Evaluation and Program Planning 47 (2014) 45–53

Contents lists available at ScienceDirect

Evaluation and Program Planning

journal homepage: www.elsevier.com/locate/evalprogplan

A framework for monitoring social process and outcomes in environmental programs

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ARTICLE INFO

Article history:
Received 12 July 2013
Received in revised form 24 June 2014
Accepted 22 July 2014
Available online 28 July 2014

Keywords:
Adaptive co-management
Collaborative adaptive management
Monitoring and evaluation
Conceptual framework
Ecosystems services theory
Environmental programs
Community based natural resource management
Conservation
Theory-based evaluation approaches
Indicators

ABSTRACT

When environmental programs frame their activities as being in the service of human wellbeing, social variables need to be integrated into monitoring and evaluation (M&E) frameworks. This article draws upon ecosystem services theory to develop a framework to guide the M&E of collaborative environmental programs with anticipated social benefits. The framework has six components: program need, program activities, pathway process variables, moderating process variables, outcomes, and program value. Needs are defined in terms of ecosystem services, as well as other human needs that must be addressed to achieve outcomes. The pathway variable relates to the development of natural resource governance capacity in the target community. Moderating processes can be externalities such as the inherent capacity of the natural system to service ecosystem needs, local demand for natural resources, policy or socio-economic drivers. Internal program-specific processes relate to program service delivery, targeting and participant responsiveness. Ecological outcomes are expressed in terms of changes in landscape structure and function, which in turn influence ecosystem service provision. Social benefits derived from the program are expressed in terms of the value of the eco-social service to user-specified goals. The article provides suggestions from the literature for identifying indicators and measures for components and component variables, and concludes with an example of how the framework was used to inform the M&E of an adaptive co-management program in western Kenya.

1. Introduction

The past few decades have been marked by a growing appreciation that environmental problems are inextricably linked to human wellbeing, and that human and environmental issues should be tackled together (Adams et al., 2004; Tallis, Kareiva, Marvier, & Chang, 2008). These links are particularly pronounced in developing countries, where many of the services provided by natural systems – such as fuel wood production or inland fisheries – are especially important to the livelihoods of poor people (Millennium Ecosystem, 2005). It such contexts it is not uncommon for natural resource management programs to include at least some social outcomes in their program agenda, and even in the developed world conservation programs increasingly frame their activities as being in the service of human wellbeing in order to motivate resource-user support (Brechin, Wilshusen, Fortwangler, & West, 2002; Salafsky, 2011).

But when environmental programs incorporate such a complex mix of biological and social aims, M&E becomes a distinct challenge. The scope of M&E increases considerably, as does the range of expertise needed to successfully measure for so many diverse processes and outcomes. This article addresses this issue by presenting a conceptual framework that aims to assist in identifying key variables for M&E, and deciding on a relevant M&E approach. The framework is based on a body of research referred to as ecosystems services research, which in recent years has become increasingly important to environmental program planning and management (Groot, Alkemade, Braat, Hein, & Willemen, 2010; Oudenhoven, Petz, Alkemade, Hein, & de Groot, 2012).

The paper is structured as follows. The first section reviews recent trends and challenges in Section 2. The second part of the paper introduces ecosystems services theory, highlighting some of the recent advances that have been made in applying this theory to enhance understanding of how human wellbeing is related to the natural environment. The framework is then presented, and an applied example is provided to show how the framework has been used to inform the M&E of a collaborative environmental management program in western Kenya.

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http://dx.doi.org/10.1016/j.evalprogplan.2014.07.004
0149-7189/

2. M&E of coupled human-natural systems

Environmental systems are examples of complex adaptive systems (Holling, 2001, 2007). Environmental programs are therefore often complex not only in their level of detail (i.e. the number of variables involved), but also their level of dynamism (i.e. the way these variables interact) (Margoluis, Stem, Salafsky, & Brown, 2009). In order to guide decision-making amid such uncertainty, effective and continuous M&E is strongly advised in order to enable an "adaptive" environmental management approach (Bellamy, Walker, McDonald, & Syme, 2001; Campbell et al., 2001; Stem, Margoluis, Salafsky, & Brown, 2005; Walters & Holling, 1990). Over the decades, numerous tools have been developed by conservation and environmental agencies to guide this adaptive management process (see Hockings, 2003 for a review). But these approaches have typically emphasised the monitoring of biological states, as well as simple project deliverables and outputs (Stem et al., 2005).

As environmental programs move increasingly towards the social domain, the limitations of M&E approaches that focus mainly on biological drivers, outcomes and outputs have become increasingly apparent (Folke, Hahn, Olsson, & Norberg, 2005). And while the concept of collaborative adaptive environmental management has become very popular, the M&E tools needed to support these efforts are still very rudimentary (Carlsson & Berkes, 2005; Cundill & Fabricius, 2009; Hermans, Naber, & Enserink, 2012; Plummer & Armitage, 2007; Plummer et al., 2012; Stephanson & Mascia, 2009). Early conceptual frameworks put forward to support M&E in collaborative contexts have tended to be quite theoretical in nature (see for example Bellamy et al., 2001; Campbell et al., 2001; Holling, 2001; Innes & Booher, 1999a,b). Although most of these frameworks typically acknowledged broad, overlapping social, ecological and economic domains that should be included in an M&E effort, these frameworks largely failed to demonstrate how these domains might be broken down into variables and indicators that are causally related to one another.

More recent advances have made some efforts to address these limitations, but major challenges still persist. For example, the Open Standards approach pioneered by the Conservation Measures Partnership initially only advocated the integration of those social factors that represent a threat to ecological outcomes. Moreover, while the Sustainable Livelihoods Framework (SLF) (Chambers & Conway, 1991) has provided broad thinking on ways to categorize the human relationship to natural resources in terms of livelihood assets, such as human capital (e.g. health, skills and capacity), physical capital (e.g. infrastructure, housing), social capital (e.g. organizations, networks) and financial capital gains (e.g. income, employment) (Neely, Sutherland, & Johnson, 2004; Plummer & Armitage, 2007; Sayer et al., 2007); this approach is increasingly being criticized as a rather mechanical and quantitative "cataloguing exercise" which plays neatly into broad categories of human wellbeing but which frequently misses the mark in terms of developing indicators that reflect accurately on the benefits, values and policy relevance of interventions to local communities (Morse, McNamara, & Acholo, 2009). More recent iterations have since sought to identify a more broad range of social variables for environmental program M&E, using for example Sen's "capabilities approach" and the United Nations Millennium Development Goals (MDGs). Yet while these refinements do indeed expand the range indicators used to capture human wellbeing (Stephanson & Mascia, 2009), separating indicators that capture desirable social outcomes of collaborative environmental management programs from indicators that reflect the conditions or methods (i.e. the processes) needed to facilitate social learning and change is an ongoing challenge (Cundill & Rodela, 2012; Reed et al., 2010).

Unfortunately, the nascent literature on M&E within adaptive co-management programs has offered little clarity on these issues. Although a bewildering number of processes and outcomes have now been identified as important to the successful realization of adaptive co-management programs, tools and procedures for actually monitoring these components are lacking. For example, while some sources recommend that M&E in adaptive co-management be kept manageable by means of prioritising a handful of "key variables" which are likely to explain most of the variability within the system (Conley & Moote, 2003; Cundill, 2010; Cundill & Fabricius, 2010; Walker et al., 2006), others stress that all variables must be considered together (Innes & Booher, 1999a,b). In practice, many sources describe a somewhat ad hoc procedure for selecting "key" M&E variables from the range of criteria outlined in the literature (Cundill, 2010; Cundill & Fabricius, 2010; Plummer, 2009) or through critical literature reviews (Plummer et al., 2012). The M&E approach for monitoring these variables is then ideally tailored to stakeholder needs by means of participatory engagement (Cundill & Fabricius, 2009; Hermans et al., 2012; Reed, Fraser, & Dougill, 2006) and, where relevant, the identification of key natural resources in the system (Carlsson & Berkes, 2005). Few frameworks or conceptual tools exist, however, to guide the evaluator through this process.

2.1. Applying social science approaches to environmental program M&E

The relevance of social science to collaborative environmental program evaluation and planning is now widely acknowledged (Cundill, Cumming, Biggs, & Fabricius, 2012; Muro & Jeffrey, 2008; Stephanson & Mascia, 2009). Specifically, theories of transformative learning have become very popular in the adaptive co-management literature to describe circumstances where people learn from each other and from nature. The analogy of single and double loop learning, as popularized in organizational learning theory (Argyris & Schön, 1978), has been widely used to explain the emergence of adaptive learning cycles in adaptive environmental co-management (Armitage, Marschke, & Plummer, 2008; Cundill, 2010; Dougill et al., 2006; Pahl-Wostl, 2009). Specifically, successful programs have been described in terms of their ability to make participants move from a defensive model of simply fixing errors in action strategies (single loop learning), to a more dialogical model where good quality data is used to revise assumptions about the cause–effect relationships upon which intervention logic is based (double loop learning). Recent expansions of this model within management theory to include triple loop learning (e.g. Hargrove, 2002), which describes a change in the underlying social values and norms that govern society, has also been a popular analogy used to describe the development of "social learning" in societies that work collaboratively and iteratively to derive benefits from environmental programs (Pahl-Wostl, 2009).

Yet while social theories have been liberally adapted to the environmental program context, confusion still abounds to the how these theories can be used to inform M&E (Cundill et al., 2012; Muro & Jeffrey, 2008; Pahl-Wostl, 2009; Reed et al., 2010). For single loop learning to lead to double-loop inferences, the organizational culture in which individuals are embedded in has to embrace the continual re-addressing of the logic and assumptions behind actions (Argyris & Schön, 1978). Many of the M&E approaches supported by social scientists suggest that evaluation should be primarily guided by an assessment of the plausability of theories relating to both program implementation and impact (Chen, 1990; Fitz-Gibbon & Morris, 1996; Rossi, Lipsey, & Freeman, 2004; Weiss, 1997). Of interest to many evaluators, therefore, would be tools which assist in developing an M&E approach for