



# The Need to Disentangle Key Concepts from Ecosystem-Approach Jargon

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**Abstract:** *The ecosystem approach—as endorsed by the Convention on Biological Diversity (CBD) in 2000—is a strategy for holistic, sustainable, and equitable natural resource management, to be implemented via the 12 Malawi Principles. These principles describe the need to manage nature in terms of dynamic ecosystems, while fully engaging with local peoples. It is an ambitious concept. Today, the term is common throughout the research and policy literature on environmental management. However, multiple meanings have been attached to the term, resulting in confusion. We reviewed references to the ecosystem approach from 1957 to 2012 and identified 3 primary uses: as an alternative to ecosystem management or ecosystem-based management; in reference to an integrated and equitable approach to resource management as per the CBD; and as a term signifying a focus on understanding and valuing ecosystem services. Although uses of this term and its variants may overlap in meaning, typically, they do not entirely reflect the ethos of the ecosystem approach as defined by the CBD. For example, there is presently an increasing emphasis on ecosystem services, but focusing on these alone does not promote decentralization of management or use of all forms of knowledge, both of which are integral to the CBD's concept. We highlight that the Malawi Principles are at risk of being forgotten. To better understand these principles, more effort to implement them is required. Such efforts should be evaluated, ideally with comparative approaches, before allowing the CBD's concept of holistic and socially engaged management to be abandoned or superseded. It is possible that attempts to implement all 12 principles together will face many challenges, but they may also offer a unique way to promote holistic and equitable governance of natural resources. Therefore, we believe that the CBD's concept of the ecosystem approach demands more attention.*

**Keywords:** adaptive management, conservation paradigms, ecosystem management, ecosystem services, governance, politics and policy, society and conservation

La Necesidad de Desenredar Conceptos Clave del Argot Ambiente-Estrategia

**Resumen:** *La estrategia ambiental - como es promocionada por la Convención Biológica sobre Diversidad en 2000 - es una estrategia para un manejo holístico, sustentable y equitativo de recursos naturales, que habrá de implementarse por vía de los 12 Principios de Malawi. Estos principios describen la necesidad de manejar la naturaleza en términos de ecosistemas dinámicos, mientras se compromete totalmente con las personas locales. Es un concepto ambicioso. Hoy en día, el término es común en la investigación y la literatura de políticas sobre el manejo ambiente. Sin embargo, se han relacionado múltiples significados con el término, lo que resulta en confusión. Revisamos referencias a la estrategia ambiental de 1957 a 2012 e identificamos tres usos principales: como una alternativa para manejo ambiental o basado en ecosistemas; en referencia a una estrategia integrada y equitativa para el manejo de recursos según la CBD; y como un término que indica un enfoque en el entendimiento y la valuación de los servicios ambientales. Aunque los usos de este término y sus variantes pueden traslaparse en su significado, típicamente no reflejan en su totalidad los valores de la estrategia ambiental como fue definida por la CBD. Por ejemplo, actualmente hay un énfasis creciente en los servicios ambientales, pero enfocarse solamente en estos no promueve la descentralización*

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del manejo o el uso de todas las formas de conocimiento, siendo ambas integrales para el concepto de la CBD. Resaltamos que los Principios de Malawi están en riesgo de ser olvidados. Para entender mejor estos principios, se requiere de más esfuerzo para implementarlos. Dichos esfuerzos deben ser evaluados, idóneamente con estrategias comparativas, antes de permitir que el concepto de la CBD de manejo holístico y comprometido socialmente sea abandonado o reemplazado. Es posible que los intentos por implementar los 12 principios juntos enfrentarán muchos obstáculos, pero también pueden ofrecer una forma única de promover el gobierno holístico y equitativo de los recursos naturales. Así, creemos que el concepto de estrategia ambiental de la CBD exige mayor atención.

**Palabras Clave:** Gobierno, manejo adaptativo, manejo de ecosistemas, paradigmas de conservación, políticas y normas, servicios ambientales, sociedad y conservación

## Introduction

In 2000, parties to the Convention on Biological Diversity (CBD) adopted as their primary framework for action the “ecosystem approach” (EA) and defined it as “a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way” (CBD SBSTTA 2000). Since then, the term has become increasingly popular, but its use is not always associated with the CBD’s definition. Instead, it is linked with various initiatives relating to understanding or managing natural resources. Because the CBD’s concept was ambitious and was presented as the key framework for enabling sustainable and equitable resource management, it is important to understand better how the term *ecosystem approach* is used and if its use reflects progress in understanding and implementing natural resource management. Furthermore, because the recent Rio+20 meeting of the CBD raised questions about the extent to which high-level international agreements can influence environmental governance and the outcomes for natural resource management (Tollefson & Gilbert 2012), it is worth reflecting on the use and influence of its primary framework for action so as to inform the debate.

### Exploring Use of *Ecosystem Approach* over Time

We explored understandings and uses of *ecosystem approach* from 1957 until 2012. The origin of this review began in a search for examples of projects implementing the EA. The aim of this search was to identify insights and synthesize best practices for new projects for natural resource management in Scotland. However, an agreement on what qualified as an EA could not be reached by the research team, and we could not agree on whether many initiatives had applied an EA. To resolve this confusion, we used web searches, books, academic articles, and policy papers in order to review the evolving use of the term *ecosystem approach*.

The term *ecosystem approach* has been used in the academic literature since at least 1957, and its use has

increased rapidly in more recent years, particularly since the 1980s (Fig. 1). Even a cursory examination of the titles of the search returns showed that the term has been used in many different ways. Some uses were entirely unrelated to the environment (e.g., Barak 2000); we excluded these from our consideration. Some slightly different terms, such as *ecosystem services approach* (e.g., Turner & Daily 2008), appeared in the search returns and often had meanings that were related but not identical to the CBD’s concept of the EA. Sometimes, different terms for or meanings of EA were used within the same article (e.g., Rouquette et al. 2009). We included these terms and meanings in our exploration of the concepts linked to EA.

### Meanings Linked to *Ecosystem-Based Management*

During the 1980s and 1990s, 2 similarly used terms, *ecosystem-based management* and *ecosystem management* (both abbreviated here as EM), became increasingly common in the conservation literature. The underlying idea, now fairly well established, is that because ecosystems are complex systems with multiple feedback loops and interactions, one cannot manage individual species in isolation (Slocombe 1993), and, consequently, managers must deal with uncertainty and complexity via adaptive management (Johnson 1999). Christensen et al. (1996) state that EM is “based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem composition, structure, and function.” This thinking has been particularly influential within the fisheries and marine sector. For example, it informed the 1982 Convention on the Conservation of Antarctic Marine Living Resources. Occasionally, the terms *ecosystem approach* and *ecosystems approach* have been used to refer to this idea (e.g., Greer 1996; Hill et al. 1999; Jones & Taylor 1999).

Although there is variation in the scope and emphasis of these definitions (Yaffee 1999), the key idea is the need to attend to natural processes and systems rather than individual species (Grumbine 1994). Some interpretations go further and explicitly advocate interdisciplinarity and

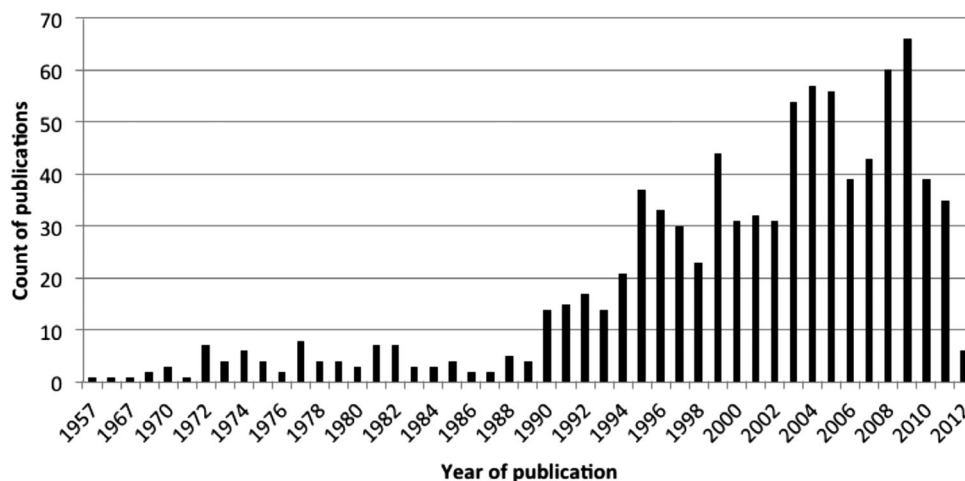


Figure 1. Found via a Google Scholar search, the number of journal articles, books, and reports published from 1957 through 2012 with the term ecosystem approach in the title. Key limitations to information portrayed in this graph are that articles published and journals in production before the 1990s were less numerous and are less likely to be archived on the web. Furthermore, Google Scholar only makes available the first 1000 search returns.

the building of a shared vision between natural resource managers, scientists, and the public (Szaro et al. 1998). However, a focus on ecosystems does not necessarily entail a focus on society.

### The CBD's Definition and Development of the Malawi Principles

In 1992, the first high profile Rio Earth Summit gave rise to the CBD. The CBD promised to be influential in promoting a global shift to resource management that was both sustainable and equitable. At that time, the latest ideas in conservation and resource management—including EM—naturally influenced the creation of the CBD's program of work.

By the time of the CBD's second Conference of Parties (COP), the EA had been explicitly adopted as its primary framework to promote conservation and sustainable use of biological diversity in relation to ecosystem function. Following its adoption, a plethora of activities followed. Numerous events, decisions, and expert groups developed principles, debated terminology, and defined and delineated the scope of the approach. The ideas were advanced at dedicated fora, such as the Sibthorp seminar in London in 1996, and in more general venues, such as the first World Conservation Congress. This enabled the diffusion of ideas between academics, nongovernmental and policy-arena workers and fostered a shared understanding of the approach.

By 1998, key aspects of the approach had been refined into 12 principles (the Malawi Principles) for presentation at CBD COP 4 (Table 1). These principles formally became the basis of the EA when they were adopted by the CBD in 2000 (CBD SBSTTA 2000).

### Links between the Malawi Principles and Other Conservation Concepts

The Malawi Principles do not promote a single sectoral or species approach; rather, they encourage decision making that takes into account how ecosystem processes will be affected over space and time (e.g., principles 3, 7, and 8). This is consistent with the ideas of EM. There are also several Malawi Principles that relate to involving and empowering stakeholders (e.g., principles 1, 2, 10, 11, and 12); these principles go beyond the concept of EM. They reflect arguments that different stakeholder groups should be involved, the desirability of devolving or decentralizing management, and the value of different forms of knowledge (e.g., Decker et al. 1996). Societal or stakeholder participation is thought to bring a variety of substantive, procedural, and normative benefits to natural resource management (Blackstock & Richards 2007).

The desire to involve society more fully is a response to the inequalities and unsatisfactory outcomes of previous more exclusionary strategies and now dominates thought in most sectors of the conservation community (Adams 2009), not only the CBD. Perhaps the most influential concept is that of community-based conservation or natural resource management (CBNRM) (e.g., Western et al. 1994). The CBNRM approach requires devolution of decision-making power and authority and incorporation of local views and institutions so that communities and resource users can fully participate in environmental decision making that balances resource use with conservation (Armitage 2005). It is likely that other management concepts or topic areas also influenced the Malawi Principles. For example, acknowledgement of the need to recognize and use multiple forms of knowledge

**Table 1.** Description of the Malawi Principles<sup>a</sup> of the ecosystem approach (CBD SBSTTA 2007) and the extent to which 3 approaches<sup>b</sup> within the environmental and natural resource management sector may reflect these principles.

<i>Principle description</i>	<i>Community-based natural resource management (CBNRM)</i>	<i>Ecosystem services approach (ESA)</i>	<i>Ecosystem management (EM)</i>
1 The objectives of management of land, water, and living resources are a matter of societal choice.	X		
2 Management should be decentralized to the lowest appropriate level.	X		
3 Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.		X	X
4 Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context.		X	
5 Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.		X	X
6 Ecosystems must be managed within the limits of their functioning.		X	X
7 The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.	X	X	
8 Recognizing the varying temporal scales and lag effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.		X	X
9 Management must recognize that change is inevitable.			X
10 The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.	X		
11 The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge innovations and practices.	X	X	
12 The ecosystem approach should involve all relevant sectors of society and scientific disciplines.	X		

<sup>a</sup>These principles are defined and further explained at <http://www.cbd.int/ecosystem/principles.shtml>.

<sup>b</sup>Definitions and details of each of these approaches were derived from the following publications: CBNRM, Armitage 2005; ESA, Turner and Daily 2008; EM, Christensen et al. 1996.

(principle 11) and integrate multiple goals (principle 10) is consistent with the tenets of integrated water resource management (Merrey et al. 2005).

The Malawi Principles connected the newest ideas about how to manage ecological processes to ideas about the need to involve people and different forms of knowledge in management. Other management approaches also reflect some of these ideas, so their implementation may be expected to support some or all of the Malawi Principles. To explore this, we considered which principles might be supported by 3 management approaches. We selected management approaches that are well-known and might be expected to be related to the EA: CBNRM, the ecosystem services approach (ESA), and EM (Table 1). The ESA, which was developed subsequent to EM and EA, is described in following sections. Our analysis of these management approaches is preliminary and only illustrative; furthermore, there are many other resource management approaches that could be considered. However, our analysis suggests that every Malawi Principle is supported by at least one other man-

agement concept, yet no single resource management approach encompasses all 12 Malawi Principles. Furthermore, most existing management approaches are associated with specific scales or sectors, unlike the EA. Thus, no single Malawi Principle is unique to the EA, but the EA is uniquely ambitious in that it encompasses all the principles (Maltby 2000). It is important to establish if and how EA can make a difference to conservation.

### Potential Challenges to Implementation of the Malawi Principles

It is widely acknowledged that many environmental problems have no simple or single solutions (e.g., Vira & Adams 2009). As such, challenges to implementation are to be expected with any management approach.

Implementation of the Malawi Principles may be subject to the same challenges associated with implementation of EM, plus the challenges associated with approaches that involve stakeholder participation. Some of the challenges associated with EM include defining the

bounds of an ecosystem and contending with poor understanding of ecological processes. These challenges make it difficult to delineate the scale of work and to produce a practical understanding of how the system functions (Slocombe 1993). The challenges of involving stakeholders are well documented (Reed 2008) and known to include complex interactions and potential conflicts with other management goals (Blackstock et al. 2012). Understanding if and how to involve stakeholder groups is not easy and remains a major challenge for research and management, often resulting in concern that the goals of CBNRM will not be achieved (Shackleton et al. 2010). Taken together, the Principles require one to understand and intervene in complex socioecological systems. This, in turn, requires trans- and interdisciplinary initiatives, which are themselves not easily implemented (Janssen & Goldsworthy 1996).

It is unknown whether attempting to implement the EA will simply highlight the complexity of socioecological systems or will actually help resolve the management challenges associated with this complexity. It is possible that implementing all the Malawi Principles will be particularly difficult because it would likely involve all the challenges encountered by more specific approaches. When applied together, the principles could even act synergistically to cause additional problems, particularly when ecological principles based on EM are brought together with social principles based on participation requirements. For example, including multiple stakeholders could potentially compound the problem of defining the appropriate ecological scale at which to work. Alternatively, the principles could be mutually reinforcing. For example, valuing and using local knowledge could allow better understanding of the ecosystem services provided by a natural system.

### Progress in Implementing the Malawi Principles

It is unclear to what extent the potential challenges to implementation of the Malawi Principles were recognized when the principles were adopted. Certainly, the principles alone were seen as giving insufficient guidance on how to implement an EA project, so 5 points of “operational guidance” were also adopted (CBD 2000). Later, in the same year, further guidance appeared in “Ecosystem Approach: from Principle to Practice” (Maltby 2000). However, it soon became clear that even with this guidance, implementation would not be achieved easily. In the latter half of 2000, the IUCN Commission on Ecosystem Management worked with the CBD secretariat and other partners to organize 3 regional “pathfinder” workshops (Smith & Maltby 2001) intended to produce globally relevant insights on how to implement the Malawi Principles. After COP 7 (CBD 2004), enlightening examples of implementation were sought (<http://www.cbd.int/ecosystem/cs.shtml>)

in order to develop guidance based on examples. However, the CBD parties contributed unevenly to the resulting “source book,” and many of their examples are post hoc applications of the term to preexisting initiatives and ideas. Although many preexisting initiatives may fit the ethos of the approach (Maltby 2000), most of the examples appear relevant to only one or at most a few principles. The source book does not contain many examples that successfully applied all the Malawi Principles.

Within and beyond CBD fora, demands for refinement of the Malawi Principles, examples of their application, and guidance on their implementation gradually shifted into calls for clarification of how the principles could be linked to related concepts (such as sustainable forest management), and requests came to halt the debate on implementation of the 12 principles (CBD SBSTTA 2003). This transfer of attention to other concepts may have indicated a frustration with implementation of the Malawi Principles, only 3 years after they had been adopted.

By the late 2000s, there were calls to review the Malawi Principles. These calls were associated with concerns that the CBD needed more effective processes to achieve its goals. A Working Group on Review of Implementation recommended an in-depth review of the EA (CBD WGRI 2005). Perhaps, unsurprisingly, this group identified no new insights for implementing the approach and found that implementation was not widespread. However, they did suggest that other CBD decisions and parallel initiatives could support the EA (CBD SBSTTA 2007). So, the hope was that the Malawi Principles might be automatically implemented via other initiatives led by the CBD, and even via initiatives led by other organizations and sectors, such as poverty reduction strategies (Smith et al. 2010). Overall, it seemed that emphasis and expectations shifted away from the EA toward other concepts and initiatives. The Millennium Ecosystem Assessment was central among these (CBD SBSTTA 2003).

### Moves toward an ESA

Commencing in 2001, the Millennium Ecosystem Assessment (MA) evaluated the state of global natural resources and the effects of ecosystem change on human well-being. The assessment, published in 2005, reported that 60% of the ecosystem services needed to support life—including fresh water, fisheries, and climate regulation—were being degraded or used unsustainably (Hassan et al. 2005).

Although the MA did not conceive the idea of ecosystem services, it greatly popularized the concept and terminology. The CBD explicitly noted the benefits of raising awareness of ecosystem services terminology and declared awareness of ecosystem services could help

**Table 2.** A hypothetical comparison of implementation of the ecosystem approach and an ecosystem services approach in a case-study system, the River Dee catchment in northeast Scotland.\*

<i>Management issue</i>	<i>Ecosystem services approach</i>	<i>Ecosystem approach</i>
Role of different stakeholders and their different knowledges	<p>Focus: people as users or beneficiaries of ecosystem services or as providers of ecosystem services.</p> <p>Activities: surveys with a large sample of households in the catchment to elicit their values for ecosystem services and with land-managers to elicit the opportunities and barriers for them to provide ecosystem services. Financial values may be attached to ecosystem services, and payment for ecosystem services schemes may be recommended. Economists and natural scientists lead information provision.</p>	<p>Focus: stakeholders whose multiple stakes, different knowledges, and interests should ideally lead decentralized prioritization and planning for management.</p> <p>Activities: Separate and then joint workshops with fishers, recreationalists, household members, land managers, and regulators. These would first focus on sharing and discussing local knowledge and scientific knowledge and subsequently on identification of management priorities and planning. This is a slow and iterative process. Facilitators with experience in supporting collaboration and conflict resolution lead, and economists and natural scientists support on request.</p>
Consideration of ecosystem function, dynamic processes, and change	<p>Focus: identifying what ecosystem services can be provided and how. Supporting services are recognized, though with some risk of overlooking the processes and cycles underpinning these.</p> <p>Activities: survey of stakeholder perceptions of ecosystem services followed by workshops to validate and share scientific information on ecosystem service provision. Ideally, scientists carry out primary and secondary research to understand how ecosystems and biodiversity underpin ecosystem services.</p>	<p>Focus: understanding the complex relationships that comprise socioecological systems, including relationships between people and nature. Ecological processes and limits should be appreciated by all who contribute to decision making.</p> <p>Activities: multistakeholder workshops to discuss ecosystem structure and function supported by scientists explaining existing understanding of ecosystem structure and function. Future scenarios or storylines of environmental and social change may be discussed as an aid to identifying management priorities as well as to identifying uncertainties and drivers of change.</p>
Scale of work	<p>Focus: not explicit.</p> <p>Activities: Information is probably collated at a catchment level for ease of decision making by catchment-level committee or external policy makers controlling regulation and incentive schemes.</p>	<p>Focus: not preset but decentralization is recommended.</p> <p>Activities: early discussions explicitly focus on the best scale at which to work. Some decision groups form at the subcatchment level, where there is a distinct identity or sense of place.</p>

\* For more information about this system, visit <http://www.theiverdee.org>.

garner support for the EA approach (CBD 2006). Some have suggested that focusing on these concepts of environmental goods and services is a good way to ensure the integration of social, economic, and environmental concerns (e.g., Beaumont et al. 2007), as called for by the CBD.

In general, since the MA, much of the content and terminology in the CBD's decisions and supporting documents has shifted to incorporate ecosystem services concepts. The perceived success of the MA contrasts with the frustration with the Malawi Principles, which never received high-profile general coverage or, arguably, directly influenced other initiatives. A 2007 CBD review concluded that there was little implementation of the Malawi Principles (CBD SBSTTA 2007): only 12% of its parties stated that the principles were being applied despite widespread adoption in policy documents from intergovernmental and nongovernmental organizations. By contrast, the MA catalyzed a number of initiatives in the

late 2000s, in particular The Economics of Ecosystems and Biodiversity (TEEB 2010) and national-level assessments such as the UK National Ecosystem Assessment (UK NEA 2011). Similarly, in the academic literature ecosystem services concepts are more frequently mentioned, and there is now a dominant discourse that is increasingly focused on economic valuation of ecosystem services (Balmford et al. 2011).

This ESA is an approach to understanding natural systems whereby "the linkages between ecosystem structures and process functioning" are understood to "... lead directly or indirectly to valued human welfare benefits" (Turner & Daily 2008). This approach is widely thought to be helpful for decision making (de Groot et al. 2010), particularly because it allows valuation of changes in specific ecosystem service flows and comparison of previously incomparable resources (Toman 1998; Salles 2011). Furthermore, services that are valued, particularly through monetary metrics, may be perceived

to have particular power as an advocacy tool for environmental concerns (Costanza et al. 1997).

However, framing problems in terms of ecosystem services can mask some of the complexities and challenges of natural resource management (as described in detail by Norgaard 2010). Although understanding a system in terms of flows of services can support holistic and equitable management, describing things in terms of ecosystem services is not the EA (Fish 2011). The idea of ecosystem services is increasingly associated with economic valuation, even though the closest the Malawi Principles come to endorsing such valuation is in principle 4: “there is usually a need to understand and manage the system in an economic context.”

The differences between the ESA and the EA are potentially profound. For example, we compared the hypothetical implementation of the EA with implementation of the ESA in the River Dee catchment in northeast Scotland. There were differences in the prioritization of stakeholder engagement and forms of data collected and knowledge used (Table 2), and these results imply substantial differences in the likely outcomes of the approaches. Ecosystem services concepts may be useful tools for assessments, but they are not by themselves a substitute for implementing the EA. The growing popularity and attention to ecosystem services therefore risks eliding most of the principles integral to the CBD’s concept of the EA.

### Implications for Natural Resource Management

At present, it appears that nearly any initiative aimed at understanding or managing ecosystems or ecosystem services may be labeled an EA. The CBD’s endorsement of the EA may have contributed to the term’s increasing popularity but not necessarily to an emphasis on the Malawi Principles that promote sustainable and equitable resource management.

A diversity of meanings and ideas could be seen as positive, the existence of which can contribute to a healthy evolution in ideas and thinking. Furthermore, enthusiastic adoption of terminology can be seen as encouraging interest in sustainable resource management. However, we believe that the conflation of terminology and ideas is problematic.

The Malawi Principles together represent some of the most ambitious thinking about how environmental management should be conducted (Maltby 2000). If they are forgotten or supplanted by other concepts, opportunities to attempt truly holistic and equitable management may be overlooked. If the present confusion and conflation of terms continues, the CBD’s concept may be forgotten before its implementation is attempted and, through experience, better understood.

Therefore, we suggest that the ambiguous meanings of the EA need to be tackled. Although elements of the CBD’s EA have been applied through other approaches to resource management, it is not clear that use of these other approaches will achieve the interlinked goals of the EA as represented by the Malawi Principles. Our cursory comparison of the Malawi Principles with CBNRM, ESA, and EM (Table 1) suggests that no more than 7 of the 12 principles are included in any 1 of these approaches. Therefore, as long as other concepts are favored over the Malawi Principles, resource management may continue to be limited in its ambitions and outcomes.

### Evaluating and Understanding the Malawi Principles

We argue that the holistic concept behind the Malawi Principles should not yet be abandoned. However, it is important to identify how it will be possible to better understand the potential, or otherwise, of the concept.

To better understand the possible uses and differences of the EA, projects that explicitly set out to implement the EA and the 12 Malawi Principles need to be implemented and evaluated. Integrating all the principles may be genuinely difficult (e.g., Fee et al. 2009); therefore, it may not be feasible to always implement them all in every site or situation (Smith & Maltby 2001). However, it is important to make visible and acknowledge any such experiences. This way one can analyze how, why, and when implementation is challenging and if any strategies or tools can help overcome these challenges.

Lessons and insights as to how to implement and understand the approach can be drawn from ideas that are evolving in related resource management fields. There is an expanding literature on CBNRM (e.g., Dressler et al. 2010) and integrated conservation and development projects (e.g., Hughes & Flintan 2001) and there have been sectoral advances in fishery (Rice 2011) and forest (Corrales et al. 2005) management. Furthermore, although a focus on ecosystem services is not by itself equivalent to an EA, useful lessons and insights as ecosystem services’ potential use as a tool for the EA may come from new research on ecosystem services provision (e.g., Cardinale et al. 2012). Future work to explore the potential of the EA may show it is useful to reconsider the labels used, to ensure the related concepts are clearly distinguished. For example, *ecosystem services framework* (Tallis et al. 2008) may be preferable to *ESA* because the latter is less similar to *ecosystem approach*.

Such lessons and insights derived from related fields will be required to help understand if and how the Malawi Principles can add value for the environmental and resource management sector. They already offer insights as to when and how we will be in a position to better understand and evaluate the Malawi Principles. First, it takes time for the full effects of any initiative to become

apparent (e.g., Mistry et al. 2010). Therefore, it will take several years before implementation can be fairly and fully assessed. There have been some attempts explicitly designed ex ante to implement the EA as per the 12 principles. For example, Natural England, a statutory body responsible for protecting and improving natural resources, has 3 pilot projects that attempt to implement the EA (Waters et al. 2012). If such initiatives are monitored then, say, in 5 years we may be in a position to start to evaluate their processes and outcomes.

Second, plans to monitor and evaluate should be made carefully and early (Kapos et al. 2008); should incorporate multiple sources of information from multiple internal and external perspectives (Kleiman et al. 2000); and should incorporate experiences of processes as well as outcomes (Blackstock et al. 2012). These steps are necessary to allow the detail of both social and ecological impacts to be identified and explained (Mistry et al. 2010). Because the EA aims to incorporate and empower stakeholder decision making, there will be multiple valid perspectives on what success is and whether it has been achieved (Blackstock et al. 2012).

Evaluation will therefore not be a simple task with clear outcomes. Furthermore, the diverse contexts in which the approach may be applied may also complicate attempts to confidently generalize about its utility. Therefore, we suggest comparative studies. Contrasting the processes and the effects of efforts to implement all Malawi Principles with those of other approaches made in similar social or natural settings can indicate the differences in what may be achieved and thus the relative worth of the concept. A comparison of the EA with the ESA (as per Table 2) will be particularly important given the latter's popularity. The outcomes of such comparisons are unlikely to be straightforward, but they should provide useful insights into the relative challenges, opportunities, and utility of the Malawi Principles.

We believe that the time is ripe to revisit the CBD's concept of the EA as represented by the 12 Malawi Principles. At present, the ethos of holistic and equitable management does not seem to be fully reflected in the emphasis of many initiatives that use variants of the term *ecosystem approach*. Instead, many efforts focus on understanding ecosystem services, whereas others focus on adaptive ecosystem management but do not involve stakeholders. Different labels may assist in minimizing future confusion. Regardless of the terminology used, the extent to which these principles can be integrated and implemented at different scales and under different governance arrangements is an important priority for research and testing. It is probably necessary to adopt the ethos of all the Malawi Principles—and address the challenges this entails—if we are to commit to achieving effective, equitable, and holistic resource management.

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