

***TRAINING MODULES FOR EVALUATING
THE SOCIAL OUTCOMES OF WATER QUALITY PROJECTS***



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Social Indicators for Nonpoint Source Pollution in Minnesota
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Karlyn Eckman
Water Resources Center
University of Minnesota

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ACRONYMS

AEA	American Evaluation Association
AI	Appreciative inquiry
BMP	Best management practice
CE	Civic engagement
HSR	Human subjects research
IRB	Institutional review board
KAP	Knowledge, attitudes and practices
MPCA	Minnesota Pollution Control Agency
NGO	Nongovernmental organization
NPS	Nonpoint source pollution
PAR	Participatory action research
PLA	Participatory learning and appraisal
PRA	Participatory rural appraisal
RFP	Request for proposals
SIDMA	Social indicators data management system
SIPES	Social indicators planning and evaluation system
SOW	Scope of work
SWCD	Soil and water conservation district
TMDL	Total maximum daily load
TOR	Terms of reference
U of MN	University of Minnesota

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MODULE 1: INTRODUCTION AND CONTEXT

Purpose and audience

This training package is designed for local watershed staff and stakeholders that want to better understand their audiences, and more effectively engage residents on watershed issues. The Clean Water Act mandates that civic engagement be an integral part of watershed efforts. However, many watershed staff are trained in the biophysical sciences and have limited training in social sciences and civic engagement processes (Eckman *et al* 2008). This training packet aims to bridge the gap by explaining and summarizing a range of social science approaches, methods and tools. Social science research and social evaluation are large and complex fields, and the methods described here are only a small portion of available methods. Our purpose is to provide an overview of some methods that have been tested in Minnesota. We also hope to provide some guidance about which tools should be used under different conditions.

This training package includes a detailed explanation of the KAP study method, and lays out a simple protocol for conducting a KAP study. Although this method is commonly used in public health, education and other disciplines, it has not been widely applied to environmental projects in North America. The protocol for this method has not previously been described for watershed projects and is presented here for the first time.

Learning objectives for this training package:

1. Users should acquire a basic understanding of common social research methods that they can use to improve their watershed projects. They should understand how to use social data to design education and outreach strategies, and to evaluate the social outcomes of water quality projects. What is a social outcome for a watershed project? A social outcome implies that an audience adopts a new clean water practice, acquires new knowledge about water quality, is willing to change practices, and that barriers to adoption have been addressed.
2. Users should be able to determine which social research method to use in different conditions. They should be able to determine whether they have the capacity to use a method, and when to hire a consultant.
3. Users should be able to design a basic KAP study on a small project within their own watershed, using the steps outlined in this packet.

Why evaluate?

Watershed managers are often pressed to show the impacts of their projects. There is ever-increasing pressure to show concrete results of the investment of public funds for

such projects. However, research in Minnesota (Eckman *et al* 2008) has documented that very few non-point source (NPS) pollution projects are ever systematically evaluated. 55% of NPS projects in Minnesota do not evaluate changes in people's knowledge, awareness, capacity, attitudes, behavior, or resource availability prior to or during project implementation. A significant majority (71%) fail to evaluate adoption rates for best management practices (BMPs) or maintenance of a recommended practice (60%). It is likely that most project managers cannot determine with certainty the impact of their projects on intended target audiences. Primary constraints to evaluation include lack of staff time, training in evaluation methods, and insufficient resources. Even more challenging is the lack of understanding of the link between changing human behaviors and biophysical impacts on watersheds and water quality. Social assessment and impact evaluation can help project staff and stakeholders understand whether a project is successful in reaching its goals.

The human dimensions of a project can often be more challenging for watershed staff to deal with than the biophysical aspects.

Although NPS evaluation has been very challenging in the past, a lot of work has recently gone into the development of evaluation tools for watershed staff. New tools and methods have been tested in Minnesota and are now available for use at the project level. This training package describes the new tools, along with an iterative process for assessing and evaluating the impacts and outcomes of watershed projects on people, that is, your intended audience. Did a watershed population improve people's understanding of the causes of a water impairment? Did a neighborhood adopt a "best management practice (BMP)"? If not, why not? The techniques described in this package can help project staff to gain a basic understanding of an audience before planning an outreach or education initiative. The techniques described here can also help education and outreach staff to determine an audience's current level of knowledge and opinions about a watershed issue, to craft educational content that builds on people's existing knowledge. Finally, the techniques can help staff to inform evaluation by collecting data on concrete impacts on intended audiences.

This training package¹ offers some basic methods and tools for evaluating the social impacts of watershed projects. It stresses the need for interdisciplinary information, and the need for integration of physical and social processes. Few water resources projects today are one-dimensional. Most projects have elements of multiple disciplines and

¹ Material in this training package has been shared with the Watershed Specialist Training Modules (MPCA 2013), www.z.umn.edu/wst

sciences. In fact, the biophysical and social elements of a water resources project are commonly closely interwoven, and are often inseparable. Many impairments could be avoided if only people's behavior could be changed!

The human dimensions of a project can often be more challenging for watershed staff to understand than the biophysical aspects. Even though a water quality issue may have a straightforward technical solution, people often get in the way! Consider a situation where a lake has become impaired by excess phosphorus. The impairment has probably accompanied changing agricultural practices, residential development, and other human activities. People's yard care practices can affect water quality in nearby lakes and streams, as can their pets and livestock. Local agencies may look for the cause of the impairment, which leads upstream to people's yard care or farming practices. Consequently, an interdisciplinary approach is needed to fully understand the biophysical and socioeconomic factors that affect project success and sustainable outcomes.

In Minnesota, watershed project evaluation is still in its infancy. Most public agencies have limited capacity to do project evaluation, and they often rely on consultants or university staff to do this. Few agencies have a dedicated evaluation unit and do not have professional evaluators on staff. For watershed field staff, a first step is to determine how project evaluation is done within their own agency. We recommend that staff first do the exercise outlined in Exercise 1 below. This will be a good starting point to understand how evaluation is done in the "real world."

The American Evaluation Association (www.eval.org) is the primary resource for program evaluation in the United States. Most evaluation professionals, including those working in environmental programs in the biophysical sciences, are members of AEA and subscribe to AEA professional standards and ethics. Trainees seeking more detailed information about the approaches and methods in this training package are referred to the AEA website. There are also many publications available about evaluation theory and practice. A few of the more commonly used publications are listed in the References section at the end of this publication.

Exercise 1: Have coffee with an evaluator

The goal of this exercise is to become familiar with the evaluation practices used by your own agency or institution. Please do the following:

1. Determine which unit or department handles project or program evaluation within your agency.
2. Identify a staff member in that department, and ask to meet with them.
3. Have an informal conversation about how evaluation is done in the agency. Ask the following questions:
 - a. Who does program evaluation (internal agency staff or external evaluators or consultants)?
 - b. Which programs are evaluated, and how often?
 - c. Which evaluation methods and tools are used?
 - d. What is done with the results and findings of program evaluation?

APPROACHES TO EVALUATION

An approach to evaluation differs from an evaluation method in that an *approach* frames the overall evaluation strategy and determines what the evaluation will include (the design or parameters). An evaluation *method* describes the “how-to” aspects, that is, which specific techniques and tools will be used to gather information. Just as there are many approaches to social assessment, there are also many approaches to evaluation. Some common approaches to evaluation are summarized below. Not all have been applied to NPS projects in Minnesota.

Utilization-Focused Evaluation

Description

Utilization-focused evaluation emphasizes the importance of designing evaluations to insure their usefulness, rather than simply creating long reports that may never get read or never result in any practical changes. It is intended to be responsive to the information needs of “primary intended users,” facilitating their use of evaluation results or catalytic validity (Patton 1997).

This evaluation approach has not been used in Minnesota for evaluating NPS projects, and it is not known whether it has been used more generally in environmental evaluation. The method has been used to evaluate international development and agricultural projects.

Resources Needed

Since the method has not been used for watershed project evaluation in Minnesota, the level of resources needed and limitations of the method are not known at this time.

When to Use this Approach

The method would most likely be useful in very focused, applied evaluations with specific information needs, and in situations where adaptive management is used.

For More Information:

Michael Quinn Patton. 2008. *Utilization-Focused Evaluation, 4th Edition*. Thousand Oaks: Sage.

Goal-free Evaluation

Description

This approach, developed by Michael Scriven, rests on the premise that an evaluation should examine the value of a program by investigating what it is actually doing rather than what it is trying to do. The evaluator intentionally ignores the stated goals and objectives of the project and instead looks for real-world outcomes and impacts. Goal-

free evaluation is a more free-form approach to conventional evaluation, which focuses on whether the stated goals and objectives of the project have been achieved. The approach recognizes that most programs and projects have a variety of outcomes that were not originally foreseen by project planners. These may be surprisingly positive and welcome, or unfortunate unintended consequences.

Resources Needed

Goal-free evaluation uses approximately the same level of resources as conventional evaluation. The primary difference is the focus of the evaluation.

When to Use this Approach

This method may work well in experimental and pilot projects, and where social dimensions may not be well-understood.

Limitations

Goal-free evaluation should not be used when an agency or donor requires a rigorous conventional evaluation format.

For More Information:

Scriven, Michael. 1991. *Evaluation Thesaurus*. Thousand Oaks: Sage.

Participatory Evaluation

Description

Participatory evaluation has been described as “evaluation intended not only to improve program understanding but also to transform program-related working relationships through broad local participation in evaluation processes” (Greene 1997). Participatory evaluation arose in the international development arena with the rise of grass-roots participatory methods including participatory rural appraisal (PRA), participatory learning and action (PLA), participatory action research (PAR), people-centered development and other similar approaches. This collection of approaches and methods will likely have an appeal to those working on civic engagement issues.

Resources Needed

Participatory evaluation approaches tend to be qualitative in nature, and generally do not involve large probability samples that require significant resources for printing, mailing and other survey-related costs. Participatory evaluation is often associated with group-based meetings and discussions, key informant interviews and similar techniques. It often uses consensus-building and conflict resolution techniques. The primary costs are associated with experienced staff, mainly those with skills in group facilitation, ranking, problem-solving and capacity-building.

When to Use this Approach

Participatory evaluation works best where program participants or outcomes do not generally conform to conventional outcomes, or where minority cultural and community values exist. Examples might include situations where a public agency (such as the DNR or MPCA) is not trusted by a minority community; where civic engagement has been very successful and there is significant local capacity; and where community values and actions have taken a leading role in project administration or management. In all cases, local communities and groups have a significant stake in project outcomes and want their views and voices to be heard.

Limitations

The primary limitation is lack of quantitative metrics and measurement of outcomes, and heavy reliance on more subjective, qualitative methods.

For More Information:

Bamberger, Michael, Jim Rugh and Linda Mabry. 2012. *Real World Evaluation: Working Under Budget, Time, Data and Political Constraints. 2nd Edition*. Los Angeles: Sage.

Greene, J.C. 1997. "Participatory Evaluation" pp 171-89 in *Evaluation and the Postmodern Dilemma*, edited by L. Mabrey. Greenwich, CT: JAI Press.

Figure 1 below compares the three evaluation approaches summarized above.

FIGURE 1: Social Evaluation Approaches Compared

Method	Qualitative	Quantitative	Indicator-based?	Sample size	Cost	Level of expertise	Notes
Utilization-focused evaluation	Yes	Yes	No	Any	Medium to high	High	Agency-focused
Goal-free evaluation	Yes	Yes	No	Any	Medium	Medium	Mixed focus
Participatory evaluation	Yes	No	No	Small to medium	Low to medium	Medium	Grass-roots focus

EVALUATION METHODS FOR WATERSHED PROJECTS

Definition of Evaluation:

Program and project evaluation is a process that compares actual outcomes and impacts with the goals and objectives originally set out in the project's plan. Evaluation can be *formative* (for example, a baseline assessment that contributes to strategic planning), or *summative* (a retrospective examination of project outcomes). Evaluation is an interdisciplinary field that applies systematic inquiry to help improve programs, and can span many areas of expertise. As noted, the American Evaluation Association (www.eval.org) is the primary resource in the United States for the practice of evaluation, and provides guidelines on ethical and professional standards.

At its best, evaluation is an iterative process yielding solid information and data that can be used to make decisions and take action. Some projects or programs require periodic evaluation (a pre-project assessment, a mid-term review and a final evaluation). When should one start thinking about evaluation during the project cycle? Well-designed projects have an evaluation plan and budget from the beginning, spelling out what is to be evaluated and how evaluation will be conducted. The American Evaluation Association recommends that projects be *evaluation-ready* from the outset, and that a clear plan to measure results and outcomes be defined as the project is designed. This means that funding for evaluation is included in the project budget, that key social baseline data is obtained, and that an evaluation plan is included in the project document. Iterative evaluation contributes to adaptive management, in that stakeholders can adjust a project strategy as new information becomes available.

While our focus is on evaluation approaches and methods, it is common to use social research methods evaluate outcomes. These social research methods include social surveys, unobtrusive observation and other techniques. There are many common ways to do social research and project evaluation, from simple to complex. The methods you chose depend upon what you need to know in your specific context, your local capacity to do social research, and available resources. It is also common to use a mixed

Know your audience!

Refer to the section on social assessment methods, and arrange to obtain baseline social data *before* your project begins. This is very important to be able to effectively engage people and evaluate results. Determine whether your organization has the internal capacity to obtain baseline social data. If not, identify a partner, subcontractor or consultant to do this.

methods approach, for example, by combining a social survey with unobtrusive observation.

You might determine that you lack the internal capacity and resources to do social assessment, and elect to contract out these services. In such a case, you should define your information needs before hiring a consultant, and clearly specify those needs in the consultant's contract.

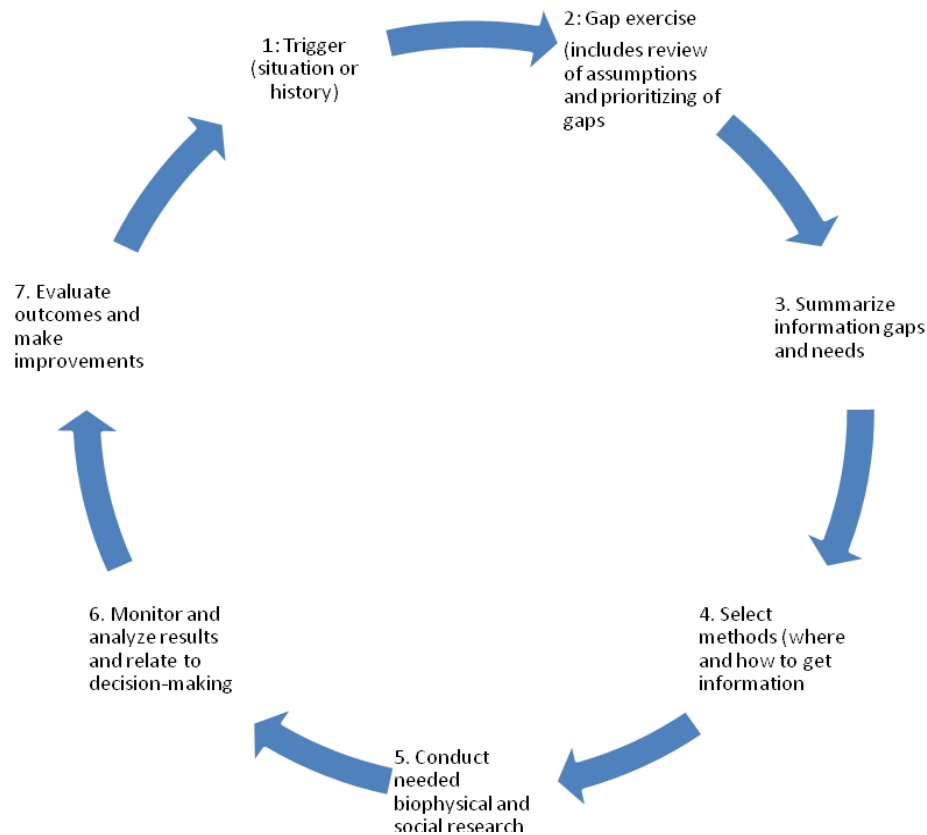
The American Evaluation Association recommends that projects be *evaluation-ready* from the outset. Have a clear plan to measure results and outcomes be defined during the planning process.

Where it All Begins: The Discovery Process

Where in the watershed cycle should baseline social research occur? Often there is some trigger or event that will result in a watershed project. This could be a series of complaints from the public, the discovery of a pollutant in a local water body, or the action of a state or local agency. This “trigger” can result in an iterative process of fact-finding, civic engagement and decision-making to remedy the problem. Ideally, an initial social assessment should be done very early in the project cycle so that “pre” and “post” project conditions can be compared at the end of the project. This is especially important for affected populations so that actual changes in human awareness, attitudes and behaviors can be determined accurately.

Ideally, watershed staff and stakeholders should begin with a *gap analysis* or exercise to identify the factors contributing to a watershed issue, focusing on what is known (or not known) about those factors. A gap exercise can help staff to determine the types of research, biophysical and social, that needs to be done to help remedy the issue. Figure 2 below outlines the iterative steps in watershed evaluation.

*Figure 2: The Discovery Process –
An Iterative Cycle for Evaluating Watershed Projects*



It is suggested that the project team begin with a situational assessment (Step 1), where the team identifies and articulates the problem or issue at hand. Think about questions such as:

- Is there a trigger or history to an issue?
- In a broad sense, what do we already know about our specific context or situation?
- What is our current interpretation of the situation?

Sometimes it is useful to map complaints from the public about the problem with GIS. The situational assessment can lead directly to a discussion about what is known (and not known) about the issue, called a “gap exercise” (Step 2). The first two steps can often be combined unless the trigger is very complex. The gap exercise is described in more detail below.

Step 2: Gap exercise

Now that you have considered what is known about a problem, the focus moves to what is *not* known about it. This is accomplished through a short brainstorming session called a gap exercise. This is best done with a small project team of staff and key stakeholders (ideally three to eight people), usually taking about three hours. The gap exercise is a basic first step in the social research method called the KAP study (described in Module 3 below). It can also be used in interdisciplinary settings, where human and biophysical processes are linked.

Step 3: Summarize the information gaps and needs in a table

One of the team members should transfer the information from the gap exercise into a simple Word table. The table is circulated to team members for review and comment. If the team has come up with many gaps, it helps to prioritize or rank the gaps that have been identified. Which can we effectively deal with so many issues in this project? Which have to be set aside for now? An example of a gap table is given in Annex 1.

Step 4. Select the methods to be used to obtain the information

Next, determine how and where to get the information needed to address the gaps just identified in the gap exercise. Check first to see if some data may already be available in existing sources (STORET, US census, county records, DNR permits, etc.). If not, then determine how to get it on your own. A key question to consider is whether there is in-house capacity to directly obtain the data? Can we do this? Do we have the internal resources to do an assessment? If yes, determine the methodology and secure necessary internal resources and people. If no, seek outside expertise through a consultant or contractor. Prepare a *scope of work* (SOW) or *terms of reference* (TOR) to recruit and screen possible consultants.

The scale of the project in part determines how it will be assessed, monitored and evaluated, as well as the methods chosen. Also, the size of the audience in part determines the types of assessment and evaluation methods that you can use. Random probability samples can be drawn from larger audiences (generally over a thousand individuals). Simpler methods should be used for smaller audiences. Most nonpoint source projects in Minnesota have audiences too small for random probability sampling (Eckman *et al* 2008). In such cases you must either sample everyone in the target area, or define a sub-set to include in your sample.

It is also important to consider the nature of your sample. If you intend to engage an entire community, the community capacity model (Davenport *et al* 2013) can provide practical guidance. If you intend to work with individuals, then consider social research approaches and methods that focus on people as individual actors. This is especially

important if the group is not homogenous, or if your sample is widely dispersed geographically (for example, trainees of an NPS project, county-wide property owners, or a statewide sample of septic workers or irrigation permit holders). Figure 3 below provides guidance about which approach or method is appropriate for different types and sizes of audiences.

There are a few quantitative social assessment and evaluation methods designed specifically for water quality programs (Illinois Social Profile; SIPES). Other social assessment and evaluation methods are generic and are used for different purposes, but can be used in watershed programs. These methods are briefly summarized below. Some methods can be either quantitative or qualitative. Many researchers use these methods in combination, called a *mixed methods approach*.

Step 5. Conduct necessary biophysical and social research to address the gaps; establish a monitoring framework if indicated. As in Step 4, a consultant might be needed to carry out this step. Some common social research approaches are summarized below, and are compared in Figure 17 in Module 9.

Step 6. Monitor, analyze and interpret results, and relate to decision-making. What do we do about the issue? What strategy do we chose to address it, and why? How do we monitor progress? The data obtained in Step 5 should help watershed staff and stakeholders to make more informed decisions through an iterative, adaptive management process.

Step 7. Evaluate outcomes and use information for strategic planning and to inform future projects. Evaluation is not only about outputs and indicators. Evaluation should tell staff and stakeholders *what happened as a result of our project*. What actual changes in water quality, people's knowledge and practices, and adoption of BMPs have taken place? Is there evidence that such change took place? Real-world outcomes are those that enable stakeholders to become involved in the watershed planning process, that help people overcome barriers to the adoption of a BMP, or that foster new knowledge and awareness among watershed residents.

THEORY OF CHANGE IN EVALUATION

Most watershed and water quality projects today are interdisciplinary in that they address both biophysical and social dimensions. The link between human actions and water pollution is often difficult to understand, and even more difficult to measure. Are people causing a water quality problem? How do we prove that a certain behavior is causing the issue? Why do people behave in a certain way? What barriers and risks do they face when asked to do something differently? How can we change their behavior in order to reduce the pollutant? These are common conversations among watershed managers that often go unresolved.

Preparing for an evaluation actually begins during project planning, by clearly defining *why* a particular social outreach strategy was used, and *how* it is expected that human actions and knowledge will change.

Watershed projects commonly promote best management practices, intending to persuade stakeholders to adopt a particular practice (installing a rain garden), or avoid certain behaviors (pouring motor oil down a storm drain). The means by which the BMP is promoted is often based on one of several theories that attempt to explain social and behavioral change. For example, an SWCD might promote a BMP by offering a financial incentive or cost-share to help “persuade” an audience (*social marketing* and the persuasion-based *theory of planned behavior*).

Alternatively, an SWCD might organize a series of hands-on activities and positive educational content for groups of neighbors or local stakeholders that draw on environmental, community, and personal themes (*social learning theory*). Another strategy is to publicize negative or admonishing messages (“Don’t pollute!”), or to set penalties for undesirable behaviors (*theory of reasoned action*), in the belief that people will avoid peer pressure and penalties. In fact, most projects will devise a social outreach and education strategy that is based upon assumptions about which mechanism (an incentive, a hands-on workshop, peer-to-peer messaging, or a penalty) motivates people to do something (adopt a particular behavior, or refrain from another behavior). But are those assumptions correct?

When evaluating the social outcomes and impacts of a project, an evaluator will want to know why a particular strategy (incentives, group activities or penalties, for example) was selected. What was the underlying theory of behavioral change, and how did it relate to the actions people were expected to take? Was a social baseline survey done about people’s existing level of knowledge that informed the educational messaging? Did the project collect data on motivation, constraints, and existing practices and behaviors? Which of these was expected to change?

In other words, preparing for an evaluation actually begins during project planning, by clearly defining *why* a particular social outreach strategy was used, and *how* it is expected that human actions and knowledge will change. As noted above, the American Evaluation Association now recommends that all projects be *evaluation-ready* by the time the project design phase is completed, and before implementation begins. A well-designed evaluation provides evidence that a project has been successful, by comparing pre-project data about knowledge, behaviors and attitudes with post-project outcomes.

Outcome rules

There are a few simple guidelines or rules by which projects can determine results and outcomes. The following are the minimum necessary questions that must be answered to determine whether the project was successful:²

- Did people *increase their knowledge* about a specific watershed or water quality issue?
- *Did attitudes shift* in a positive direction?
- Did people *adopt a recommended practice*, and did they maintain it over time?
- Did the project identify and address any *barriers or constraints*?

These questions must be answered by comparing pre and post-project social data, and gathering evidence that these elements have in fact changed.

Exercise 2

1. Choose a project that you are familiar with. Try to identify the project's **theory of change** by describing the expectations about **why** you expect that your audience would be willing to change their behavior, for example, by adopting a new BMP. Describe why you want to affect that change. State your assumptions about what will motivate your audience to make a change (for example, their concern for clean water; wanting to do the right thing; profit motive; fear of penalties; or other reason).
2. Based on your theory of change, consider **how** you will affect the change, such as promoting the adoption of a new BMP (**your theory of action**).
3. Consider why people might not behave as they are expected to do, that is, to adopt a recommended BMP. Consider what barriers and constraints people might face in making a change. For example, is the change too risky, too expensive, requires too much labor, etc.?

² Eckman 2011; Eckman, Nuckles and Were 2012.

A NOTE ABOUT HUMAN SUBJECTS RESEARCH (HSR)

An objective of many water quality projects is to encourage people to change a particular behavior, acquire new knowledge, or adopt a different practice. Your project may also intend to engage local people in water quality efforts, especially in watershed planning or project implementation. In these cases you will need information about people's current behaviors, attitudes or practices in order to determine whether the project has successfully led to engagement, behavioral change or other outcome. Socioeconomic research will often be needed to better understand people's behaviors, motivations, and opinions. Such research on people, whether individuals or community-based, is considered to be human subjects research (HSR), and is subject to federal and state laws. The rules are mainly intended to protect human subjects in medical research trials and in psychiatric or educational research, and have provisions and protections for working with children, prisoners and other special groups.

The federal statute governing human subjects research are found in Title 45, Part 46 (45 CFR 46) in the Code of Federal Regulations³, and is known as the Common Rule. This statute is considered the legal standard guiding all government-funded research regardless of funding source. The statute provides for institutional review boards (IRBs) for federal and state agencies (such as land grant universities), although some agencies (such as the FDA) have established their own internal review processes. The Common Rule establishes research rules and ethics for medical, food, and drug research, and processes for reviewing proposals to conduct research with human subjects. It also governs confidentiality, privacy, informed consent, and the safekeeping and security of HSR data. The IRB reviews research projects which involve human subjects to ensure that two broad standards are upheld: first, that subjects are not placed at undue risk; second, that they give un-coerced, informed consent to their participation.⁴

For watershed projects, training in HSR should be provided to staff and interviewers hired to carry out studies. Social data that is collected as part of a survey or study must be kept confidential and secure (encoded). Once entered into a database, questionnaires should be shredded.

³ U.S. Department of Health and Human Services. "[Code of Federal Regulations](#) - Title 45 Public Welfare CFR 46". Retrieved 2008-10-21.

⁴ U.S. Department of Health and Human Services. 1979. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research. www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

Socioeconomic research in environmental projects is generally deemed except from Common Rule provisions (informed consent), although data protection and confidentiality are an essential requirement. If your project team is considering a socioeconomic study, contact your agency (such as DNR or MPCA) about current internal HSR rules and guidelines. If you have contracted a university⁵ or college, an internal IRB review will likely be needed. A private consultant or contractor will also need to follow Common Rule provisions.

⁵ The University of Minnesota IRB website is
<http://www.research.umn.edu/irb/#.UHmOiJbYG8Q>

MODULE 2

SOCIAL ASSESSMENT FOR WATER QUALITY PROJECTS: STANDARDIZED METHODS

This section summarizes some conventional methods for collecting social data and for evaluating the social impacts of watershed and other environmental projects (Steps 4 and 5). There are only a few standardized frameworks available for assessing the social dimensions of water quality projects and programs. These include the *Social Indicators Planning and Evaluation System (SIPES)* (Genskow and Prokopy 2011) and the *Illinois Social Profile for Watershed Planning* (McDermaid and Barnstable 2001). The SIPES framework has been tested in Minnesota by the Minnesota Pollution Control Agency in collaboration with the University of Minnesota Water Resources Center. It is thought that the Illinois Social Profile has not been used previously in Minnesota. Both methods provide guidance for conducting a social survey of a watershed population and are summarized below. The two methods are described in detail in other publications, and are only briefly summarized here.

The Social Indicator Planning and Evaluation System (SIPES)

Description

The *Social Indicator Planning and Evaluation System* (SIPES) is a relatively new Internet-based framework for planning and evaluating water quality projects that address Total Maximum Daily Load (TMDL) impairments. SIPES was designed by a team drawn from six universities within EPA Region 5, which funded the SIPES effort. SIPES' intended users are staff of local agencies (such as watershed districts or pollution control agencies) who manage nonpoint source (NPS) water quality projects. SIPES also features a handbook (Genskow and Prokopy 2011) and an on-line database and questionnaire-builder, *the Social Indicators Data Management and Analysis* (SIDMA) software (<http://35.8.121.111/si/home.aspx>).

The SIPES framework is based upon fourteen indicators of human behavior, opinions, knowledge, values and other criteria. SIPES features two standardized questionnaires, one for agricultural property owners, and another for non-farm property owners. Each has a set of mandatory questions related to TMDL impairments for a given location. If additional questions are needed by the local agency, they can be added to the questionnaire but results cannot be entered into SIDMA. A separate database (such as Excel) must be used. SIPES and SIDMA have evolved considerably based on several years of testing in Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin. In Minnesota, SIPES and SIDMA were tested by four local agencies on audiences ranging from very large to very small.

Resources needed

SIPES requires substantial resources in terms of watershed staff time and survey costs in comparison with some other methods. The SIPES questionnaires (downloadable from SIDMA) are designed to be used as a mailed survey, and for use with random probability samples (more than 535 respondents). Printing and mailing expenses can be high, in the \$5,000 - \$10,000 range for a one-time survey. Watershed staff should have some familiarity with questionnaire construction, preparing a sampling frame and survey administration. The largest SIPES test in Minnesota (1,133 households in four counties) took 3-4 months to prepare the sampling frame and to clean the lists of property owners provided by the counties, and postage costs exceeded \$8,000.

When to use this method

SIPES and SIDMA are currently not recommended for use in Minnesota by the Minnesota Pollution Control Agency, especially for watershed audiences that are too small for random probability sampling. In Minnesota, SIPES would be most appropriate for use in large-scale watersheds with a relatively uniform audience.

Limitations

SIPES is a complex system that requires a certain level of expertise, available time and funding to utilize. Unless an agency has a social science researcher on staff, a consultant might be needed to carry out the effort. Scale is a critical factor: the size of the audience determines in part the type of evaluation method that should be used. Standardized social surveys such as SIPES are appropriate for large, well-funded projects with large audiences and adequate professional capacity. However, SIPES/SIDMA is not practical for smaller projects and audiences.

For more information:

Genskow, Ken and Linda Prokopy (eds.). 2011. *The Social Indicator Planning and Evaluation System (SIPES) for Nonpoint Source Management: A Handbook for Watershed Projects*. 3rd edition. Great Lakes Regional Water Program. 104 pages. The social indicators weblink is <http://35.8.121.111/si/home.aspx>.

The Illinois Social Profile Approach for Watershed Planning

Description

The Illinois Social Profile is a guidebook for conducting a baseline social assessment prior to developing a watershed management plan. The method is designed as a one-time survey to identify key social issues in a watershed, and evaluate the importance of social issues during the planning process. It is also used to prepare the content of a human dimensions section of a watershed management plan. The survey results provide a snapshot of life in the community at one point in time. It can also reveal stresses in the community that may hinder the watershed planning process.

Like the SIPES/SIDMA framework, the Illinois social profile is an indicator-based system. While SIPES has standardized indicators that are applied universally, the Illinois profile allows project staff to determine their own indicators. This method is typically administered as a mailed survey.

Resources needed

This method is a baseline social assessment method that requires a medium to high level of resources. Human resources will include at least one experienced researcher and probably a few trained enumerators. Time should be budgeted for developing a sampling frame, questionnaire construction, survey administration, data analysis and reporting. As with all survey methods, mailed surveys can be costly (\$5,000 to over \$10,000 in printing and postage).

When to use this method

This method is useful when a watershed-wide baseline survey is needed, and when little is known about the sample population.

Limitations

Smaller projects with limited resources and professional staff may not be a good fit for this method.

For more information:

McDermaid, Karen and Daniel C. Barnstable. 2001. *Step-by-Step Guide to Conducting a Social Profile for Watershed Planning*. Champaign-Urbana: Department of Natural Resources and Environmental Sciences, University of Illinois.

MODULE 3

THE KAP (KNOWLEDGE, ATTITUDES AND PRACTICES) STUDY METHOD

Description

KAP studies are short focused surveys that measure changes over time in human *knowledge, attitudes and practices* as a result of a specific initiative or project. These three core constructs were identified decades ago by public health practitioners as the key areas where one would expect to see changes in a positive direction as a result of a project intervention. These three constructs can be linked to project goals and objectives, and are therefore useful in assessing project impacts, results and outcomes in human populations.

KAP studies are done twice: before a project is started, and a year or two after its completion. First-round study results are useful when planning project activities; identifying and engaging target audiences; determining existing behaviors and values; and evaluating outcomes and results. The study is repeated at the project's end. By comparing pre and post KAP data, direct results and impacts can be captured. If a project is successful, one would expect to see an increase in audience knowledge about x, a reorientation or change in attitudes toward x, and an increase in adoption and maintenance of certain practices. KAP studies can provide evidence that people have adopted or maintained a new practice, that their knowledge has increased, and that their attitudes and values have changed. However, changes in these three constructs may not be simultaneous or equal.

KAP studies tell us what people know about certain things, how they feel, and how they behave. They explore gaps in information about the target audience, stakeholders or community ("what do I need to know about our local audience?"). Each study is unique to a particular setting and is designed for a specific project. Whereas standard social surveys may explore a broad range of social values and activities, the KAP method focuses specifically on the knowledge, attitudes and practices (behaviors) for a particular resource problem or issue:

- The **knowledge** possessed by a community refers to their understanding of that issue.
- **Attitude** refers to their feelings toward this issue, as well as any preconceived ideas that they may have towards it.
- **Practice** refers to the ways in which they demonstrate their knowledge and attitudes through their actions and behaviors.

These three basic elements can help program staff to know whether a particular community has adopted a recommended practice, whether they maintain that practice over time, and if their attitudes and knowledge have changed. KAP studies can also be used to explore barriers and constraints in the first-round KAP study. This information can help staff to design outreach strategies that address those barriers.

Resources needed

These studies are not intended to be comprehensive baseline social surveys. KAP studies tend to be more cost-effective than other social research methods because they are limited in scope. A typical KAP study contains between ten and twenty-five questions developed by local project staff.

People

An experienced person familiar with the KAP study protocol is needed to guide the study. It can be done with an inexperienced team if coaching is available from someone trained in the KAP study protocol. Knowledge about social science research and HSR requirements is necessary.

Time

A typical KAP study takes approximately two to four months of preparation time, depending on the scale of the survey. A door-knocking survey takes about a week; a mailed survey can take one to two months if following the Dillman Method. Time should also be budgeted for data analysis and writing up field assessment results.

Cost

KAP studies may cost between \$5,000 and \$25,000 depending on the sample size and method of delivery (mail, door-knocking, etc.) As with all survey methods, mailed surveys can be costly (\$5,000 to over \$10,000 in printing and postage costs for a large audience). Posting a survey on-line can greatly reduce costs.

When to use this method

KAP studies have been used during watershed planning, to inform education and outreach strategies, to gain baseline information about an audience, and to evaluate project outcomes. The KAP method may or may not be appropriate for a project, depending on the local context and information needs. If detailed socioeconomic information is required, the Illinois social profile or SIPES is a better choice since KAP is intended as a short, focused survey. KAP studies are scale-neutral, and can use either random sampling or qualitative methods.

Limitations

KAP studies conducted with small samples (<500) are not statistically rigorous and results cannot be generalized to a larger population. A one-or two day training workshop is needed for staff to learn this method.

THE MINNESOTA KAP STUDY PROTOCOL

This section explains the Minnesota KAP study protocol in detail. KAP studies are done in a wide variety of ways around the world. We reviewed the literature (Eckman 2011) to identify the steps needed to carry out a KAP study in the context of watershed projects in Minnesota. The protocol outlined here for watershed projects is based upon lessons drawn from the literature, as well as our experience conducting twenty-five KAP studies in Minnesota (2006-2013).

The discovery process described above is reflected in the KAP protocol described in this module. The protocol can be described as a step-wise and very creative process of discovery about people and how they interact with the world around them. We have successfully tested this protocol in a variety of watershed projects (urban stormwater, shoreland habitat, residential yard care practices, winter maintenance projects, manure management planning and others). We believe that it may work in other types of environmental projects where people's behaviors, beliefs, knowledge and constraints are relevant. It should be considered a guide, and the user should adapt this protocol as needed.

Figure 3: Steps in the Minnesota KAP study protocol

1. Identify the problem, trigger or issue
2. Build a team
3. Do a gap exercise to discover what is *not known* about the issue
4. Prepare a gap table
5. Review human subjects research (HSR) requirements
6. Prioritize the gaps and refine the focus
7. Build your survey instrument (questionnaire) from the gaps you've identified
8. Prepare the sampling frame
9. Pre-test the questionnaire
10. Administer the survey and enter the data
11. Analyze and interpret the data, and apply it to your project situation

These steps correspond approximately to the discovery process outlined in Figure 3 and are described in more detail below.

1. Identify the problem, trigger or issue

Most KAP studies are conducted in response to a water resources issue where people are contributing to or affected by a problem. The problem could be related to a new TMDL or impairment, a long-standing pollution problem, flooding, or a potential future pollution issue associated with an emerging industry. To fully address the issue, watershed staff must study the underlying human causes of the problem, as well as potential unintended consequences on human populations. This is because the human dimensions of a water quality issue can be more complex than the biophysical dimensions. To solve a water quality problem its biophysical and human dimensions must be understood. In this step, watershed or agency staff must clearly define the problem, and define its scope, possible causes and treatments.

2. Build a team

In our experience a KAP study is best done with a small group of 4-8 people who collectively frame the issues and determine the scope of the KAP study. The larger the group, the more difficult it becomes to reach a consensus about the program content and structure. If a gap exercise is used to initiate a KAP study, larger groups tend to have more difficulty agreeing on the survey constructs and content.

When considering the composition of the gap team, we recommend the following:

- One or two internal team members, especially if they will be responsible for implementing the project
- One or two local stakeholders (such as a concerned citizen or innovative farmer)
- A local government official (planning officer, watershed staff member, or extension agent) who is knowledgeable about the situation and audiences
- An experienced facilitator or university researcher

It is helpful, although not essential, that the team members know each other. They should be open-minded, collegial, good listeners, and “team players.” Individuals with strong opinions, a determined agenda or narrow focus should not be included.

3. Do a gap exercise to discover what is *not known* about the issue

When planning the gap exercise, arrange for an informal brainstorming session in a relaxed setting. A comfortable room with plenty of empty wall space is helpful. If possible, provide refreshments (good quality coffee and chocolate are essential). Inform the team to come with an open mind and to be prepared to think about “big picture” concepts.

Introduce the session by noting that the purpose is to think about the gaps in our understanding of water quality issues in a specific portion of a watershed. What do we

know about the watershed, the stressor or causes, the affected population, and those contributing to the problem? Ask the team to talk frankly about their assumptions about the issue and its causes.

Most importantly, ask the team to consider ***what is not known about the problem and how it impacts people***. What ought to be known (or learned) in order to address the problem? In particular, what is not known about the watershed stakeholders, audience, and households in the affected area? What do we, as watershed staff, need to know about our audience to better connect people with knowledge and improved practices? In turn, what do people already know about the watershed problem, and what are their attitudes toward it? How do we respond to their needs and priorities for information? Are residents willing to step up and take part in the planning process, adopt a new practice, or stop doing a destructive practice? How can we help them to overcome barriers and constraints to adoption? These are the gaps that are critical to the planning process, and crucial for project success.

To begin a gap exercise, use four or five large flipchart sheets taped to the walls. Ask team members to write their gaps on large-size Post-it Notes and put them on the sheets. The sheets can be labeled “Knowledge,” “Attitudes,” “Practices” and “Barriers or Constraints” and “Other” (as a placeholder for points that don’t fit the standard categories). It is likely that the team will produce many Post-it Notes, and that there will be considerable discussion in the process. These can easily be sorted or grouped at the end of the exercise.

Expect that team members will actively discuss the gaps, and encourage them to do so. When the team has reached saturation (redundant points are being made and no one can think of new further points to include), ask the team to take a break. Next, ask the team to prioritize or rank the gaps or issues that have been identified. Which can we effectively deal with in this project?

Helpful pointers:

- Conduct a gap exercise in person, not by conference call
- If possible, limit the number of participants; four to six people is ideal
- Plan to hold the gap exercise meeting for about two hours or until saturation is reached (people run out of ideas)
- Use flipchart paper and large adhesive “post-it” notes, which allows the team to move ideas around and to group them (see photos below)

During the gap exercise the group should consider the following:

- What are the gaps in *our* understanding (i.e. the *team's* understanding) about problem x (the watershed, the stressor or causes, the affected population, or those causing the problem)?
- What *don't* we know about the situation, but should in order to make our project successful?
- How can we obtain that information? Is it already available, or do we need to do our own research about it?
- What evidence do we need to measure to evaluate actual project outcomes?
- Are there some key metrics that we can obtain pre-project, then repeat post-project? For example, did our audience actually adopt and maintain a recommended BMP? Did that affect pollutant levels at a downstream site?
- Be sure that the team is avoiding listing things that have already been answered in some other way. Often the information is already available from census data or property tax records, or previous surveys.

Brainstorming focuses on the gaps in *our* knowledge (that is, the team's knowledge) about biophysical and social dimensions of problem x. During the gap process the team reviews our assumptions about the issue and about people (those causing the problem and those affected by it).



Figure 4: A gap exercise in process

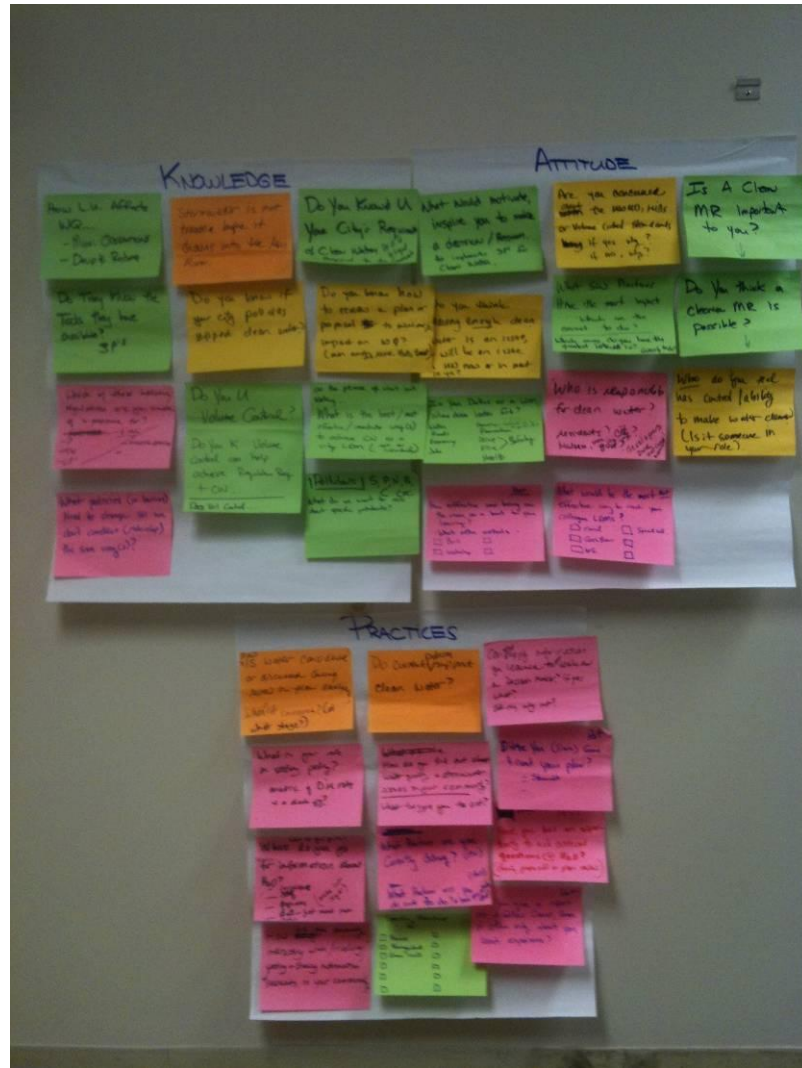


Figure 5: An example of a gap exercise focusing on what is not known about the audience of an urban storm water project

Toward the end of the gap exercise the team is asked to talk about their *theory of change*. If a goal is to reduce pollutant loads as measured by water quality data, are local populations expected to change their behaviors or adopt new practices? If so, by what logic will they do so? Why should they do what we want them to do? Finally, how will that change be measured? These linkages need to be explicitly described in the project's theory of change, and will enable the project to be evaluation-ready when it is launched. Stating a project's theory of change will also help to build an education and outreach program. For example, many projects assume that people will not adopt a BMP unless they are given an incentive (cost-share). However, by what other mechanisms might they adopt?

In one example from Otter Tail County a KAP study found that people were very interested in adoption but didn't know what to do. What people needed and wanted (direct contact with a natural resources professional, along with technical information) was very different than what watershed staff assumed (a cost-share).

Figure 6: An example of a gap team

An inter-agency team used a gap exercise to determine the purpose and content of a KAP study. Because the project was based upon a partnership involving many agencies, about fifteen people participated in the initial exercise. Several sessions were needed to come to an agreement on the survey content, and most of these were done by conference call. In hindsight, this was not a good idea because it was challenging to facilitate the conversations during a conference call, and to determine individual reactions to the discussion. Some individuals had strong opinions and were more vocal, while others did not talk much. One or two people dropped out of the process when it appeared that their opinions were challenged or not accepted by other group members.

The initial discussion resulted in a long list of gaps to investigate. The facilitator summarized all of them in a gap table, which proved to be very large because of the large number of team members. The table was circulated by email to the participants, who made their comments in track mode and returned them to the facilitator. Given the large number of gaps, the facilitator asked participants to prioritize them, generally setting aside those with lower priority. Similar gaps were combined into a single concept. This resulted in a more manageable list. Next, the team converted the gaps into rough questions, which became the basis for the survey questionnaire. The rough questions were refined and entered into a Survey Monkey questionnaire template. This was pre-tested and eventually administered. In this way, the survey directly reflected the core concepts (or constructs) that were discussed by the team. This contributed to an important criterion called “construct validity” that is emphasized by social scientists. In this example the team did not discuss a theory of change.

Lesson learned: *Keep the number of people on the gap team between three and eight to better manage information, expectations and work load.*

4. Prepare a gap table

The next step is to summarize the types of information needed for determining social outcomes for the project. During this step one person takes the flip charts or Post-it Notes and creates a simple chart or table (see Figure 7 below). Each gap that was identified by the team, and written on a Post-it Note, is entered into the corresponding row or column in the gap table. The gap table is prepared as a Word document so that it is easy for the team to revise it in Track Mode. It is advisable not to use a spreadsheet

(such as Microsoft Excel) because it is more difficult for the facilitator to track and find changes on the table.

The Microsoft Word table below is a simplified version of a gap table that became the basis for an actual KAP study. Note that not every box has to be filled in; only those with direct relevance to the local issue are considered.

Figure 7: An example of a gap table prepared for a KAP study

Construct being measured	Knowledge	Attitudes	Practices
Responsibility for stormwater		Who is responsible for managing stormwater flowing onto and off of your property?	
Awareness of water quality	What is the name of the stream in your neighborhood? What do you think happens to stormwater that runs into the storm drain on your street?"	How concerned are you about water quality in Sample Creek?	
Willingness to adopt a new practice		Would you be willing to try something to manage stormwater (such as a rain garden or rain barrel) on your property?	Have you ever done anything to manage stormwater on your property?
Barriers to participation in the project			What prevents you from managing stormwater on your property? What would help you to adopt a practice to manage stormwater?

This first draft gap table is circulated to the team. Team members review the table and consider whether anything is missing. It may be necessary to revise the table three or four times until the group is satisfied that all gaps have been captured in the table.

Helpful hints:

- Date each version of the gap table, and give team members deadlines for responding with comments.
- Once the gaps are agreed upon, the discussion turns to what the team expects to change as a result of the program or project. Consider how those changes are expected to occur (your theory of change).

5. Review human subjects research (HSR) requirements

Review the Note on Human Subjects Research on page 20 above. Check with your agency to determine whether human subjects review is needed for your study. If your agency is unaware of HSR requirements, try to identify a professional colleague willing to review the questionnaire and your data confidentiality/storage plan. Even if your agency does not have an IRB or HSR requirement, you are still required by the Common Rule to safeguard data privacy and confidentiality. Make a plan to store the survey data securely and to encode or encrypt the data.

6. Prioritize the gaps and refine the focus

Generally speaking, each gap that has been identified will form the basis for a survey question that will be posed to a respondent. Most gaps will need to be rewritten before they are properly and fairly stated to be included in the survey. It often happens that different team members will write up the same gaps, but stated in different ways. Several team members may have come up with three or four sticky notes that suggest the same idea (called a *construct*) to be explored by the survey. Often these can be combined into a single question that addresses a common construct.

As the team lists gaps in their understanding of their audience, some will write a simple statement (for example, "I don't know why they don't show up at a workshop," or "how much do residents already know about storm water running off their yards"). Others will jot down a few words ("responsibility for clean water"). These raw statements and questions need to be refined, edited and reworded before they can be included in a questionnaire. Some of the gaps will sound biased at first, or are incomplete thoughts. The team will need to work through each gap and discuss whether they are focusing on the main construct.

If the team identifies many gaps (say, more than thirty or forty), and these are all separate constructs, it will be necessary to reduce the total number of gaps to a manageable number. Generally speaking, a KAP study should be limited in the number of questions posed to a respondent. An acceptable range would be between ten and twenty-five questions. Asking more than twenty questions can result in *respondent burden* and the likelihood that a respondent answers all of the questions is reduced.

Therefore, the number of gaps should be reduced to no more than 25, and ideally 15-20.

Your team may not entirely agree on which questions are most critical. In such a case the team should consider which of the "more important" questions will yield actionable information? To reduce the number of gaps, ask the team to rank or prioritize them, Which gaps are critical and must be asked? Which gaps are less important and can be set aside? Generally, most teams can whittle down the number of gaps (or questions) to a manageable number.

7. Build your survey instrument (questionnaire) from the gaps you've identified

At this point the team should have reduced the total number of gaps to a maximum of twenty-five. A KAP study is a short, focused social survey, and ideally contains between ten and twenty questions. Longer questionnaires (over twenty questions) take longer to administer and to enter and analyze data. As noted, long questionnaires can also result in "respondent burden," where a respondent becomes bored or fatigued and does not complete the questionnaire.

To create the questionnaire, simply "flip" or convert the gaps into a question. Using the example above, "I don't know why they don't show up at a stormwater workshop" implies that the watershed staff needs to know more about how to effectively deliver educational messages to an audience. It also suggests that there may be other ways to interact with an audience than a workshop. The team might re-frame the construct to explore audience preferences for acquiring programmatic or technical information. In this case the final question might look something like:

How do you prefer to receive information about stormwater treatments (such as installing a rain garden) from your local watershed district? Check all that apply.

- a. Email, text or Twitter
- b. A mailed brochure or pamphlet
- c. Newsletter
- d. Workshop
- e. Direct contact with a project staff member
- f. A tour of local BMP treatments such as rain gardens
- f. Other (please specify)

In another example from above, a team identified a gap in "how much do residents already know about stormwater running off their yards?" Researchers could pose this question with possible responses being ("a little," "A fair amount" and "a lot"). However, these responses may not yield much actionable information. As written it will only yield

self-reported awareness of stormwater, which could be biased. In this case it is better to pose the construct as a knowledge question with specific knowledge content. For example:

What happens to storm water when it runs off your yard? Check only one response.

- a. It goes to a storm drain in the street and then to Lake Johanna
- b. It goes to a treatment plant
- c. It goes to the Mississippi River
- d. I don't know
- e. Other (please specify)

This revised question will yield more specific information about audience awareness than the original "gap" question.

There are many software packages that are useful in questionnaire construction. A simple on-line provider such as Survey Monkey (surveymonkey.com) can be used, although you may be required to pay for a basic subscription. Such software providers have ready-made questionnaire templates and are very intuitive and easy to use. Data can be entered and stored securely on-line. Survey Monkey also provides a downloadable summary of results.

An on-line format generally works better than an accounting database like Microsoft Excel, because you will need another software program (such as Microsoft Word) to create the actual questionnaire. Transferring data between different software programs can consume time and effort. For these reasons we recommend using a software program designed for survey research and that is capable of multiple tasks.

8. Prepare the sampling frame

A sampling frame is a list of eligible respondents that has been drawn from a larger population. The population is the total list of residents, households or individuals within a defined place, such as a subwatershed, a riparian area, or a community. If the population is large (say over 550) it may be possible to draw a random probability sample from the larger population. If the population is small (under 550), consider including everyone in the sampling frame, budget permitting. An eligible sample includes those above the age of 18, and meeting any other criteria set by the researcher. Examples of those criteria might include residents of Subwatershed 6; residents located within five miles of the Minnesota River; or households living in a certain floodplain.

How do you create a sampling frame? First, define the audience of interest (for example shoreland property owners on Rush Lake). Then, obtain a list of properties from the county and determine which reside within the project boundaries. If you need further information (such as age or income) about your audience, consult the US Census Bureau database. Create a master list or spreadsheet of eligible respondents (your sampling frame). If conducting a door-knocking survey, each team (interviewer and enumerator) should have a version of the master list for reference as they conduct the survey.

There are many good resources available on sampling procedures, questionnaire construction and other aspects of social science research. Consequently, detailed instructions will not be provided here. The reader is referred to Babbie (2009) or Babbie and Benacquisto (2002) for more detailed information on preparing a sampling frame.

9. Pre-test the questionnaire

Social researchers generally pre-test their questionnaires before actually administering it to their "real" audience. This step is done to ensure that all questions are well-worded and without bias, that the respondents understand the purpose of the study, and that the question sequencing and "skip to" logic is correct.

Identify four or five people who are willing to take the survey. If your survey is to be administered as a mailed questionnaire, and on-line survey or by interview, be sure to replicate those conditions for the pre-tester.

As the pre-testers take the survey, they should note and report any issues with questions or question choices. This gives the researchers one last opportunity to correct any flaws in the questionnaire before it is administered.

10. Administer the survey and enter the data

KAP studies can also be administered at a workshop, by phone, or online. We have tested the KAP study method in Minnesota at community workshops, training venues, door-knocking and on-line through Survey Monkey. All have worked very well. A KAP study can also be done through the mail. Many researchers conducting a mailed survey use the Dillman method (Dillman 2002). This method provides detailed guidance on timing and sequencing of mailed communication (letter introducing the upcoming survey; full survey packet with self-addressed stamped envelope; reminder letter or postcard; second packet, etc.). This method is best used with large random probability surveys but is also useful for smaller surveys.

In all cases training must be provided to those administering the survey if direct contact with respondents is planned. This is an important first step and cannot be overlooked, especially in a door-knocking survey. Generally the researcher or evaluator organizes a one-day training schedule for the survey crew. Training should include the following components:

- Overview of the KAP study
- Purpose of the study
- Human subjects research⁶
- Tasks and responsibilities
- Explanation of the master list and survey locations
- The interviewing process (interviewer and enumerator)
- Data entry process
- Mock interviews

The above tasks may vary somewhat depending upon how the study is administered.

We find that it is convenient to door-knock with two-person teams. Two-person teams include an interviewer, who interacts directly with the respondent, and a second person (an enumerator) who enters the respondent's answers onto the survey questionnaire. Trainees should practice both tasks (interviewing and enumerator) so that each becomes very familiar with the questionnaire and tasks. Male-male teams are not advisable, especially in neighborhoods with an older demographic, because elderly respondents may not open the door to an all-male team.

A key step in the sampling process is to prepare a basic table that monitors the progress of your survey by location, number of interviews completed, refusals and cumulative response rate. An example is provided in Annex 1. The table is used to track responses on a daily basis as the survey progresses. If you are doing a larger sample, the sampling and response rate table can help you to determine whether you are reaching your target response rate, number of refusals and vacant houses by sector. It might be helpful to divide a survey area into quadrants or sectors, which are assigned to survey teams. Each team should have a master list so that they can keep track of the houses that have been contacted. At the end of each day, the enumerators should turn over their lists and completed questionnaires for safe-keeping.

⁶ By law interviewers and respondents must be adults over eighteen years of age.



Figure 8: Trainees learning how to interview in preparation for a door-knocking survey



Figure 9: A door-knocking survey crew in Duluth

11. Analyze and interpret the data, and apply it to your project situation

Many survey software packages will automatically calculate survey results and are capable of performing a variety of statistical functions. If your study area is large it may be useful to run crosstabs as well. In our experience most local watersheds prefer basic descriptive statistics (numbers, percentages, etc.) and tend not to need or want more detailed analysis. If you are using Survey Monkey (or similar software) you can download a summary of responses in pdf format. You can also produce a summary graphic or chart for each question, as in Figure 10 below. These charts can be used in presentations or reports, or converted into Powerpoint slides.

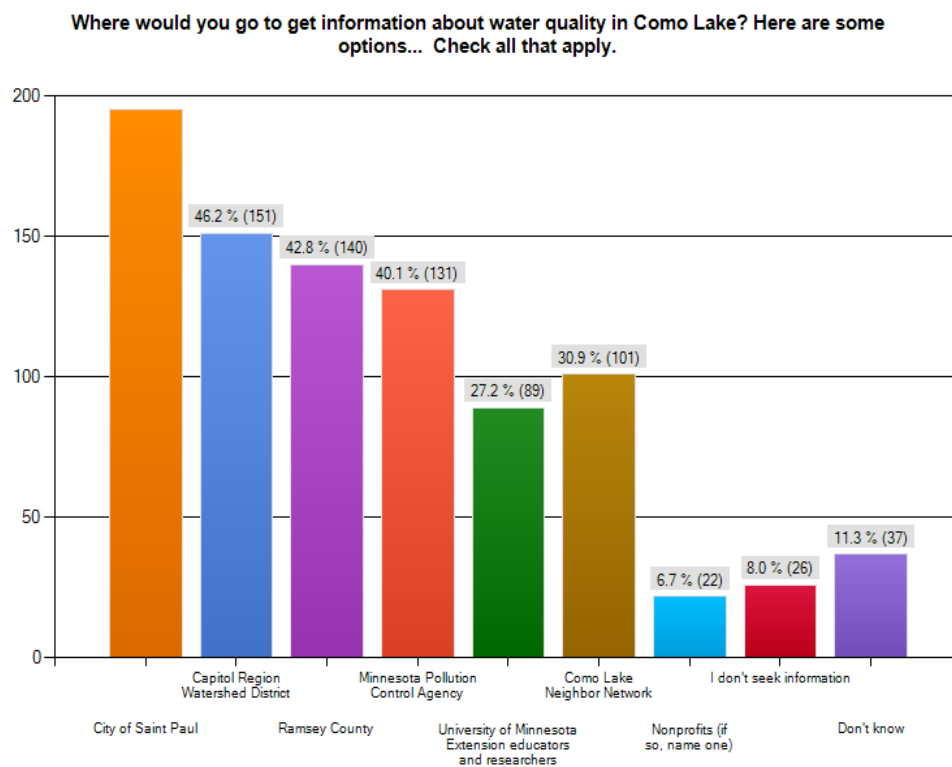
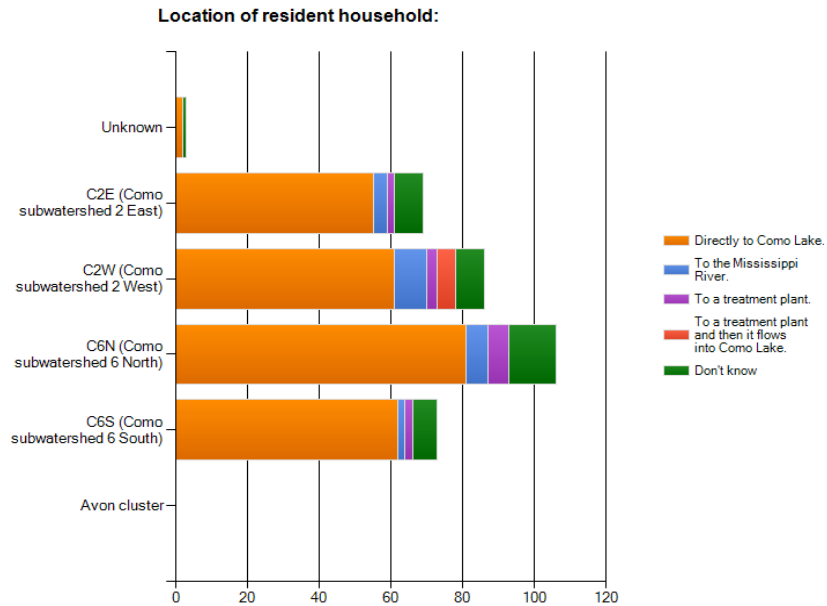


Figure 10: Example of a chart used to present data from a single KAP study question. This chart was generated by Survey Monkey.

In Figure 11 below, data is presented and cross-tabulated by sub-watershed:



*Figure 11: A cross-tabulated graph.
This graph was created with Survey Monkey.*

If you administer two surveys (before and after) you will have two data sets from which you can compare results. In Figure 12 below, results from the same question posed in both the pre/post project surveys were downloaded and analyzed. This simple table was created using Excel to compare the results from both surveys.

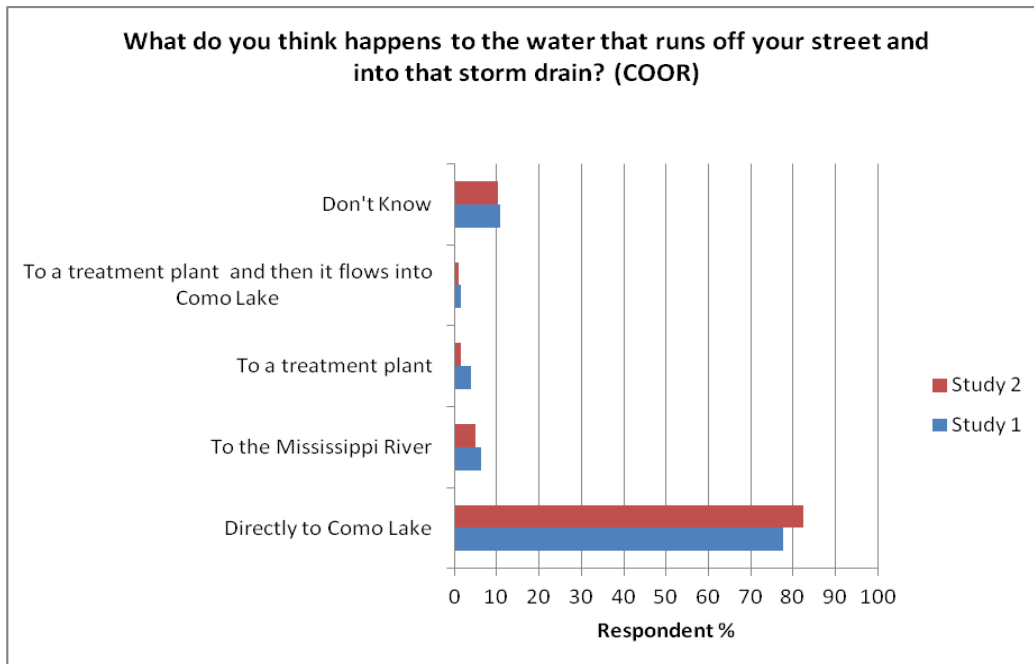


Figure 12: A chart combining the pre-post project data sets. This chart was created using Microsoft Excel.

Note that this chart provides evidence that respondent knowledge about the destination of storm water did improve from pre-project levels, although in this case respondent knowledge was already very high.

Applying the research results to your project can lead to major changes in how your project engages people and presents information. An example comes from East Otter Tail County, where the county shoreland expert had assumed that shoreland owners would be interested in a certain type of shoreland restoration. He presented the same slides and educational content at many events (see Figures 13 and 14).



Figure 13: Powerpoint slide of a shoreland installation prior to the KAP study



Figure 14: Powerpoint slide of a shoreland installation prior to the KAP study

The KAP study revealed that people preferred open views of their lake and sky. They perceived the slide in Figure 1 as “a wall of weeds” that might harbor ticks and mosquitoes. The image in Figure 2 almost completely blocked the view of lake and sky.

After the KAP study the shoreland expert reconsidered his educational content and presentation. He created new slides and content based upon the preferences expressed in the survey data. The new image (Figure 15) showed open water and sky, but reduced the percentage of shoreland treatment to a smaller area of the frame.



Figure 15: Post-KAP image of shoreland installation.

Following the KAP study, new options for shoreland treatments were developed, including a prairie garden, a cottage garden, and a naturalized buffer. The expert also developed new ways for property owners to interact and learn about buffer installation.⁷

12. Data protection

As noted in Module 1, Federal law requires that data and respondent confidentiality are protected through all stages of the process and beyond. As a precaution, code or encrypt the data so that responses cannot be traced to individual respondents. Instruct the survey crew that their conversations with respondents remain confidential and that they may not speak about their interviews with others who are not part of the team. Completed questionnaires must be kept securely by the survey team leader.

⁷ Photos in Figures 12, 13 and 14 were provided by Steve Henry.

Once data has been entered into a database, ensure that your data is backed up and stored in a secure location. Once you have secured the database be sure to shred the questionnaires.

13. Repeating the study

KAP studies are typically repeated a second time so that pre and post data sets can be compared for evaluation purposes. Generally the same sampling frame is used, and the same response rate is desirable.

Ask questions in the same way to be sure that they are comparable across both data sets. You may decide that some questions are no longer needed and can be omitted because they were intended for first-round information. Some KAP teams decide to add a few new questions that address efficacy. For example “Which incentive offered through the project was most useful to you?” or “What could have been done differently...?” It is helpful to review your questionnaire a month or two before planning to administer your second KAP study to determine which questions could be omitted, and whether any new questions should be added.

MODULE 4 UNOBTRUSIVE OBSERVATION

Description

Unobtrusive observation (also called participant observation), is a research technique used in social and ethnographic research, communication studies and social psychology. In its beginnings nearly a century ago, western researchers lived with their subjects (often Native Americans or villagers in developing countries) and documented the activities of the “participants” (or subjects) of their research in great detail. The resulting ethnographic studies were rich sources of information about traditional farming systems, property rights, access to resources, use of forests, gender roles and other aspects of local culture.

Today, unobtrusive observation is sometimes used to triangulate other types of research findings, and as an observational evaluation tool. It has been used in watershed projects in Minnesota to observe whether rain barrels have been connected to gutters; that property owners have adopted a native shoreland buffer (Figure 16); and that rain gardens are being maintained. It is generally considered to be a qualitative method, although it can yield quantitative data if the sample is large enough.



Figure 16: Example of unobtrusive observation in Itasca County. Watershed staff are examining shoreline condition during a “boat-by” and verifying the adoption of native buffers by shoreland property owners.

Resources Needed

People

One or two staff persons are needed to visually observe the installation or BMP. They will need binoculars, camera, field notebook, and a list of properties to be assessed. Field notes are used to document specific types of information or data, according to pre-determined criteria. This method can also be used with other remote sensing methods.

Time

Depends on the area in the watershed to be observed, but generally a few days is sufficient.

Cost

Expenses are related mainly to transportation and staff time.

When to Use this Method

This method is best used as a means to triangulate and verify another research method, or as a quick end-of-project evaluation tool. Consider using the method if people have reported that they have adopted a specific BMP, but where there is reason to doubt that adoption rates are as high as being reported.

Limitations

There can be ethical considerations using this method, especially if children are being observed, or where informed consent may be an issue. Generally speaking, respondents should not suffer any ill effects directly or indirectly, participants should be informed about their rights as subjects of such a study, and that the participants were justly chosen for such study as required by HSR rules (Belmont Report 1979). As with other forms of social research, respondents (or “participants”) should be notified in advance of the study, advised that their participation is voluntary, and be given the option to decline. The main limitation is that staff should be discrete in their observations because there is a danger that residents could feel that they are being “spied upon.”

For More Information:

Spradley, James. 1980. *Unobtrusive Observation*. Orland: Harcourt Publishers.

U.S. Department of Health and Human Services. 1979. The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.

www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

MODULE 5 THE FOCUS GROUP METHOD

Description: This method utilizes successive panels of respondents to discuss a short, pre-determined list of questions about a narrowly defined issue or topic. The purpose is to obtain information about respondent preferences or opinions on a specific, narrowly defined topic. This method originated with consumer surveys and advertising research in the 1950s. Focus groups are a relatively inexpensive and rapid means of learning about consumer preferences. While focus group studies are fairly common, they are often conducted without proper training or following accepted protocols.

The focus group process begins with preparing a short list of questions or talking points around which to center a discussion. Panel members are drawn from a specific sample and demographic (for example, Target shoppers aged 18-24; or shoreland owners in Becker County aged 60-70). Group size varies, typically between four to twelve people. Multiple sessions with *different* groups meeting the sampling criteria are held, and all groups are asked the same set of questions. Successive focus groups must be held and recorded until “saturation” is achieved, that is, new groups raise points heard in previous sessions, and no new information is gained. At that point the research is considered complete.

Resources Needed:

People: Two at a minimum to coordinate and prepare the sessions. One person serves as a facilitator for the discussion and poses questions. The other is a recorder/note-taker. Sessions are typically recorded by audio or videotape, or by detailed note-taking of all discussion contents. Recorded material is transcribed and entered into a database. It is then analyzed to identify patterns, preferences, constraints, etc.

Time: Allow two months to prepare questions, draw the sampling frame and invite participants. Allow on average one week per session to organize; allow two weeks per session to transcribe session notes. On completion of sessions, allow 2-4 weeks to analyze notes and prepare report. If six sessions are required, assume that you will need 4-5 months to organize and complete the research.

Cost: Focus group costs are generally moderate in comparison with other quantitative methods, with the main expense being staff time (this is a very labor-intensive method). Budget should include incentives for participants (typically refreshments and a gift card or cash payment). You may need to budget for travel (mileage, meals, lodging), room rental, and video or audio equipment rental.

When to use this method: The method is useful *after* you have conducted a formal social survey, and wish to explore a specific issue or question in more detail. For example, you may have already conducted a baseline social survey and learned that respondents have a certain level of knowledge about an invasive species. However, you need more specific information about preferences about how to deliver additional information (venue, visual content, frequency, etc.). It should not be used as a baseline social survey, as the method has limited rigor and is very time-intensive for staff.

Limitations:

It is difficult to predict how many sessions will be needed to reach saturation, making budgeting imprecise. Results are less rigorous and more subjective than standardized social surveys, and may be less reliable. This is a time-intensive method.

For more information:

Krueger, Richard A. and Mary Anne Casey. 2009. *Focus Groups: A Practical Guide for Applied Research (4th Edition)*. Los Angeles: Sage.

MODULE 6

KEY INFORMANT INTERVIEWS

Description

Conversations with key informants are commonly used by watershed staff as a quick, informal means of gathering information. A key informant is a person with specialized knowledge about a particular issue or problem, such as a county extension agent, an innovative farmer or a community activist. There is a protocol for conducting key informant interviews, which includes having a prepared list of informants and a checklist of questions. The method requires that field staff keep organized notes of interviews and have a means to systematically interpret the results. Data and information collected using this method is subject to HSR requirements (confidentiality, informed consent, etc.).

Resources needed

People

This is one of the least costly social research methods, requiring mainly staff time and ability to travel. Even though this is a very simple method, the staff member should be knowledgeable about interviewing practices and protocols, as well as human subjects research requirements.

Time

This is a rapid tool for collecting informal information, and several interviews can be done in a matter of hours. However, additional significant time is required if interview notes are transcribed and entered into a database for analysis.

Cost

Very limited to medium, depending on whether notes are transcribed and entered into a database.

When to use this method

Key informant interviewing is often used to “triangulate” findings from other assessment methods, or to explore a particular finding in more detail. When properly used, it can be a useful method that can yield rich and detailed information, especially where transcribing and categorical data analysis are used to interpret results.

Limitations

The method can be an unreliable assessment tool if used improperly by interviewers without training. A small number of key informants are not a representative sample and findings cannot be generalized to the larger watershed population. It can also be a very

impressionistic method, especially where agency staff rely solely on information from one or two key informants for decision-making and planning.

For more information:

<http://www.uwex.edu/ces/pdande/progdev/pdf/keyinform.pdf>

Bamberger, Michael, Jim Rugh and Linda Mabry. 2011. *Real World Evaluation: Working Under Budget, Time, Data and Political Constraints*. 2nd Edition. Los Angeles: Sage.

MODULE 7

INFORMAL EVALUATION WORKSHOPS

An informal evaluation workshop can be considered if a project has a very small number of participants, and if the audience is very specialized (for example, a small group of municipal employees or trainees). This type of evaluation has been tested in one case (Lake City MN) with municipal officials who implemented an NPS good housekeeping project at the Lake City marina (Eckman and Walker 2008). In the Lake City example, a two-hour workshop was held focusing on "what worked?" and "what didn't work and why not." The workshop was triangulated with unobtrusive observation of boat owners at the marina, which confirmed that marina BMPs were being utilized.

Description

This method can be described as a meeting with a focused discussion on how the project was administered, and what outcomes resulted from the project. An external facilitator guides the discussion, working with a note-taker. The facilitator works with a project staff member or project manager to organize the meeting venue and logistics.

A short checklist of questions is used to focus the discussion. The meeting should take about two hours. The discussion is centered on the process by which the project was organized, and what happened as a result of the project. The discussion should primarily be outcome-focused, and may also include efficacy questions ("*would we have had a better result if we had used a different strategy?*").

Using an external facilitator helps to avoid internal project bias, and keeps the discussion focused on the evaluation. This individual might observe or hear things that a project staff member might not, because they are too close to the project. The external facilitator prepares a short checklist of points to be discussed at the meeting. After the workshop, the facilitator and note-taker write up a summary report of the points discussed and conclusions reached.

Resources Needed

This evaluation method is very inexpensive compared to others. Costs will mainly be associated with personnel. The facilitator and note-taker's time may need to be covered, and these individuals might need to be recruited and contracted. Other expenses might include travel and per diem for attendees, and facilities rental for the workshop.

When to Use this Method

Consider this method where the target audience of an NPS project is very small or specialized, and where there are no other appropriate methods. It may also be useful where civic engagement or highly participatory methods have been introduced.

Limitations

The information evaluation workshop has obvious limitations. It is not a rigorous method and could be subject to bias with very small groups. It takes an experienced facilitator to moderate the discussion and write up the results. The method is unfamiliar, lacks rigor, and should only be used on very small projects where other evaluation methods are not a good fit.

References

Eckman, Karlyn and Rachel Walker. 2008. Lake City Project Evaluation Mini-Workshop Report. Report submitted to MPCA. Saint Paul: University of Minnesota Water Resources Center.

MODULE 8 PARTICIPATORY METHODS

Participatory rural assessment (PRA) is a broad approach to social research and community development that emerged from the community organizing methods used by international and local development organizations (NGOs). Participatory methods have evolved from a collection of social mobilization techniques used by NGOs to organize disadvantaged groups to reflect upon the roots of their poverty, take on grass-roots oriented self-help activities, and achieve economic development. Several different branches and methods have since developed, including participatory rural assessment (PRA), participatory action research (PAR), participatory learning and action (PLA) and appreciative inquiry among others. These are more a collection of methods of social inquiry from which researchers can select specific tools.

The rich historical roots of PRA and PAR date to the 1930s, and can be traced to Mahatma Gandhi and Dr. B.K. Ambedkar, Paolo Freiere and the Rev. Dr. Martin Luther King. A good summary of this history can be found at www.wikipedia.org/wiki/Participatory_rural_appraisal. PRA practitioners recognize that those conducting the inquiry are *learners and students*, and that the participants (e.g. local population of interest) have skills, capacities and knowledge with value to others. Broadly, these approaches attempt to incorporate the views, needs and priorities of rural people when planning and implementing rural development programs. Most PRA, PLA and PAR tools are qualitative in nature, and include transect walks; individual, group and key informant interviews; Venn diagrams; ranking methods; and other investigative techniques.

Resources Needed

Facilitators trained in participatory methods are required for this method. A participatory inquiry and participatory planning process takes time, and results do not happen overnight. Allow for weeks and possibly one to two months for this method. Other resource costs are likely to be low. Primary expenses will be related to hiring a facilitator experienced in participatory methods, meeting costs, meals or refreshments, and possibly transportation.

When to Use this Method

Fundamentally, participatory approaches are intended to fully involve local residents in planning and managing natural resources projects and programs. There are many successful examples worldwide, especially for community forestry groups and water users' associations. Participatory approaches may work best where civic engagement and local leadership and management are strong priorities. Participatory approaches should also be considered when working with culturally diverse communities.

Limitations

Main limitations include the limited number of trained facilitators in the United States, sufficient time for multiple community meetings and transportation. Collecting and summarizing results can be a major task if multiple tools are used.

For More Information:

The International Institute for Environment and Development (IIED) publishes the Participatory Learning and Action journal, available at www.pubs.iied.org.

MODULE 9

WHICH EVALUATION METHOD SHOULD I USE FOR MY PROJECT?

As noted in Module 1, the scale of the project in part determines how it will be assessed, monitored and evaluated, as well as the social research and evaluation methods that are appropriate. Also, the size of the audience in part determines the types of social assessment and evaluation methods that you can use. Social research methods can be either quantitative or qualitative. The one you chose should be appropriate for the size of your audience, the resources that you have available, and staff capacity. It is common to use one primary method (a social survey), supplemented by another method (unobtrusive observation) to triangulate results and findings. Figure 17 below compares the various approaches and methods presented in this training package, and may be helpful in selecting an evaluation method for your project.

**FIGURE 17:
Social Assessment and Evaluation Tools Compared**

Method	Qualitative	Quantitative	Indicator-based?	Sample size	Cost	Level of expertise	Notes
SIPES	No	Yes	Yes	Random probability sample (> 535)	High	High	See Albright and Eckman 2012 for an example from Minnesota
Illinois social profile	Yes	Yes	No	Medium to high	Unknown	Medium to high	See McDermid and Barnstable 2001
KAP study	Yes	Yes	No	Any	Low to medium	Medium	See Eckman <i>et al</i> 2013 for an example
Community capacity model	Yes	Yes	No	Any	Medium	Medium	Focus is on the community as a whole; not individual households or respondents
Focus groups	Yes	Yes (categorical data analysis)	No	# of repetitions depends upon saturation	Low to medium	Medium to high	Protocol is often misused. See Krueger and Casey 2009.
Participatory evaluation	Yes	Yes, with adequate sample size	No	Any	Low to medium	Medium	
Key informant interviews	Yes	No	No	Very small	Very low	Medium	Protocol is often misused.
Unobtrusive observation	Yes	Yes, with adequate sample size	No	Small	Very low	Medium	See Spradley 1980.
Participatory assessment methods (PRA, PLA, PAR)	Yes	Yes, with adequate sample size	No	Small to medium	Low	Medium	
Informal evaluation workshops	Yes	No	No	Very small (<25)	Low	Medium	Not a rigorous method. Can be combined with unobtrusive observation.

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