
USING INDICATORS OF UNSUSTAINABILITY
IN DEVELOPMENT PROGRAMS

Karlyn Eckman

The Search for Sustainability in Development Programs

Throughout the Third World, trends in population growth and land use are occurring that signal increasing problems with the availability and condition of natural resources and, in particular, of indigenous forests. Expanding populations place more pressure on natural resources, as demand rises for tillable soil, forest products, pastures, and sources of water. Deforestation and erosion result, with disruptive economic and social impacts on local users of natural resources, and on downstream communities. Degraded land is far less productive, and rural people experience a decline in their economic and physical well-being. Ultimately, local people find themselves further impoverished, with fewer resources available to sustain their livelihoods

Many nongovernmental organizations (NGOs) are addressing the interlinked problems of poverty and land degradation in developing countries. NGOs are a diverse and dynamic group of development organizations that operate at the local, national, and international levels. Their activities encompass community development, humanitarian relief and emergency assistance, natural resources and conservation projects, and many other sectoral programs.

¹ Karlyn Eckman is a Ph.D. candidate and teaches at the University of Minnesota College of Natural Resources, St Paul, Minnesota, USA.

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There is much discussion among NGOs at present on the failure of well-intended development programs, and considerable interest in fostering sustainable solutions to rural poverty and resource degradation problems. Thus, the concept of **sustainability** has come to be regarded both as a goal in development programs and as an approach to policy and programming.

There are many definitions of sustainability in the literature, as well as in empirical use among development workers. Because the term is strongly dependent upon the context in which it is used, Brown et al. (1987) maintain that a meaningful definition must specify explicitly the context as well as the temporal and spatial scales being considered.

As the focus of this paper is at the operational NGO project level, sustainable development projects are defined here as those with beneficial impacts enduring beyond the original time frame of the project, and that may be diffused beyond the original spatial limits of the project. Such activities acquire a life of their own, and are independently adopted or adapted by local people without significant inputs from external sources as the "official" project ends. Sustainable community-based development projects are represented by a set of conditions in which-

- ▶ Local participation in the activity is relatively constant or increasing.
- ▶ The activity maintains or improves the productivity of the community's natural resource base.
- ▶ The distribution of benefits derived from the project activity remains equitable.
- ▶ Subsidized external inputs lessen to a zero point.
- ▶ Social welfare is increased as a result of project activities.

Sustainability, then, encompasses both environmental and socioeconomic elements. These elements are specific to the project, as well as to the larger community and context in which the project is sited.

Problems in Measuring Sustainability

If defining sustainability is difficult, it is even more difficult to measure programmatically (Brown et al., 1987; Carpenter, 1993). Conventional

monitoring and evaluation methods used by many NGOs are not designed for the task of detecting or quantifying sustainability. They are sometimes inadequate for measuring such complex aspects as technology adoption, resource degradation, or local conflicts arising from a development activity.

Conversely, as a matter of practicality, unsustainability is easier to identify, measure, and address at the project level. Unsustainability in a development project can be defined as a situation in which-

- ▶ Local participation in the activity declines over time, and participation must be prodded or prompted.
- ▶ The upstream or downstream natural resource base (soil, water, forests, and watersheds) is depleted or degraded more quickly than can be regenerated, as a result of project activities.
- ▶ Distribution of project benefits is inequitable, or conflicts arise over project resources.
- ▶ Project activities cannot be continued without external inputs or subsidies provided by the donor.
- ▶ Social welfare does not increase, or some groups are placed at greater disadvantage as a result of the project.

Many NGOs lack simple, low-cost methods to monitor and evaluate development projects. For this reason, NGOs are often hard-pressed to determine the potential sustainability or unsustainability of a development activity at any point in its cycle, or are unable to accurately judge either the direct or indirect impacts of the projects that they fund.

A World Bank study indicated that 27 of 34 projects collected no qualitative monitoring data whatever (Doolette and McGrath, 1990). Another recent study found that while NGOs use a wide variety of monitoring and evaluation methods, most NGOs indicate that gaps remain in their ability to measure impacts or the quality of local participation (Eckman, forthcoming).

Several factors complicate the development of more sensitive methods of impact assessment. Western methods of monitoring environmental or socioeconomic change are often inappropriate or inaccurate in Third World conditions, where highly diverse ecologies and farming practices exist. Linguistic and cultural differences, isolation, and lack of electricity can make

rigorous quantitative analysis difficult. Disciplinary boundaries also hamper the effective assessment of a problem having multidisciplinary aspects.

An inability to measure change and impact is of special concern in natural resources and conservation programs, where changes in human behavior and land use are being intentionally fostered. "Social engineering" is sometimes attempted by foresters and other technically trained professionals with limited training in the social sciences.

Finally, local people are rarely involved in assessing, monitoring, or evaluating development projects in a participatory way, which results in an incomplete picture of the development impact. Increasingly, NGOs are focusing on the importance of local participation in the projects that they support.³ In practice, local participation means different things to different donors and reflects a wide range of actual methods and approaches, ranging from "grassroots" self-help to allocative food-for-work schemes. NGO projects may reflect a greater or lesser degree of community input in project planning and decision-making. Similarly, local participation may reflect either a fairly democratic or more autocratic process, depending on the political context and the approach of the donor.

Using Indicators to Measure Impacts

This paper centers on a monitoring tool already used widely by NGOs in impact assessment and in monitoring and evaluation, namely, monitoring indicators. There are many types of indicators in use by NGOs, although only a few will be noted here.

In monitoring and evaluation, indicators are commonly used to measure progress toward stated goals and objectives in a development project. In natural resources projects, the use of indicators is often limited to a few quantitative "success" indicators such as "50,000 seedlings planted by 5,000

³ For more information on participatory planning, monitoring, and evaluation, see PACT, 1989; ILO, 1990; Rahman, 1984; Clark University *et al.*, 1989; National Environment Secretariat *et al.*, 1990; FAO, 1989a, 1989b, and 1989c; and the Rapid Rural Appraisal Notes series published by IIED, London.

farmers within six months" or "400 hectares reforested within two years by food-for-work labor." Other quantitative indicators are based on seedling survival rates. Such indicators tell nothing about who planted the seedlings, who maintained the seedlings, or who ultimately benefited from the mature trees and in what way. Indicators of this type are difficult to correlate with broader developmental goals of poverty reduction, improved well-being, or conservation of natural resources.

Recent research indicates that most NGOs use indicators (Eckman, forthcoming). However, most use only a few quantitative indicators that measure physical action, rather than other elements of sustainability or potential unsustainability. Many NGOs report that their monitoring practices tend to be largely informal, and that there is considerable variation even within a single NGO as to practices and methods. A number of NGOs have begun to reform their monitoring and evaluation practices, noting that their existing methods are not sensitive enough to the needs and perspectives of local participants (Eckman, forthcoming).

Empirical evidence suggests that NGOs have not previously used socio-economic or environmental indicators in a systematic or multidisciplinary way. There is, however, considerable potential in expanding the use of indicators to identify elements of **unsustainability** at the community level.

When used in a comprehensive way, indicators can be a versatile assessment tool. Indicators can be designed to follow participation in a project over time (Bamberger, 1988) and to track the distribution of benefits. They can be used as a basis for forecasting and predicting, as well as for explaining various processes (Chisholm and Dumsday, 1987). Indicators can point out trends in natural resource availability and condition, and provide evidence of degradation. And they can suggest irregularities in project impacts and provide an opportunity to correct a problem in an iterative way.

A Tool for Sustainability: Unsustainability Indicators

Noting that it is easier to detect when something is unsustainable than when it is sustainable, it seems logical to base indicators on measuring unsustainability. Unsustainability indicators are early warning signs that can sense negative trends in the project area and beyond, when measured over time.

They can anticipate a potential problem, trigger a closer assessment, and lead to a change in the way the activity is done so as to minimize negative impacts.

Unsustainability indicators establish benchmarks against which to measure trends. Unsustainability indicators will not yield rigorous data or prove causal relationships in most cases. They will, however, point out a troublesome trend needing attention. The benchmarks are based upon previously gathered information, common wisdom, or (lacking other information) a “guesstimate” of preexisting conditions. As with other indicators, they are used with repeated measurements to enable comparison over time, and to establish the direction of a general trend.

Fundamental elements of **socioeconomic unsustainability** in village-projects can be measured and expressed as a generally negative trend:

- The level of conflict present over the project
- Technological change (failure to adopt or adapt an introduced technology or practice)
- A decline in the level and nature of local participation
- A lack of improvement in the situation of disadvantaged groups such as women or minorities
- Problems in community-based decision making regarding project resources
- Changes in access to land or to common property resources for some groups
- Institutional capacity

Other elements also could be measured depending on the nature of the project.

Some fundamental elements of **environmental unsustainability** can also be measured and expressed as a generally negative trend over time:

- The quantity and condition of the community’s forest resources
- The quantity and condition of the community’s pasture resources (all tenure categories)
- The condition of watersheds, both upstream and downstream from the site

- Water quality and availability
- Soil loss (degree of mass, surface, gully and wind erosion)
- Pollution levels

For example, building a small dam in a village might benefit upstream dwellers but cause problems in water quality or quantity for people living downstream. Conflict might arise between upstream and downstream residents over the water resource. Unsustainability indicators could be created to anticipate environmental and socioeconomic problems in the watershed that might occur as a result of the dam project. This would help the project stakeholders to take steps to mitigate negative impacts.

How to Use Unsustainability Indicators

NGO projects differ from each other in scale, objectives, complexity, funding levels, and participatory nature. The environmental, political, and socioeconomic contexts will also differ greatly from one setting to another. Consequently, the stakeholders for each project should create a comprehensive set of indicators appropriate to the project’s specific objectives and context. If developed for an already existing project, unsustainability indicators can supplement the project’s existing monitoring and evaluation system, although some on-the-ground adjustments will likely be needed to gather new kinds of information.

Mindful of the differences between project and the range of participatory mechanisms and circumstances, indicators must be appropriate to the user to be meaningful. Where donors implement more top-down, allocative projects, indicators are usually developed that reflect donor needs. NGOs may have some administrative reasons for certain indicators that are of little interest to a villager. In participatory monitoring and evaluation, the indicators should be determined by local people involved in the activity. NGOs and local participants may need to determine jointly the indicators that will keep them informed of project impacts.

To set up a comprehensive monitoring system using unsustainability indicators, the project stakeholders should first review the environmental and socioeconomic contexts that will influence project outcomes. They should note which aspects need recurrent monitoring, such as rainfall or fluctuations

in market prices. Stakeholders should try to anticipate any potential problems or negative outcomes that could occur within the domain of the project (thinking about basic project assumptions and constraints may be helpful in identifying potential problems). Indicators should then be created that will detect such problems. The items listed in Box 1 (below) are **examples** of potential areas for socioeconomic monitoring.

1. Checklist of potential areas for socio-economic monitoring in natural resources projects
<ul style="list-style-type: none"> - Income generated or lost as a result of the project ● Employment created or lost as a result of the project - Assets (private or communal) created or lost as a result of the project <ul style="list-style-type: none"> ● Community lending/borrowing patterns ● Gender relations ● Tenurial relations ● Changes in land use - Adoption/adaptation/diffusion of introduced technologies - Local participation <ul style="list-style-type: none"> ● Group organization and empowerment aspects ● Decision-making patterns in participatory projects - Institutional capacity <ul style="list-style-type: none"> ● Local political support for project ● Local, national, and international market structures for forest products

When designing unsustainability indicators, project stakeholders should make sure that the indicators have the following characteristics:

Simplicity

- Be simple in information-gathering requirements
- Be easily understood by field staff and participants having limited technical training

Reliability and validity

- Be easily cross-checked and verified by multiple methods or sources (triangulation)
- Have the attributes of repeatability and consistency
- Can be repeated at multiple sites

Minimum resources

- Have minimum data and cost requirements
- Have low time requirements for data gathering and analysis

Appropriateness

- Be culture and gender sensitive (data on participation and income should be disaggregated by sex)
- Be sensitive to aspects of seasonality and tenure
- Employ and facilitate the use of participatory methods

The key in creating unsustainability indicators is that they be simple to measure and analyze, and relate to symptoms of possible negative outcomes.

Many projects use only a few indicators when monitoring impacts. **How-**ever, unsustainability indicators are most effective when they are numerous, interdisciplinary, and linked programmatically. Unsustainability indicators should be crafted for as many potential problems as can be anticipated, once the project design has been agreed upon. Sets of complementary indicators can be drawn up by project stakeholders to anticipate a range of potentially unsustainable outcomes.

An early warning system should then be set up for the project, detailing the following:

- ▶ What is to be monitored (what information will be needed to indicate that the anticipated problem is occurring?)
- ▶ Who will do the monitoring

- Where the monitoring will take place
- When to monitor
- How the information will be gathered, organized, and assessed

The early warning system must be conceptually and functionally linked to the project's conventional monitoring and evaluation system. The early warning system should contain the following elements to bridge the two systems:

- A set of unsustainability indicators that anticipate possible negative impacts resulting from the project
- A mechanism to link the information derived from the unsustainability indicators with the conventional monitoring and evaluation system of the project, such as an expanded reporting and information review system
- Mechanisms for making decisions and taking action based upon the combined information system, such as the establishment of threshold levels, periodic meetings to discuss emerging trends and issues, and iterative project redesign

A few words of caution are in order when using unsustainability indicators. First, the feedback provided by the indicators is useless if it is not used to make improvements as the project progresses. Once a negative trend is detected, the project stakeholders must diagnose the problem and find ways to adjust the project design to mitigate the problem. Second, indicators can be sensitive to outside changes that are beyond the scope of the project. For example, changes in prices for raw materials or for substitutes may affect the performance of a project. Third, environmental indicators are most useful when compared to other similar areas nearby, ideally a park or reserve with less pressure on the environment. This will help to distinguish between environmental changes that are climate-driven and those that are accelerated by human activities. Finally, strive to collect the **minimum** amount of information needed to detect a trend. Collecting large amounts of interesting but useless information is an unwise use of resources.

A number of generic unsustainability indicators have been developed for some environmental and socioeconomic aspects of natural resources projects (Eckman, forthcoming).⁴ These should be taken as examples, and adapted or changed as needed to local conditions, socioeconomic and environmental contexts, and geographical characteristics. Obviously, not all of the indicators will be appropriate for all projects.

Summary

Using unsustainability indicators will not guarantee that a project will be sustainable. Nor can indicators in themselves identify a relevant strategy for dealing with a problem. This must be done through a process of diagnosis and iterative corrections in the project design. When used creatively, however, unsustainability indicators can contribute to more sensitive monitoring and effective evaluation. As a result, donors and participants can have a better understanding of actual project impacts, both anticipated and unanticipated.

Note to the reader:

Examples of unsustainability indicators can be obtained by writing to Karlyn Eckman, c/o Dept of Forest Resources, 1 15 Green Hall, University of Minnesota, 1530 N Cleveland Ave, St Paul, MN 55108-1027, USA.

⁴ A copy of the set of indicators may be obtained by writing to the author.

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