Chapter 3:
Leveraging

Chapter Contents

Chapter 3: Leveraging

Introduction

Leveraging is the process of amplifying the benefit from an investment or project by using available resources to obtain additional resources, such that the total effect is greater than the sum of the parts. Leveraging can involve making new contacts through networking, growing an existing relationship, or obtaining supplemental funding.
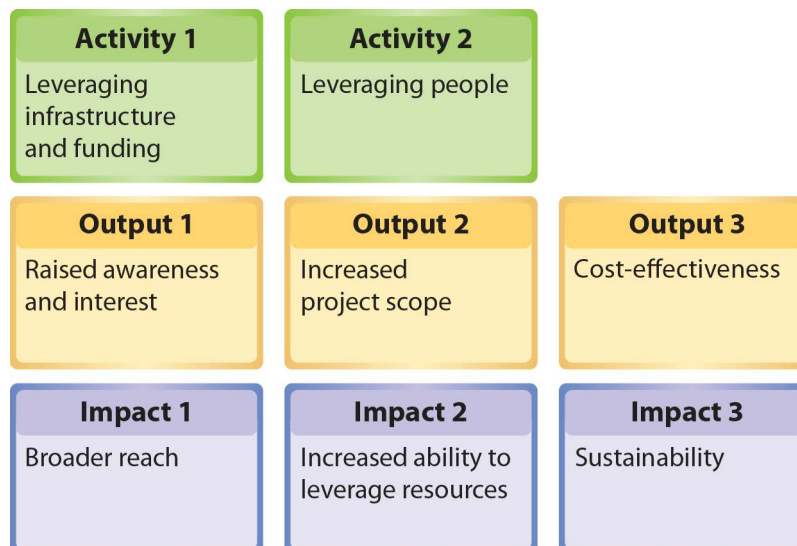
Leveraging Logic Model

This model identifies potential activities, outputs and impacts of successful leveraging. Grantees should use this chapter to brainstorm other activities, outputs, and impacts that are applicable to their specific projects. This model contains three major components:

- **Activities** are actions that are based on available inputs for leveraging.
- **Outputs** are the direct products of leveraging.
- **Impacts** are benefits or changes resulting from the activities and outputs (ultimate or long-term impacts are also examined in Chapter 7: Principles of Evaluation).

We developed the logic models in this Manual recognizing that grantees reflect a wide range of experience and capacity. Some grantees have been funded for more than 20 years, while others are just getting started. In general, the logic models show increasing levels of maturity from left to right and from top to bottom. However, a logic model is not necessarily linear; not every PEPH project will begin with "leverage infrastructure and funding" and proceed through all components to "sustainability." Additionally, projects might not necessarily adhere to or exhibit all of the elements of the model.

Ideally, anyone working to leverage resources will recognize themselves in one or more of the logic model components. The elements of the model are numbered in Figure 3.1 to provide reference for discussion in the text of this chapter.

Figure 3.1 A Leveraging Logic Model With Examples of Activities, Outputs, and Impacts

Activity 1	Activity 2	
Leveraging infrastructure and funding	Leveraging people	

Output 1	Output 2	Output 3
Raised awareness and interest	Increased project scope	Cost-effectiveness

Impact 1	Impact 2	Impact 3
Broader reach	Increased ability to leverage resources	Sustainability

Sources of Data

In Chapter 1, we discussed potential sources of data. Grantees may find the following items to be helpful sources of data in tracking achievements related to leveraging:

- Activity logs
- Contact logs
- Participant lists
- Feedback forms
- Publication and material development lists
- Meeting agendas
- Telephone logs

- Budgets
- Group discussions
- Surveys
- Interviews
- Meeting notes
- Email exchanges
- Internet web logs

> For a more comprehensive list of data sources, see **Chapter 7: Principles of Evaluation**.

Records describe what happened and how. Records often take the form of an activity log or a journal that catalogues decisions, event attendees, and other critical information.

When selecting metrics, remember that it will be easier to measure activities and outputs. Documenting impacts is important, but it may be challenging because of the length of time it might take to achieve the impacts, as well as the contextual factors that are likely to influence your ability to achieve these impacts.

The rest of this chapter provides ideas about activities, outputs, and impacts related to partnerships, as well as potential metrics to measure them.

> Consider whether you can collect data for your metrics in a realistic time frame.

Inputs

The leveraging logic model example used in this chapter (Figure 3.1) provides a framework for evaluating leveraging resources such as infrastructure, funding, and people within PEPH programs. While the logic models we present in this chapter focus on activities, outputs, and impacts, we also discuss inputs here because of their inherent connection to leveraging activities.

> Partners might need to achieve a certain level of capacity in order to leverage inputs to a greater overall result. For more information on obtaining and expanding resources, see **Chapter 6: Capacity Building**.

Inputs are resources a project can use to achieve an output or result. Inputs include infrastructure, funds, relationships, ideas, and knowledge that can be used to achieve more resources, or more outputs from the same resources. Inputs can be included in any logic model, but they are especially important for leveraging activities because inputs define the baseline for leveraging.

> Although we have numbered the components in the logic model to facilitate the discussion in this chapter, it is important to remember that the logic model is not linear. Projects will conduct activities, produce outputs, and work to achieve impacts that are appropriate to their communities.

Activities

Activities are actions that help maximize leveraging based on available inputs. We identify two leveraging activities that grantees might conduct:

> Activity 1: Leveraging infrastructure and funding
>
> Activity 2: Leveraging people: relationships, ideas, and knowledge

Activity 1: Leveraging infrastructure and funding

Activity 1	**Activity 2**
Leveraging infrastructure and funding	Leveraging people
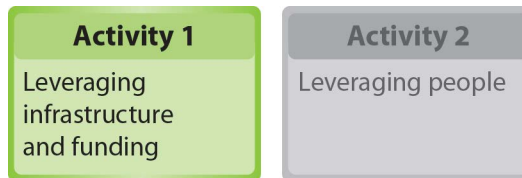
Tangible resources, such as physical or organizational infrastructure and money, are perhaps the simplest inputs to leverage. Examples of tangible resources that can be leveraged:

- Physical space (offices, cubicles, meeting rooms, laboratories, etc.).

- Office or scientific equipment (telephones, Integrated Services Digital Network (ISDN) lines, email address network, internet access, teleconference or video-conference services/equipment, microscopes, polymerase chain reaction (PCR) imaging machines,[19] etc.).

- Supplies (sticky notes, pens, paperclips, pipettes, microscope slides, etc.).

- Existing products related to the project:

    – Format and content of presentations, newsletters, brochures, websites, etc.

    – Survey questions and protocols.

    – Previous grant applications.

    – Existing Institutional Review Board (IRB) applications and "approved" consent language.

    – Pilot project data.

    – Statistical or geographical modeling approaches.

    – Biomarkers.

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[19] The PCR is a scientific technique in molecular biology to amplify a single or a few copies of a piece of DNA across several orders of magnitude, generating thousands to millions of copies of a particular DNA sequence.

- Organizational and administrative resources:

  – Existing administrative relationships, such as those needed for payroll and accounts management.

  – Resources from "Service" or "Facility Cores" either from the same grant or a different grant. Some large grants, such as P30 Core Centers, P42 Superfund Projects, P01 Children's Environmental Health Centers, etc., have facility and service cores that can provide resources to the other projects in the same grant. Projects can also leverage resources in grants funded by other sources, such as the National Center for Research Resources Clinical and Translational Center Awards (CTSAs).

Examples of additional funding that can be leveraged:

- Reserves from a "Director's Fund" either within an existing grant structure, such as the P30 Core Center, or from another institutional resource (such as a Department Chair's or Provost's fund).

- Alignment of activities with those of similar projects to combine resources for a given program activity (for example, if a local community is sponsoring a health fair, different partners could co-fund printed materials to advertise the event, thereby meeting the needs of both groups and potentially resulting in cost efficiencies).

- Additional investment in the project from other sources (foundations, discretionary funds, additional grants, etc.).

Both infrastructure and money can be leveraged to facilitate achievement of any of the outputs or impacts shown in a leveraging logic model.

Some examples of how to measure leveraging of infrastructure and money:

- Developing a catalog of related research projects in the same geographic region.

- Identifying resources within those projects that might be available and helpful.

- Listing discussions with personnel working on related research projects about potential monetary or "in kind" support.

> Use of existing products means leveraging resources from other programs or organizations, which can stretch existing resources further to save time and money – for example, adding questions to an existing survey as opposed to creating a new survey from scratch.

> Federal funding cannot be awarded to a project that has scientific and/or budgetary overlap with another existing or previously-funded project. Any new research activities, infrastructure, or personnel for which new funding is requested must be sufficiently different in scope. If you have questions about potential overlap, please contact your Project Officer to determine if newly requested funds or proposed leveraging of existing funds would be permissible.

**Example Metrics for Activity 1: Leveraging infrastructure and funding**

- Number and description of physical space obtained or used from other sources.

- Number and description of office equipment, supplies, or existing products obtained or used from other sources.

- Number and description of organizational or technical resources obtained or used from other sources.

- Dollar amount obtained from other funding sources.

- Number of applications submitted and funded ("spin-off" funding).

- Number and description of contacts made that might be tapped for additional funding.

Metrics in Action 3.1: In order to leverage funding and personnel, the **International Chemical Workers Union Council (ICWUC) Center for Worker Health and Safety Education** aligns its activities with those of similar projects. The Center educates workers about Hazardous Waste Operations and Emergency Response (HAZWOPER) standards and many other health and safety topics. The program cooperates with a multi-union consortium to provide on-site educational services targeted to facility workers who handle hazardous substances. In some instances, it targets disadvantaged or under-employed groups, such as the Coalition of Black Trade Unionists (CBTU). The program obtained a $288,000 grant from the Department of Transportation (DOT) by demonstrating its effective use of the $2,210,000 grant NIEHS awarded. The ICWUC used the DOT grant to develop worker trainers from the ICWUC, United Steelworkers, United Auto Workers, and the CBTU. ICWUC also has contracts with private companies such that the companies cover the majority of costs to train their workers. The program provides trainees with the credentials to obtain employment in hazardous chemical and remediation, and it leverages the education of past participants by employing them as trainers. Finally, ICWUC leverages temporary participation, such as business contracts and consortium membership, to encourage widespread adoption of its training model.

Metrics for leveraging funding:

- Dollar amount obtained from other funding sources: *$288,000 from DOT.*

- Number and description of contacts made that might be tapped for additional funding: *ICWUC maintains a list of XX partners who can be tapped to provide additional financial or infrastructure resources.*
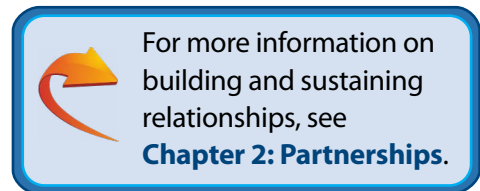
Activity 2: Leveraging people

Activity 1	Activity 2
Leveraging infrastructure and funding	Leveraging people
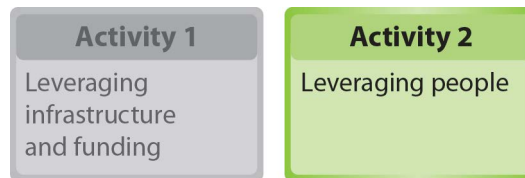
Leveraging people involves building or maintaining relationships to enable sharing of ideas and knowledge. This process is sometimes called "human capital" management or development. Leveraging relationships can focus on amplifying productive relationships that have been formed within or outside the project, as well as putting these relationships to use in other ways. One goal of leveraging might be to pool the ideas and knowledge of "friends" and partners to brainstorm, combine resources or data sets, and form new ideas. Another possibility is to develop a cadre of people that can be contacted for help.

Leveraging people can involve:

For more information on building and sustaining relationships, see **Chapter 2: Partnerships**.

- **Broadening networks:** One approach to leveraging people is through networking. In this context, networking is the cultivation of helpful relationships. For example, partners can research other local projects to find like-minded people. They can also meet other PEPH grantees at annual meetings or through grantee workgroups and use these connections to gain information about projects similar to their own that are being conducted elsewhere. By leveraging these new relationships, project staff can:

  – Learn about available resources (other sources of support or existing instruments).
  – Brainstorm ideas for new projects.
  – Learn how others have solved similar problems or overcome obstacles.
  – Pool resources to achieve common aims.
  – Gather input from other disciplines.
  – Expand their sphere of influence.

- **Developing a directory of your network:** Knowing whom to call to ask for help with various grant-related questions is often challenging. Creating a database of your contacts and their levels of expertise in various areas can help project staff share their own institutional knowledge with each other.

- **Using online resources:** The internet has become a powerful leveraging tool for identifying like-minded people and for helping people understand environmental health policy issues, ideas, and knowledge. For example, the National Conference of State Legislatures Environmental Health Legislation Database (https://www.ncsl.org/default.aspx?tabid=13230) allows users to research environmental health-related legislation in participating states.

Example Metrics for Activity 2: Leveraging people

- Number and description of networking activities.

- Number and description of listings in contacts or network databases.

- Number of new people contacted in leveraging efforts.

- Number of new people brought into the project.

- Number and description of relationships formed or expanded.

- Number and description of formal advisory board activities conducted to leverage relationships, ideas, and knowledge.

- Description of ideas, or knowledge resulting from these activities.

- Number and description of bartered exchanges.

- Number of ad hoc meetings, seminars, poster sessions, etc. that were held.

Metrics in Action 3.2: The **West Harlem Environmental Action, Inc. (WE ACT)** is a Northern Manhattan community-based organization whose mission is to build healthy communities. In the summer of 2004, WE ACT leveraged the services of two participants in the Californian Movement Activist Apprenticeship Program (MAAP) and received a "double-dose of organizing power." MAAP, which began in 1985, is a flagship organizer of training programs involving intensive six-week field placements with grassroots community or labor organizations that focus on issues affecting people of color. The MAAP interns have worked to mobilize WE ACT's community members to take action to prevent greater exposure to diesel exhaust, which was seen as particularly compromising for a community that is already challenged by a variety of environmental health hazards. The aligned missions of WE ACT and MAAP allowed them to leverage people to broaden each organization's networks and to barter services. The interns employed skills learned through the MAAP in WE ACT projects, and they were then able to apply these to the benefit of both organizations.

Metrics for leveraging people:

- Number and description of networking activities: *MAPP interns mobilized community members during (number and description of meetings attended).*

- Number of new people contacted in leveraging efforts: *MAPP interns mobilized XX community members to take action against the Metropolitan Transit Authority.*

Outputs

Leveraging activities can enable grantees to use existing resources more strategically and to obtain additional resources. The more resources available to a project, the more likely they will be to achieve improvements in community health. Outputs are the direct products of leveraging activities. Developing metrics for outputs enables grantees to assess the strengths and weaknesses of the program and the partnership.
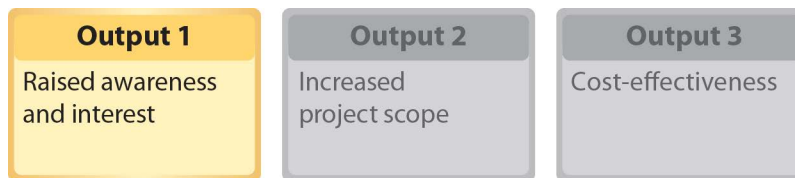
We identify three possible outputs that can result from leveraging activities:

> Output 1: Raised awareness and interest
>
> Output 2: Increased project scope
>
> Output 3: Cost-effectiveness

Output 1: Raised awareness and interest

Output 1	Output 2	Output 3
Raised awareness and interest	Increased project scope	Cost-effectiveness

One of the primary goals of PEPH programs is to raise awareness of, and interest, in environmental public health issues among community members, potential partners, and policymakers. If communities are aware of environmental public health issues, they are more likely to invest in addressing these issues. PEPH grantees can do this by gaining support for and increasing visibility of PEPH projects. To gain support and increase visibility, grantees may work to expand their network of partners, as well as to expand the types of partners who are interested in working with the project. These two activities will ensure that grantees both raise awareness and increase their access to partners with expertise in key areas.

> For more information on developing human resources and increasing awareness, see **Chapter 6: Capacity Building**.

Strategies for measuring this output can include:

- Measuring communities' awareness of project activities through surveys or participation in activities.

- Tracking the change in the number of partners and community members who know about the project and its goals and activities.

- Tracking the expertise that partners bring to the project.

- Assessing the level of investment of participants and partners in the projects or programs.

> Strategies for increasing awareness are also discussed in **Chapter 4: Products and Dissemination**.

Example Metrics for Output 1: Raised awareness and interest

Expanded network

- Number and description of new relationships.
- Description of expertise provided by new partners.
- Description of communication systems between partners when help or resources are needed.
- Change in the number of people who contact your organization for more information.
- Description of new expertise gained through new relationships.

Increased volunteers and donations

- Number of new volunteers who get involved with the project following efforts to increase awareness and interest.
- Number or amounts of donations following efforts to increase awareness.

Increased collaboration

- Number of individuals and organizations who collaborate for the first time to accomplish a common goal (such as planning a town hall meeting).
- Number of repeat collaborations between partners.

Partner sharing of resources

- Description of shared meeting space or other meeting resources (such as planning a small meeting during an associated national conference).
- Costs or descriptions of sharing physical resources, such as printing costs.
- Expenses that were shared between partners.

Increased awareness

- Change in number of people who indicate that they know about the project or issue.
- Change in the number of people who know what the project does.

Metrics in Action 3.3: The **West End Revitalization Association (WERA)** serves residents, homeowners, and landowners of five African American communities in Alamance County and Orange County, North Carolina. It was founded in 1994 as the area's first and only community development corporation and community-based environmental protection (CBEP) organization. Concerned citizens originally founded the organization to address concerns about a particular highway project, but the organization's scope soon began to expand. WERA now addresses environmental health risks associated with unpaved streets, contaminated drinking water, and failed backyard septic tanks. WERA raises awareness of community members and policymakers by conducting community training workshops, protesting discriminatory land-development practices, and maintaining a communication campaign that includes an information website, articles in local newspapers, and publications in peer-reviewed journals.

WERA leveraged funding from both NIEHS and EPA to obtain additional financial support to conduct research on adverse environmental health impacts in the surrounding communities, including the collection and analysis of drinking and surface water. The evidence of very high levels of *E. coli* and fecal coliforms in the community's water helped WERA further leverage millions of dollars in block grants and matching municipal funds to install sewer systems in more than 90 houses, pave dirt streets, remove underground storage tanks, and stop housing construction on top of a century-old industrial landfill. WERA was able to achieve these changes because of its work to educate and involve the community members in solving the environmental health problems in their neighborhoods.

Metrics for raised awareness and interest:

- Description of communication systems between partners when help or resources are needed: *WERA hosted workshops to train community members about processes that could be used to address historical environmental justice issues. WERA also obtained coverage in local news to raise awareness of the issues.*

- Number of repeat collaborations: *WERA continues to rely on a core group of 35 volunteers and nine partnership groups to address the many environmental justice issues in their community.*

For more information about WERA, visit: https://www.wera-nc.org [accessed 19 January 2021]

Output 2: Increased project scope

Output 1	Output 2	Output 3
Raised awareness and interest	Increased project scope	Cost-effectiveness
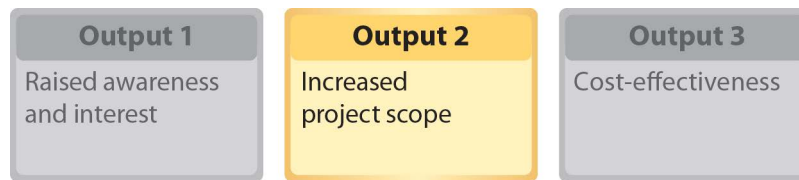
Leveraging can lead to an increase in the project scope. With research projects, broader goals can include the addition of new questions to be addressed. For community projects, broader goals can include reaching a broader audience or adding new strategies for reaching existing audiences. A project can expand over time by using data or other resources to address additional environmental health issues in a community. Increased project scope can also be a consequence of increased capacity.

Strategies for measuring increased project scope can focus on an analysis of factors that contribute to project scope. For example, partners can assess outreach that encourages more individuals to participate in studies and in other program activities. Partners can also measure whether participants become project partners and otherwise expand their involvement in the project. Analysis of new resources, such as equipment or working space, that allows for new research or outreach can be performed. And an assessment of productivity within the project itself can include factors such as increasing numbers of volunteers, capacity, and more. For example, as a project grows, there might be more volunteers involved, a greater capacity to analyze and collect data samples, or new goals added to the project plan.

> While increased project scope can be an important impact of leveraging activities, it is important to guard against "scope creep." If an organization starts to expand a project beyond the original intent, grantees may want to weigh the costs and benefits of the additional work and ensure that the resources are available to support the expanded scope.

Example Metrics for Output 2: Increased project scope

- Number of study participants over time.

    – Increases in people collecting and analyzing data.

    – Increases in individuals sampled or contacted because of larger networks.

    – Increases in study size because of pooled cohorts.

- Number and types of target audiences the project reaches over time.

    – Trends of attendance and contributions at meetings.

    – Increases in the number of individuals attending workshops.

    – Increases in people expressing interest in program.

    – Increases in the number of people or partners taking action to change workplace, school, or community processes.

- Description of changes in the specific aims of a project as a consequence of leveraging new resources.

- Number and description of new connections with other projects (e.g., relationships or resource sharing).

- Description of follow-up and supplementary work or resource development.

    – Number of competitive renewals and grants submitted and awarded.

    – Description of applications to an Environmental Health Sciences (EHS) Core Center grant for a pilot project.

    – Evidence of expansion of roles of individuals, e.g., from being a partner to a principal investigator.

- Description of diversification of questions and topic within the project.

    – Description of the growing complexity of grant applications as data and resources increase.

    – List of potential future research needs agreed upon by partners.

    – Description of partnership and communication models applied to the project and results of these efforts in new relationships.

    – Number and description of additional projects and partners.

Metrics in Action 3.4: The **Somerville Immigrant Worker Health Project (SIWHP)** is a partnership based in Somerville, Massachusetts, that includes the following organizations:

- Immigrant Service Providers Group/Health (ISPG/H)

- Community Action Agency of Somerville (CAAS)

- Brazilian Women's Group (BWG)

- Haitian Coalition of Somerville

- Massachusetts Coalition for Occupational Safety and Health (MassCOSH)

- Cambridge Health Alliance (CHA)

- Tufts University

    – Department of Civil and Environmental Engineering

   – Department of Public Health and Community Medicine

Somerville, Massachusetts, has a large and diverse immigrant population. Two perspectives shaped the consideration of immigrant occupational health in this project. First, the number of immigrant residents working and living in Somerville is undercounted because of issues concerning immigrant and legal documentation. Second, the work reported here follows the Environmental Justice model in that SIWHP holds to the premise that the environmental and occupational risks borne by immigrant workers are disproportionally distributed in society. Together, these perspectives led the group to attempt to reach further into the immigrant community in Somerville while bringing significant resources to the immigrant service agencies who were partners on this project.

The project recruited and trained a cohort of bilingual teen educators who devised and implemented a survey that produced information from self-identified immigrant workers living or employed in Somerville. The existence of the teen educators also provided an opportunity for educating the children of recent immigrants about occupational health and safety concepts and practices. The launch of the Vida Verde Co-Operative (VVCO), an environmentally conscious co-op of Brazilian immigrant women housecleaners, was also accomplished as a result of support from this grant. The VVCO features the use of environmentally friendly ("green") cleaning products and a structure that supports and empowers its members. The successful launch of the co-op is an extension of the Collaboration for Better Work Environment for Brazilians (COBWEB) project based at the University of Massachusetts at Lowell and at the Brazilian Immigrant Center in Boston.

Metrics in Action 3.4: Somerville Immigrant Worker Health Project *(continued)*

Metrics for increased project scope:

• Number and description of new connections with other projects: *The SIWHP provided the resources necessary for the launch of the "Green Cleaning" VVCO, which after its successful launch addressed its sustainability by successfully raising funds to contract the ICA Group (ICA), a nationally recognized consulting group, to assist them in developing a business plan. The VVCO continues to thrive, and it met the targets for new members and number of houses under contract from 2008 to 2010, based on the business plan. These achievements, together with the health-driven and market-oriented adoption of green cleaning products, generated much media interest in the VVCO in addition to an invitation from the Danish government to share experiences about the roles that non-governmental organizations can play in fostering positive changes in immigrant occupational health.*

• Number and types of target audiences the project reaches over time: *The SIWHP leveraged PEPH environmental justice funding and experience to develop "evidence-based" policy recommendations for representatives of the broader Somerville community (including local and statewide appointed and regulatory officials, local and state elected officials, and union representatives) and for a group of immigrant workers at a Community Meeting on October 13, 2010.*

Output 3: Cost-effectiveness
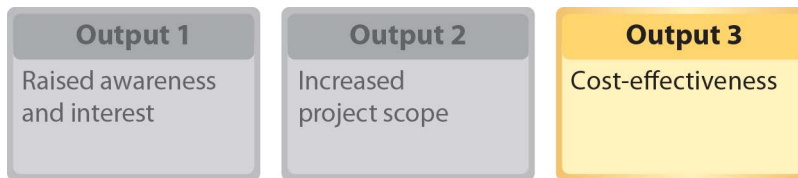
Cost-effectiveness is the extent to which an undertaking maximizes the value attained from the resources used. Toward this goal, partners can use funds strategically to take full advantage of the productivity of a project or program. Partners can also strive to get more done with fewer resources while maintaining overall project goals and objectives.

Cost-effectiveness is a common output from leveraging activities because the objective of leveraging is often to stretch existing resources further. For example, partners can be more cost effective if they can add questions or analyses to existing studies or pool their resources for common aims.

Approaches and techniques for measuring cost-effectiveness can include comparing the expected costs of projects operating separately verses the costs of the same projects working together. Partners could obtain anecdotal evidence and survey comments on the coherence, communication, and coordination of projects that might result in cost savings. Analyzing the level of duplication among projects in the same area or field is another possible approach.

Example Metrics for Output 3: Cost-effectiveness

- Comparison of actual productivity using leveraged resources to estimated productivity without leveraged resources.

- Description of duplicate efforts that were minimized.

- Description of effectiveness of combined efforts.

Impacts

Impacts are benefits or changes resulting from activities and outputs. We identify three potential impacts that grantees might expect as a result of leveraging:

> Impact 1: Broader reach
>
> Impact 2: Increased ability to leverage resources
>
> Impact 3: Sustainability

Impacts are more difficult to measure than activities and outputs, in part, because it often takes several years for substantive changes to occur. When thinking about the impacts a project might be able to achieve and how to measure those impacts, it can be helpful to think in terms of short-term and long-term impacts. Short-term impacts are typically those changes that would be expected to see in the first few years of a project. Long-term impacts might not be seen for five or more years. It is helpful for grantees to identify intended impacts so that they can identify measures that will help document their progress in achieving impacts.

Grantees may also be hesitant to claim credit for impacts because other organizations or other contextual factors may have contributed to the changes. While grantees may not be able to claim sole credit for these impacts, it is important to be able to track these broader changes and to document the contributions made by the project to achieving these impacts.
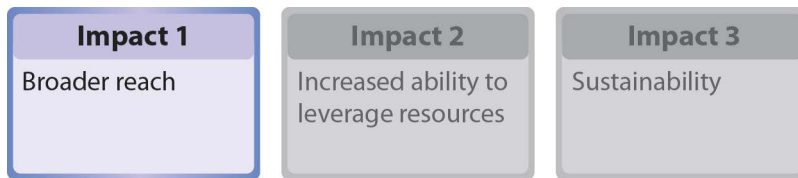
> For additional information on long-term impacts, see **Chapter 7: Principles of Evaluation**.

Although there are challenges associated with measuring impacts, tracking progress toward these goals helps grantees stay on track, demonstrate success, and identify areas for improvement. What is most important is that the ultimate goal of leveraging is to produce outcomes and impacts that lead to improvements in health through a reduction in environmental health hazards.[20]

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[20] See also, Silka L. 2000. Evaluation as a strategy for documenting the strengths of community-based participatory research in: Successful Models of Community-Based Participatory Research, 29-31 March 2000: Final Report, Washington, DC. 49-54. (O'Fallon LR, Tyson FL, Dearry A, eds). Available: *https://www.hud.gov/sites/documents/DOC_12485.PDF* [accessed 19 January 2021].

Impact 1: Broader reach

Impact 1	**Impact 2**	**Impact 3**
Broader reach	Increased ability to leverage resources	Sustainability

Broader reach is defined as the ability of a project to have a greater effect on the target population or environmental health issue than was originally planned. Grantees with broader reach may see an increase in the number of questions addressed by the project or may reach a broader audience. For example, a project's initial research questions may have focused on contaminated water, but then expanded to investigate the causes of a contaminated landscape. Alternatively, the project might have begun by targeting a single local community and expanded to influence national public health efforts.

Grantees may also achieve a broader reach by working to effect policy or regulatory change or to modify clinical practice guidelines. Policy change may take place at the organizational, local, state, or national level, and therefore it guarantees a much broader reach than specific, targeted interventions. Alternatively, grantees may achieve broader reach by influencing changes to clinical practice guidelines, whereby physicians change their treatment practices for all patients. For example, a PEPH project may work with a group of physicians to educate them about asthma prevention interventions that focus on healthy home environments. If physicians adopt this practice for all their patients, the project reaches more families than just those who may have been involved in the initial intervention.

Example Metrics for Impact 1: Broader reach

- Number and types of people that are affected by the results.

- Number and types of topics that are addressed.

- Change in number of target audiences.

- Description of target audiences added.

- Number and description of additional or expanded research questions.

- Number and types of policies or regulations that can be or have been influenced by the project:

    – Environmental health regulations at the local, regional, state and national level.

    – Zoning ordinances to decrease exposure to pollutants.

    – Clinical practice guidelines.

Metrics in Action 3.5: By working to influence local policy through the **Clean Air for Barrio Children's Health (CABCH)** project, **Environmental Health Coalition** staff and National City community residents were able to broaden the reach of their environmental health activities. Rather than working with individual body shops, the group persuaded the City Council in National City, California, to adopt an ordinance that will result in the relocation of auto body shops out of the neighborhoods. This strategy will reduce exposure of residents and students at Kimball Elementary School to emissions of vehicle paints, solvents, and metals. In addition, the City Council of San Diego banned commercial vehicles weighing more than five tons from Cesar Chavez Parkway, a major street that runs through the heart of the Barrio Logan community, and from several other Barrio Logan streets. According to the project's report, "an estimated 2,600 trucks per day are re-routed around the community since the ban has been enforced, beginning in January 2006. This action [further] reduces the community's exposure to diesel exhaust and truck safety hazards."

Metrics for broader reach:

- Number and types of people that are affected by the results: *Community members who live in the Barrio Logan and National City areas.*

- Number and types of policies or regulations influenced by the project:
  Two policies were implemented as the result of this project: an ordinance that phased out auto body shops from neighborhoods and a city law banning commercial vehicles weighing more than five tons from the Cesar Chavez Parkway.

Impact 2: Increased ability to leverage resources

Impact 1	**Impact 2**	**Impact 3**
Broader reach	Increased ability to leverage resources	Sustainability
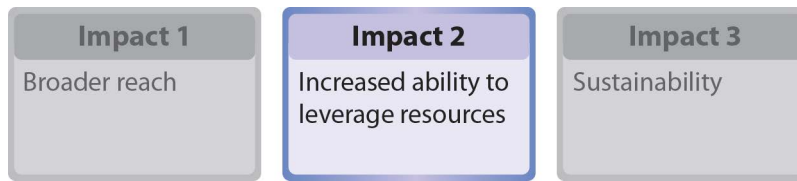
By working to leverage resources to address environmental health issues, grantees also gain the ability to help communities with other issues. Grantees with an ability to leverage resources might have a larger network of partners, more ideas, and greater knowledge. The ability to leverage resources also means that grantees and their partners typically have access to more funding opportunities. In addition, stronger organizational structures can result in greater organizational sustainability or longevity (see Impact 3).

For additional information on capacity building, see **Chapter 6.**

Example Metrics for Impact 2: Increased ability to leverage resources

- Number of project staff or volunteers who work to leverage resources.

- Number and description of trainings provided to teach project staff and partners about fundraising.

- Number of larger grants that were submitted or awarded.

- Number of people and partners involved over time.

- Number and types of topics covered by project scope that increase with increasing resources.

- Number and description of increased connections between groups, e.g., community organizations, researchers, health care professionals, and decision-makers.

- Description of larger projects that grew beyond the scope of the original projects.

Impact 3: Sustainability

Impact 1	Impact 2	**Impact 3**
Broader reach	Increased ability to leverage resources	Sustainability
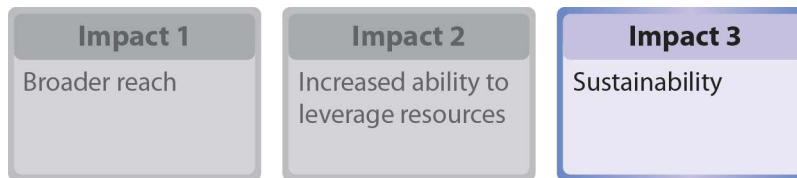
In the long term, leveraging can also contribute to greater project sustainability. Sustainability is the capacity to endure. By leveraging current resources, a project can have a greater and longer-lasting impact. Sustainable activities and partners typically follow when projects can achieve some level of sustainable funding. Some examples of the types of sustainability that can be measured within PEPH projects are:

• Sustainable funding can be achieved by finding other funding sources, coordinating services with other partners, looking for ways to reduce duplicate services, and sharing resources and infrastructure with other partners. Sustainable activities and partnerships typically follow when organizations can achieve a level of sustainable funding.

• Sustainable activities are individual actions associated with PEPH projects that can be maintained or utilized over time, such as the creation of a community website where people are allowed to add content, comment on research, and participate in a forum for dialogue.

• Sustainable partnerships are manifested by the continued collaboration of members of various groups that are united by PEPH-related goals, such as collaboration between university and community partners to reduce environmental exposures. For example, partners might be able to maintain a working relationship that extends over the course of several projects, such as a memorandum of understanding, or MOU.

• Sustainable projects leverage existing resources by regularly applying for additional funding and expanding investigations to address concerns of the community.

Example Metrics for Impact 3: Sustainability

• Number of funding streams maintained over time.

• Number of financial relationships that extend over the course of several projects.

• Survey results or other forms of feedback that shows partners' continued commitment to the project.

• Number and description of policies enacted that ensure sustainability of impacts.

• Description of new or expanded research questions.

• Number of applications for additional funding.

• Relevance of information available through sustainable activities.

• Continued collaborations over long periods of time.

Metrics in Action 3.6: By securing funding from multiple sources and garnering the support of many individuals and institutions at the local, state, tribal, and federal level, the **Children's Environmental Health Network (CEHN)** has become a strong voice for children's environmental health research and advocacy in many areas. CEHN has established sustainable activities and partnerships despite its small size because of its excellent leveraging abilities. Although it has a small staff of five, those staff members work to coordinate and manage the activities of a consultant, a board of directors, a Policy Advisory Committee and a Science Advisory Committee. This leveraging of staff to coordinate these other volunteer partners ensures that the group has access to a much larger pool of human resources than just the paid staff. With the support of funding from other local, state, and federal resources, they stimulate nationwide research, education, awareness, and policy formation to produce strategies that protect children from environmental health hazards and promote a healthy environment. CEHN also serves as an information resource for those interested in up-to-date information in pediatric environmental health.

CEHN built a strong national leadership by collaborating at the local level with various groups united by similar goals. The organization holds leadership positions on a few key partner boards as well as with partner health collaboratives and committees in Washington, D.C. At the local level, it creates advisory boards involving local child-care providers, child-care licensing staff, health professionals, and representatives from federal agencies (EPA, CDC, and NIEHS). The sustainability of this partnership stems from the strength of this network. The network adapts well to current and rapidly changing issues pertaining to childhood health and leads to sustainable partnerships.

Metrics for sustainability:

- Number of funding streams maintained over time: *CEHN has X sources of funding that have remained stable over the course of the organization's history.*

- Number of financial relationships that extend over the course of several projects: *XX organizations have provided funding for more than one CEHN project.*

Chapter 3 Case Study: Environmental Impacts of Large-Scale Goods Movement

The two side-by-side ports of Los Angeles and Long Beach are dubbed Southern California's "economic engine" by economic development advocates. According to the U.S. Department of Transportation, more than 40% of all imported goods for the United States enter through this essential port complex of Los Angeles and Long Beach. A national economic impact study of the twin ports reported in March 2007 that imports coming through the complex generated jobs, income, and tax revenue in every state of the United States. Although the economic importance of international trade is recognized, the environmental public health concerns associated with trade are also numerous. The U.S. Environmental Protection Agency (EPA) called the movement of freight into and out of such complexes a "public health concern at the national, regional, and community level."[21]

Photo credit: Andrea Hricko and Port of Los Angeles

In 2001, only those residents affected directly by their pollution and heavy traffic thought about the human health implications of ports and the transport of goods. It was not until the NIEHS sponsored a town hall meeting on "Healthy Schools," hosted by the **Environmental Health Sciences (EHS) Core Center at the University of Southern California (USC)**, that a community representative expressed concern about the impact of ports and the transport of goods on air quality, particularly from diesel emissions. USC EHS Core Center members responded to the town hall comments by working closely with community residents to understand concerns and begin developing research and outreach on these issues. In response to the town hall meeting, that same year homeowner associations participated in lawsuits that challenged the Port of Los Angeles's environmental review of planned construction for a major shipping terminal, and various collaborations emerged to combine environmental objectives and trade policy.

In February 2005, USC convened a follow-up town meeting called "Growing Pains: Health and Community Impacts of Goods Movement and the Ports" to discuss the effects of international trade on the Southern California region. Building on the outcomes of that meeting, the USC Center organized an even larger town meeting in 2007 in partnership with other academic and community organizations. The "Moving Forward" conference brought together participants from across the United States to discuss the impacts of goods movement on human health.
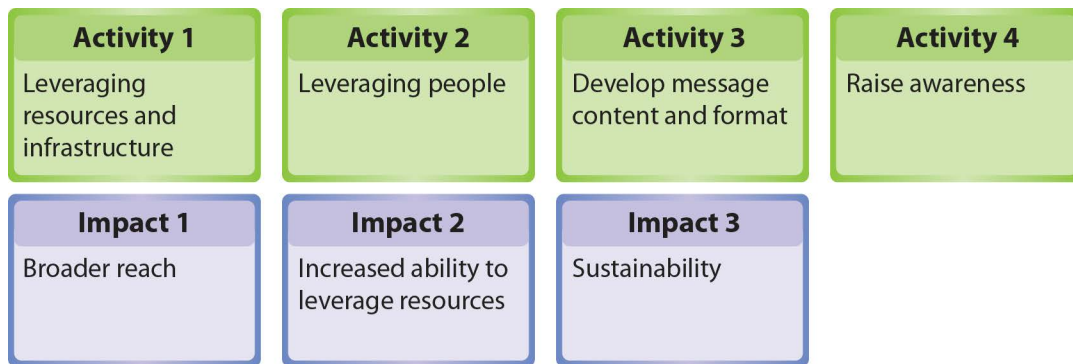
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[21] Hricko A. 2008. Global trade comes home: Community impacts of goods movement. *Environ Health Perspect* 116:a78-A81.

During a meeting of the National Environmental Justice Advisory Council (NEJAC), the EPA also cited mounting evidence that local communities adjacent to ports and heavily trafficked goods movement corridors are the most significantly affected by the goods movement system. NEJAC therefore decided to hold a town hall meeting to bring together partners and members of the community to discuss how best to protect the health of community members and workers and to improve the "quality of life" in affected communities.[22]

Figure 3.2 Case Study Logic Model

Activity 1	**Activity 2**	**Activity 3**	**Activity 4**
Leveraging resources and infrastructure	Leveraging people	Develop message content and format	Raise awareness

Impact 1	**Impact 2**	**Impact 3**
Broader reach	Increased ability to leverage resources	Sustainability

Below we discuss the activities, outputs, and impacts of these town meetings.

Activities

The town meetings brought together a variety of groups to network and share ideas (Activity 1: Leveraging people). Groups included:

- Economists

- Elected officials and government staff

- Health scientists and academic researchers

- Interested residents

- Members of community-based, environmental, and environmental justice groups

- News media

- Officials and staff from the logistics industry (ports, railroads, trucking associations)

- Transportation and regional planners

- Labor representatives from the ports, rail, trucking, and other goods movement industries

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[22] USC Children's Environmental Health Center. Community Outreach.

The specific objectives of the town meetings were to:

- Share results from scientific studies on the health effects of air pollution on children, the elderly, workers, and others (Activity 3).

- Provide an opportunity for community members and workers to voice environmental health concerns about goods movement and the ports, including concerns about air pollution, as well as transportation of hazardous materials (Activity 4).

- Raise interest in and awareness of community environmental health concerns (Activity 4).

Neighborhood Assessment Team members count truck volume and measure ultrafine particles in West Long Beach.
Photo by Andrea Hricko

- Share information on strategies for reducing exposure to diesel exhaust and other air pollutants (Activity 3).

- Leverage communication infrastructure by providing an opportunity to discuss the policy implications of increased international trade and goods movement on community health and worker safety, as well as on air quality, jobs, the economy, traffic and community life (Activity 1).

- Leverage social infrastructure by developing a regional communications network for the latest scientific findings, information on new goods movement infrastructure projects, and environmental health solutions (Activity 2).

Metrics:

- Number and types of topics that are addressed: *The town meetings discussed impacts of trade and goods movement on health and air quality, as well as on traffic, jobs, and the economy. This broadened the topic raised in the first meeting (air quality) and increased the potential policies the meetings can influence.*

- Number and description of policies enacted that ensure sustainability of impacts: *The project advocated for several regulatory changes by incorporating health and safety considerations as an integral component of goods movement and transportation decisions.*

Attendees leveraged ideas and knowledge by participating in discussions of:

- Relevant scientific findings on air pollution and health effects.

- Impacts of trade and goods movement on health and air quality, as well as on traffic, jobs, and the economy.

- Local and regional impacts from transporting, warehousing, and distributing goods.

- Solutions to reduce diesel exhaust and other air pollutants and to prevent hazardous materials spills and other incidents.

- Ways to share information in the future.

Outputs and Impacts

The town meetings began an information-sharing collaboration that resulted in leveraging ideas and knowledge. As a result, the group identified interim outputs of longer-term project goals and assessed intended outputs and impacts. These interim outputs included:

1. Increased interest and awareness by producing momentum to deal with the environmental health challenges of goods movement (Output 1). The multiple meetings allow one to describe a growing number of new organizations and collaborations. The changing participants in the meetings likely showed increased expertise as new relationships formed based on technical or expertise gaps in the group.

2. Broader reach and ability to leverage resources by sharing local and regional concerns and solutions (Impacts 1, 2). The town meetings discussed impacts of trade and goods movement on health and air quality, as well as on traffic, jobs, and the economy. This strategy broadened the topic raised in the first meeting (air quality) and increased the potential policies the meetings can influence.

3. Increased capacity of individuals and organizations to consider community and worker concerns when developing scientific research agendas (Impact 2).

4. Creation of sustainable regulatory changes by incorporating health and safety considerations as an integral component of goods movement and transportation decisions (Impact 3).

Metrics:

• Number and types of topics that are addressed: *The town meetings discussed impacts of trade and goods movement on health and air quality, as well as on traffic, jobs, and the economy. This broadened the topic raised in the first meeting (air quality) and increased the potential policies the meetings can influence.*

• Number and description of policies enacted that ensure sustainability of impacts: *The project advocated for several regulatory changes by incorporating health and safety considerations as an integral component of goods movement and transportation decisions.*

Summary of Leveraging Metrics

Example Metrics for Activity 1: Leveraging infrastructure and funding

- Number and description of physical space obtained or used from other sources.

- Number and description of office equipment, supplies, or existing products obtained or used from other sources.

- Number and description of organizational or technical resources obtained or used from other sources.

- Dollar amount obtained from other funding sources.

- Number of applications submitted and funded ("spinoff" funding).

- Number and description of contacts made that might be tapped for additional funding.

Example Metrics for Activity 2: Leveraging people

- Number and description of networking activities.

- Number and description of listings in contacts or network databases.

- Number of new people contacted in leveraging efforts.

- Number of new people brought into the project.

- Number and description of relationships formed or expanded.

- Number and description of formal advisory board activities conducted to leverage relationships, ideas, and knowledge.

- Descriptions of ideas or knowledge resulting from these activities.

- Number and description of bartered exchanges.

- Number of ad hoc meetings, seminars, poster sessions, etc. that were held.

Example Metrics for Output 1: Raised awareness and interest

Expanded network

- Number and description of new relationships.

- Description of expertise provided by new partners.

- Description of communication systems between partners when help or resources are needed.

- Change in the number of people who contact your organization for more information.

- Description of new expertise gained through new relationships.

Increased Volunteers and Donations

- Number of new volunteers who get involved with the project following efforts to increase awareness and interest.

- Number or amounts of donations following efforts to increase awareness.

Example Metrics for Output 1: Raised awareness and interest

Increased collaboration

- Number of individuals and organizations who collaborate for the first time to accomplish a common goal (such as planning a town hall meeting).

- Number of repeat collaborations between partners.

Partner sharing of resources

- Description of shared meeting space or other meeting resources (such as planning a small meeting during an associated national conference).

- Costs or description of sharing physical resources, such as printing costs.

- Expenses that were shared between partners.

Increased Awareness

- Change in number of people who indicate that they know about the project or issue.

- Change in the number of people who know what the project does.

Example Metrics for Output 2: Increased project scope

- Number of study participants over time.
  - Increases in people collecting and analyzing data.
  - Increases in individuals sampled or contacted because of larger networks.
  - Increases in study size because of pooled cohorts.

- Number and types of target audiences the project reaches over time.
  - Trends of attendance and contributions at meetings.
  - Increases in the number of individuals attending workshops.
  - Increases in people expressing interest in program.
  - Increases in the number of people or partners taking action to change workplace, school or community processes.

- Description of changes in the specific aims of a project as a consequence of leveraging new resources.

- Number and description of new connections with other projects (e.g., relationships or resource sharing).

- Description of follow-up and supplementary work or resource development.
  - Number of competitive renewals and grants submitted and awarded.
  - Descriptions of applications to an Environmental Health Sciences (EHS) Core Center grant for a pilot project – Evidence of expansion of roles of individuals, e.g., from being a partner to a principal investigator.

- Description of diversification of questions and topic within the project.
  - Description of the growing complexity of grant applications as data and resources increase.
  - List of potential future research needs agreed upon by partners.
  - Description of partnership and communication models applied to the project and results of these efforts in new relationships.
  - Number and descriptions of additional projects and partners.

Example Metrics for Output 3: Cost-effectiveness

- Comparison of actual productivity using leveraged resources to estimated productivity without leveraged resources.

- Description of duplicate efforts that were minimized.

- Description of effectiveness of combined efforts.

Example Metrics for Impact 1: Broader reach

- Number and types of people that are affected by the results.

- Number and types of topics that are addressed.

- Change in number of target audiences.

- Description of target audiences added.

- Number and description of additional or expanded research questions.

- Number and types of policies or regulations influenced by the project:

  – Environmental health regulations at the local, regional, state, and national level.

  – Zoning ordinances to decrease exposure to pollutants.

  – Clinical practice guidelines.

Example Metrics for Impact 2: Increased ability to leverage resources

- Number of project staff or volunteers who work to leverage resources.

- Number and description of trainings provided to teach project staff and partners about fundraising.

- Number of larger grants that were submitted or awarded.

- Number of people and partners involved over time.

- Number and types of topics covered by project scope that increase with increasing resources.

- Number and description of increased connections between groups, e.g., community organizations, researchers, health care professionals, and decision-makers.

- Description of larger projects that grew beyond the scope of the original projects.

Example Metrics for Impact 3: Sustainability

- Number of funding streams maintained over time.

- Number of financial relationships that extend over the course of several projects.

- Survey results or other forms of feedback that show partners' continued commitment to the project.

- Number and description of policies enacted that ensure sustainability of impacts.

- Description of new or expanded research questions.

- Number of applications for additional funding.

- Relevance of information available through sustainable activities.

- Number and discription of continued collaborations over long periods of time.