



Closing the Environmental Justice Gap: A Workshop on Advancing Evaluation Methods

September 30, 2011
UCLA Royce Hall

UCLA Luskin School of Public Affairs

**Luskin
Center**
FOR INNOVATION



Pre-Workshop Briefing Paper

Created by the UCLA Luskin Center for Innovation

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I. INTRODUCTION

Workshop Objective: The objective of the upcoming workshop is to develop the sub-field of Environmental Justice (EJ) policy and program evaluation. There are a growing number of EJ-oriented policies and programs at the federal, state, regional and local levels, but limited evidence of their effectiveness. Evaluation is a critical tool for determining policy and program effectiveness, generating knowledge to improve the effectiveness of future efforts, and holding government agencies accountable that adopted policies and programs are implemented. By improving our use of evaluation, we can better design and implement EJ policies and programs in order to address the ultimate goal of closing the EJ gap.

Purpose of this Paper: This briefing paper serves to provide key background information and definitions to help participants arrive at the workshop on a similar page. This is important because the workshop intentionally brings together a diverse group of people from across the country to begin a new dialogue, in the hopes that this can be our starting point to advance EJ policy and program evaluation. While the heterogeneity of perspectives is important, it also poses a challenge for communication at the workshop because we do not share a common language, academic background, or set of evaluation methods and other methodological tools. Selecting terminology for this document was a struggle because of the differences in terminology among and even within fields. We ask for your help in respecting differences of opinion and perspective.

Acknowledgments and Disclaimer: This paper was produced by the UCLA Luskin Center for Innovation, specifically Colleen Callahan and Cristin Kenyon, under the leadership of J.R. DeShazo. The first section of the briefing document was adopted by a paper written by the following event thought-leaders and members of the advisory committee: Paul Ong, UCLA Luskin School of Public Affairs; Manuel Pastor, USC Program for Environmental and Regional Equity; Rachel Morello-Frosch, UC Berkeley School of Public Health & Department of Environmental Science, Policy and Management; and Douglas Houston, UC Irvine Department of Planning, Policy & Design & Metropolitan Futures Initiative. Katherine Dawes, Director of the Evaluation Support Division in the EPA, provided important feedback and edits on the entire document. The Luskin Center appreciates the contributions of these individuals. This document, however, does not necessarily reflect their views or anyone else involved in the workshop. We hope to do more analytical writing after the event.

II. BACKGROUND

Key Definitions and Distinctions

Environmental Justice (EJ): As defined by the U.S. Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental Justice Gap: Marginalized communities systematically experience disproportionately greater adverse environmental risks and impacts. This phenomenon is known as the EJ gap.

Key Distinction #1: *The thought-leaders for this workshop see our ultimate goal as reducing the environmental justice gap. It is important to differentiate between the goal of reducing the environmental gap (distributive justice), and the goal of nondiscriminatory actions (procedural justice). We believe that evaluation can help improve the design and implementation of EJ policies and programs in order to address the ultimate goal of closing the EJ gap.*

EJ Policies are adopted using EJ principles and guidelines.

EJ Programs are specific interventions or projects.

EJ Practices are formal and informal organizational operations, methodologies, and behaviors.

Policy Evaluation: Policy evaluation is the empirical analysis of data to determine the effects of governmental policies enacted due to laws, guidance or regulation. Policy evaluation typically uses aggregated data over time.

Program Evaluation: Program evaluations are individual systematic studies conducted periodically or on an ad hoc basis to assess how well a program is working, and why. Program evaluation is often conducted by evaluation experts external to the program, either inside or outside the organization (government or non-government) responsible for the programs' implementation.

Key Distinction #2: *There are many distinctions between policy and program evaluation that are not covered in this paper. The goal of the paper is to briefly review how a range of evaluation activities might improve EJ policy development as well as the design and implementation of EJ programs. The nuanced differences between the two disciplines of policy and program evaluation and the ways in which they overlap, however, are beyond the scope of the workshop.*

Background on EJ Research

Research has been an integral part of the EJ movement since its inception in the 1980s as a grass-roots effort to address racial and class inequality. The seminal works by the United Church of Christ's Commission for Racial Justice (1987) and Robert Bullard (1990) provided empirical evidence of environmental racism, the disproportionate exposure to toxins and pollutants suffered by minorities. While a wave of studies challenged this early research (see, for example, Anderton et al., 1994; Bowen, 2000; Oakes et al., 1994), a subsequent set of studies have tackled this issue with increasing methodological sophistication and have found that income, race and other socioeconomic variables (including linguistic isolation and measures of political engagement) often matter in the distribution of both stationary and mobile sources of environmental hazards (see, for example, Bullard et al., 2007; Houston et al., 2004; Mohai and Saha, 2006, 2007; Morello-Frosch and Lopez, 2006; Pastor et al., 2006). Among these later studies, a meta-analysis conducted by Evan Ringuist (2005) examining forty-nine empirical studies found evidence of racial disparity in environmental hazard burdens regardless of "the type of risk examined, the level of aggregation employed, or the type of control variables used in the analysis" (p. 233).

A great deal of research on exposure disparities has occurred within California. One study (Houston et al., 2004) found that in the Southern California region, minority and high-poverty neighborhoods bear over two times the level of traffic density compared to the rest of the region, suggesting that these communities may be disproportionately exposed to concentrated near-roadway air pollution. In the low-income and nonwhite communities adjacent to the Ports of Los Angeles and Long Beach, researchers (Houston et al, 2008) documented that traffic levels are particularly elevated (heavy-duty diesel truck traffic on surface streets were at levels of 400 to 600 trucks per hour for several hours during the day immediately upwind of schools, residences, and parks). Such exposures occur in the context of historic and structural inequalities, including racial segregation, a lack of economic opportunity, disinvestment, and declining property values.

Along with studies of environmental inequity has emerged another line of inquiry that involves the documentation of the role of activists and community organizations in fighting governmental and corporate actions (see, for example, Camacho, 1998; Pellow and Brulle, 2005). Such political advocacy, along with early research evidence, led to a 1994 Executive Order 12898 by President Clinton, which directed federal agencies to incorporate EJ in their programmatic activities. This order and subsequent legislation resulted in rules and requirements in multiple sectors that seek to provide communities with access to information and opportunities to participate in decision-making processes in order to promote accountability and ensure fair policies and programs (Cairns et al., 2003; Schweitzer and Valenzuela, 2004).

Examples of EJ Program & Policy Evaluation, the Need for More Evaluation, and the Challenge

As described in the previous section, there is now a large body of research on environmental inequality and environmental activism, and this research has influenced the proliferation of EJ policies and programs undertaken by federal, state, and local governments. Yet, there is a paucity of studies exploring evaluative questions about program/policy process, effects or effectiveness.

Case study analysis has examined the role of EJ communities and advocates in improving the development and implementation of EJ policies (Corburn, 2009).¹ In 2001, the U.S. EPA's Evaluation Support Division evaluated the use of collaborative partnerships to address environmental justice issues in six demonstration projects in low-income and minority communities and found that although collaboration presented several challenges, it can be an effective means for addressing environmental justice issues in communities (U.S. EPA, 2003).

Policy studies using aggregated data over time indicate some positive findings that broad governmental policies have reduced inequality in the period after the adoption of EJ principles, but the results are not always consistent and can be dependent on how the environmental gap is calculated (Kahn, 2001; Sigman, 2001; Pastor, 2008). Moreover, these analyses are not directly linked to any specific EJ policy but rely on temporal correlation, although they do provide insights into the possible net, diffused and *de jure* impacts of the EJ and environmental movement.²

The largest gap in EJ evaluation is at the program level. We have very limited examples of program evaluations assessing whether a specific EJ program contributed to its intended effects. Our literature review did not identify a significant body of published work aside from a handful of program evaluations that will be presented at this conference.

In short, we have few studies that give us insight into this key question: just how effective are existing EJ policies and programs at ameliorating or eliminating environmental inequality?

Why have so few evaluations been conducted? The experience of Paul Ong, in seeking to answer questions about a program's impact, gives us insight into this question. Ong conducted a preliminary analysis of an EJ program adopted by the South Coast Air Quality Management District (AQMD) as a part of the regulation to phase in the use of less toxic chemicals at dry cleaners over an 18-year period (Ong, 2010). AQMD provided financial incentives to switch early, and establishments in EJ neighborhoods (defined as having a poverty rate above a given level and experiencing high levels of cumulative exposure) were given priority. After accounting for confounding variables, the preliminary findings show that dry cleaners in low-income minority neighborhoods are less likely to be an early adopter of green technologies. One of the lessons learned from this on-going effort is that the required micro-level data to isolate the independent program effects is extremely difficult and costly to assemble. The expense and challenge of collecting performance data to address the most complex evaluative question of causal impact and contribution partially accounts for the dearth of program evaluations.

¹ Corburn's work, however, involves the very recent development of a Health Impacts Assessment process in San Francisco and thus has a limited amount to say about actual impacts.

² An interesting observation is that there was little temporal progress in reducing the racial gap before EO 12898 (Brooks and Sethi, 1997).

Nevertheless, we believe that EJ policy and programs must be more regularly designed with evaluation in mind (per the example we have in the CARE program). Evaluation is a valuable way to answer whether a policy or program is meeting its intended objectives with reference to a logic model of causality (see Section III), and why or why not. By improving our use of evaluation, we can better design and implement EJ policies and programs that address the ultimate goal of closing the EJ gap. In other words, we believe that evaluation is essential to developing a collective understanding of the impact that EJ policies and programs have made on the underlying patterns of inequity by race, income and geography, as well as building a systematic body of evidence as to the alternative approaches that could be used to achieve better results.

California gives us a particularly compelling example of why policy and program evaluation is so relevant to closing the environmental gap. Agencies such as the California Air Resource Board and the South Coast Air Quality Management District have adopted a variety of EJ principles and programs. Indeed, California is ahead of the curve in terms of the quantity and quality of its EJ rules. A recent review of all fifty states by Bonorris (2010) highlights California's wide range of policies. Whether all this attention is really moving the needle on the underlying disparities – and which strategies are most efficient to do so – is thus a topic that is both timely and worthy of attention.

Successful evaluation requires policies and programs that are well monitored and have measureable benchmarks towards a clearly defined and quantifiable goal. Although well-intended, the goals of EJ policies and programs are often stated in general terms (e.g. considering cumulative impacts or engaging community participation). Additionally, there is a lack of clarity about the desired outcomes (e.g. reduce disparities in exposures, health risks – and by how much?), and too few efforts to monitor quantifiable outcomes. We thus need to develop tools and metrics by which to monitor and measure progress towards defined EJ goals.

III. EVALUATION WITHIN POLICY & PROGRAM DEVELOPMENT FRAMEWORKS

For the purpose of this workshop, we are focused on evaluating the effectiveness of EJ policies and programs. This is a place to step back and think conceptually about what it means to measure effectiveness. In the article “The Modus Narrandi: A Methodology for Evaluating Effects of Environmental Policy,” Gysen et al. distinguish between measuring effects and measuring effectiveness relevant to both policy and program evaluation:

- An effects assessment considers the effects of a policy or program, both intended and unintended.
- An effectiveness assessment attempts to determine whether the effects of the policy or program match the goals and objectives of the policy or program (intended effects only).

It is also important to consider which aspect of effectiveness is being measured. Effectiveness assessments have a variety of focuses, illustrated by the following research questions:

- Were the desired effects observed?
- Was the policy responsible for the observed effects?
- How and why did the policy achieve these effects?
- Were the desired effects produced in the most efficient way?

Another important consideration in evaluating effectiveness is recognizing where in the chain of effects the evaluation is looking. Policies and programs have multiple levels of intended effects: outputs are intended to spark a chain of intermediate outcomes that are intended to ultimately lead to environmental changes. Evaluators need to identify the link in the chain of effects that is being measured, and to draw conclusions on effectiveness accordingly (See Crabbé and Leroy, 2008, p.12).

Policy and program specific evaluations often focus on the most proximate effects of the policy or program, the outputs. Outputs can be linked directly to policy inputs and actors, and therefore causality can be directly confirmed. But we are concerned not only with the effectiveness of a policy or program to produce outputs, but also at producing intermediate outcomes, and ultimately influencing environmental changes. In order to address the effectiveness of a specific policy or program in influencing larger environmental changes, we must first connect the outputs and intermediate outcomes of the policy or project to those downstream effects in a chain of causality. All the intermediate micro-steps and linkages have to be true for the program to be effective in influencing environmental change. Charting the chain of causality allows us to check our mental models and assumptions about what a policy or program is actually achieving and how we can know.

Box 1: The Last, Critical Link in the Causal Chain

Much discussion and debate in the EJ field has centered on the ultimate goal of EJ policies and programs. As previously mentioned, the thought-leaders for this workshop see this ultimate goal as reducing the environmental justice gap, which we define as the difference in adverse environmental impacts experienced by marginalized populations (distributive justice). This differs from the goal of nondiscriminatory actions (procedural justice). Government can be race-neutral in its policies and programs, but that may not be sufficient to overcome societal and market forces that can reproduce and potentially amplify environmental inequality. It is also important to make the distinction between reductions in inequality and universal approaches for reducing hazard exposures that benefit the entire population, something that in itself is very desirable.

Evaluation in the Policy Cycle

Figure 1 is one simplified model of the policy cycle. We acknowledge that this figure makes policy-making appear more like a rational, goal-oriented process than may be realistic. An important thing to note is that the policy cycle takes place within and is influenced by a larger context. The political, economic, environmental and geographic situation affects every stage of the process. Agenda-setting, as well as policy design, selection and implementation, are affected by, among other things, the availability of scientific information, the power relations among stakeholders, and prevailing ideologies. Often choices are determined by institutional structures and needs more than by considerations of effectiveness.

This figure helps to highlight key stages in which evaluation can occur. Evaluations may focus on one stage in isolation, multiple stages, the links between stages, or the process as a whole. Of particular interest to this workshop is conceptualizing and operationalizing how evaluation can help us to answer the question: Is the policy effective, i.e. is it achieving its intended effects/results?

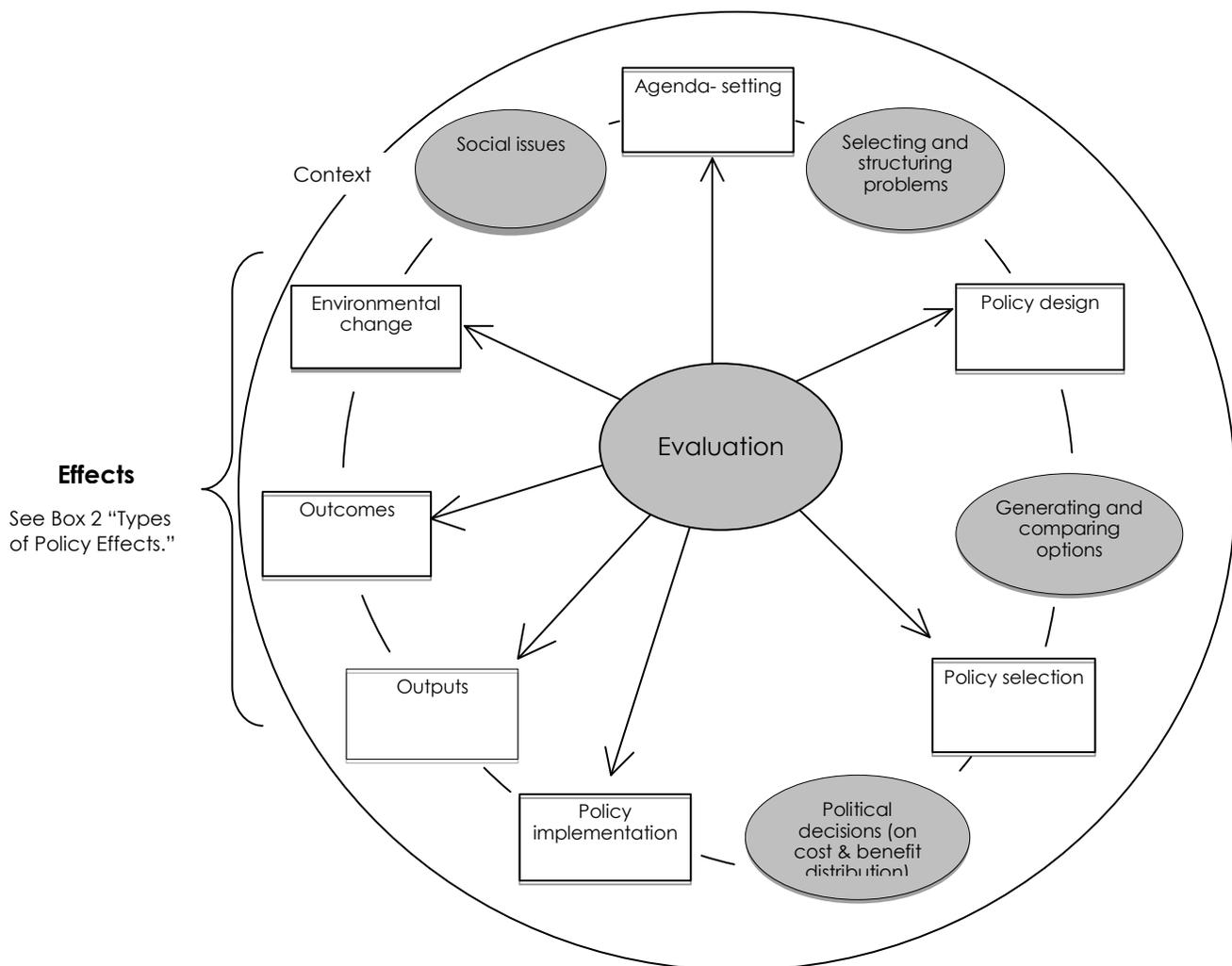


Figure 1. The Policy Cycle
Adopted from *The Handbook of Environmental Policy Evaluation* (Crabbé and Leroy, 2008).

Box 2. Types of Policy Effects (Crabbé and Leroy, 2008; EPA, 2001; Gysen et al., 2006; Mickwitz, 2003)

Main Effects

- *Output*: Policy outputs are the tangible results of a policy or program; the products and services delivered by policy makers. (Examples: More field inspectors and citations on industry; a map of EJ areas)
- *Outcome*: This refers to the response of the target groups to the policy or program outputs; the impact of the outputs on behavior. (Examples: fewer factories out of compliance; more investment in EJ areas). One outcome often leads to another and then another, generating a chain of outcomes.
- *Impact (environmental change)*: This describes the consequences of the behavioral changes, including immediate, intermediate and long term impacts. These impacts include actual changes in the state of the environment, health and quality of life impacts, as well as broader economic and structural changes. (Examples: cleaner air, improved health and reduced environmental disparity).

Side Effects

- These are the unintended effects of policies and programs (both foreseen and unforeseen). Side effects can fall under any of the above levels of effects (policy output, policy outcome, or environmental change).

Note: The connections between policy outputs, outcomes, and environmental changes are rarely straightforward. It is important to consider effects at various scopes – from immediate effects to ultimate objectives – and chart the causal links.

Evaluation across the Program “Logic Model”

Figure 2 is a simplified linear model that highlights the role of evaluation in programs – various versions of which are used by federal evaluation units to explain the how evaluation might address questions about a program’s design, delivery, effectiveness or impact.

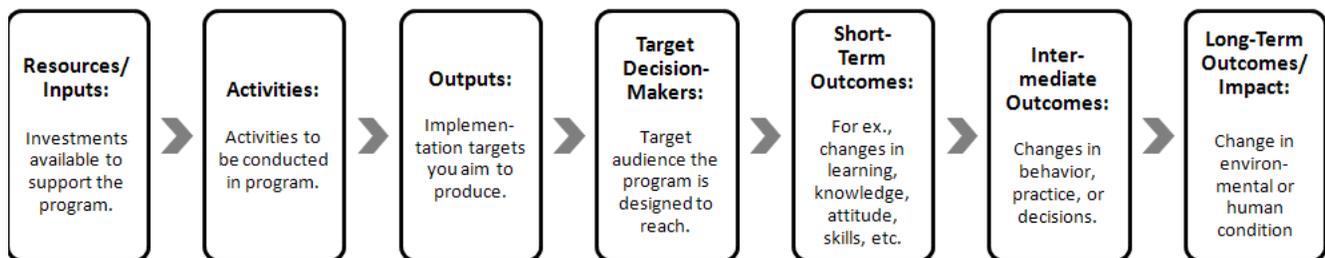


Figure 2: The Program “Logic Model”

Adopted from “Guidelines for Evaluating an EPA Partnership Program (Interim).
(EPA and the National Center for Environmental Innovation, March 2009).

Typology of EJ Programs & Policies and Illustrating the “Logic Model” Causal Chain

This section presents an example typology of EJ programs. Understanding the landscape of EJ programs is important to developing evaluation strategies, as different types of EJ programs will require different types of evaluation strategies.

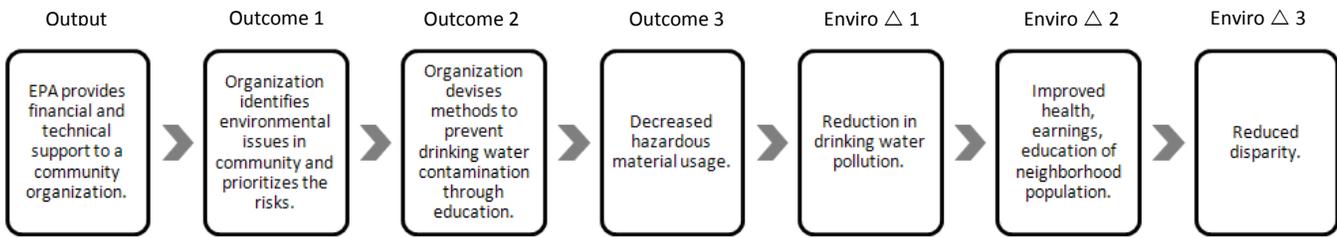
The following typology is not meant to be definitive, but just one of many ways to categorize EJ programs. It is meant to ground the workshop’s conceptual discussions on evaluation in real-world examples. It is important to note that only programs with main objectives that are EJ-related are included. Policies and programs that are not explicitly EJ but have EJ consequences are excluded in order to narrow the discussion. For example, federal efforts to acknowledge EJ impacts in agency assessment documents are outside the scope of this typology.

Table 1. Typology of EJ Programs

Type of EJ Programs	Examples
Community capacity building (including strategies of training, technical assistance, community-based participatory research, empowerment approaches and community organizing/social action)	U.S. EPA’s CARE program
Pollution reduction, mitigation of disproportionate impacts and community revitalization	Harbor Community Benefit Fund
Information disclosure, surveillance, tracking, compliance and enforcement	Los Angeles Area Environmental Enforcement Collaborative
Assessment of cumulative impacts	OEHHA’s development of guidelines and a screening methodology to help Cal/EPA prioritize their programs and target those communities with the greatest cumulative impacts

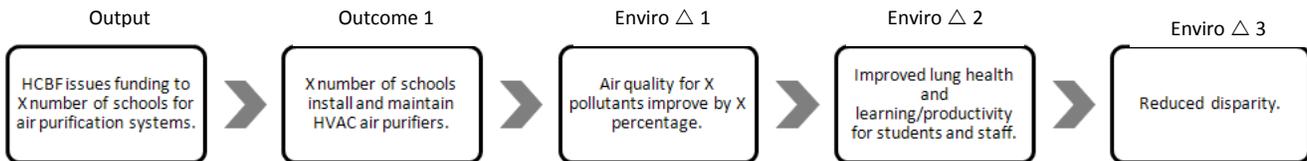
The following page contains simplified examples of models of causality for each of the example programs in our typology. We want to stress that these are examples and not necessarily based on detailed analyses of the programs. They are meant as a starting point for discussion and are merely hypothetical.

U.S. EPA's CARE program

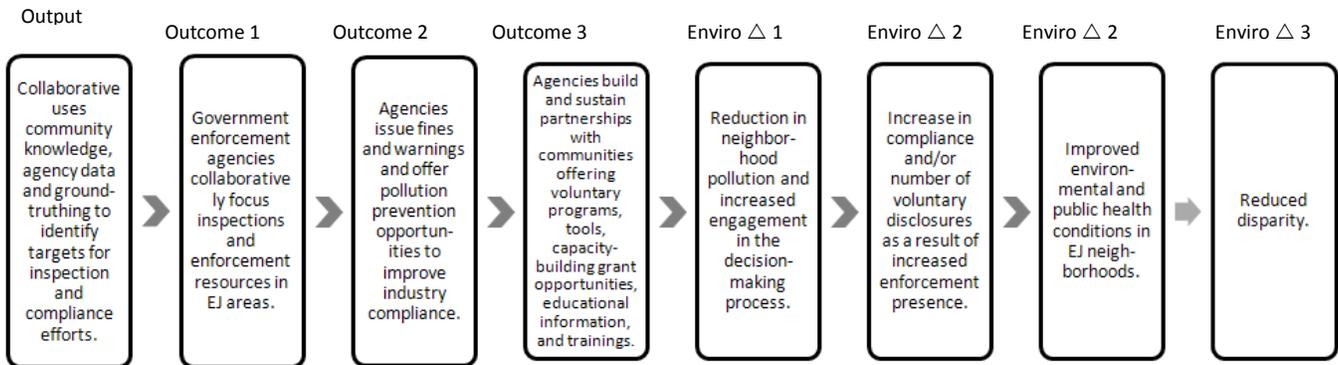


Harbor Community Benefit Fund

The Harbor Community Benefit Fund (HCBF) -- established through an agreement between the Port of Los Angeles and community, environmental, health, and labor organizations -- will invest in community capacity building. Technical assistance will be provided to harbor area residents so that residents can propose projects to mitigate air pollution, noise pollution, lack of open space, and other issues. For the purpose of the below model, we are just focusing on one aspect of the HCBF's investment that was previously prioritized as part of the agreement between the Port of Los Angeles and the organizations.

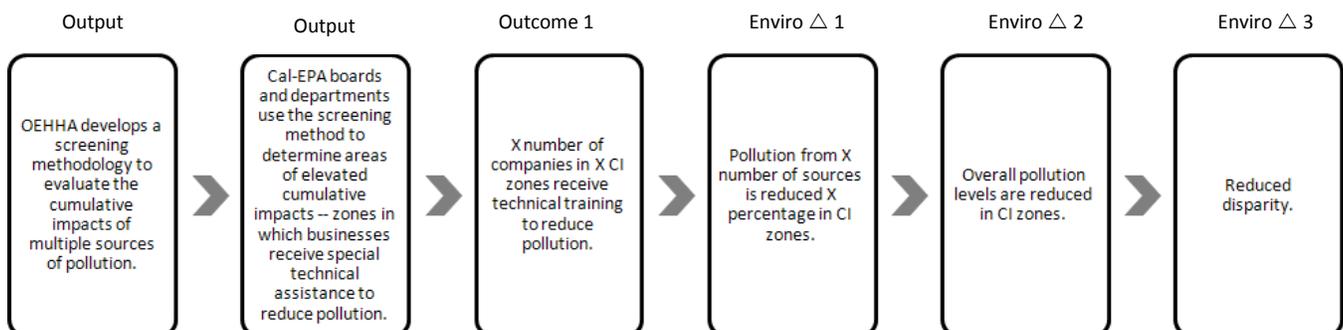


Los Angeles Area Environmental Enforcement Collaborative



OEHHA's development of a methodology to screen for cumulative impacts

Again, the following is hypothetical. Cal-EPA has not formally adopted a screening methodology to assess cumulative impacts, nor guidelines to accompany such as tool, nor made any determinations what so ever about how a screening methodology could impact permitting or regulatory processes.



IV. EVALUATION IN PRACTICE

As described previously, program evaluation is a systematic study with a well-defined methodology that uses measurements and analysis to answer specific questions about how well and why a policy or program is working to achieve its objectives. We are including once again the visual illustration of the program logic model, this time highlighting types of evaluation that can be conducted during different stages. Table 2 then provides more information about these evaluation types.

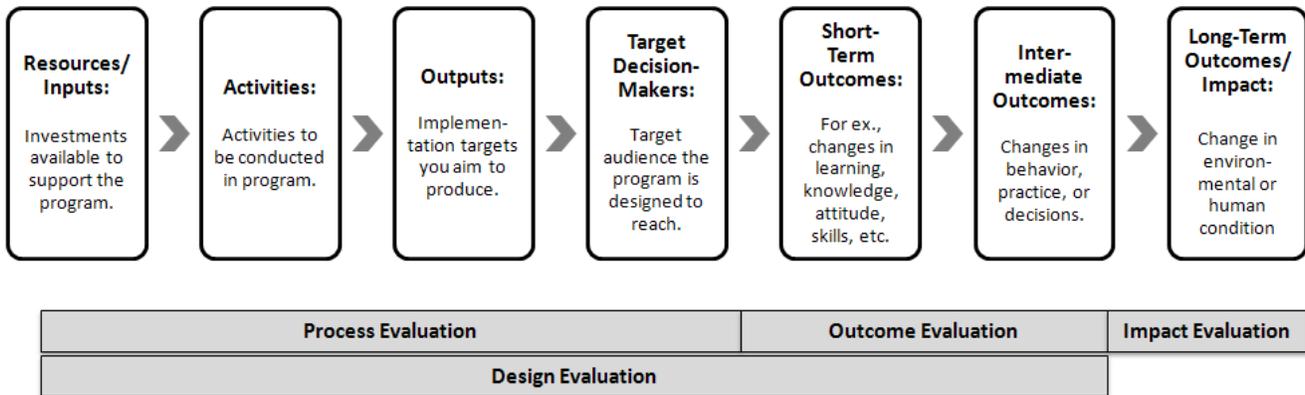


Table 2. Typology of Evaluation Types

Evaluation Type	What It does	Why It Is Useful
Design Evaluation	Analyzes whether a program’s approach is conceptually sound	Informs program design and increases the likelihood of success
Process Evaluation	Assesses how well a program is being implemented; asks what processes are working, what are not working	Checks how well program plans are being implemented and what process changes might be needed
Outcome Evaluation	Assesses the extent to which a program has demonstrated success in reaching its stated short-term and intermediate outcomes	Provides evidence of program accomplishments and short-term effects of program activities
Impact Evaluation	Measures the causal relationship between activities and outcomes— asks whether a program’s activities caused its goals to occur	Provides evidence that the program, and not outside factors, has led to the desired effects

There are countless ways to design policy and program evaluations, and certain evaluation approaches will prove more applicable than others to different types of EJ policies and programs. Rather than sit on a shelf, evaluations should have practical consequences. They can inform policy design, selection and implementation, as well as impact agenda setting and the larger policy debate surrounding issues in the EJ field. Because learning is not an automatic result of the evaluation process, it is important to design evaluations with the policy and/or program context in mind.

Below are key questions about the context for evaluation that must be considered during evaluation planning and execution (Adopted from a paper by Michael Mason (2002), accessed from the EPA website: <http://www.epa.gov/evaluate/pdf/consider.pdf>):

- Who has the need for what information and why? Developing a list of potential stakeholders with their questions, information needs and interests in the evaluation will help determine the purpose of the evaluation and secure buy-in.
- What is the policy or program that you have been asked to evaluate? Define or describe the policy or program in terms of inputs, activities, outputs and outcomes. This will help organize stakeholder questions and information sources around key policy or program components.
- What issues and/or problem areas have already been identified? Is there already sufficient information to answer many of the questions? A literature review or interviews with stakeholders may determine that an evaluation is not needed.
- What information sources exist? If readily available sources do not exist, how feasible is it to obtain them? This will drive the design of the evaluation.
- What will the policy or program do with the information or results once it receives them? The evaluation should be timed and designed to feed into decision-making processes.
- Who is the principle owner of the evaluation? It is important the evaluator has the capability or authority to make effective use of the evaluation information.

Glossary

Activities: The actions you do to conduct your program. Examples of activities are developing and maintaining a program Web site, offering trainings, and establishing relationships with partners.

Attribution: The assertion that certain events or conditions were, to some extent, caused or influenced by other events or conditions. In program evaluation, attribution means a causal link can be made between a specific outcome and the actions and outputs of the program.

Baseline Data: Initial information on a program or program components collected prior to receipt of services or participation activities. Baseline data provide a frame of reference for the change that you want the EJ Program to initiate. These data represent the current state of the environment, community, or sector before your program begins. Baseline data can also approximate what environmental results might have been in absence of the program.

Conclusions: The interpretation of the evaluation findings, given the context and specific operations of your Program.

Confounding Variable: A variable that is combined with your program's activities in such a way that your program's unique effects cannot be validly determined.

Contribution: The assertion that a program is statistically correlated with subsequent events or conditions, even after you have accounted for non-program factors also associated with the same events and conditions.

Control Group: A group whose characteristics are similar to those of the program but which did not receive the program services, products, or activities being evaluated. Collecting and comparing the same information for program participants and non-participants enables evaluators to assess the effect of program activities.

Customers: See "Target Decision-Makers."

Dependent Variable: The variable that represents what you are trying to influence with your program. It answers the question "what do I observe" (e.g., environmental results).

Evaluation Methodology: The methods, procedures, and techniques used to collect and analyze information for the evaluation.

Evaluation Practitioners: Those individuals that typically have significant evaluation knowledge and are generally capable of planning and managing an evaluation without external assistance. Evaluation practitioners might occasionally need to seek advice on advanced methodologies from outside experts or the Evaluation Support Division.

Evaluation Questions: The broad questions the evaluation is designed to answer and the bridge between the description of how a program is intended to operate and the data necessary to support claims about program success.

Expert Review: An impartial assessment of the evaluation methodology by experts who are not otherwise involved with the program or the evaluation; a form of peer review. EPA's Peer Review Handbook outlines requirements for Peer Review of major scientific and technical work products, provides useful tips to managing expert reviews.

External Evaluation: Development and implementation of the evaluation methodology by an independent third party, such as an academic institution or other group.

External Influences: Positive or negative factors beyond your control that can affect the ability of your program to reach its desired outcomes.

Ex Ante: Ex ante evaluation means that policy is evaluated prior to implementation. Ex ante evaluation methods are methods for policy design and policy development. Ex ante evaluations often simulate expected effects to select among alternative policy approaches.

Ex Nunc: Most policy evaluation is ex nunc; it deals with the evaluation of current policy, monitoring implementation and making necessary adjustments to maximize desired outcomes.

Ex post: Ex post evaluation refers to evaluation after the policy has been developed and implemented. These studies examine final and longer term outcomes, leading to new insights for policy development and ex ante policy evaluation. Since policy is rarely completed, let alone terminated, there is very little ex post policy evaluation in the strict sense of the word.

Feasibility: The extent to which an evaluation design is practical, including having an adequate budget, data collection and analysis capacity, staff time, and stakeholder buy-in required to answer evaluation questions.

Findings: The raw data and summary analyses obtained from the respondents in a program evaluation effort.

Functionality: The extent to which information collected through the evaluation process can be acted upon by program staff.

Impact Evaluation: Focuses on questions of program causality; allows claims to be made with some degree of certainty about the link between the program and outcomes; assesses the net effect of a program by comparing program outcomes with an estimate of what would have happened in the absence of the program.

Independent Variable: The variable that represents the hypothesized cause (e.g., Partnership Program activities) of the observations during the evaluation.

Indicator: Measure, usually quantitative, that provides information on program performance and evidence of a change in the “state or condition” of the system.

Information Collection Request (ICR): A set of documents that describe reporting, recordkeeping, survey, or other information collection requirements imposed on the public by federal agencies. Each request must be sent to and approved by the Office of Management and Budget before a collection begins. The ICR provides an overview of the collection and an estimate of the cost and time for the public to respond. The public may view an ICR and submit comments on the ICR.

Internal Evaluation: Conducted by staff members within the program being studied, typically EPA staff and/or by EPA staff and contractors who regularly support evaluation at EPA.

Intermediate-Term Outcomes: Changes in behavior that are broader in scope than short-term outcomes. They often build upon the progress achieved in the short-term.

Logic Model: A diagram with text that describes and illustrates the components of a program and the causal

relationships among program elements and the problems they are intended to solve, thus defining measurement of success. Essentially, a logic model visually represents what a program does and how it intends to accomplish its goals.

Long-Term Outcomes: The overarching goals of the program, such as changes in environmental or human health conditions.

Mean: A measure of central tendency sometimes referred to as the average; the sum of the values divided by the number of values.

Median: A measure of central tendency; the number separating the upper and lower halves of a sample. The median can be found by ordering the numbers from lowest to highest and finding the middle number.

Natural Experiment: Situations that approximate a controlled experiment; that is, they have “natural” comparison and treatment groups. This scenario provides evaluators with the opportunity to compare program participants with a group that is not receiving the program offered. Natural experiments are not randomized, however, and therefore strong causal claims of direct impact cannot be made and evidence is required to show that the comparison group is a reasonable approximation of an experimental control group.

Non-Experimental Design: A research design in which the evaluator is able to describe what has occurred but is not able to control or manipulate the provision of the treatment to participants as in a true experimental design or approximate control using strong quasi-experimental methods.

Outcome Evaluation: Assesses a mature program’s success in reaching its stated goals; this is the most common type of evaluation conducted for EPA programs. It focuses on outputs and outcomes (including unintended effects) to judge program effectiveness but can also assess program process to understand how outcomes are produced. Often, outcome evaluations are appropriate only when at least baseline and post-baseline data sets are available or could be developed.

Outputs: The immediate products that result from activities, which are often used to measure short-term progress.

Participatory Evaluation: Involves stakeholders in all aspects of the evaluation, including design, data collection, analysis, and communication of findings.

Performance Measure: An objective metric used to gauge program performance in achieving objectives and goals. Performance measures can address the type or level of program activities conducted (process), the direct products and services delivered by a program (outputs), or the results of those products and services (outcomes).

Performance Measurement: The ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals.

Primary Data: Data collected “first-hand” by your EJ Program specifically for the evaluation.

Process Evaluation: This form of evaluation assesses the extent to which a program is operating as it was intended. Process evaluations are typically a check to see if all essential program elements are in place and operating successfully. Process evaluations can also be used to analyze mature programs under some circumstances, such as when you are considering changing the mechanics of the program.

Program Design Evaluation: Most appropriately conducted during program development; can be very helpful when staff have been charged with developing a new program. Program design evaluations provide a means for programs to evaluate the strategies and approaches that are most useful for a program to achieve its goals.

Program Evaluation: Systematic study that uses objective measurement and analysis to answer specific questions about how well a program is working to achieve its outcomes and why. Evaluation has several distinguishing characteristics relating to focus, methodology, and function. Evaluation 1) assesses the effectiveness of an ongoing program in achieving its objectives, 2) relies on the standards of project design to distinguish a program's effects from those of other forces, and 3) aims to improve programs by modifying current operations.

Qualitative Data: Describe the attributes or properties of a program's activities, outputs, or outcomes. Data can be difficult to measure, count, or express in numerical terms; therefore, data are sometimes converted into a form that enables summarization through a systematic process (e.g., content analysis, behavioral coding). Qualitative data are often initially unstructured and contain a high degree of subjectivity, such as free responses to open-ended questions. Various methods can be used to constrain subjectivity of qualitative data, including analytical methods that use quantitative approaches.

Quality Assurance Project Plan (QAPP): Describes the purpose of the evaluation, the methodology used to collect data for the report, how and where data for the evaluation were collected, why the particular data collection method was chosen, how the data will be used and by whom, how the resulting evaluation report will be used and by whom and, what are the limitations of data collected.

Quantitative Data: Can be expressed in numerical terms, counted, or compared on a scale. Measurement units (e.g., feet and inches) are associated with quantitative data.

Quartile: The three data points that divide a data set into four equal parts.

Quasi-Experimental Design: A research design with some, but not all, of the characteristics of an experimental design. Like randomized control trials (see below), these evaluations assess the differences that result from participation in program activities and the result that would have occurred without participation. The control activity (comparison group) is not randomly assigned, however. Instead, a comparison group is developed or identified through non-random means, and systematic methods are used to rule out confounding factors other than the program that could produce or mask differences between the program and non-program groups.

Randomized Control Trial (RCT): A true experimental study that is characterized by random assignment to program treatments (at least one group receives the goods or services offered by a program and at least one group—a control group—does not). Both groups are measured post-treatment. The random assignment enables the evaluator to assert with confidence that no other factors other than the program produced the outcomes achieved with the program.

Range: The difference between the highest and lowest value in a sample.

Recommendations: Suggestions for improvement and/or change based on the evaluation's findings and conclusions.

Reliability: The extent to which a measurement instrument yields consistent, stable, and uniform results over repeated observations or measurements under the same conditions.

Resources: The basic inputs of funds, staffing, and knowledge dedicated to the program.

Secondary Data: Data taken from existing sources and re-analyzed for a different purpose.

Short-Term Outcomes: The changes in awareness, attitudes, understanding, knowledge, or skills resulting from program outputs.

Spillover Effects: Environmental improvements by non-participants due to transfers of attitudes, beliefs, knowledge, or technology from program participants.

Stakeholder: Any person or group that has an interest in the program being evaluated or in the results of the evaluation.

Stakeholder Involvement Plan: A plan to identify relevant stakeholder groups to determine the appropriate level of involvement for each group and engage each group in the evaluation accordingly.

Targets: Improved level of performance needed to achieve stated goals.

Target Decision-Makers: The groups and individuals targeted by program activities and outputs, also known as the target audience or program participants.

True Experimental Design: A research design in which the researcher has control over the selection of participants in the study, and these participants are randomly assigned to treatment and control groups. See “Randomized Control Trial.”

Validity: The extent to which a data collection technique accurately measures what it is supposed to measure.

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