wintu tribe in California to conduct GIS mapping and oral histories about their sacred sites, which were threatened by a proposed expansion of the Shasta reservoir. Winnemem members mapped sites using cell phones and gathered the stories, and a member of the tribe analyzed the data, documenting their historical importance for ceremonies, healing, and spirituality. The Winnemem used the evidence to negotiate with the Forest Service and other government agencies to protect their ancestral sites from inundation and desecration by increased public access for recreational users of the reservoir. DataCenter (2015c) documented the work and produced a guide to using these research methods, which other tribes can use to document and protect their traditional lands and hand down their cultural knowledge to future generations.

Community Arts

Arts-based research methods can be used to gather or disseminate data (Coemans & Hannis, 2017). As a data collection technique, art is the vehicle through which research participants communicate their experience to researchers (as in photovoice, discussed in the next section). As a means of dissemination, art provides the medium for expressing research findings and conclusions, replacing or supplementing traditional academic publication with an exhibition of images or artifacts, street murals and other public installations, or performances of dance, theater, music, etc. Community arts events can also provide opportunities for dramatizing and transmitting information about public health, organizing efforts, and other EJ-related issues.

Like storytelling in general, community arts projects can integrate disparate types of knowledge and experience, provide testimony and other illustrative evidence in accessible and compelling ways, help imagine alternative futures, generate collective action, and strengthen communal ties. Recent literature reviews summarize arts-based approaches to CBPR with vulnerable populations (Coemans & Hannes, 2017), in health care settings (Fraser & Al Sayah, 2011; Boydell, Gladstone, Volpe, Allemang, & Stasiulis, 2012), and with indigenous peoples (Hammond et al., 2018). Other reviews provide entry points into the literature on using particular media in community arts research. For example, researchers have adapted Augusto Boal's theatre of the oppressed to address EJ issues (Sullivan & Lloyd, 2006; Sullivan & Parras, 2008). Others have enlisted community members to author collaboratively-written "policy novels," which weave explanations of sustainability policies into fictional storylines (Van der Arend, 2018).

PHOTOVOICE AND PARTICIPATORY MEDIA

Photovoice methods equip community residents with cameras to photograph their lives and environs in ways that address the goals of a research project. Participants discuss their photographs in groups, and present their work to community members and leaders to support calls for action on the conditions depicted (Wang &

Burris, 1997). Reviews of the literature find many potential benefits of using photovoice techniques for EJ research (Powers & Freedman, 2012; Wilson et al., 2018). These include its abilities to:

- recruit participants from groups that are typically marginalized from research or distrustful of researchers;
- represent residents' local and experiential knowledge of their environment and community life;
- create a sense of ownership of information among participants, adapt to their cultural preferences, and engender trust between them and researchers;
- provide qualitative data that can be translated into priority-setting and action agendas;
- identify themes for community interventions;
- be shared widely in many media, including online community mapping projects;
- teach individual skills in photography, research, presenting, and activism;
- and develop community capacities for recognizing, representing, and discussing EJ issues.

The same literature reviews find that photovoice also poses potential challenges. Because projects typically involve small groups, it is difficult to include representative samples of a community. The method requires significant time commitment of participants. Researchers need to avoid imposing their interpretations of residents' work during the discussion phase. While photovoice research has documented many examples of capacity building among participants, it has not demonstrated many immediate impacts on policies or practices.

Given these strengths and limitations, researchers often use photovoice for assessing public health needs and identifying EJ issues, which can be addressed by longer-term efforts involving the larger community (Coughlin, Smith, & Fernández, 2017b). One study identified African-Americans' views of the causes of poor health in Atlanta, GA, including substandard housing, racially discriminatory disinvestment, and the threat of displacement by gentrification (Redwood et al., 2010). Castleden, Garvin, and the Huu-ay-aht First Nation (2009) employed photovoice to represent indigenous Canadians' views of unsustainable forestry management in their ancestral lands. Harper, Steger, & Filčák (2009) collaborated with Roma youth in Hungary to document environmental injustices in their community, such as unequal access to water and playgrounds, and illegal dumping by outsiders. However, participants also chose to represent their stewardship of their environment, which they felt city leaders needed to understand, as shown through gardening, using sustainable forms of transportation, and their affection for the local river as a recreational space. Freedman and her colleagues (2014) used photovoice with public housing residents in the American south to identify community-level interventions for improving their living conditions. In a study that combined photovoice with interviews, Schwartz et al. (2015) collaborated with Mexican-Americans in rural California to depict their concerns about the impact of pesticide spraying on childhood asthma, and potential responses.

Photovoice techniques can also be adapted to participatory video and digital media projects (Gubrium & Harper, 2016). For example, Clement (2018) enlisted Nepalese villagers to produce videos that sparked community deliberations about structural causes of vulnerabilities to climate change. The Participatory Sustainable Waste Management (PSWM) program, a long-term research partnership among the University of Victoria (Canada), the University of São Paulo (Brazil), local governments, and community organizations, used participatory video to represent the work and needs of informal recyclers in both countries. The project

trained participants, who are often stigmatized as “scavengers” and harassed by authorities, to make short documentaries aimed at local policy makers explaining how recyclers provide valuable services of resource recovery and recycling from landfills and city streets. The videos were used in campaigns to integrate informal recyclers’ work into the formal sector in Brazil (Tremblay & Jayme, 2015) and decriminalize their activities in Canada (Gutberlet, 2008; Gutberlet & Jayme, 2010).

III. CHALLENGES AND RESPONSES

UNIVERSITY-COMMUNITY COLLABORATIONS

This section serves as a brief guide to the literature on the characteristic challenges of university-community collaborations. It canvasses the main issues that often arise and how they are addressed by experienced practitioners of engaged scholarship. For step-by-step guides to doing engaged scholarship, and sample partner agreements, research instruments, publications, and the like, see:

- Examining Community-Institutional Partnerships for Prevention Research Group (depts.washington.edu/ccph/cbpr/index.php);
- Community-based Participatory Research: A Partnership Approach for Public Health (2nd ed.) (www.detroiturc.org/online-cbpr-course.html);
- Campus-Community Partnerships for Health (ccph.memberclicks.net);
- The Community Tool Box (ctb.ku.edu);
- [The Research University Engaged Scholarship Toolkit](http://compact.org/initiatives/trucen/research-university-engaged-scholarship-toolkit/) (compact.org/initiatives/trucen/research-university-engaged-scholarship-toolkit/);
- Engagement Scholarship Consortium (engagementscholarship.org/);
- Rebecca Dumlao (2018) *A guide to collaborative communication for service-learning and community engagement partners*;
- Marshall Welch (2016). *Engaging higher education: Purpose, platforms, and programs for community engagement*.

Preparing to Collaborate

Few graduate programs train aspiring faculty members to conduct engaged scholarship. Expertise in an academic field alone does not qualify scholars to embark on a collaboration with community partners. Like other complex tasks that mix research and practice, ES for EJ requires training and preparation in a wide array of knowledge, skills, and dispositions.

Self-Examination

Hyde (2017) offers a framework for self-examination for researchers preparing to enter the field, adapted from Axner (2011), which gives helpful advice on:

- Taking inventory of one's own and community partners' cultural and professional attributes, including both the power (or unearned privileges) and subordination they can confer;
- Taking the vantage point of others involved in the research, especially to imagine how community partners may experience the researcher;
- Developing one's abilities to address potential barriers to collaboration by practicing self-awareness, empathy, flexibility, openness to others' ideas and experience, relationship building and reparation;
- Considering the best "use of self" in collaboration, including how one's knowledge, skills, and cultural attributes can help or hinder the formation of authentic relationships to advance the research.

On the whole, this process of self-examination should help researchers plan to maximize their assets, while acknowledging and addressing inevitable community concerns about researchers' cultural identities or qualifications.

Cultural Competence and Humility

Self-examination is vital for developing the capacity and commitment to redress power imbalances between professionals and lay people, and between scholars and communities (Faronda, Baptiste, Reinholdt, & Ousman, 2016; see also Tervalon and Murray-Garcia, 1998). Many case studies examine how cultural humility has been applied in practice (e.g., Burke et al., 2013; Garzon et al., 2013; Shepard et al., 2013; Smith, Ansa, & Blumenthal, 2017). ES researchers and community partners also offer general guidance on addressing differences of race and ethnicity (Fernández et al., 2017; Murphy et al., 2013), national origin and immigration status (Vaughn & Jacquez, 2017), and how these intersect with differences of class and expertise (Muhammad, Garzón, Reyes, & West Oakland Environmental Indicators Project, 2017). Eng et al. (2017) and Yonas et al. (2013) specifically address anti-racism training. Several sources summarize cultural issues that arise in partnerships with communities that are Asian-American (Islam et al., 2017), LGBTQ+ (Kano, Sawyer, & Willgang, 2017), deaf (Barnett, Cuculick, Dewindt, Matthews, & Sutter, 2017), faith-based (Kitzman-Ulrich & Holt, 2017), or HIV positive (Rhodes et al., 2017). Adults' role in supporting youth-led participatory research is described by Arredondo et al. (2013), Mueller and Tippins (2015), and Ozer and Piatt (2017).

Understanding Situation and Context

ES depends on a thorough understanding of the community context and situation of the groups involved to build good working partnerships. EJ researchers need to appreciate how community members view the focus of the research in relation to larger patterns of subordination. In North Carolina, for example, some researchers were able to partner more effectively with local EJ organizations to regulate industrial hog farming than mainstream environmental groups were able to do. Mainstream green organizations led by whites framed the work narrowly as ameliorating air and water pollution, while EJ community leaders saw it as one aspect of a larger struggle against historic and institutionalized racism, which required action on many fronts. As one EJ organizer commented, "One of the things we learned in this whole process was that white people want to solve problems and black people want to solve issues" (quoted in Tajik, 2012, p. 137).

Similarly, critics of participatory research in global development work accuse it of being ineffective or of coopting community energy that would be better spent on other change strategies, such as organizing resistance to political and economic power holders' control of natural resources or enacting stronger pollution regulations (Cooke & Kothari, 2001). To avoid these dangers, research partnerships need a clear view of how their joint work relates to long-term and structural injustices, and how their projects can build communities' capacities for change over the long haul. This calls for close study of local histories and how they fit into larger patterns of injustice. Partners also need to understand subordinated groups' prior experiences with researchers; many EJ communities feel exploited or let down by past promises of change (Cable, 2012). The sources cited above on cultural humility offer guidance on how to work well with specific communities.

Understanding how local groups are situated in larger contexts and how issues interconnect is also important for achieving intended impacts and avoiding unintended ones. For example, the role of greening urban environments in paving the way for gentrification and displacement of low-income residents appears to be a growing peril (Anguelovski, 2016; Curran & Hamilton, 2018; Schusler & Krings, 2018). Partners need to consider how to help secure long-term benefits for communities that are threatened as much by rising rents and property prices as by living in urban brownfields and food deserts.

Forming Partnerships

As researchers and community-based partners explore whether to work together, how, and to what ends, the process involves several major stages.

Initial Questions

Hartwig et al. (2006) pose a series of useful questions that academics and community partners should ask themselves before engaging in ES. Among the most important are:

- Are partners' agendas being driven primarily by opportunism or self-interest (to get a grant, a job, access to study participants, etc.), rather than community need?
- Do researchers have the necessary skills and attitudes, such as cultural humility, collaborative communication and decision making, ability to analyze the community context, and so on?
- Are community partners knowledgeable about the community, and do they have a history of engagement that has built trust in the community?
- Are researchers comfortable with ES methods and principles, especially allowing community concerns to drive the research agenda, the idea of co-learning with the community rather than studying it as an object, and committing to iterative rounds of inquiry rather than a "one and done" study that can be fast-tracked for publication?
- Are community partners genuinely interested in participating in research to address questions they do not know the answers to yet, rather than simply obtaining resources and services or demonstrating their existing programs' effectiveness?
- Do the potential benefits of ES to the community outweigh the likely costs of all participants' time and energy?

Initial conversations among research partners should seek to answer these questions before applying for grants and making other plans. The answers should be reflected in formal agreements partners make about how they will work together and what each will do. For more guidance on how to choose effective academic and community partners, see Flicker, Senturia and Wong (2006).

Defining and Representing the Community

Defining the community and who is able to represent it are foundational decisions for each partnership. These choices determine which organizations should lead the research partnership, who the project will recruit as participants, and where to turn for funding. Because communities are rarely homogeneous and harmonious,

they are not well represented by a single organization, government agency, or elected official. Because communities are rarely governed equitably, ES projects need to amplify the voices of subordinated groups. It can be illuminating to have both insiders and outsiders attempt to define the community (Eng et al., 2013). Successful partnerships typically start among a small group of diverse organizations that are accountable to grassroots constituencies who are directly affected by the research problem. These budding partnerships then enlist others who can represent additional facets of the community as co-investigators, advisors, and/or staff members, matching individuals with roles according to their availability, skills, resources, and legitimate influence in the community (Flicker et al., 2006; Flicker, Guta, & Travers, 2017; Hancock & Minkler, 2012).

Developing Relationships with Partners

Partnerships are held together by structures, processes, and people that can bridge the academic-community divide (Palermo, McGranaghan, & Travers, 2006; Greene-Moton, Palermo, Flicker, & Travers, 2006; for additional summaries, see Duran et al., 2013; Griffin, Yancey, & Armstrong-Mensah, 2013). Most engaged projects form a community board to steer and review the project, and to help disseminate and implement its findings (for an overview of the process, see Palermo et al., 2006). Some schools of medicine and public health have especially extensive experience in implementing community review committees to help select research projects to fund (Horowitz et al., 2017; Smith, Kaufman, & Dearlove, 2013; Smith et al., 2017). Goytia et al. (2013) explain how universities have trained community leaders in research methods and supported them to initiate their own projects. Other sources draw lessons about how to strive for equitable decision making among partners throughout the research process (Rideout et al., 2013; Yonas et al., 2013). Palermo et al. (2006) describe partnerships' typical organizational structure and key staff positions, which include not only principal investigators and co-investigators, but community liaisons, who play a critical role of coordinating the academic and community partners' relationships.

Scholars who want to earn EJ communities' trust could begin by reading the Jemez Principles for Democratic Organizing (www.ejnet.org/ej/jemez.pdf) and the Second People of Color Environmental Leadership Summit's "Principles of Working Together" (www.ejnet.org/ej/workingtogether.pdf), in which advocates spelled out what they expected from each other. For example, the latter document encourages EJ organizations to form partnerships with academic institutions and lawyers who recognize community expertise. Both documents help illuminate how to build respectful relationships, address cultural differences, practice leadership that is accountable to the grassroots, resolve conflicts, and share resources fairly. Academics and community partners have fleshed out these principles in their reflections on working together (Christopher, Watts, McCormick, & Young, 2008; Lucero, Wright, & Reese, 2017), including strategies for building trust (Greene-Moton et al., 2006), communicating openly and constructively (Dumlao, 2018), developing healthy group processes and structures (Pinto, Spector, & Valera, 2011; Schulz, Israel, & Lantz, 2017), resolving conflict (Allen, Hurtado, Linares, Garcia-Huidobro, & Hurtado, 2013; Lucero & Wallerstein, 2013), and forming effective coalitions (Becker et al., 2012; Butterfoss & Kegler, 2012; Wolff, 2012).

Universities that are committed to building long-term community relationships prepare and train external partners to identify faculty collaborators, navigate human subjects protections and sponsored project requirements, and advocate for their interests (Welch, 2016).

Many community-based organizations would prefer to develop their capacities to conduct their own research. Doing so allows community groups to strengthen the credibility of their work, attract funding from new sources, and avoid dependence on academic partners. Academics can help to design and teach capacity-building workshops to such groups, as an alternative to collaborating with them on a specific research project. For example, Goytia et al (2013) surveyed community organizations about their interest in research topics and preferred learning formats, finding that community groups most wanted training in program evaluation, needs assessments, survey construction, and statistical analyses. Based on these findings, the scholars designed a research capacity-building course. In the 2010s, the Clinical and Translational Science Awards program of the U.S. National Institutes of Health helped to drive similar work by requiring academic grant recipients to develop community engagement cores that develop partners' research abilities.

Writing Formal Agreements

Mission statements, bylaws, funding agreements and legal contracts codify the arrangements that define a partnership. Rather than starting from scratch, partners can examine and adapt model agreements on shared governance of research collaborations (Greene-Moton et al., 2006; Palermo et al., 2006), control of resources and data (Espinosa & Richmond, 2017; Jarquín, 2012), and publishing agreements and credits (Engage for Equity, 2017). The Community Tool Box (<http://ctb.ku.edu>) also offers training modules and document templates for many tasks associated with engaged scholarship, from creating to evaluating partnerships.

Raising Funds and Sharing Resources

Historically, many funders awarded all or most of their grant money to academic institutions, leaving community partners with little access to or control over project funds. As a result, many community organizations felt academics exploited local problems to raise money and further their careers, while failing to produce data that directly addressed the demands of regulators and other decision makers (Cable, 2012; Muhammad et al., 2017). Today, more funding agencies distribute support more equitably among research partners, but agreeing on a fair plan for sharing resources is crucial to any joint project. This begins with partners co-developing a fundraising plan and writing proposals collaboratively (for guidance, see Senturia, Seifer, & Wong, 2006).

At the other end of the spectrum from university control of funding, in community-owned and managed research (COMR) grants go entirely to local organizations, who serve as principal investigators (Heaney, Wilson, & Wilson, 2007). Community groups formulate research questions, manage projects, and hire academics to help carry out the work. This approach may focus more squarely than academic-initiated research does on producing findings that conform to public health, environmental, planning, or civil rights regulations, using “science for compliance” (National Institute of Environmental Health Sciences, 2015, p. 26). COMR can be successful if local organizations have well-developed administrative and research capacities (Wilson et al., 2018).

A community engagement consulting model offers a third option, in which academic partners administer grants but compensate community partners equitably for contributing technical assistance and expertise in connecting with local residents and organizations (Black et al., 2013).

Partners can begin their search for funding with several sources:

- The University of North Carolina at Chapel Hill provides an excellent overview of fundraising strategies for participatory research, with links to public and private grants databases (participatoryresearch.web.unc.edu/funding-for-participatory-research-projects/). Kegler and her colleagues (2013) provide another useful summary of resources for CBPR projects.
- For tips on successful proposal writing, see depts.washington.edu/ccph/pdf_files/cbpr-reviewf.pdf.
- The U.S. EPA offers several environmental justice granting and technical assistance programs (www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance).
- Some states distribute small grants for EJ projects, including California (calepa.ca.gov/envjustice).
- The Health and Environmental Funders Network (hefn.org) is a good starting point for researching private foundation support.
- Several recent articles summarize philanthropists' EJ funding strategies and priorities (Leviton & Green, 2017; Nisbet, 2018; Sessions, Fortunato, Johnson, & Panek, 2016; Travers, 2019).

Conducting Research

Co-Designing Studies

All aspects of study design can potentially be shared endeavors, depending on community partners' capacities and engaged researchers' willingness to develop those capacities. In especially engaged partnerships, community members help to review the literature, assess community assets and challenges, identify and select research topics and questions, and choose research methods (e.g., Horton, 1993; Islam et al., 2017). Figure 3 lists the major collaborative techniques and research methods, which are explained in depth in CBPR methods textbooks and handbooks (e.g., Blumenthal, DiClemente, Braithwaite, & Smith, 2013; Coughlin et al., 2017a; Hacker, 2013; Israel et al., 2012; Minkler, 2012; Munck et al., 2014; Jason & Glenwick, 2016; Wallerstein et al., 2017a).

Figure 3. Collaborative Techniques and Research Methods

Collaborative Techniques	Research Methods
<ul style="list-style-type: none">• <i>Forming partnerships:</i> defining the community; establishing relationships; forming community advisory or governing boards; developing shared norms; writing memoranda of understanding that identify goals, outcomes, processes, and control of resources; obtaining funding• <i>Conducting research:</i> assessing community strengths, needs, and dynamics (mapping assets, decision makers, power holders, cultural values and beliefs); identifying priority issues and research questions; reviewing the literature; choosing research methods and designing interventions; adapting the design to community culture; training community and academic researchers; educating Institutional Review Boards about community partnerships; recruiting participants with and from the community; gathering and analyzing data collaboratively• <i>Analyzing and interpreting findings:</i> educating community partners about data analysis techniques, communicating the data, engaging partners in interpretation through iterative dialogue• <i>Disseminating and translating findings:</i> designing dissemination and translation plans for academic, policy, stakeholder, and community constituencies; co-owning the research by involving all partners in dissemination• <i>Implementing and evaluating practices:</i> designing follow-up evaluations, interventions, campaigns, programs, and research	<p><i>Qualitative</i></p> <ul style="list-style-type: none">• Ethnography• Interviews• Focus groups• Oral history, storytelling, digital storytelling, and photovoice• Community arts and culture <p><i>Quantitative</i></p> <ul style="list-style-type: none">• Environmental monitoring• Health monitoring• Epidemiology• Surveys• Experiments• Clinical trials <p><i>Mixed</i></p> <ul style="list-style-type: none">• Community mapping of assets, risks, health, etc.• Interventions and campaigns• Case studies• Participatory planning and evaluation

Choosing Research Topics, Questions, and Methods

To ensure that research responds to authentic community needs and takes advantage of its strengths, ES partners often begin by mapping community needs (McKnight & Kretzmann, 1996), local knowledge (Corburn, 2005) and other assets (Minkler & Hancock, 2003). Partners collaborate on choosing and “cutting” an issue that is bounded enough to provide a focus for the work, but that can also build the community’s capacities for future efforts (Staples, 2012). Often, the best issues are ones that address widely-recognized problems by allowing community organizations to employ their strengths and develop new ones to pursue their existing missions (Flicker et al., 2006). University and community collaborators can accomplish more by working together on these problems than if they worked separately. These issues may also hold promise for developing new alliances and attracting new resources to the community. To maximize opportunities to effect change, partners can also conduct a power analysis, identifying people and organizations that can translate the project’s findings into new policies and practices (Falbe, Minkler, Dean, & Cordeiro, 2017). The Action Catalogue (actioncatalogue.eu) helps researchers identify the most appropriate participatory method for their projects.

Incorporating Peer Researchers

Peer researchers are recruited from the community population that is the focus of the research and trained to participate as co-researchers. The CBPR textbooks cited above discuss how to train and employ peer researchers to help gather data via surveys, interviews, focus groups, observations, and other methods. Fewer studies extend the promise of participation to helping analyze the data (Flicker et al., 2010). Developing ways for community members to play a role in data analysis can increase their ownership of the work, and enrich the interpretation and dissemination of data to the community (Scott, 2012). Peer researchers have been trained successfully to participate in analyzing qualitative and quantitative data (Cashman et al., 2008; Foster et al., 2012; Gregg et al., 2010; Jackson, 2008; Schaal et al., 2016). Guides are available on hiring, training, and managing community researchers (Guta, Flicker, & Roche, 2010), and compensating them (Cheff & Roche, 2018). Some Institutional Review Boards have raised barriers to the use of peer researchers – a problem that is addressed below in part three in the section on transforming academia.

Communicating, Implementing, and Evaluating Research

Disseminating and Translating Findings

Engaged research typically calls for dissemination and translation plans for academic, policy, stakeholder, and community constituencies. Tensions can arise when professional scholars focus only on drafting academic publications, ignoring community participants’ need to convey results in more accessible formats that can influence policy and practice. Ideally, all partners should collaborate on drafting policy briefings, testimony, white papers, opinion articles, interactive presentations at community meetings, and the like.

Experienced partners develop comprehensive agreements on how they will share access to data, translate findings for multiple audiences, allocate resources to different channels for disseminating results and

recommendations, and share authorship credits and speaking opportunities in the news media and elsewhere (Flicker et al., 2017; Schnarch, 2004). Partners also must make intentional choices about when to use academic language (which can be inaccessible and technocratic to community partners) or lay language (which can appear emotional and anecdotal to policy makers) to address different audiences (Muhammad et al., 2017). Relatedly, partners must consider how to reconcile scientific standards of proof with the need to draw clear working conclusions on which community members and policy makers can act (Van Buuren, Van Vliet, & Termeer, 2014).

Conducting Participatory Evaluation

The cycle of engaged scholarship includes evaluating projects with an eye toward designing future interventions, programs, and research. Participatory evaluation enlists community members fully in this work. Partners begin by clarifying the goals of the evaluation, which may include understanding a project's effects on policy (Cacari-Stone, Minkler, Freudenberg, & Themba, 2017; Minkler et al., 2012), health programming and outcomes (Wiggins et al., 2017), power inequities and community self-determination (Cousins & Chouinard, 2012; Fetterman, 1994; Patton, 2011), or community capacities to transform systems (Leighninger, 2016; Schwab Foundation, 2017).

ES partners on EJ projects often have to expand the metrics used in standard evaluation research called for by most government agencies and private funders. ES and EJ goals go beyond numerical measures of narrow instrumental goals and mechanical replication of model programs. Participatory processes are complex and contextual, and they aim as much to strengthen community ties and democratize political power (Jagosh et al., 2012; Wallerstein, Duran, Oetzel, & Minkler, 2017b). In response, many ES partners employ mixed methods and non-traditional measures of processes and outcomes (for examples in public health, see Oetzel et al., 2017; Wiggins et al., 2017; Wright, 2017). Increasingly important both to funders and ES partners is whether the work will be sustained by additional funding, new organizations or coalitions, or the institutionalization of discoveries in the everyday routines of academic or community organizations (Coughlin, 2017). A mark of success for many scholars is that they have equipped community partners with sufficient research expertise and resources to continue the work on their own (O'Brien, 2001).

TRANSFORMING ACADEMIA

While many engaged scholars have learned to navigate academia, they continue to face strong headwinds from universities, professional associations, and publishers. This struggle does not merely affect academics' career aspirations. It limits the supply of research that is often most useful to environmental justice communities and limits universities' ability to educate students who can work collaboratively for EJ in social movements, faith-based organizations, government agencies, neighborhoods, and workplaces. This section

examines the remaining transformations needed within academia to expand ES for EJ. The section begins with ways of addressing stubborn barriers posed by the profession and then focuses on university-level changes.³

Scholarship Standards

Engaged scholarship challenges us to rethink how we assess the value and purpose of research. The design and evaluation of scholarship is slowly becoming more inclusive as academic associations and universities create community review boards, in which community members and academics work together to weigh engaged research proposals and publications. Many disciplines have developed standards of peer review specific to engaged scholarship. These standards apply traditional criteria, such as authors' ability to reference and build upon prior research in the field, but also assess how effectively academic researchers incorporate community expertise, the degree to which the work benefits communities, and other standards unique to engaged scholarship (Doberneck & Schweitzer, 2017; Glassick, Huber, & Maeroff, 1997; International Collaboration for Participatory Health Research, 2013; Jordan, 2007; Kastelic, Wallerstein, Duran, & Oetzel, 2017; Sandoval et al., 2011; Wright, 2017). In addition to traditional research ethics requirements for treatment of human subjects, evaluators of engaged research examine evidence that collaborations are guided by "mutual respect, shared work, and shared credit (and approval by an institutional review board and/or community-based review mechanism, if applicable)" (CES4Health.info, 2018). The resources section below lists links to detailed advice on how and where to publish engaged scholarship.

However, many fields have not fully integrated engaged scholarship by defining it clearly and valuing it on equal terms with traditional research, despite widespread endorsement of academic-community collaboration (Appel et al., 2017; Kearney, 2015). More fields need to recognize and value the time commitment and expertise required to create and sustain community-based partnerships, especially with marginal communities, as these relationships often generate novel interdisciplinary scholarship, experiential learning opportunities, and direct social and environmental benefits. Engaged researchers and others can continue to reform the scholarship standards of their professional associations, conferences, and journals.

Engaged scholars themselves have raised different critiques of standards for some community-based research, which are amenable to different solutions. One concern is that some ES can adopt a naive understanding of the community it purports to represent and study by assuming that it is homogeneous and consensual. These simplified visions of community can often reflect the views of power holders. All partnerships need to carefully define and represent different elements of the community, acknowledge their internal diversity and conflicts, and recognize local power imbalances (Flicker et al., 2017). Rather than treating communities as self-contained billiard balls, partners also need to consider how communities interact with influential forces at different economic, political, and ecological scales and levels.

³ Parts of this section are adapted from Raphael, Bacon, and Stewart-Frey (2018a; 2018b).

A second concern is that ES, like any research paradigm, can produce its share of cookie-cutter case studies that rediscover and restate the field's founding insights (e.g., that open communication and respect contribute to successful partnerships, academics can train community members to do research, and so on). Many of these case studies are also wholly positive accounts of what researchers did right and few contribute to a larger understanding of their topic or of engaged scholarship.

In response to these self-criticisms, engaged scholars have encouraged each other to:

- Think in more complex and specific ways about what it means to emancipate or empower community participants, and how projects contributed to these aspirations (Jagosh et al., 2012; Wallerstein et al., 2017b).
- Produce more original accounts of less understood factors in the success of projects, and, especially, offer new insights into why projects do not meet their goals (Avila, Sanchez-Youngman, Muhammad, Silva & Domingo De Garcia, 2017; Donahue, 2018).
- Contribute to broader understanding by employing systems thinking, which can illuminate how components of a social, political, economic, or environmental system interrelate, and how they relate to the whole (Huntjens et al., 2014). For example, design and evaluate interventions carried out by coalitions that target multiple sectors, such as a recent health equity program that employed a broad array of policy, environmental, and health care strategies to increase access to healthy food and increase physical activity in 15 local communities (Islam et al., 2017).
- Recognize that community participation is characterized by complexity and indeterminacy (Liston, 2014) without confusing these insights with the ends of ES. An approach that produces more complex accounts of complexity than non-experts can participate in articulating is not likely to help or empower them. Community members are unlikely to want to devote their time to research with indeterminate outcomes. Engaged scholars can employ approaches such as “realist methodology,” which aims to develop “an evidence-informed program or middle-range theories about what works, for whom, under what circumstances, and how” (Jagosh, 2017, p. 370). Such approaches can identify “promising practices” that might work across some similar contexts rather than simplistic recipes for “best practices” abstracted from local context (Liston, 2014).

Collaboration across Disciplines

Because problems of environmental justice cross the boundaries of academic disciplines, communities need to address these challenges in collaboration with teams of scholars from multiple fields. The breadth of understanding these teams can muster is needed to help communities develop fair and effective solutions to complex problems (Beachy, 2011), such as climate and food justice (see, e.g., Bacon et al., 2014; Maurer, Roby, Stewart-Frey, & Bacon, 2017). Just as important, these teams need scholars who know how to collaborate with each other and with community partners (Lindenfeld, Hall, McGreavy, Silka, & Hart, 2012).

Engaged scholars can avail themselves of many models of collaboration. MacMynowski (2007) suggests a continuum in which different disciplines' ways of knowing conflict with one another (in single-disciplinary research), are tolerated (multidisciplinarity), cooperate (interdisciplinarity), or transform one another

(transdisciplinarity). Mossman (2018) and London, Sze and Cadenasso (2018) summarize how these different approaches can be applied to sustainability and EJ research.

However, there are still more calls to work across disciplines than there are examples of academics taking up the challenge. Bridging disparate methods and epistemologies is never easy. In addition, while engaged scholarship has gained a foothold in many disciplines (especially the social and behavioral sciences, education, social work, health, agriculture, and environmental studies), it is still rare in others (such as the humanities, arts, physical and biological sciences, and math, engineering, and computer sciences) (Doberneck & Schweitzer, 2017).

To promote ES across fields, professional associations, funders, and universities can work to:

- Ensure that the faculty and staff in every discipline are aware of opportunities to conduct engaged scholarship.
- Train faculty members in fields that have been less involved in ES to do this kind of research.
- Encourage and reward cross-disciplinary collaborations with community partners.
- Form more centers and institutes that convene scholars from different fields and prepare them to collaborate with off-campus partners. Nonacademic research institutions (NARIs) oriented to address specific problems may provide useful models for breaking down disciplinary silos (Bursztyn & Drummond, 2014).
- Help to convene and support scholars to apply for the growing number of cross-disciplinary research grants aimed at solving major problems of sustainability and justice (Mossman, 2018).

Research Ethics

Ethics of Collaboration and Community

ES also raises new challenges for rethinking research ethics. One issue is that traditional ethics protocols used by university institutional review boards (IRBs) when deciding whether to approve proposed projects miss many of the most important ethical considerations of engaged partnerships. Ethics protections enforced in the U.S. since the 1970s evaluate whether research designs comply with the Belmont principles, including respect for persons (participation must be voluntary and there must be additional protections for children and others who do not have the ability to make their own choices); beneficence (research designs must maximize benefits and minimize risks to participants); and justice (research must be designed to balance potential risks and benefits to participants).

However, as the section above on university-community collaborations showed, almost all decisions about how to share power over joint research projects are also ethical choices, including ones that many IRBs are not trained to assess. These are foundational decisions about who participates, gets funding, makes decisions, gathers and interprets data, participates in disseminating the results, and owns and controls the work (Flicker et al., 2017). Engaged scholarship demands consideration of these choices as well.

Unlike traditional ethics criteria, ES supplements concern for the rights of individuals with attention to the rights of communities, including rights to participate, share control and ownership, ensure cultural appropriateness, and benefit from research (Banks & Brydon-Miller, 2018). Research ethics trainings can incorporate these rights (see, e.g., Pearson & Sánchez, 2017). Community review boards and ethics boards can assess whether proposals observe these rights. Some native communities have especially well-developed research review boards and IRBs with distinctive criteria rooted in principles of tribal sovereignty (Parker, 2017). Unfortunately, academic IRBs have sometimes blocked collaborative research approved by their tribal counterparts by imposing stricter protections for individual rights of participants (Morello-Frosch, Brown, & Brody, 2017).

ES may need to employ methods that depart from traditional scientific ideals to respect community goals or values. For example, some projects omit control groups because partners consider it unethical to deny community members potentially beneficial interventions (Minkler & Baden, 2008). In other cases, researchers must weigh whether and how to disseminate negative findings about a community that would harm its reputation or alienate it from further cooperation with potentially beneficial interventions. As Minkler and Baden (2008) note:

From a pure science perspective these challenges may be viewed as shortfalls of CBPR. Yet from the vantage point of public health practice, many of these concerns can be recast as ethical issues typically associated with human research. If the goal, for instance, is improving health status and reducing disparities, it is critical to frame the data in a way that avoids just focusing on the negative, so that the community continues to stay involved to address the issues. Here, however, the unit of concern becomes the community, rather than the individual as in clinical research (p. 253).

Peer Researchers and Reporting Data to Participants

Some university IRBs have impeded ES proposals because of reluctance to oversee compliance by partner organizations. These IRBs have been especially concerned that lay members of research teams may not have sufficient training to protect participants' rights, such as confidentiality. In these cases, research may be delayed, community members' may be restricted from gathering or accessing data, or local partners may be forced to pay for independent IRB oversight (Morello-Frosch et al., 2017).

Other ethics disputes with IRBs arise over whether researchers should report individual-level results of exposures to hazardous substances and other health data to study participants when there is scientific uncertainty about their impact (Morello-Frosch et al., 2015; Morello-Frosch et al., 2017). Many environmental justice studies prefer to report back these data out of respect for community members' right to know. At the same time, these individuals' may not be able to reduce their exposures. Despite evidence that the public supports individualized reporting back, many IRBs are hesitant to approve it out of concern that sharing the results of chemical exposures or genetic data can cause participants unnecessary stress, given the uncertainty about their implications for health. In response, advocates of releasing these data note that participants gain important knowledge about environmental health, take precautionary steps, and involve themselves in policy processes to reduce their risks (Morello-Frosch et al., 2017).

ES partners and universities can take several steps to reform research ethics practices (Morello-Frosch et al., 2017). These include:

- Educating IRBs that are unfamiliar with engaged scholarship about its principles, benefits, and distinctive ethical concerns, which include protecting community rights.
- Encouraging IRBs to value statements of “community consent” along with statements of individual consent to participate in research.
- Recruiting and training community members to participate in review boards to evaluate engaged research projects, which can inform IRB decisions.
- Enlisting major funding institutions, especially federal granting agencies, in offering guidance on handling human subjects concerns in engaged scholarship.
- Encouraging IRBs to weigh the quality of training of peer researchers and respect diverse data collection methods, rather than dismissing community participation out-of-hand, and to develop new criteria for reporting back health exposure results to study participants.

Anchor Institutions, Science Shops, and Centers

Over the past four decades, many universities have institutionalized new ties to their surrounding communities. For example, the Carnegie Foundation for the Advancement of Teaching’s Elective Community Engagement Classification, developed in 2005, certifies over 300 universities in the U.S. for implementing a broad range of community-engaged educational and scholarly practices (Carnegie Foundation & Swearer Center, 2018).

Many universities also launched place-based learning centers and anchor programs in their communities to promote civic learning and research across the curriculum, and to build local capacities to improve public schools, healthcare, social services, and economic development (Democracy Collaborative, 2019; Hodges & Dubb, 2012; Netter Center for Community Partnerships, 2008). Some anchors are especially interested in addressing longstanding inequities in their communities (Sladek, 2019). Advocates of ES for EJ can tap into these opportunities for institutional support.

Science shops are an especially relevant type of center for EJ scholars to consider founding at their institutions. Launched in the 1970s by student movements in the Netherlands and Belgium to help civil society organizations tackle local problems, science shops later got a major boost from universities, governments, and scientific organizations across Europe, and spread also to Canada, the U.S., and Israel. Science shops provide support for research that responds directly to community needs, in collaboration with local non-profit organizations, officials, schools, and others (De Filippo et al., 2018; Fontan et al., 2013). Initially, findings were shared openly, rather than locked up as intellectual property, although pressures on universities to marketize and monetize their research threaten these practices (Munck, 2014). Open science labs (also called public or citizen science labs) operated by non-profits using crowdsourced funding models offer an alternative. For example, Counter Culture Labs in Oakland, California attracts amateurs and scientists with doctorates to learn new skills and conduct research together (Stoll, 2017).

One EJ project conducted at a science shop with youth in Tacoma, Washington examined the impact of wood smoke on asthma, using air sampling and photovoice methods (Evans-Agnew & Eberhardt, 2018). Students documented the experience of asthma attacks as part of a campaign to help local residents understand the need to convert from wood stoves to alternative sources of heat and eliminate recreational burning of wood in home fireplaces.

Universities and engaged researchers can consider:

- Applying for the Carnegie Elective Community Engagement Classification.
- Creating or deepening opportunities for engaged scholarship with their surrounding communities and regions through centers for community-based learning and anchor institution programs.
- Founding their own science shops, on campus or in the community, with local partners.
- Integrating an environmental justice focus into these centers and partnerships.

Recruitment, Tenure, and Promotion Policies

At most institutions, standards for faculty promotion and tenure continue to erect barriers to community-engaged scholarship (Welch, 2016, pp. 219-220). A recent study examined how thirty-one colleges and universities in the U.S. express their institutional commitments to community-engaged scholarship in faculty recruitment, reappointment, promotion, and tenure policies (Wagner, 2017). All of the schools in the sample had earned the Elective Community Engagement Classification from the Carnegie Foundation for the Advancement of Teaching. In addition, all of the schools were Catholic institutions with an explicit commitment to advancing social justice.

Despite these Catholic commitments and Carnegie classifications, only a handful of the schools in the study clearly articulated how community-based research and learning should be considered in the hiring and promotion process. Some schools had not yet addressed the value of this kind of scholarship, while most did so ambiguously, especially in regard to faculty teaching and research. As the author noted, “clear and specific policies that define and name what is meant by community engagement signals to faculty not only what is allowed, but what is desirable and encouraged” in their teaching, research, and service (p. 256).

Studies elsewhere in the world confirm that this problem is pervasive, despite widespread endorsement of university-community collaboration (Appel et al., 2017; Kearney, 2015). For example, some schools consider contract research performed by faculty for corporate clients to be community-engaged research (Doberneck & Schweitzer, 2017), while many others would not.

In addition, the more that faculty members can synthesize their teaching, research, and service activities, the more they can build expertise, increase their impact on the university and the world, and align their work with the university’s mission. Proponents of engaged scholarship recognize that these three areas of faculty work are not entirely separate, that each can be strengthened by a continuous dialogue, and that community engagement can help faculty members to discern more coherent vocations. Faculty and academic staff can especially cultivate this holistic approach to sustainability by synthesizing their educational, scholarly, and service efforts through community engagement.

Universities need to review their policies and practices for hiring and promoting all administrative, faculty, and staff positions that contribute to scholarship. This includes the non-tenure track faculty, who teach a large proportion of courses. It includes staff, who administer much of the co-curriculum, including community service and learning activities. All university employees have personal and professional connections to the community, which can help advance engaged learning for sustainability and justice. In reviewing their policies and practices, higher education institutions should ask themselves:

- Are we using common definitions of community-engaged scholarship, sustainability, and social justice in our policies?
- Do our recruitment criteria and practices clearly state the value we place on knowledge of and commitment to engaged scholarship, sustainability, and social justice? Have we trained our hiring committees to assess these qualifications? Do we involve community partners with experience in ES in advising our hiring committees for faculty and staff who specialize in this kind of scholarship?
- Do our standards for faculty and staff evaluation, promotion, and tenure explicitly value engaged scholarship, teaching, and service? Do our standards clearly value sustainability and social justice? Have we trained all evaluators to apply these criteria?
- Do we encourage and reward the integration of community-based scholarship, teaching, and service?

A thorough examination of these questions would benefit from:

- Consideration of major models of engaged scholarship, especially social justice and university social responsibility approaches (Appe, et al., 2017).
- Reviewing policies and practices developed at other institutions for evaluating engaged teaching, scholarship, and service (Campus Compact, 2018; Engagement Scholarship Consortium, 2018; Jordan, 2007; Seifer, 2008).

Scholarly Communication

Many faculty members are concerned that devoting the considerable time required to make and maintain collaborative relationships with community partners runs counter to some institutions' demand for increasing numbers of academic publications in the name of "scholarly productivity." In addition, restrictive standards that put heavy emphasis on journal articles and books from university presses lead faculty members to devote most of their energy to publishing in formats that fail to communicate scholarship to partners and decision makers outside the academy. Too often, we reduce the impact of scholarship to the number of citations in prestigious journals, failing to include benefits to communities. As a result, we can lose focus on the vital questions of *whose* knowledge we are contributing to, and to *what ends*?

Universities can review their hiring, tenure and promotion policies to ensure that they:

- Value a broader range of audiences, formats, and impacts of scholarly expression, including publications that directly address and benefit community members, professionals and advocates, and policy makers.

- Encourage and reward faculty for work that translates academic research into usable information for the public, implements research in the community, helps communities to express themselves, and invents practical tools and processes that enhance sustainability and social justice.
- Value the scholarship of teaching and learning in all fields, which diffuses innovative and successful curricula, pedagogies, and projects, pursuing the most basic educational purposes of universities.

Training and Funding

Universities are only beginning to provide training for community partners who want to participate in engaged scholarship. Community organizations need help identifying potential partners within universities, understanding protections for human subjects and the requirements of funders and sponsored projects offices, and advocating productively for their needs while collaborating with academic partners (Welch, 2016).

Faculty partners also need professional development to build community partnerships. In addition to practical knowledge of engaged research methods, faculty members need essential skills such as relationship-building, communication and listening, respect and empathy for diverse cultures, flexibility and adaptability, and the ability to collaborate across disciplines (Campus Community Partnerships for Health, 2018). These are skills that will also help the faculty to be better contributors to university life.

Few potential donors are aware of the existence and value of community-engaged scholarship. Sponsored projects offices and faculty may not be aware of public funding agencies and private foundations that support this kind of scholarship.

Universities can:

- Ensure that institutional review boards, sponsored projects offices, and faculty and staff experienced in engaged scholarship are resourced to offer training and advice to faculty and community partners.
- Prepare our development staff to educate alumni and other donors about the value of engaged scholarship for sustainability by students and faculty, and especially for the need to fund community-university collaborations.
- Provide long-term funding endowments to campus centers that can spread and sustain a vibrant community of scholars who do engaged research.

IV. RESOURCES AND REFERENCES

RESOURCES

Environmental Justice

History

[Timeline of Milestones in U.S. Environmental Justice Movement](#)

Statements of EJ Principles

[SouthWest Organizing Project's Letter to Big Ten Environmental Groups \(1990\)](#)

[Principles of Environmental Justice \(1991\)](#)

[Jemez Principles for Democratic Organizing \(1996\)](#)

[Principles of Working Together \(2002\)](#)

[Principles for Alliance with Green Groups \(2002\)](#)

[Principles of the Youth Environmental Justice Movement \(2002\)](#)

[Youth-to-Youth and Youth-to-Adult Principles of Collaboration \(2002\)](#)

[Bali Principles of Climate Justice \(2002\)](#)

[Principles of Climate Justice \(2009\)](#)

[Universal Declaration of the Rights of Mother Earth \(2010\)](#)

U.S. Government EJ Policies

[Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations \(1994\)](#)

[Plan EJ 2014](#)

Recent Overviews of EJ Research

Holifield, R., Chakraborty, J., & Walker, G. (Eds.), *The Routledge handbook of environmental justice*. Abingdon & New York: Routledge.

Konisky, D. M. (Ed.). (2015). *Failed promises: Evaluating the federal government's response to environmental justice*. Cambridge, MA: MIT Press.

Shelton, D. L. (2011). *Human rights and the environment* (Vol. 1 & 2). Cheltenham, UK & Northampton, MA: Edward Elgar Publishing.

Wells, C. W. (Ed.) (2018). *Environmental justice in postwar America: A documentary reader*. Seattle: University of Washington Press.

Catholic and Jesuit approaches to EJ

Laudato Si'

Francis, P. (2015). [Encyclical letter laudato si' of the Holy Father Francis: On care for our common home](#). Vatican City: Vatican.

North American

Association of Jesuit Colleges and Universities - [Integral Ecology Affinity Group](#)

Loyola University Chicago - [Institute for Environmental Sustainability](#) and [International Jesuit Ecology Project](#) (*Healing Earth* online textbook)

Santa Clara University – [Environmental Justice Collaborative](#), [Center for Sustainability](#), [Thriving Neighbors Initiative](#), and [Miller Center for Social Entrepreneurship](#)

Seattle University - [Center for Environmental Justice and Sustainability](#)

Global

[EcoJesuit](#) – Ecology and Jesuits in Education

[Environmental Science for Social Change](#) (ESSC)

Ignatian Solidarity Network – [Jesuit Institutions' Responses to Laudato Si'](#)

[Jesuit European Social Centre](#) (JESC)

[Jesuit Conference Asia Pacific Reconciliation with Creation](#)

[Jesuit Worldwide Learning: Higher Education at Margins](#) (formerly Jesuit Commons)

EJ Archives, Tools, and Databases

[Environmental Justice Atlas](#)

Database of social science case studies of environmental justice conflicts around the world for teaching, networking, and advocacy. Academics and activists collaborate to write the case studies. Created by Institute of Environmental Science and Technology (ICTA) at the Universitat Autònoma de Barcelona.

[EnviroAtlas](#)

Created by U.S. Environmental Protection Agency to map and provide data about the benefits people receive from nature or ecosystem services.

[EJSCREEN: Environmental Justice Screening and Mapping Tool](#)

Created by U.S. Environmental Protection Agency, allows users to map environmental, health, and demographic disparities across the U.S.

[Community-Focused Exposure and Risk Screening Tool \(C-FERST\)](#)

Created by the U.S. Environmental Protection Agency, this online tool includes local maps, reports, fact sheets, links to other environmental and public health tools, information about other community projects, and guides to help communities plan projects to assess their environmental conditions. Users can upload citizen science data from other resources to supplement the existing map layers.

[Toxics Release Inventory Data and Tools](#)

U.S. EPA data on the volume of toxic chemicals managed or released into the environment annually. The [TRI University Challenge](#) includes projects designed by researchers to “increase awareness of the TRI Program and data within academic communities; expose students to TRI data, tools, and analysis; and generate innovative programs, activities, recommendations, or research that improve the accessibility, awareness, and use of TRI data.”

[CalEnviroScreen: California Communities Environmental Health Screening Tool](#)

The California Environmental Protection Agency’s tool for mapping environmental, health, and demographic data to identify the communities across the state that are most burdened by the cumulative impacts of pollution and most vulnerable to its effects.

[HealthyPeople.gov](#)

Database of health disparities created by the U.S. Office of Disease Prevention and Health Promotion.

[CES4Health.info](#)

Peer-reviewed archive of products of community-based participatory action research, including articles, videos, curricula, etc., created by Community-Campus Partnerships for Health.

[Public Lab](#)

Provides tools, support, and an archive of citizen science projects on community-based environmental monitoring and assessment.

Engaged Scholarship

Methods and Tools

[Action Catalogue](#)

Helps researchers identify the most appropriate CBPR method for their projects.

[Campus-Community Partnerships for Health](#)

Dedicated to the promotion of health equity and justice, the CCPH provides online resources about all aspects of community-based participatory research, including a [curriculum](#) on how to conduct CBPR for academics and community members.

[The Community Tool Box](#)

Hosted by Kansas State University, provides training modules and document templates for many tasks associated with CBPR, from creating community partnerships to evaluation research.

[Research University Engaged Scholarship Toolkit](#)

Developed by Campus Compact, the toolkit conceptualizes engaged scholarship, explains its benefits, presents exemplary projects, offers guidance on how faculty and universities can document and value engaged scholarship in the tenure and promotion process, and lists additional resources on how to form partnerships and conduct engaged research at public and private institutions in the U.S. and globally.

Academic and Professional Associations

[Anchor Institutions Task Force](#)

AITF is a leadership network that supports the advancement of mutually beneficial university-community partnerships.

[Campus Compact](#)

Campus Compact provides many resources for improving higher education's ability to fulfill its public purposes and improve community life.

[Engagement Scholarship Consortium](#)

The ESC advances engaged scholarship through conferences, workshops, publications, and its web site, which offers a list of publications and resources on promising practices.

[North American Association for Environmental Education](#)

The NAAEE promotes environmental education from kindergarten through higher education, including community-engaged learning.

[UNESCO Chair in Community Based Research and Social Responsibility in Higher Education](#)

Based at the University of Victoria and the Society for Participatory Research in Asia, the Chair supports North-South and South-South partnerships among universities, communities, and governments.

Resources for Publishing

Publishing Advice

Campus Compact provides a list of [references](#) on how to publish engaged scholarship and a [Journal Section Comparison Table](#), comparing the kinds of articles published in 22 interdisciplinary ES journals.

For lists of journals that publish ES, see:

- [Campus Compact](#)
- [Engagement Scholarship Consortium](#)
- [Journal of Community Engagement and Scholarship](#)

Book Publishers

- [Michigan State University Press—Transformations in Higher Education: Scholarship of Engagement](#)
- [Stylus Publishing](#)

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