Module 7

Sustainability

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FÈVRE, S, HORWITZ, P, WALTNER-TOEWS, D (2013), (EDITORS), ECOHEALTH TRAINER MANUAL. FIELD BUILDING LEADERSHIP INITIATIVE, VWB/VSF: CANADA
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**MODULE 7 – SUSTAINABILITY**

**Overview**

This module describes different understandings of sustainability, built around the simple concept that we must meet the needs of the present generation in social, environmental, and economic terms, without comprising those of the future. Sustainability is central to Ecohealth because it keeps us asking the question: “Why does Ecohealth matter”? If researchers and stakeholders are interested in helping facilitate long-enduring change for communities, they need to be sure their work will have long-term and meaningful impacts. Building sustainability into a research framework is not easy and often requires adaptive approaches. Because sustainability is rooted in an understanding of the dynamics of social-ecological systems, many solutions relating to adaptive governance have their roots in environmental management.

The module then describes the concepts of program/project sustainability, what it means for an intervention to be sustainable, exploring specific factors affecting sustainability and presenting methods of assessing the sustainability of Ecohealth intervention research. Maintaining the long-term benefits of health interventions depends on sustaining innovations beyond short program timelines, and increasingly, under conditions of unstable and interacting social, ecological, climatic, and economic forces.

Combined with short lectures on sustainability, this module contains active sections where participants workshop sustainability principles and learn how to assess sustainability, how to measure a program/project’s sustainability, and what indicators can be used to determine if a program/project is sustained. Thus, this module provides the opportunity to help learners to start thinking about how they can contribute to ensuring lasting Ecohealth interventions.
Conceptual Map: Module 7

**Learning Objective:**
Formulate a set of sustainability principles from understandings of the need to integrate different economic, environmental, and social perspectives.

**Advanced Learning Objective:**
Explain the value-based, ethical, and cultural foundations of sustainability principles.

**Learning Objective:**
Recognize the similarities, and differentiate between the principles for Ecohealth and the principles for sustainability.

**Advanced Learning Objective:**
Interpret real-world problems in terms of principles of sustainability.

**Learning Objective:**
Demonstrate an ability to apply the principles of sustainability where an Ecohealth approach is used, and where intervention options are specified.

**Advanced Learning Objective:**
Describe a framework for considering the sustainability of a program and how one might generate a list of indicators that can be used to assess the sustainability of a program.

**Learning Objective:**
Derive a set of indicators for the sustainability of an Ecohealth program of action/activities.

**Activity 1A, 1B, C, 1D:**
Small groups; create a word map

**Activity 2A:**
Small groups

**Activity 2B:**
Group discussion; Bellagio Principles for Sustainability Assessment

**Activity 3:**
Facilitate discussion; case study

**Activity 4A:**
Lecture

**Activity 4B:**
Small groups
Introduction to the Topic – Education for Sustainability

Sustainability seeks to meet the needs of present generations without compromising the ability of future generations to meet their own needs. Beyond that important concept lie a number of uncertainties and complexities, and consequently the concept of sustainability can mean different things to different people. In fact, the definition of sustainability needs these ambiguities because of the very uncertain, complex, and ambiguous problems we face in society. More specific definitions of sustainability, through attempting to identify precisely what it is that needs sustaining, are inherently controversial and the subject of much debate. In this module, we have chosen not to use the (otherwise valuable) phrase “sustainable development” since it deals with a “developmental studies” context for what is sustainable; “sustainability” is broader and less constrained in that sense (see Terminology for definitions).

Principles for sustainability include: to ensure life support systems in perpetuity, including the resources that sustain the economic system; to encourage people to live cooperatively and in harmony with each other and have their basic needs satisfied in a fair and equitable way; to have appropriate development to ensure that people can support themselves in a long-term way; and to have a democratic system to ensure that people have a fair and equal say over how natural, social, and economic systems should be managed.

Arguably our global environmental trajectories and current societal progressions over the past few hundred years are becoming more and more unsustainable. This non-sustainability is reflected in such outcomes as climate change, loss of biodiversity, inappropriate personal behaviours, over-use of resources, and cultural and socio-economic inequalities. Professionals knowledgeable in principles of sustainability will contribute to their resolution, by recognizing the multi-faceted nature of broad societal problems, and by being able to propose and know how to implement systemic, lasting changes to ensure inter-generational equity.

The debates about sustainability are often represented by proponents of the so-called notions of weak and strong sustainability. The weak notion of sustainability is based on a strong faith in three things: technology, normative science, and human ingenuity (“we can use science, technology and the infinite capacity of humans to solve whatever challenges we face”). Its supporters’ view of the world is largely one of a machine, where nature is given use-values only, and where humanity is thought to be the only situation in which intrinsic values can be found. The notion of weak sustainability interlocks with anthropocentrism, which represents the almost unchallenged, dominant social paradigm in western society.

Contrastingly, the notion of strong sustainability is based on more pessimistic assumptions. Proponents of this approach have philosophical allegiances to a more eco-centric worldview and therefore challenge culture-specific structures and beliefs. They reject economic rationality, absolute faith in technology, and what they perceive as the arrogance of humanism, which in their view
perpetuates the division between humanity and nature and contributes to human domination of the non-human world. Sustainability, according to this worldview, is therefore contingent on radical social, political, and economic reform. The intellectual tools of the pessimists are trans-scientific in nature, and based on holistic and integrative conceptualizations of human economy-ecology relations.

The adoption of either notion of sustainability has implications for the development of sustainability strategies. On the community level, the degree of optimism/pessimism about the future held by members of a community will determine their treatment of risks and the way they exercise precaution. It also determines their visions of the future, the means they choose to accomplish community goals, and their definition of a sustainable community.

In general terms, it is held that a sustainable community continues to thrive from generation to generation because it has:

- A healthy and diverse ecological system that continually performs life sustaining functions and provides other resources for humans and other species
- A social foundation that provides for the health of the community, respects cultural diversity, is equitable in its actions, and considers the needs of future generations

A healthy and diverse economy that adapts to change, provides long-term security to residents, and recognizes social and ecological limits (Sustainable Community Roundtable 2003).

Module Aims

The aims of this module are two-fold. Participating learners will derive principles for sustainability based on different notions of sustainability, their disciplinary experiences, and shared problem statements that concern inter-generational issues. These principles will be compared with those of Ecohealth, and the first aim is for learners to determine the contributions that the principles might make to an ecosystem approach to human health.

The second aim relates to a specific application of the notion of sustainability. Where an Ecohealth approach is used to intervene to improve human health and well-being, the program itself will need to be sustainable. This module aims to provide opportunities for participants to identify factors affecting program sustainability, including the social-ecological context, to use indicators to assess the likelihood that a research program will ensure lasting impacts, and to suggest ways in the proposal development and
implementation phases to ensure more sustained Ecohealth programs/projects.

Why is this topic important?

Sustainability is important in its own right, in all circumstances. It is important to Ecohealth researchers and practitioners for two reasons.

Sustainability relates directly to global concerns of sustainable development, political, environmental, and economic instability, and deep human desires for fair play and equity. It is an ethical position that starts with the assumption that the current trajectory of human society cannot be sustained, and that we are undermining the foundations of life on this planet. The consequences for human health and well-being are unacceptable unless we intervene – by understanding the integrated nature of human societies, their economies, their cultures and the environment – at all levels, from local to global.

Our interventions must also themselves be sustainable, based on integration, and at all levels. If researchers and stakeholders are interested in helping facilitate long-term change for communities, they need to be sure their work will have long-term impacts. More importantly, because Ecohealth research tends to work directly with communities (participatory), and has implications not just for health, but for all aspects of life (systemic and trans-disciplinary), Ecohealth research generates high expectations in communities where it is carried out. Ecohealth researchers and practitioners become stakeholders in the communities, and, in so doing, have ethical responsibilities to those communities.

Building sustainability into a research framework is not easy and requires adaptive approaches, learning as we go. This module will help learners start thinking about how they can contribute to this process of adaptive learning.

Key Concepts

1. Principles of sustainability can be derived from listening to multiple perspectives that come from integrating, and keeping foregrounded, environmental, social, economic, and cultural concerns (without privileging any of them)

2. The concept of “health” is integral to the concept of sustainability, which includes principles such as healthy and diverse ecological systems, equity and cultural respect, and a healthy and diverse economy

3. Views of what sustainability means are sometimes classified by “weak” and “strong” views of sustainability. These views have different implications for what type of action is considered necessary.
Guiding Questions

1. The nature of sustainable solutions depends very much upon the construction of problem statements – what sort of problems are implied by the principles of sustainability?

2. Why do some people think that changes in attitude, and behavioural change, are central to the design of sustainable solutions?

3. How does sustainability relate to the other principles of Ecohealth – are they synonymous? How can we depict the relationship between sustainability and systems thinking, collaboration, transdisciplinarity, participation, and gender and equity?

4. What is program (or project) sustainability? What is the conceptual framework for program sustainability?

5. How do we know whether a program is going to be long-enduring? What are the indicators of program sustainability? Should we consider these when designing and implementing research?

6. What barriers and enablers have you encountered regarding the sustainability of Ecohealth/public health/environmental health/community health interventions?

Basic Learning Objectives

After completing this module, learners will be able to:

- Formulate a set of sustainability principles from their understandings of the need to integrate different economic, environmental, and social perspectives
- Describe the similarities, and differentiate between the principles for Ecohealth and the principles for sustainability
- Demonstrate an ability to apply principles of sustainability where an Ecohealth approach is used, and where intervention options are specified
- Describe a framework for considering the sustainability of a program and how one might generate a list of indicators that can be used to assess the sustainability of a program.
**Advanced Learning Objectives**

On completion of this module, advanced learners will be able to:

- Describe why principles of sustainability need to be formulated from value-based, ethical, and cultural foundations
- Interpret real-world problems in terms of principles of sustainability
- Assess program sustainability for an Ecohealth research program/project (when designing, implementing and/or evaluating it)
- Present/introduce the concept of program sustainability to other researchers/participants.

**Practical Notes**

The instructors for this course should be familiar with the overall contents of all modules and should have relevant experiences in both i) the principles of sustainability and their application to complex societal problems; and ii) the sustainability of programs/projects where interventions are involved.

One trainer and an assistant trainer are ideal for this module. Trainer and assistant trainer should have good active teaching and facilitating skills.

This is conceived as a half day module, but can be extended to a full day for more advanced participants who are seeking some additional introduction on considering both i) principles of sustainability and ii) factors affecting program sustainability when designing, and implementing Ecohealth research program/project as well as assessing program/project’s sustainability. It can also be divided into shorter modules for an on-going course.

It is assumed that learners will have completed *Module 2: Introduction to Ecohealth* and will be familiar with the six principles of Ecohealth.

If the class is composed of many people without background in proposal development, program implementation, monitoring, and evaluation, then the lecture should be combined with group discussions on the current status of program sustainability, the gaps, barriers and enablers, and recommendations for strengthening the sustainability of Ecohealth research programs/projects at different stages, e.g. proposal development, program implementation, evaluation etc.

It is desirable that the participants in the course have diverse disciplinary backgrounds and/or experiences including program/project development, implementation, monitoring and evaluation, public health, social sciences etc.
Approximately 20 to 30 participants are the ideal number for delivering this module; the class can be divided into 4-5 small groups for discussion. This half day module is composed of lecture materials, sharing experiences and group discussion, and group activities. The design of the instructing/training setting should facilitate the sharing and exchange of information and experiences among participants.

Background information

The role of education

Education (like this training module) is something of a paradox in the context of sustainability. It seeks to enable the future through training, yet more often than not does so by reiterating the successes of the present and the past, which maintain the status quo. However, if we start with the premise that our current behaviour is diminishing the choices of future generations then education must adjust, and challenge the status quo.

The UN declared 2005-2014 the decade of Education for Sustainable Development. A UN report states that education for sustainability is the best framework for future development (UNESCO 2010) and universities and other education providers have a role in the development of future leaders in sustainability. A paradigm shift from unsustainable growth to that of sustainable economies, communities, and ecosystems requires a fundamental shift in people’s behaviour. However, it is very difficult to change behaviours. Top-down approaches that aim to dictate the behaviour of individuals are rarely effective (Lautensach 2011). Instead, changing beliefs and attitudes is the most effective way to instigate lasting changes and education at all levels has an influential role in shaping people’s beliefs and attitudes.

For genuine changes to be made in the community and within industry, leaders are required with a deep understanding of sustainability as well as the necessary skills to enact lasting change and encourage the involvement of others. It has been argued that traditionally education has failed to provide learners with the necessary skills that form the basis for sustainable living (Orr 2010; Lautensach 2011). Graduates who are able to lead sustainable lives and promote sustainable living need to have a deep understanding of moral reasoning and strong analytical skills, as well as understand at least basic ecological and social justice concepts. Ideally, these are skills all graduates possess, however, it is evident that this is currently not the case, although changes are in progress (Lautensach 2011).

Educating for sustainability varies considerably from educating about sustainability, which implies only the dissemination of knowledge. Instead, it is now understood that sustainability is “a process of adaptive management and systems thinking, requiring creativity, flexibility, and critical reflection” (Tilbury et al 2004).
Furthermore, education for sustainability builds the individual’s capacity to instigate and manage change, skills which are an integral part of sustainability. Higher education has a role in providing these skills to learners, who ideally come from a wide range of interests and life experiences.

*What has this got to do with Ecohealth? Program/Project Sustainability?*

In the field of Ecohealth, sustainability can be referred to as follows:

“An ecosystem approach to health is predicated on an understanding that protecting ecosystems and improving degraded environments are fundamental requirements for human health and well-being now and for future generations... As research for development, Ecohealth research aims to make ethical, positive, and lasting changes. Sustainability implies that these changes be environmentally sound and socially sustainable” (Charron 2012).

This module will focus on what it means for an intervention to be sustainable. This is defined as *the capacity of a project to continue to deliver its intended benefits over a long period of time* (Bamberger and Cheema 1990), and can also be considered as *the continuation of programs without outside help, i.e. when the financial, organizational, and technical aid of external donors/organizations ceases* (Swiss Development Corporation 1991). The sustainability of projects is grounded in both social process and the ecological contexts in which those processes occur. Modules 2 and 4, on introducing Ecohealth and systems thinking, suggested how well-intentioned interventions might have negative outcomes; in part this occurs because of feedback loops between the natural world and social activities. Thus, an irrigation project to improve food production and local economies (an agriculturally-related social goal), will fail if water flows, soil types, and habitats for disease vectors, as well as land-ownership and equity, are ignored. Projects and organizations built around the original objectives can fail as problems arise if they cannot adapt and change along with changing ecological and social realities. This is especially important as we enter a period of climatic, ecological, economic and social instability, after decades of relative stability.

Experiences show that the sustainability of a program is usually affected by three broad groups of factors: how the project was designed and implemented; how the project was organized; and external factors operating at the local, national, and international levels. Using an Ecohealth approach, sustainability is one of six core principles which guide Ecohealth research. Ecohealth research programs aim to bring ethical, environmentally sound, positive, and sustained changes.

In recent years, attention to the sustainability of intervention projects/programs has been increasing, but little consensus occurs on the conceptual and operational definitions of sustainability (Rizkallah & Bone 1998). Maintaining the long-term benefits of interventions depends on sustaining innovations beyond short project timelines. While identifying determinants of program sustainability is still a challenge for researchers, a large body of research has identified key features of adaptive governance that fosters sustainability in the face of change and uncertainty. Participatory
approaches and management are considered to be integral to ensuring the long-term acceptability and continuation of initiatives. In part because of poor lines of communication between research communities devoted to public health, agriculture, ecology, and equitable socio-economic development, it is difficult for public health practitioners to know how and when to influence programs’ sustainability, for decision makers to know how and when to evaluate, and for researchers to study them.

Activities

Activity 1A

*Language and synonyms*

*Learning Objective:*

- Formulate a set of sustainability principles from understandings of the need to integrate different economic, environmental, and social perspectives.

*Advanced Learning Objective:*

- Explain the value-based, ethical, and cultural foundations of sustainability principles.

This is an important activity for two reasons – we ground our understandings of what it is “to sustain,” while sharing our experiences of languages around this concept (since they are different). This manual is in English but the concepts in southeast Asian languages need to be explored too.

**INSTRUCTIONS**

Ask working groups of four to construct two word maps for the term “sustain”; one in English, and one for one other language (try to make sure group members have another common language – if not, just complete the map for English).

A word map starts when participants write the key word in the centre of a piece of paper or on a whiteboard. Participants try to find other words, like synonyms, that have a similar meaning, or share a part of a meaning. These new words are arranged around the central word in a meaningful way, clustered or spread out, near or distant, relative to the central word. The size of the font can be used to emphasise more commonly used words, or words the group thinks are more important in the map. The map is complete when no more new words can be added meaningfully.
Activity 1B

Clustering perspectives

Learning Objective:

- Formulate a set of sustainability principles from understandings of the need to integrate different economic, environmental, and social perspectives.

Advanced Learning Objective:

- Learners should be able to explain the value-based, ethical, and cultural foundations of sustainability principles.

INSTRUCTIONS

Start this activity by setting a context. The context can be as follows, or a similar example:

a) Our family life
b) The street/neighbourhood where the workshop is being held.

Then, starting with the phrase:

“To meet the needs of the present generations without compromising the ability of future generations to meet their own needs.”

Divide participants into working groups to develop answers to the following three questions:

<table>
<thead>
<tr>
<th>What are our “needs” of the present?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of these will be the needs of the future?</td>
<td></td>
</tr>
<tr>
<td>How are these needs compromised/at risk of not being met?</td>
<td></td>
</tr>
</tbody>
</table>

These answers to abstract questions can be exchanged in a plenary session, or groups can share their answers with each other.
Activity 1C

Integration

Learning Objective:

• Formulate a set of sustainability principles from understandings of the need to integrate different economic, environmental, and social perspectives.

Advanced Learning Objective:

• Learners should be able to explain the value-based, ethical and cultural foundations of sustainability principles.

INSTRUCTIONS

Ask working groups to choose one of the “needs” discussed in Activity 1B as a goal for society, and answer the following questions:

How will these needs be met? What actions are required in each domain: economic, environmental, social, cultural to achieve this goal?

<table>
<thead>
<tr>
<th>Need</th>
<th>Economic</th>
<th>Environmental</th>
<th>Social</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the group has successfully completed the table for one row, ask them to consider the following: What would happen if actions were pursued along only one of these lines (like only environmental, or only social, or only economic)? In other words, in what way will these actions, done in isolation, undermine the achievement of the goal?

What is the solution?
Activity 1D

Deriving principles

Learning Objective:

• Formulate a set of sustainability principles from understandings of the need to integrate different economic, environmental, and social perspectives.

Advanced Learning Objective:

• Learners should be able to explain the value-based, ethical, and cultural foundations of sustainability principles.

INSTRUCTIONS

Based on the discussions so far, assign the groups to discuss:

What approaches to sustainability, or what values of sustainability, are universally applicable?

The groups can chose three approaches or principles that are meaningful to them, and write them on sticky notes.

Bring workshop participants back together in plenary. Use a collation process to cluster and word principles. Many of them will have similar intent, if not wording. You can facilitate a process where six or less principles can be derived.

Emphasize that the participants have produced a set of principles that are as valid as any that have been found in the literature. All sets of principles have strengths and weaknesses!

Alternatively, you can give learners task/homework to write an essay or an account of the values of sustainability using a specific socio-ecological context, expanding on to what extent they are universally applicable.

For this activity ensure that each learner has made a record of these (less than) six principles. Give them a copy of Module 7: Handout 1 – Activity 1: The Principles of Sustainability used by Gladwin et al (1995) as a supplement or an alternative perspective.
Activity 2A

Overlaps and distinctions

Learning Objective:

- Recognize the similarities, and differentiate between the principles for Ecohealth and the principles for sustainability.

INSTRUCTIONS

Assign learners to work in groups of four people. Make sure these groups are different from the groups formed in the previous activities.

Instructions for learners:

Using Table 7.1 (Module 7: Handout B), relate the two sets of principles (Ecohealth and sustainability), and in abstract terms, discuss which ones are encompassed by others.
Activity 2B

Assessing sustainability: “sustainable outcomes”

Learning Objective:

- Recognize the similarities, and differentiate between the principles for Ecohealth and the principles for sustainability.

INSTRUCTIONS

Introduce “assessing sustainability” to the whole group in the following way:

Many attempts have been to measure progress towards sustainability – something some say is impossible. Researchers say our “measurement” tools are not sophisticated enough for such complex processes; some also argue a lack of agreement concerning the scope of what sustainability actually is.

This said, useful schemes have been devised to assess progress towards sustainability. The Bellagio Principles (Table 7.2) seek to enable an assessment of a proposal, development, idea, policy, or law for its contribution to sustainability, providing:

1. A starting point, establishing a vision and goals that reflect sustainability in practical terms
2. The substance or “what” sustainability is
3. The process or “how” of sustainability
4. Institutional capacity for entrenching a capacity for continuous learning (Hardi and Zdan 1997).

Facilitate a discussion with the whole group around the four points listed above (1-4) and the 10 Principles outlined in Table 7.1 in Module 7 - Handout 2 – Activity 2: Ecohealth and Sustainability Principle Sets. (In other words, use the four guiding points as a way of making sense of the ten principles.)
Activity 3

**Plenary discussion around the following questions**

**Learning Objective:**
- Demonstrate an ability to apply the principles of sustainability where an Ecohealth approach is used, and where intervention options are specified.

**Advanced Learning Objective:**
- Interpret real-world problems in terms of principles of sustainability.

**INSTRUCTIONS**

Facilitate a discussion with the entire participant group around the following two questions:

1. How do we know whether an action, a policy, a decision, a law etc. will have outcomes that conform with principles of sustainability?

2. How do we know whether an intervention strategy will have sustainable outcomes?

Use the Case Study in Box 7.1 to exemplify the questions.

Endpoint: the critical endpoint of this activity will be to distinguish between two equally valid approaches to “sustainability”: i) whether an outcome of a program is sustainable (following the principles of sustainability), and ii) whether a program intervention itself is sustainable and durable.

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**Box 7.1: Case Study**

(sourced and adapted from Lehmann et al. 2003)

Indigenous Australian children have very high rates of pyoderma (pus-producing skin lesions) and otitis media (glue ear). In some communities as many as 70 per cent of children have been found to have skin sores at any one time. The major pathogen of pyoderma is group A streptococcus, which is also associated with chronic renal failure and rheumatic fever, both of which have high incidence rates in Indigenous communities in Australia.

Some people say that these conditions are exacerbated when children swim in surface waters in remote communities where the water quality is poor (turbid, nutrient rich, and warm).

Impaired hearing, a symptom of otitis media, can seriously affect performance at school, subsequent employment, and social circumstances in adulthood. Between 10 and 67 per cent of Aboriginal school age children have perforated tympanic membranes, and between
14 and 67 per cent have some degree of hearing loss; remote communities have the highest prevalence.

Drowning occurs at a higher rate in the Aboriginal population in Western Australia than in the non-Aboriginal population. With the introduction of the Royal Life Saving Societies’ “Swim and Survive” program (conducted by Royal Life Saving Societies pool managers) all school age children in the communities currently attend swimming lessons.

People in remote Aboriginal communities have little or no opportunities for physical exercise, and changes in diet and lifestyle have made Aboriginal people more prone to the group of conditions known as “syndrome X”—obesity, Type 2 diabetes, cardiovascular, and renal disease.

As part of a public health intervention, the Western Australian government built 25 metre, part shaded, salt water swimming pools in three remote Aboriginal communities.

Activity 4A

Assessing the sustainability of an Ecohealth intervention – a mini lecture

Learning Objective:

- Describe a framework for considering the sustainability of a program and how one might generate a list of indicators that can be used to assess the sustainability of a program.

Advanced Learning Objective:

- Interpret real-world problems in terms of principles of sustainability.

INSTRUCTIONS

Following are notes provided as ideas for a lecture on how to assess the sustainability of an Ecohealth intervention. Develop a presentation around these concepts.

Definitions and Frameworks for Program Sustainability

The following are suggested “definitions” of program/project’s sustainability:

- The concept of sustainability refers to the continuation of programs without outside help, i.e. when the financial, organizational, and technical aid of external donors/organizations ceases (Swiss Directorate for Development Cooperation and Humanitarian Aid 1991)
• A sustained program is a set of durable activities and resources aimed at program-related objectives (Scheirer 2005).
• A program/project’s sustainability is the maintenance of activities and results after external financing and support has been withdrawn (US Agency for International Development 1988).

Maintaining the long-term benefits of interventions which improve human health depends on sustaining innovations beyond short program timelines, and this presents a major challenge to many organizations. If sustainability can only be measured in decades, and if needs and circumstances are constantly changing, how can one identify factors that might predict sustainability? Just as one might be able to characterize healthy or resilient people without knowing how long they will live, researchers have studied characteristics of social-ecological systems that seem to predict the ability to transform and adapt in the context of a changing world. Just as healthy people can adapt to changing environments, so healthy communities and projects within those communities require adaptive forms of governance.

Rizkallah and Bone (1998), in their study, listed three similar groups of 11 factors as potential influences on project sustainability, as shown in Table 7.3.

<table>
<thead>
<tr>
<th>Table 7.3 Factors influencing program sustainability (Rizkallah &amp; Bone 1998)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project design and implementation factors</strong></td>
</tr>
<tr>
<td>1. Project negotiation process</td>
</tr>
<tr>
<td>2. Project effectiveness</td>
</tr>
<tr>
<td>3. Project duration</td>
</tr>
<tr>
<td>4. Project financing</td>
</tr>
<tr>
<td>5. Project type</td>
</tr>
<tr>
<td>6. Training component included</td>
</tr>
<tr>
<td><strong>Factors within organizational setting</strong></td>
</tr>
<tr>
<td>7. Institutional strength</td>
</tr>
<tr>
<td>8. Integration with existing programs/services</td>
</tr>
<tr>
<td>9. Program champion/leadership</td>
</tr>
<tr>
<td><strong>Factors in the broader community environment</strong></td>
</tr>
<tr>
<td>10. Socioeconomic and political considerations</td>
</tr>
<tr>
<td>11. Community participation</td>
</tr>
</tbody>
</table>
Studies have shown that sustaining the long-term benefits of successful interventions involved change at individual, organizational, and institutional levels as organizations adopted innovations and effective approaches were diffused into other parts of the system (Paine et al. 2000; Swerissen and Crisp 2004). Factors shown to enhance uptake included: an appropriate and modifiable project design; building and maintenance of technical capacity among health personnel; strong community involvement; political support; adequate financing; and management and leadership capacity (Scheirer 2005).

In general, health intervention projects have been demonstrated to be successful and sustainable when they: (1) demonstrate effectiveness in reaching clearly defined goals and objectives; (2) integrate their activities fully into established administrative structures; (3) gain significant levels of funding from national sources (budgetary and cost-recovery) during the life of the project; (4) negotiate project design with a mutually respectful process of give and take; and (5) include a strong training component. SDC (1991) also proposed six principles of project sustainability, which are summarized in the following Figure 7.1.

The most important characteristics of a sustainable program are good leadership, trust, and vision. After this, what is required is legislation that enables local communities to undertake innovative ideas and funds. All of these, in turn, are dependent on the ability to draw on a variety of sources of information to monitor changes, and to learn from this information, and then to respond.

If we consider the above, then we can say that for Ecohealth research to create sustainable programs, we need to be able to foster these qualities in the communities where we work. In short, as implementers, we help empower communities with the capacity to continue (and preferably leave only when the community has that capacity). Community capacity is made up of interdependent factors such as knowledge, skills, leadership, trust and honesty, forms of participation, resources and infrastructure, sense of community, external networks, and so on. Some people say that community capacity takes a long time to build, but a short time to erode! The importance of community capacity is emphasized in Figure 7.1 (Rizkallah and Bone 1998).

A significant element of this community capacity is the importance of ensuring program aims are co-determined with stakeholders, that there is “buy in” and a benefit to stakeholders, and that they take ownership of the interventions and their outcomes. In other words, creating sustainable programs inevitably involves participation, and the material covered in Module 3 (Participation) is very relevant here.
Indicators of Program Sustainability

Some researchers have suggested that, since indicators are measures of progress towards achieving goals, and goals in a project which takes an ecosystem approach are generated by stakeholders, the indicators themselves cannot be pre-determined, but only a participatory process for identifying them (Boyle and Kay 2008). Others have used a combination of indicators, some generated within the project and others set ahead of time by the researchers. Ecohealth projects in Kenya (Gitau et al 2008), Peru (Murray et al 2008), and Nepal (Neudoerffer et al 2008) have used such a mixed approach.

Some indicators are intended to measure the sustainability of the project itself (that is, how long does it last, and why); other indicators refer to the substance of the project (are the activities in the project sustainable?). These are not always the same. For instance, a project to create large open-pit mines may be sustained if a lot of money and resources are devoted to it; such a project would not be sustainable in the same way, however, as one that trains people to grow and distribute foods that improve nutrition. This alludes to the fact that sustainability is both about “acceptability” of an intervention as well as the enduring nature of that intervention. Furthermore, some indicators are more useful by governments and researchers and others by local people. Indicators always measure progress against a stated goal, and for an identified group. These indicators should be made clear before they are used.

Bamberger and Cheema (1990), after presenting case studies of project sustainability: Implications for policy and operations from Asian experience (World Bank, Washington, D.C), developed four groups of indicators for assessing program sustainability, combining quantitative and qualitative aspects of program performance (Table 7.4). This set of indicators is used to assess the sustainability of most kinds of social development programs, including programs in agriculture and rural development; urban development; population health and nutrition; and education (Bamberger & Cheema 1990). These indicators may require some slight modifications adjusted to the characteristics of particular sectors, while significant modifications were required for the assessment of industrial and commercial projects (Bamberger and Cheema 1990).
### Table 7.4 Indicators of project sustainability by Bamberger and Cheema (1990)

#### A. Continued delivery of services and production of benefits
- 1. Comparison of actual and intended benefits and their stability over time
- 2. Efficiency of service delivery
- 3. Quality of services (benefits)
- 4. Satisfaction of beneficiaries
- 5. Distribution of benefits among different economic and social groups

#### B. Maintenance of physical infrastructure
- 1. Condition of physical infrastructure
- 2. Condition of plant and equipment
- 3. Adequacy of maintenance procedures
- 4. Efficiency of cost recovery and adequacy of operating budget
- 5. Beneficiary involvement in maintenance procedures

#### C. Long-term institutional capacity
- 1. Capacity and mandate of the principal operating agencies
- 2. Stability of staff and budget of operational agency
- 3. Adequacy of interagency coordination
- 4. Adequacy of coordination with community organizations and beneficiaries
- 5. Flexibility and capacity to adapt project design and operation to changing circumstances

#### D. Political support
- 1. Strength and stability of support from international agencies
- 2. Strength and stability of support from the national government
- 3. Strength and stability of support from provincial and local government agencies
- 4. Strength and stability of support at the community level
- 5. Extent to which the project has been able to build a broad base of support and to avoid becoming politically controversial
The frameworks proposed by Rizkallah and Bone (1998) and Bamberger and Cheema (1990) have been used to assess the sustainability of most kinds of social development programs, including programs in agriculture and rural development; urban development; population health and nutrition; and education. One possibility is that Ecohealth researchers can adapt a framework such as this and develop indicators that are grounded in the participatory processes of particular projects. By doing this, the process of identifying the indicators promotes support from the stakeholders and helps to achieve the ends that we wish to achieve.

Activity 4B

Working groups

Learning Objective:

- Derive a set of indicators for the sustainability of an Ecohealth program of action/activities.

INSTRUCTIONS

Form groups of five people, and have each choose an Ecohealth Intervention. Participants can use a case study example, e.g. from Charron’s book – Chagas disease in Guatemala, sanitation in Yaoundé, Cameroon, or improved soil and nutrition in Malawi etc.

I) Each group should work together to come up with a list of indicators for what would make that intervention sustainable.

II) For each indicator, ask learners to describe a) what type of data are important; b) where the sources of data are likely to be found; c) who would find these indicators most useful.

Participants should be reminded to think about other modules. How do the indicators of sustainability relate to gender and equity? To participatory work? To a systems understanding of the community and the project?

III) Have the groups report back to plenary and list out the indicators they have suggested. Ask the group if any indicators are missing.
NOTE FOR TRAINERS

Major Ecohealth research projects in Kenya (Gitau et al) and Nepal (WT et al) found that indicators chosen by local community people were easy to measure and easy to use. E.g. Are there piles of garbage in the street? Is the water dirty? How far away is the school? How many projects does our community undertake every year? How many people willingly volunteer for community activities? Indicators chosen by researchers tended to be expensive, time-consuming, and technical. For instance, measurements of soil and water quality, distribution of disease, and so on; without a relevance to local people, what are the uses of each of these? In the plenary, encourage participants to consider whether local people will readily understand the relevance of the selected indicators.

In plenary, generate a broad ranging discussion with learners: ask what kinds of outcomes, and over what time frame, would be of interest to community members, in relation to the case studies discussed? If we don’t know, how would we find out? Who would measure them? Why? Who would respond? How would Ecohealth researchers ensure that the appropriate outcomes are measured and responded to?

Ask what kinds of outcomes, and over what time frame, might researchers, governments, and funders be interested in? If we don’t know, how would we find out? Who would measure them? Why? Who would respond? How would Ecohealth researchers ensure that the appropriate outcomes are measured and responded to?

For each indicator, have the group identify who in the community cares about it, whether they have an interest in measuring it, and whether they have the funds or capacities to measure it. For each indicator, suggest who has the responsibility to respond to what has been measured. If those who monitor and those who respond are not the same, what kinds of communication or organizational networks are needed?

What is the role of the Ecohealth research in this process?

IV) Conclusion, questions, and answers.

Ask participants if they have any questions or issues that have not discussed. Briefly conclude on the main concepts and learning objectives of the module to clarify if the objectives are met.
### Sample Timetable: Module 7

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>TIME ALLOCATED</th>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>30 mins</td>
<td>Mini lecture: Instructors/trainers introduce themselves, get to know participants’ background, and introduce the topic</td>
</tr>
<tr>
<td>Part 1</td>
<td>20 mins</td>
<td>Group work 1A: Language and synonyms</td>
</tr>
<tr>
<td></td>
<td>15 mins</td>
<td>Group work 1B: Clustering perspectives</td>
</tr>
<tr>
<td></td>
<td>15 mins</td>
<td>Group work 1C: Integrating</td>
</tr>
<tr>
<td></td>
<td>20 mins</td>
<td>Group work 1D: Deriving principles</td>
</tr>
<tr>
<td>Part 2</td>
<td>20 mins</td>
<td>Group Work 2A: Overlaps and distinctions</td>
</tr>
<tr>
<td></td>
<td>15 mins</td>
<td>Group Work 2B: Assessing sustainability: “Sustainable outcomes”</td>
</tr>
<tr>
<td>Part 3</td>
<td>30 mins</td>
<td>Activity 3: Plenary discussion</td>
</tr>
<tr>
<td>Part 4</td>
<td>30 mins</td>
<td>Activity 4A: Assessing the sustainability of an Ecohealth Intervention – A mini lecture</td>
</tr>
<tr>
<td></td>
<td>45 mins</td>
<td>Group Work Activity 4B: Derive a set of indicators for the sustainability of an Ecohealth program of action/activities</td>
</tr>
<tr>
<td>Conclusion, questions and answers</td>
<td>15 mins</td>
<td>Trainer asks if participants have any questions or issues that have not discussed. Briefly conclude on the main concepts and learning objectives of the module to clarify if the objectives are met.</td>
</tr>
<tr>
<td>Reflection task</td>
<td>Done in their own time</td>
<td>Reflection exercise based upon: the three most important elements participants would seek to include to ensure the sustainability of a hypothetical program where an intervention based on an Ecohealth approach is to be implemented.</td>
</tr>
<tr>
<td>Total time allocated</td>
<td>4 hours and 15 minutes</td>
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</table>
Evaluation, Assessment or Reflection

Ensure that each individual has made a record of the principles of sustainability which they identified.

A) Give them a copy of Module 7 – Handout 1 – Activity 1: The Principles of Sustainability used by Gladwin et al. 1995 as a supplement, or alternative perspective. Ask them to answer the following questions:
   • What are the similarities and differences between the two sets of principles?
   • Are any of these due to cultural perspectives?

B) As an end of module exercise, ask learners to work on their own, and to write in their reflections, the three most important elements they would seek to include to ensure the sustainability of a hypothetical program where an intervention based on an Ecohealth approach is to be implemented. Reflect on the following three questions: Why do they think these are the three most important? How do they relate to the two sets of principles used in this module (one derived by participants, one set from Gladwin et al). Why do they think sustainability is so notoriously difficult to define?

C) For Advanced learners/Ecohealth practitioners, ask: “If you are designing and implementing a project/program, what will you do to ensure its impacts will be long lasting?”

D) Ask participants to develop a list of indicators for assessing an Ecohealth research program that they are developing/ implementing/ assessing.

Terminology

Community Capacity

“...the set of assets or strengths that residents individually and collectively bring to the cause of improving local quality of life” (Easterling et al 1998). The authors of this definition highlight three aspects of it. The first is that the assets need to contribute to increased quality of life for the whole community, not just one individual or organization. Secondly, it refers to assets that already exist in the community, rather than those imported in by outside organizations or the government. Finally, although many of these assets reside with individual members of community, the definition refers to the synergistic effects of these combined individual assets. Five dimensions are identified: skills and knowledge; leadership; a sense of efficacy; social capital; and a culture of learning (Easterling et al 1998).
**Indicators**
From indicate – to be a sign of, to imply, to show; indicator may be something that points out that a remedy or treatment is necessary. Indicators should be measurable in some way, and reliably establish a connection between a cause and an effect. Perhaps the most obvious criticism of the concept of the indicator is that it tries to convey something complex (like sustainability) in a simple measurement. If we reduce something whole to a component of it, how can we be sure that component is meaningfully representing the whole? The art of indicator selection is a trade-off between simplification and meaningfulness in the context of the whole. So the indicator spectrum goes from narrow, component-like indicators (like pH of water, amount of cars on the road between 5 and 6 pm), others are composites – representing simply many interrelationships (like indices of diversity, the gross domestic product). Comprehensive indicator selection may need to cover this spectrum. According to Bell and Morse (1999), some sustainability indicators are State Indicators – describing the state or quality of a variable (like the nutrient concentration in paddock soil), while others are Control Indicators – describing the magnitude or extent of a process (like the rate of fertilizer application to paddocks). Again, comprehensive indicator selection may need to include both.

**Sustainability**
“A process of adaptive management and systems thinking, requiring creativity, flexibility and critical reflection” (Tilbury et al 2004). “An ecosystem approach to health is predicated on an understanding that protecting ecosystems and improving degraded environments are fundamental requirements for human health and well-being now and for future generations…. As research for development, Ecohealth research aims to make ethical, positive, and lasting changes. Sustainability implies that these changes be environmentally sound and socially sustainable” (Charron 2012).

**Sustainable development**
A mode of human development that seeks sustainability. Task: search online i.e. Wikipedia for the definition – can you determine the differences between sustainability and sustainable development?

**Systems thinking**
See Module 4: Using Systems Concepts in Ecohealth

**Key References**


Additional References


The Principles of Sustainability used by Gladwin et al. 1995

A systemic approach developed by Gladwin et al (1995) for components of sustainable development has produced the following five principles: inclusivity, connectivity, equity, security, and prudence.

Inclusivity

Sustainability demands a shift to more inclusive behaviours in the forming of perspectives and opinions, and integrative in devising approaches to problem specifications and problem solving. Correspondingly, inclusive communities need to consider the different sectors our communities are comprised of and the different groups within these communities. Inclusivity should also be considered in terms of space and time, i.e. local and global issues, as well as concerns for the present and the future (futurity – inter-generational equity). Finally, inclusivity also stands for respect and tolerance. In short, inclusivity seeks to recognize boundaries and barriers, and bridge or breach them as an appropriate response to the quest for diverse, pluralistic, and sustainable communities.

Connectedness

Connectedness is an ecological concept, and one that demands that we appreciate the multi-faceted consequences of our actions. Connectedness applies just as much to the domains of economy, environment, society, and culture. Wealthy communities will suffer long-term consequences from the erosion of natural resources and ecological harm. Poverty has important political, cultural, and ecological dimensions that must be addressed. Just as traditional approaches to social, economic, and environmental problems lack inclusivity, they also rely on, and promote, a disconnectedness between these domains. Connectedness is also about our life support systems. Water air and earth connect all of life. A separation of humanity from its settings, giving rise to a perception that humans are more important than, and independent of, bio-physical systems, has become culturally entrenched.

Equity

A sustainable community is an equitable, fair, and just community, one that is accessible and open to all groups within it and one that redistributes social goods and resources. Equity involves provision for basic needs, equal opportunity, and rules of interaction and distribution which are perceived as fair, for current and for future generations. Sustainability also demands special protection for vulnerable groups such as infants and youth, women, Indigenous people, disabled and elderly, and the very poor. The notion of sustainability extends equity to include inter-generational equity. Futurity, per se, is not a dimension of health as consideration is usually given to
communities and individuals presently alive or soon to be born. Health, future development, and ecological integrity are inextricably linked.

**Prudence**

Humanity has to live with incomplete knowledge, yet ought to act prudently in the face of ambiguity so as to avoid adverse, irreversible outcomes. Prudence encompasses a sense of care and protection of the world’s connected systems as a means of preventing irreversible damage to social, ecological, and economic support systems. In practical terms, this means that the recognition of resilience and capacity of systems needs to be at the forefront of political, technological, and scientific decisions. Resilience and capacity, however need to be considered against the principles of inclusivity and equity; in fact, resilience and capacity may indeed work to maintain exclusive and inequitable systems.

**Security**

Security is a warrant for quality of life, assuring that current and future generations can lead safe and healthy lives and are being protected from chronic threats and harmful disruptions. The notion of security is rooted in the “harm principle,” an ancient ethical principle within moral philosophy which implies a moral right of an individual not to be harmed and in turn assumes a moral duty not to violate an individual’s inalienable right to be unharmed. Security is seen as the pre-condition for peace, health, equity, democratization, and social integration, and thus integral for the achievement of sustainability. The safeguarding of ecological and social integrity is of utmost importance; irrespective of their culture, race, gender, income, etc. Security, however, is not to be achieved at the cost of inclusivity; the two principles must be thought of together, as well as what one assumes of the other.
### Ecohealth and Sustainability Principle Sets

**Table 7.1 Ecohealth and sustainability principle sets**

<table>
<thead>
<tr>
<th>5 Ecohealth Principle Set</th>
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</thead>
<tbody>
<tr>
<td>- Systems thinking</td>
</tr>
<tr>
<td>- Gender and social equity</td>
</tr>
<tr>
<td>- Participation</td>
</tr>
<tr>
<td>- Transdisciplinarity research</td>
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<tr>
<td>- Knowledge to action</td>
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</tbody>
</table>

One more Ecohealth principle: Sustainability (insert your derived principles, or use handout principles)

<table>
<thead>
<tr>
<th>Which set seeks to be universally applicable to all human endeavours?</th>
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<table>
<thead>
<tr>
<th>Which principles are value-based, or derived from an ethical stance?</th>
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<table>
<thead>
<tr>
<th>Which principles are methodological?</th>
</tr>
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</table>

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## The Bellagio Principles for Sustainability Assessment

### Table 7.2 The Bellagio Principles for Sustainability Assessment (adapted from Hardi and Zdan 1997)

<table>
<thead>
<tr>
<th>1. GUIDING VISION AND GOALS</th>
</tr>
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<tbody>
<tr>
<td>• Assessment of progress towards sustainable development should be guided by a clear vision of sustainable development and goals that define that vision</td>
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</table>

<table>
<thead>
<tr>
<th>2. HOLISTIC PERSPECTIVE</th>
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<tbody>
<tr>
<td>• Review of the whole system as well as its parts</td>
</tr>
<tr>
<td>• Well-being of social, ecological, and economic sub-systems, their state as well as the direction and rate of change of their component parts, and the interaction between parts</td>
</tr>
<tr>
<td>• Positive and negative consequences of human activity, reflecting the costs and benefits for human and ecological systems, in monetary and non-monetary terms</td>
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</table>

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<tr>
<th>3. ESSENTIAL ELEMENTS</th>
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</thead>
<tbody>
<tr>
<td>• Equity and disparity within the current population and between present and future generations, including resource use, poverty, human rights, and access to services</td>
</tr>
<tr>
<td>• Ecological conditions on which life depends</td>
</tr>
<tr>
<td>• Economic development and non-market activities that contribute to human/social well-being</td>
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<table>
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<tr>
<th>4. ADEQUATE SCOPE</th>
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</thead>
<tbody>
<tr>
<td>• Long time horizon to capture both human and ecosystem time scales, thus responding to needs of future generations as well as those of current to short term decision-making</td>
</tr>
<tr>
<td>• Space of study large enough to include local and long distance impacts on people and ecosystems</td>
</tr>
<tr>
<td>• Build on historic and current conditions to anticipate future conditions – where we want to go, where we could go: Principles in Practice</td>
</tr>
</tbody>
</table>
5. **PRACTICAL FOCUS**
   - Explicit set of categories or organizing framework that links vision and goals to indicators and assessment criteria
   - Limited number of key issues for analysis
   - Limited number of indicators or combinations to provide a clearer signal of progress
   - Standardized measurement to permit comparison
   - Comparing of indicator values to targets, reference values, ranges, thresholds, or direction of trends, as appropriate

6. **OPENNESS**
   - Make methods and data accessible to all
   - Make explicit all judgments, assumptions, and uncertainties in data and interpretations

7. **EFFECTIVE COMMUNICATION**
   - Address the needs of the audience and set of users
   - Draw from indicators and other tools that are stimulating and serve to engage decision-makers
   - Simplicity in structure and use of clear and plain language

8. **BROAD PARTICIPATION**
   - Broad representation of key grass-roots, professional, technical, and social groups, including youth, women, and indigenous people – to ensure recognition of diverse and changing values
   - Participation of decision-makers to secure firm link to adopted policies and resulting action

9. **ONGOING ASSESSMENT**
   - Develop capacity for repeated measurement to determine trends
   - Iterative, adaptive, and responsive to change and uncertainty due to complexity and frequent change
   - Adjust goals, frameworks, and indicators as new insights are gained
   - Promote development of collective learning and feedback to decision-making

10. **INSTITUTIONAL CAPACITY**
    - Clearly assign responsibility and provide ongoing support in the decision-making process
    - Provide institutional capacity for data collection, maintenance, and documentation
    - Support development of local assessment capacity