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Michele Morrone [a] & Tania B. Basta [a]
[a] Department of Social and Public Health , Ohio University , W339 Grover Center, Athens , OH , 45701 , USA
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Public opinion, local pollution havens, and environmental justice: a case study of a community visioning project in Appalachian Ohio

Michele Morrone* and Tania B. Basta

Department of Social and Public Health, Ohio University, W339 Grover Center, Athens, OH 45701, USA

The pollution havens hypothesis argues that developed countries will locate polluting industries in developing countries to avoid costs associated with environmental regulations. This study explores the role of community visioning and public opinion in creating a possible pollution haven in a rural area in Appalachian Ohio. Data from a community-based participatory process that included focus groups, key informants interviews, a regional public opinion survey, and an online voting activity are examined in the context of public acceptability of long-term environmental consequences for short term economic gain. The outcome of the multi-faceted community visioning process indicates that the approach to engaging citizens affects opinions about the future use of a federal uranium enrichment site in southeast Ohio. In addition, local pollution havens are likely to continue to emerge as long as the economy remains weak, and communities are willing to house facilities because they promise jobs even if they will create disparate environmental impacts.

Keywords: community visioning; environmental justice; nuclear power

Introduction

For more than 30 years, the Gallup organization has polled Americans about their beliefs related to tradeoffs between the economy and the environment. The survey asks respondents to state whether the environment should be protected at the expense of economic development or vice versa. Until 2008, the Gallup Poll indicated that Americans prioritized environmental protection over economic growth. Priorities appear to have changed in 2009 as more Americans now believe that economic growth should be the priority, even if "the environment suffers" (Jacobe, 2012). While, the Gallup Poll is a snapshot of public opinion at one point in time and artificially dichotomizes the complicated relationship between the environment and the economy, it does provide an indicator of attitudes about this relationship.

Evidence of the current state of public perception related to environmental protection and economic growth is found in the plans to move Canadian oil across the USA and in the rush to extract natural gas from underground. While it may appear that overall economic development is motivating activities that could have long-term negative environmental consequences, politicians from local mayors to world leaders tend to focus on the job-creating potential of their decisions. This struggle between creating jobs and protecting the environment is especially pertinent to local areas with high unemployment rates

*Corresponding author. Email: morrone@ohio.edu
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and could mean the emergence of communities as homes to activities that lead to immediate, temporary jobs at the expense of potential future environmental impacts. In short, some communities may become what have been referred to as "pollution havens."

While much of the pollution havens research has focused on trade between developed and developing countries, the emergent concept of a local pollution haven and its possible environmental consequences is explored in this paper. In particular, the relationship between pollution havens and environmental justice is still ripe for research and this could be due to the fact that pollution havens research has largely been conducted in the field of economics, while environmental justice occupies researchers in the social sciences.

From early 2010 through 2011, a public outreach project, known as "PORTSfuture," was implemented in a rural area in Southeast Ohio. The project was designed as a community-based participatory approach to engaging stakeholders in four counties most directly affected by activities at a Department of Energy (DOE) uranium enrichment facility. The overall purpose of the project was to quantify public perception and document a community vision for the future use of the 3700 acres that comprise the federally-owned land. The community visioning approach was multi-faceted and included key informant interviews, focus groups, public outreach at special events, a telephone survey, and an on-line voting tool.

There were numerous research questions that this project sought to answer and two of them will be explored here. The first question concerns the practice of community visioning and explores the impact of multiple approaches to community visioning on public opinion. That is, will different preferences for the future use of the site emerge from approaches that are deliberative such as small group meetings vs. those that are polling-based such as a telephone survey?

The second research question is more theoretical and has to do with the public acceptability of facility siting. Specifically, under what conditions are communities willing to accept a facility that could lead to adverse local environmental consequences? One of these consequences could be an enhanced pollution burden, or the creation of a local pollution haven. Another consequence could be the exacerbation of disproportionate exposures to harmful environmental conditions that might arise from additional pollution in the region.

The pollution havens hypothesis: from global to local

The pollution havens hypothesis (PHH) arose from the work of Copeland and Taylor (1994), who developed an economic model to examine the relationships between income levels, international trade, environmental policy, and pollution levels. In applying their model, to estimate the impact of free trade between rich countries and poor countries, they conclude that without free trade "the relative price of pollution-intensive goods is higher in relatively high-income countries" (p. 782). Without trade barriers, this price differential could contribute to richer countries seeking to lower their bottom line by moving industry to countries where the impact of environmental policy is minimized. The result is that both countries will reap economic benefits, but only the rich country will see environmental benefits in the face of growing incomes levels.

The PHH argues that as rich countries move manufacturing facilities to the developing countries, they create areas that harbor pollution (Brunnermeier & Levinson, 2004). The PHH is also known as the "race to the bottom" approach and has been mainly examined in the context of international trade and is grounded on the belief that a major

impetus for locating polluting industries in developing countries has to do with the lack of environmental regulations (MacDermott, 2009). To put this in a different perspective, the PHH suggests that businesses in developed countries with strong environmental regulations, will seek to maximize profits by eliminating environmental compliance from their bottom line (Madsen, 2009).

Pollution havens research in the realm of international economics uses models to examine relationships between Foreign Direct Investment (FDI) and environmental regulations (Dean, Lovely, & Wang, 2004; Eskeland & Harrison, 2003; Smarzynska & Wei, 2001). FDI occurs when a corporation in one country opens a new facility or business in another country; it is more than just investing money in a new endeavor because it involves ownership and control, rather than just financial interest (Moosa, 2002). The World Health Organization (WHO, n.d.) explains that FDI has contributed to the economies of some developing countries, however not all of the impacts have been positive and may include substandard working conditions, health risks, and environmental degradation.

While FDI is a relatively straightforward economic indicator, some studies have used FDI and found evidence to support the PHH (Spatareanu, 2007), but others have not (Cole, 2004; Kearsley & Riddel, 2010); one study suggests that when environmental impacts are transboundary a "race to the top" can actually occur (Dong, Gong, & Zhao, 2012). The challenge in much of the research related to business investment and pollution levels has been in identifying if there are policy reasons, such as weak environmental regulations, that encourage a rich country to locate a pollution-intensive facility in a poor country. Quantifying the impact of differences in environmental regulations has been challenging for those who study the PHH. There are complexities involved in identifying a variable that is able to compare environmental regulations and enforcement across countries that limits the findings of PHH research (Dong et al., 2012).

Additional research is emerging related to expanding the factors that might contribute to pollution havens to include societal characteristics rather than just economics or environmental policy (Clapp, 2002). Strohm (2002) explores whether the "dynamic transfer of environmental risk is guided by democratic choice and market signals, or by coercion, corruption and constraint" (p. 30). She calls for more discussion about the role of the democratic process in facility siting decisions that could lead to pollution havens. Citizen engagement includes a "lack of conscious defense" (p. 31) by those who might be the most affected by decisions to locate a facility in their communities, even when these decisions could result in environmental injustice. The economic models that either support or refute the PHH do not take environmental justice into consideration because this is a value without a dollar amount. According to Strohm, researchers should "measure democratic participation in decision-making" (p. 35) and should not "confuse unethical transfers of environmental risk for democratic choice or market signals" (p. 36).

In contrast to the "lack of conscious defense" suggested by Strohm (2002), Hall (2002) examines the role of environmental protest in facility siting decisions and argues that there is some evidence that industries may avoid an area if it is ripe for environmental protest. This avoidance can then create pollution havens in areas that do not have similar protest potential. He highlights the importance of examining the politics involved in siting decisions rather than just the economics of such decisions.

Matthews (2010) suggests that pollution havens could be within countries not just between countries. He compares counties in the USA on the basis of six indicators that

he posits identify pollution havens. According to Matthews (2010), in order for a county to be a pollution haven it must exhibit high levels of pollution and low levels of economic rewards related to this pollution. He presents indicators of a local pollution haven as the ratios between toxic releases and the numbers of manufacturing jobs and the amount of manufacturing wage. By using such ratios, counties that have high levels of pollution and high economic rewards from manufacturing would not be considered a local pollution haven, as such, when the county benefits economically from the pollution, the existence of social injustice is in question.

In addition to the "pollution-per-economic reward" indicator, Matthews (2010) includes measures of governmental control in defining a local pollution haven. For these indicators, he uses the number of enforcement actions from the Environmental Protection Agency (EPA) as well as categories of the strength of state enforcement. Matthews applies his model to 3111 counties in the USA, and identifies 140 that meet his definition of local pollution havens because of their high levels of pollution, low economic reward, and weak environmental regulations. Most of the counties that he identifies as local pollution havens are located in the southern USA, specifically Alabama, Tennessee, and Mississippi.

The pollution havens hypothesis and environmental justice

Regardless of the causes of pollution havens, the consequences include localized environmental and health disparities that suggest a connection between pollution havens and environmental justice. Environmental and health disparities that result from disproportionate exposures to pollution are global as well as local. At the global level, environmental conditions in developing countries include lack of access to basic sanitation which leads diarrhea to be a leading cause of death. In developed countries, poor people are more likely to live in areas with high levels of air pollution which leads to adverse health outcomes related to respiratory diseases such as asthma (Delfino et al., 2009; Maantay, 2007; Neidell, 2004).

In the realm of public health, vulnerability means the "degree to which individuals and systems are susceptible or unable to cope with adverse effects" (Kovats, Ebi, & Menne, 2003). It is a function of sensitivity, exposure, and adaptation capacity. In terms of sensitivity, regardless of whether it is a developed or developing country, people living in poverty may be more sensitive to environmental conditions because of their overall health status. Combine this sensitivity with environmental exposures and the inability of poor people to access health care or make a major lifestyle changes, and it is clear that vulnerability to health outcomes associated with environmental conditions is a factor in overall health status. In this context, there is a cycle that includes the relationship among poor people, poor environments, and poor health and this relationship is at the heart of environmental justice research.

Environmental justice is similar to the PHH, because it focuses on disproportionate exposures to pollution as related to sociodemographic characteristics. Decades of environmental justice research indicate that race and socioeconomic status are correlated with adverse environmental conditions (Bhat, 2005; Bryant & Mohai, 1994; Bullard, 1994; Elliot, Wang, Lowe, & Kleindorfer, 2011; Perkins, King, & Varner, 2012). The first study that linked the location of hazardous facilities with race emerged in the late 1980s (United Church of Christ, 1987) and led to a Presidential Executive Order (White House, 1994) requiring federal agencies to consider demographics when making decisions or setting policy that could affect the environmental quality. The executive order

drew attention to possible disparate impacts of federal environmental decisions and suggests that there was potential for local pollution havens in the USA.

Research related to the PHH and environmental justice, both address the geography of polluting facilities and understanding why there are differences based on sociodemographic characteristics. In the case of pollution havens research, attention is paid to the economic forces that are related to facility siting. On the other hand, environmental justice research emphasizes the role of citizen empowerment. While Matthews (2010) has taken the concept of pollution havens debate from global to local, one thing missing from his examination of pollution havens and environmental justice is the impact of public perception and support. Public support for facilities that might cause long-term environmental consequences raises the question of whether an area should be identified as a local pollution haven or a case of environmental injustice when community residents welcome environmental risks because of the perceived immediate benefits that could result.

Case study: public opinion and facility siting

Pike County, which is in the heart of Appalachian Ohio, offers a compelling practical application for exploring the role of public opinion in facility siting in the context of pollution havens and environmental justice research. According to the Ohio Department of Job and Family Services (2012), the county has the dubious distinction of posting the highest unemployment rates in the state. Once a hub of patriotic activity related to national defense, Pike County is now experiencing plant closings, family exodus, and economic despair. Table 1 depicts sociodemographic characteristics from the four counties in the study area and shows that Pike County has the lowest number of manufacturing jobs combined with the highest poverty and unemployment rates in the region. In addition, the four counties have higher unemployment rates and poverty rates than the state and lower median household incomes.

During the 1950s, a culture of patriotism emerged in Pike County when the USA Department of Defense identified three sites to enrich uranium for use in nuclear weapons; weapons that were needed in response to the Cold War and to maintain the global status of the country (US Department of Energy, n.d.). Two of these sites were located in the region of the USA now known as Appalachia, one in Tennessee and one in Pike County, Ohio. The other site in Paducah, Kentucky, is not part of the officially designated Appalachian region, even though much of Kentucky is (Appalachian Regional Commission, n.d.).

Table 1. Select sociodemographic characteristics of four-county region.

County	Population (2010)[a]	Unemployment rate (2012%)[b]	Manufacturing jobs[c]	% below poverty[c]	Median household income ($)[d]
Jackson	33,225	8.0	2756	20.5	34,279
Pike	28,709	11.9	1442	23.4	40,363
Ross	78,064	7.3	5068	16.0	43,187
Scioto	79,499	9.8	3188	22.1	34,124
State	162,694,945	6.5	774,572	13.6	45,052

[a]2010 Decennial Census, US Census Bureau.
[b]Ohio Department of Job and Family Services.
[c]2006–2010, American Community Survey 5-Year Estimates, US Census Bureau.
[d]2010, Economic Research Service, US Department of Agriculture.

The facility built in Pike County is known as the Portsmouth Gaseous Diffusion Plant, or PORTS, and construction brought jobs to more than 22,000 people (McCaffree, 1957). To put this employment impact into perspective, in 1950 when construction was commencing, the total population of Pike County was 14,607, so the construction phase had a significant impact not only in Pike County but in the surrounding region as well. The construction and operation of PORTS was a major source of employment for residents of counties surrounding the location of the site and powered the economic engine in this rural area for many years.

While PORTS was operating in the 1950s through the 1970s, it provided employment for thousands of people in the region. This employment bubble burst in the 1980s as demand for enriched uranium decreased, even though by that time PORTS was supplying fuel for nuclear power plants rather than national defense. The customer base for enriched uranium was "deserting it" leaving DOE's uranium enrichment plans on the "brink of disaster" (Norman, 1984). In 2001, uranium enrichment at the facility ceased, and by 2005 activities at PORTS shifted to cleanup.

Evidence of the impact of the cessation of uranium enrichment can be seen in the decline of private, nonfarm employment in Pike County of 37.6% between 2000 and 2009, during this time period the state of Ohio only experienced at 10.8% decline. Not only did the plant provide direct employment, it also supported the local economy including its service and retail components. Currently the site employs about 2000 people through various contracts, and much of this employment does not promise to be long-term, since it is funded largely through government sources, including the American Reinvestment and Recovery Act and grants and contracts from the USA DOE.

Eventually the site will be cleaned up according to an agreement between the DOE and the Ohio EPA, and this will create a large area of land that is equipped with infrastructure for redevelopment. As part of determining what the future holds for the site, DOE sought to involve the public in the decision-making process. Under Public Law 92 463, also known as the Federal Advisory Committee Act (FACA) (US General Services Administration, n.d.) first passed in 1972 and amended several times since then, DOE was authorized to create advisory boards to assist with public participation activities. Currently PORTS has a Site Specific Advisory Board (SSAB) which operates under FACA and to enhance the capacity of the PORTS SSAB, DOE supported the community engagement research presented here through a grant.

Methods

Community visioning in rural areas gained strength in the 1990s, largely supported by the USA Department of Agriculture in response to economic conditions related to agriculture and manufacturing (Walzer & Deller, 1996). Community visioning was seen as a way to address "unique and complex problems" in rural areas and a tool for local leaders to use to "revive their local economies or direct growth and change in ways as envisioned by residents" (p. 9). Visioning projects have taken place in New Hampshire (French & Gagne, 2010), Ohio (Moss & Grunkemeyer, 2010), Montana (Lachapelle, Emery, & Hays, 2010), and Massachusetts (Mandell, 2010). While the approaches and outcomes of these efforts vary, the visioning process itself is valuable and can provide useful information about a shared future for the community (Lachapelle et al., 2010). The community engagement process, known as "PORTSfuture," employed in this research was designed to include multiple approaches with the common goal of creating a vision for the future of the PORTS site. The project also created a research

opportunity to explore outcomes related to different visioning methods including those that are deliberative versus those that are participatory only.

Prior to beginning the visioning process, a media content analysis of local newspapers was completed to identify key informants (Morrone, Basta, & Somerville, 2012) and purposeful sampling (Patton, 2002) was conducted to recruit others. Key informants are those people who have extensive knowledge or experience about the issue in question and can offer valuable context for understanding the major issues in the community (Chazdon & Lott, 2010). Eight interviews were conducted in June and July 2010 with individuals from a variety of backgrounds, including: current and former plant employees, local elected officials, local environmental activists, and economic and community development organizations.

Semi-structured interview guides were developed to explore the following issues: connection to the plant, current involvement with the plant, community perceptions of the plant, credible sources of information about the plant, communication channels used to access information, and current community priorities. The semi-structured guide standardized the questions for all participants, but also allowed the researchers the freedom to probe further when more clarification was needed (Patton, 2002). All interviews were conducted face-to-face, lasted between 30 and 60 minutes, and were audio-recorded following consent from the participants. The audio tapes were transcribed for further analysis and only the researchers have access to identifiers for each of the interviews.

The next step in the visioning process was a series of deliberative focus groups for the purpose of clarifying themes identified during the key informant interviews. Focus group participants were recruited from fairs in all four counties in July and August 2010. A traveling exhibit was staffed at each county fair by at least one research team member during the evening hours. If an individual was interested in being a part of a focus group, he/she provided contact information on a postcard and was contacted when dates and times of the three planned sessions were established. To enhance recruitment efforts, an advertisement about the focus groups was placed in the local newspapers.

Twenty-six individuals participated in three focus groups. As with the key informants interviews, semi-structured focus group discussion guides facilitated discussion about the following topics: community priorities, personal understanding/connection to the plant, and communication and information received about the plant. Focus groups were held at local restaurants and three members of the research team were present, including a moderator and two note takers. All focus group discussions were audio recorded with the consent of the participants. Each focus group lasted 60 minutes and participants were provided with food and a gift card for their participation. The focus group data helped inform the development of a telephone survey that would help "frame" visioning discussions (Solop, 2001).

The goal of the telephone survey was to obtain a representative sample of 1000 residents in the four counties surrounding PORTS. As such, the sample was stratified using gender and age quotas from the USA census in attempt to represent demographic characteristics of four counties. Random digit dialing using listed land lines in the geographic area generated the sample and the survey data was collected using computer assisted telephone interviewing. Questions for the survey were developed from key informant interviews, focus groups, and historical records of the site.

The survey data, as well as the qualitative data from interviews and focus groups, provided some baseline public opinion data for small groups of stakeholders to use in further deliberations about future use scenarios. The deliberative portion of the visioning process began with two large community meetings, followed by smaller meetings in

each of the four counties. More than 100 people attended two kickoff meetings in March 2011 which were structured and facilitated in order to ensure maximum input in the limited time available. Perhaps the most important outcome of the kickoff meetings was the discussion about a vision for the future of the region and the site's role in this vision. The kickoff meetings also provided additional qualitative data about community values and concerns. Most notably, in response to the question about the role that PORTS plays in the future of the community, the dominant themes that emerged during the large visioning meetings included jobs, economic growth, industrial reuse, and education.

Following the large community kickoff meetings, smaller groups of volunteers from the four counties met to draft alternatives for the future of the site. These county visioning teams were provided with all of the qualitative and quantitative data previously gathered in the interviews, focus groups, kickoff meetings, telephone survey, and county fairs. In addition, current and historical data related to environmental conditions at the site were compiled for the teams to use in their deliberations. More than 70 possible future use scenarios emerged from the county visioning team meetings and were passed on to one advisory group with representatives from each of the four counties. The entire visioning process took several months, and when it was completed nine possible future use scenarios emerged. The nine scenarios included several multi-use alternatives that focused on energy production including alternative energy, and only one of the scenarios was identified as a single use nuclear power plant.

For each scenario, the advisory group developed specific descriptions and rationale for why the scenario could work at the site. The rationale included the use of existing infrastructure, the educational co-benefits of the scenario, and the potential for future growth related to the scenario. In addition, the advisory group qualitatively rated the nine scenarios using factors such as environmental conditions, overall feasibility, job potential, and public health/environmental impact. The ratings were combined to produce a ranked list of scenarios from the most preferred to the least preferred by the advisory group and is as follows: (1) Industrial Park; (2) Green Energy Production; (3) Multi-Use Southern Ohio Education Center; (4) National Research and Development; (5) Training and Education; (6) Greenbelt; (7) Warehousing and Transportation Hub; (8) Nuclear Power Plant; and (9) Metals Recovery.

The scenarios were summarized as a series of fact sheets which included a pictorial representation, a text description, and estimates of the potential economic impact of each. The economic estimates were based on models and included the future employment impact of each scenario and the potential for each scenario to contribute to the local economy. The graphics and fact sheets were used in a public outreach exercise that involved inviting people to vote on the scenarios by choosing up to three that they prefer for the site. An extensive campaign took place to encourage community members to vote. This campaign included newspaper advertisements, postings in bulletins and newsletters, direct email contact, speaking engagements, attendance at all county fairs, and even a billboard with the web address for voting. Anyone could vote either in-person ballots and through and on-line balloting process.

Findings

Limited demographic data were collected from the interview and focus group participants as to not inhibit their willingness to share information. All of the interview participants and the focus group participants were white, and the majority was

male. Most of the participants had lived in Southern Ohio all of their lives; however, the length of residency ranged from 3–61 years. One of the most important outcomes of the key informant interviews was a more thorough understanding of the technical, societal, and political issues surrounding the plant. Most of the interviewees have been involved or associated with the plant for many years and shared numerous concerns related to the economic and environmental conditions connected to PORTS. Every key informant noted that jobs are the biggest concern in the region. On the other hand, key informants had differing viewpoints about public awareness and support of the plant.

The telephone survey further assessed the major problems facing the local community, awareness of and information about the plant, and preferences for the future use of the site. A total of 1000 responses were collected from residents aged 18 and older–a response rate of 37.9%. Seventy-five percent of the survey respondents ($n = 747$) indicated familiarity with the PORTS site, of which 38.2% felt they knew a lot about the site. Survey results further emphasized the importance of the economy in general and jobs in specific. When it comes to concerns about their community, the overwhelming concern raised by survey respondents and participants in the kickoff meetings is jobs and the economy (Figure 1).

Another purpose of the telephone survey was to get a sense of public acceptability of possible future scenarios for the site. More than 75% of the respondents during the telephone poll indicated that PORTS is very important to the future of their community and 68% of individuals familiar with the PORTS site favored using the site for an energy production plant, while 18.2% favored using the site for a manufacturing plant. As such, survey respondents were asked to rank four possible future uses of the site as

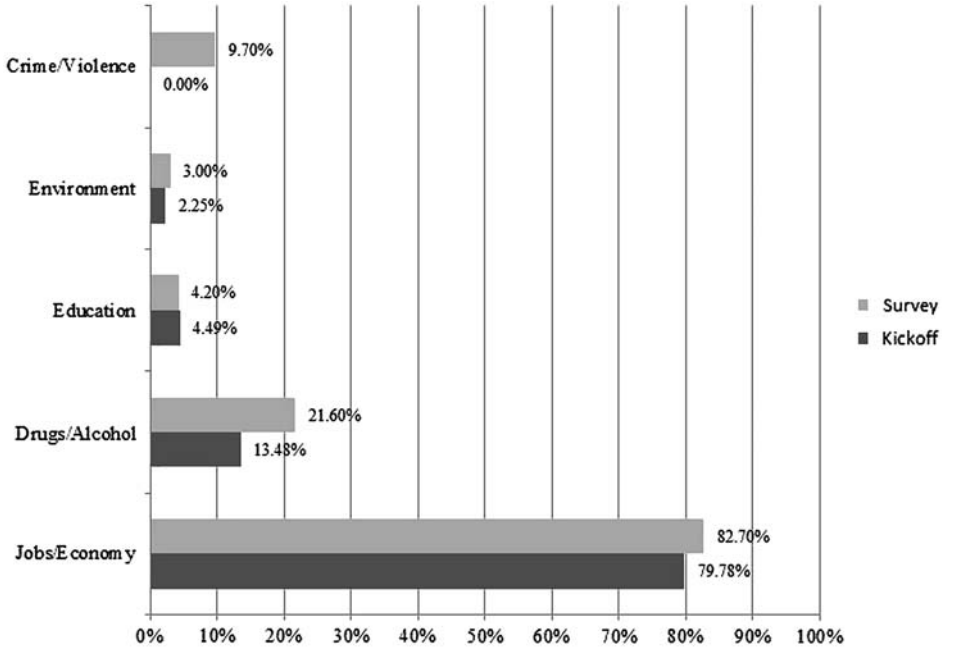

Figure 1. Comparison of opinions about most important issue between kickoff participants ($n = 102$) and survey respondents ($n = 747$).

the most favorable and the least favorable. Figure 2 summarizes the community preferences for possible future uses of the PORTS site. It is clear from the telephone survey that there is broad support for some sort of energy production facility in the community. On the other hand, there is little support for developing recreational activities on the site.

Data from the survey served as baseline information for those involved in the deliberative visioning process and the creation of the nine scenarios that were presented for public voting. As noted above, the community visioning process involved compiling public perception in multiple forums with the goal of crafting a finite number of alternative future uses for PORTS. Ultimately, nine scenarios were put forward by the advisory group for public vote. The results of public voting are summarized in Figure 3. A total of 1141 people voted on their preferences for the nine scenarios. Approximately 37% (422) of the votes took place in person by paper ballot, and 63% (719) people voted online. The scenario that emerged as the most preferred among those who voted is the single use nuclear power plant scenario.

The results of the community visioning process were compiled in a 500 page report and submitted to the DOE for their consideration. DOE will determine how to use the data in determining future uses for the site. Although some of the data are based on deliberative methods and others are only voting or survey research, DOE will ultimately decide if one method is more valid than others.

Discussion

This case demonstrates how a broad visioning process could document community preferences for the future of a large federal facility in a rural area. In addition, the results of the visioning process ultimately suggest a role that public opinion may have in creating environmental conditions that could disproportionately impact the local community. Multiple techniques were used; some of the techniques were deliberative such as focus groups and visioning teams, while other approaches focused solely on gathering public opinion through the use of surveys. Regardless of the method used, a common theme emerged with the importance of jobs and the economy being the chief concern.

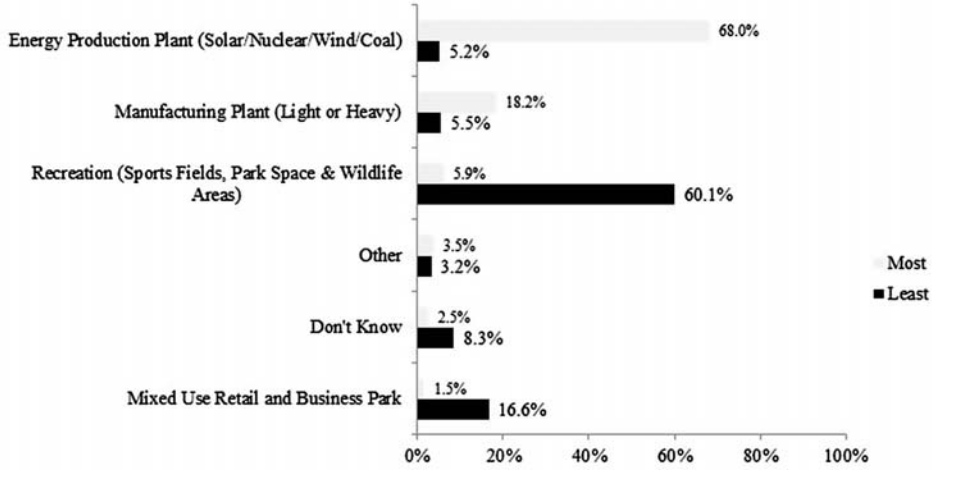

Figure 2. Most and least preferred future use of site ($n = 747$).

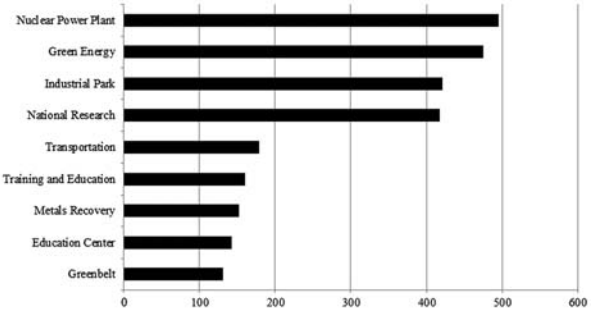

Figure 3. Number of public votes for each scenario ($n = 1141$).

In this case, the results of the public voting depict that those who are likely to be most affected by siting decisions, are open, and even supportive, of building a nuclear power plant in the region. This result is especially compelling, considering that during the course of this project, the Fukushima nuclear power plant in Japan was the subject of conversations related to the viability and safety of these plants. To further confound the support for nuclear power in the community, the economic estimates available to the public when voting on scenario options did not identify the nuclear power plant scenario as having the most positive economic impact on the region. In addition, past research suggests that large nuclear facilities can stigmatize local economic development efforts and create conditions in which local officials relinquish some control of economic growth (Greenberg, 2009).

Previous research related to environmental decision-making regarding nuclear power indicates that perceptions of risks and benefits, as well as procedural fairness, may be more important that overall perceptions of nuclear power. In examining a request to expand a nuclear power plant in South Carolina, Besley (2010) concluded that those most affected by the potential expansion were more likely to support it if they believed they would personally benefit from the expansion. The other important factor in their support of the expansion was whether the public believed that the means for citizen engagement was fair. The community visioning process used in this project may have led to a positive perception of citizen engagement, contributing to support for a facility that might result in disproportionate impacts to the local environment.

It is important to note that the advisory group, which was the most important deliberative component of the visioning process, ranked the nuclear power plant alternative eighth out of the nine scenarios. The difference in the nuclear power plant ranking between the advisory group and the public opinion polling could be explained by research which suggests that the level of citizen engagement affects knowledge exchange (Phillipson, Lowe, Proctor, & Ruto, 2012). In this case, those who participated in the advisory group were not only more knowledgeable about the PORTS site, sharing information through group discussion was likely a factor in their acceptability of a nuclear power plant. These differences identify additional research questions about community visioning, such as how to reconcile deliberative approaches that include facilitated discussion and focus groups with the broader public outreach that includes public opinion polling.

The preference for a single use nuclear power plant is additionally perplexing, considering the fact that it is likely to take many years for a nuclear power plant to

receive a license to be built, and the application for the license will not be without controversy. So the belief that a nuclear power plant will create an immediate short term economic boost to the community is likely misguided since construction cannot begin until the design phase is completed including safety, environmental, and antitrust reviews by the Nuclear Regulatory Commission. The entire licensing process is conducted in public and there will be opportunities for public input and, in this case, the input for a Pike County plant will likely include those from outside the region. Furthermore, no new nuclear power plants have been constructed in the USA since 1977, and one implication of this time lapse on future construction proposals could be enhanced scrutiny.

There is still debate about what contributes to pollution havens and whether they even exist, but this debate is mostly occurring at the global level. There is a evidence that there are some areas that are more prone to pollution than others regardless of how this disparity was created. While this debate has been occupying the global landscape, it is important to examine environmental exposure disparities within countries. This is the essence of environmental justice research and to date there are still a wealth of unanswered questions in this realm.

The most important question has to do with the causes of injustice, and whether disproportionate environmental exposures are intentional or an artifact of poor planning and lack of public involvement. Identifying cause and effect relationships is an area that will continue to occupy researchers as long as environmental injustice exists. As these cause and effect relationships are explored, it must be done in the context of local social and economic forces. In particular, in the case of Pike County the high unemployment rates may be the key reason for public support of facilities that could create negative environmental impacts. In addition, when decision-makers place an emphasis on community engagement in creating a vision for the future of the local environment the case presented here suggests that multiple approaches are valuable. If public opinion polling was the sole source of ideas for a community vision in this case, it would be difficult to offer any explanation for the results.

Regardless of the designated future use of the site, this case clearly depicts the influence that high unemployment rates can have on creating a community vision and public acceptability of community development alternatives. The results also suggest that support for, rather than protest against, facilities with potential adverse environmental consequences can be an important factor in the creation of local pollution havens. This is especially compelling, considering that the location of the site is in a rural region that already experiences environmental, health, and economic disparities.

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