The Logic Model
for Program Planning and Evaluation

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What is the Logic Model?

The Logic Model process is a tool that has been used for more than 20 years by program managers and evaluators to describe the effectiveness of their programs. The model describes logical linkages among program resources, activities, outputs, audiences, and short-, intermediate-, and long-term outcomes related to a specific problem or situation. Once a program has been described in terms of the logic model, critical measures of performance can be identified.[1]

Logic models are narrative or graphical depictions of processes in real life that communicate the underlying assumptions upon which an activity is expected to lead to a specific result. Logic models illustrate a sequence of cause-and-effect relationships—a systems approach to communicate the path toward a desired result.[2]

A common concern of impact measurement is that of limited control over complex outcomes. Establishing desired long-term outcomes, such as improved financial security or reduced teen-age vi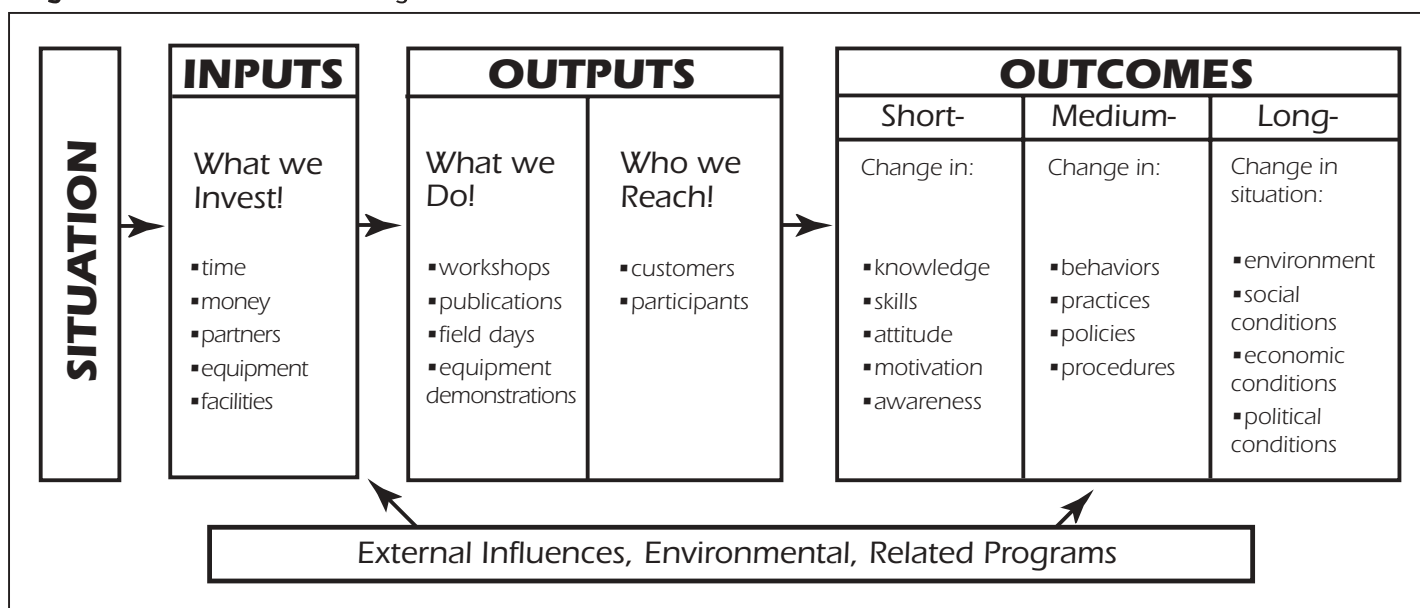olence, is tenuous because of the limited influence we may have over the target audience, and complex, uncontrolled environmental variables. Logic models address this issue because they describe the concepts that need to be considered when we seek such outcomes. Logic models link the problem (situation) to the intervention (our inputs and outputs), and the impact (outcome). Further, the model helps to identify partnerships critical to enhancing our performance.

Planning Process

The logic model was characterized initially by program evaluators as a tool for identifying performance measures. Since that time, the tool has been adapted to program planning, as well. The application of the logic model as a planning tool allows precise communication about the purposes of a project, the components of a project, and the sequence of activities and accomplishments. Further, a project originally designed with assessment in mind is much more likely to yield beneficial data, should evaluation be desired.

In the past, our strategy to justify a particular program often has been to explain what we are doing from the perspective of an insider, beginning with why we invest allocated resources. Our traditional justification includes the following sequence:

Figure 1. Elements of the Logic Model.[3]

SITUATION	INPUTS	OUTPUTS		OUTCOMES		
				Short-	Medium-	Long-
	What we Invest!	What we Do!	Who we Reach!	Change in:	Change in:	Change in situation:
	▪time ▪money ▪partners ▪equipment ▪facilities	▪workshops ▪publications ▪field days ▪equipment demonstrations	▪customers ▪participants	▪knowledge ▪skills ▪attitude ▪motivation ▪awareness	▪behaviors ▪practices ▪policies ▪procedures	▪environment ▪social conditions ▪economic conditions ▪political conditions

External Influences, Environmental, Related Programs

1) We invest this time/money so that we can generate this activity/product.
2) The activity/product is needed so people will learn how to do this.
3) People need to learn that so they can apply their knowledge to this practice.
4) When that practice is applied, the effect will be to change this condition;
5) When that condition changes, we will no longer be in this situation.

The logic model process has been used successfully following the above sequence. However, according to Millar *et al,*[2] logic models that begin with the inputs and work through to the desired outcomes may reflect a natural tendency to limit one's thinking to existing activities, programs, and research questions. Starting with the inputs tends to foster a defense of the status quo rather than create a forum for new ideas or concepts. To help us think "outside the box," Millar suggests that the planning sequence be inverted, thereby focusing on the outcomes to be achieved. In such a reversed process, we ask ourselves "what needs to be done?" rather than "what is being done?" Following the advice of the authors, we might begin building our logic model by asking questions in the following sequence.

1) What is the current situation that we intend to impact?
2) What will it look like when we achieve the desired situation or outcome?
3) What behaviors need to change for that outcome to be achieved?

4) What knowledge or skills do people need before the behavior will change?
5) What activities need to be performed to cause the necessary learning?
6) What resources will be required to achieve the desired outcome?

One more point before we begin planning a program using the logic model: It is recognized that we are using a linear model to simulate a multi-dimensional process. Often, learning is sequential and teaching must reflect that, but the model becomes too complicated if we try to communicate that reality (figure 2). Similarly, the output from one effort becomes the input for the next effort, as building a coalition may be required before the "group" can sponsor a needed workshop. Keep in mind that the logic model is a simple communication device. We should avoid complications by choosing to identify a single category to enter each item (i.e., inputs, outputs or outcomes). Details of order and timing then need to be addressed within the framework of the model, just as with other action planning processes.

Planning Elements

Using the logic model as a planning tool is most valuable when we focus on what it is that we want to communicate to others. Figure 3 illustrates the building blocks of accountability that we can incorporate into our program plans (adapted from Ladewig, 1998). According to Howard Ladewig, there are certain characteristics of programs that inspire others to value and support what we do. By describing the characteristics of our programs that communicate relevance, quality, and impact, we foster buy-in from our stakeholders and audience. By including these characteristics within the various elements of the logic

Figure 2. Over-complicated, multi-dimensional planning model.

SITUATION

INPUTS

Research base, 4-weeks time, editor & print $ → 42 p. curriculum

42 page curriculum, classroom, teaching partners

2 participants neglected new equipment, 12 needed retraining

OUTPUTS

3-day workshop for 20 participants

1-day follow-up workshop for

OUTCOMES

8 participants had increased knowledge of proper fermentation techinques

6 participants installed timing equipment

10 participants installed timing equipment

12 participants in follow-up had increased knowledge of techniques
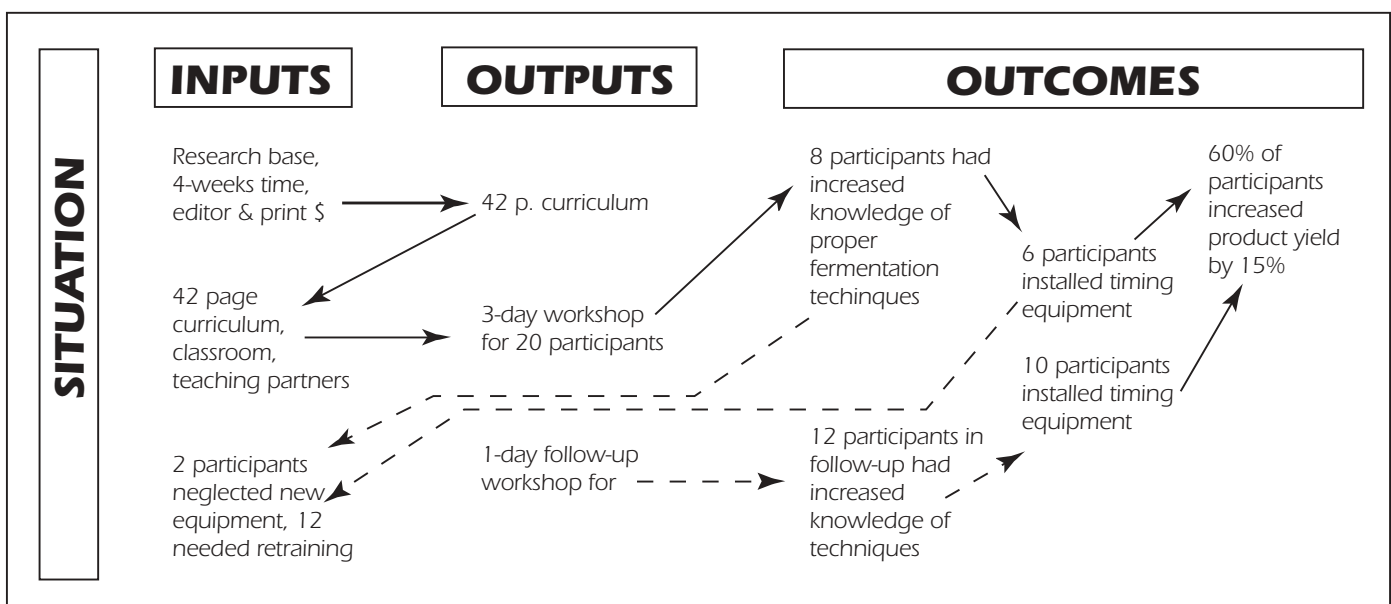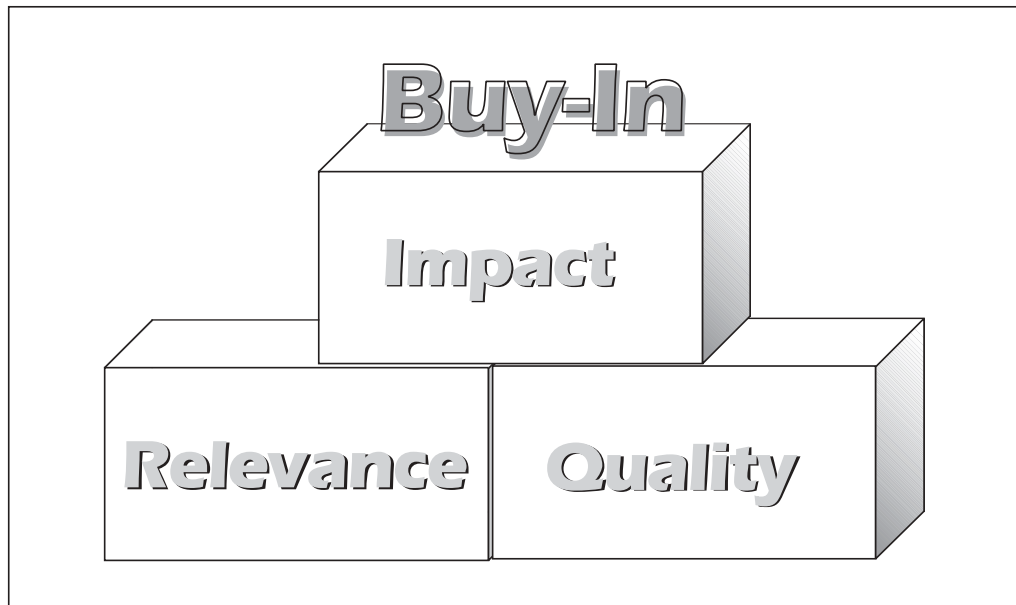
60% of participants increased product yield by 15%

Figure 3. Structure of Acountablility.

model, we communicate to others why our programs are important to them. The elements of accountability are further described in the context of the logic model, below.

Situation

The situation statement provides an opportunity to communicate the relevance of the project. Characteristics that illustrate the relevance to others include:

- A statement of the problem, (What are the causes? What are the social, economic, and/or environmental symptoms of the problem? What are the likely consequences if nothing is done to resolve the problem? What are the actual or projected costs?);
- A description of who is affected by the problem (Where do they live, work, and shop? How are they important to the community? Who depends on them–families, employees, organizations?);
- Who else is interested in the problem? Who are the stakeholders? What other projects address this problem?

The situation statement establishes a baseline for comparison at the close of a program. A description of the problem and its symptoms provides a way to determine whether change has occurred. Describing who is affected by the problem allows assessment of who has benefited. Identifying other stakeholders and programs builds a platform to measure our overall contribution, including increased awareness and activity, or reduced concern and cost.

Inputs

Inputs include those things that we invest in a program or that we bring to bear on a program, such as knowledge, skills, or expertise. Describing the inputs needed for a program provides an opportunity to communicate the quality of the program. Inputs that communicate to others that the program is of high quality include:

- human resources, such as time invested by faculty, staff, volunteers, partners, and local people;
- fiscal resources, including appropriated funds, special grants, donations, and user fees;
- other inputs required to support the program, such as facilities and equipment;
- knowledge base for the program, including teaching materials, curriculum, research results, certification or learning standards etc.
- involvement of collaborators - local, state, national agencies and organizations involved in planning, delivery, and evaluation.

Projects involving credible partners, built on knowledge gained from research and delivered via tested and proven curricula, are readily communicated as quality programs. Assessing the effectiveness of a program also is made easier when planned inputs are adequately described. By comparing actual investments with planned investments, evaluation can be used to improve future programs, justify budgets, and establish priorities.

Outputs

Outputs are those things that we do (providing products, goods, and services to program customers) and the people we reach (informed consumers, knowledgeable decision

makers). Describing our outputs allows us to establish linkages between the problem (situation) and the impact of the program (intended outcomes). Outputs that help link what we do with program impact include:

- publications such as articles, bulletins, fact sheets, CISs, handbooks, web pages;
- decision aids such as software, worksheets, models;
- teaching events such as workshops, field days, tours, short courses;
- discovery and application activities, such as research plots, demonstration plots, and product trials.

The people we reach also are outputs of the program and need to be the center of our model. They constitute a bridge between the problem and the impact. Information about the people who participated and what they were taught can include:

- their characteristics or behaviors;
- the proportion or number of people in the target group that were reached;
- learner objectives for program participants;
- number of sessions or activities attended by participants;
- level of satisfaction participants express for the program.

Outcomes

Program outcomes can be short-term, intermediate-term, or long-term. Outcomes answer the question "What happened as a result of the program?" and are useful to communicate the impacts of our investment.

Short-term outcomes of educational programs may include changes in:

- awareness–customers recognize the problem or issue;
- knowledge–customers understand the causes and potential solutions;
- skills–customers possess the skills needed to resolve the situation;
- motivation–customers have the desire to effect change;
- attitude–customers believe their actions can make a difference.

Intermediate-term outcomes include changes that follow the short-term outcomes, such as changes in:

- practices used by participants;
- behaviors exhibited by people or organizations;

- policies adopted by businesses, governments, or organizations;
- technologies employed by end users;
- management strategies implemented by individuals or groups.

Long-term outcomes follow intermediate-term outcomes when changed behaviors result in changed conditions, such as:

- improved economic conditions–increased income or financial stability;
- improved social conditions–reduced violence or improved cooperation;
- improved environmental conditions–improved air quality or reduced runoff;
- improved political conditions–improved participation or opportunity.

External Influences

Institutional, community, and public policies may have either supporting or antagonistic effects on many of our programs. At the institutional level, schools may influence healthy eating habits in ways that are beyond our control but that may lead to social change.[5] Classes in health education may introduce children to the food pyramid and to the concept of proportional intake, while the cafeteria may serve pizza on Wednesdays and steak fingers on Thursdays. The community also can influence eating habits through availability of fast-food restaurants or produce markets. Even public policies that provide support (food bank, food stamps) to acquire some items but not others might impact healthy eating habits.

Documenting the social, physical, political, and institutional environments that can influence outcomes helps to improve the program planning process by answering the following:

- Who are important partners/collaborators for the program?
- Which part(s) of the issue can this project realistically influence?
- What evaluation measures will accurately reflect project outcomes?
- What other needs must be met in order to address this issue?

Evaluation Planning

Development of an evaluation plan to assess the program can be superimposed, using the logic model format. The evaluation plan should include alternatives to assess the processes used in planning the program. Process indicators should be designed to provide a measurable response to questions such as:

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- Were specific inputs made as planned, in terms of the amount of input, timing, and quality of input?
- Were specific activities conducted as planned, in terms of content, timing, location, format, quality?
- Was the desired level of participation achieved, in terms of numbers and characteristics of participants?
- Did customers express the degree of customer satisfaction expected?

The evaluation plan also should identify indicators appropriate to the desired outcomes, including short-, medium-and long-term outcomes. Outcome indicators also should be measurable, and should be designed to answer questions such as:
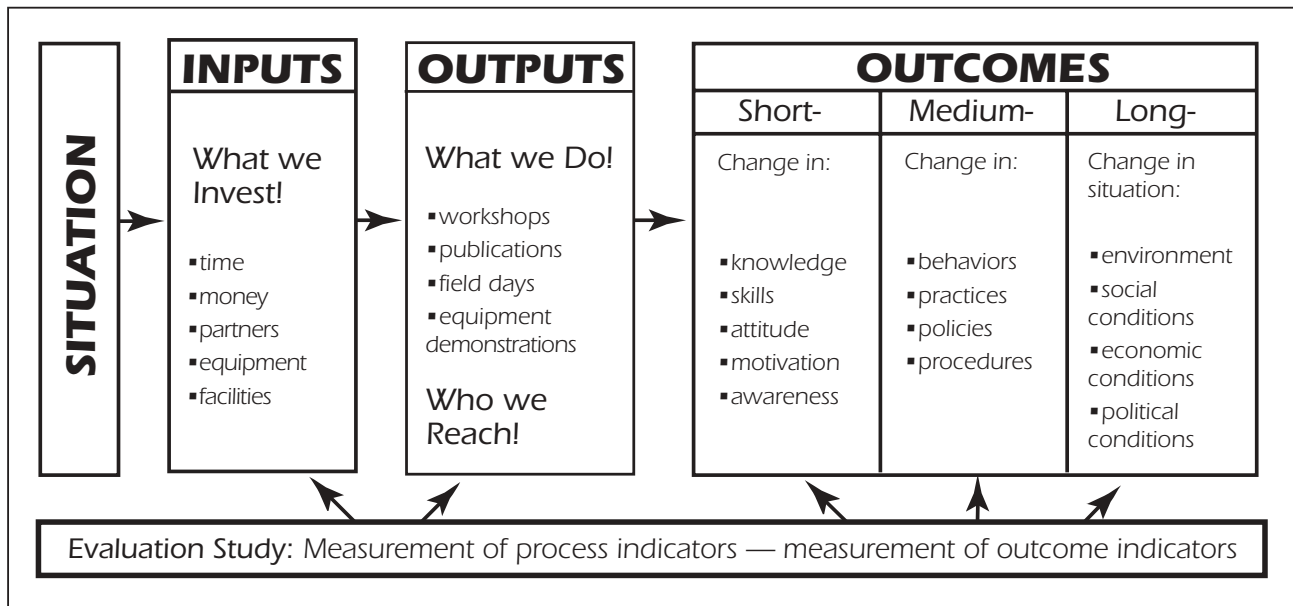
- Did participants demonstrate the desired level of knowledge increase, enhanced awareness, or motivation?
- Were improved management practices adopted, behaviors modified, or policies altered to the extent expected for the program?

- To what extent were social, economic, political, or environmental conditions affected by the program?

Conclusion

Developing appropriate and measurable indicators during the planning phase is the key to a sound evaluation. Early identification of indicators allows the program manager/team to learn what baseline data already may be available to help evaluate the project, or to design a process to collect baseline data before the program is initiated. The logic model is useful for identifying elements of the program that are most likely to yield useful evaluation data, and to identify an appropriate sequence for collecting data and measuring progress. In most cases, however, more work on a project will be required before indicators are finalized. Outcome indicators to measure learning should be based on specific learner objectives that are described as part of the curriculum. Indicators to measure behavioral change should specify which behaviors are targeted by the program. Conditional indicators may require a significant investment of time to link medium-term outcomes to expected long-term outcomes through the application of a targeted study or relevant research base.

Figure 4. Insertion of evaluation plan into the logic model.

SITUATION

INPUTS

What we Invest!

- time
- money
- partners
- equipment
- facilities

OUTPUTS

What we Do!

- workshops
- publications
- field days
- equipment demonstrations

Who we Reach!

OUTCOMES

Short-	Medium-	Long-
Change in:	Change in:	Change in situation:
- knowledge - skills - attitude - motivation - awareness	- behaviors - practices - policies - procedures	- environment - social conditions - economic conditions - political conditions

Evaluation Study: Measurement of process indicators — measurement of outcome indicators

[1] McLaughlin, J.A. and G.B. Jordan. 1999. Logic models: a tool for telling your program's performance story. Evaluation and Planning 22:65-72.
[2] Millar, A., R.S. Simeone, and J.T. Carnevale. 2001. Logic models: a systems tool for performance management. Evaluation and Program Planning 24:73-81.
[3] Adapted from Taylor-Powell, E. 1999. Providing leadership for program evaluation. University of Wisconsin Extension, Madison.
[4] Ladewig, Howard. 1998-1999. Personal communication during sessions on "building a framework for accountability" with ECOP Program Leadership Committee (Tannersville, PA, 1998) and the Association of Extension Directors/ECOP (New Orleans, LA, 2000). Dr. Ladewig was a professor at Texas A&M University at the time of communication; he now is at the University of Florida.
[5] Glanz, K. and B.K. Rimer. 1995. Theory at a glance: a guide for health promotion practice. NIH pub. 95-3896. National Institutes of Health-National Cancer Institute. Bethesda, MD.

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