

Indigenous knowledge and occidental science: How both forms of knowledge can contribute to an understanding of sustainability

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INTRODUCTION

The concepts of sustainability and sustainable development have become powerful and controversial themes that continue to provide the foundation for a number of local, national, and international initiatives. Proposals for change are often revealed in terms of their contributions to sustainability (Barkin 1998). However, one of the problems in trying to achieve sustainability is knowing what it means. The Brundtland Report (World Commission on Environment and Development 1987) stated that sustainable development required the conservation of plant and animal species, and defined sustainable development as “a process of change in which the exploitation of resources and technological development were in harmony with current, and future, human needs and aspirations.” This report recognized the role Indigenous Peoples must play in sustainable development, and recommended that Indigenous Peoples be given a “decisive voice” in resource management decisions that may affect them.

The Rio Declaration was drafted five years later, in 1992, at the Earth Summit in Rio de Janeiro. This declaration stated that Indigenous Peoples have a vital role in environmental management and development, and clearly established the relevance of their knowledge and traditional practices in sustainable development, and the need to protect their rights. The Earth Summit recognized that the use of traditional knowledge could contribute to the conservation of biodiversity and sustainable ecosystem management. The Convention on Biological Diversity was opened for signature at the Earth Summit. This Convention was an attempt by the global community to commit to sustainable development. Article 8(j) of the Convention specifically refers to the importance of Indigenous knowledge (IK) in the conservation and sustainable use of biodiversity, by stating the need to:

respect, preserve and maintain the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biodiversity, the need to promote the wider application with the approval and involvement of the holders of such knowledge, and to encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices.

In an effort to understand sustainability, I discuss this concept from both scientific and Indigenous perspectives. The objectives of this paper are to identify Indigenous knowledge (IK) as a critical information gap, and highlight how the combined use of Indigenous knowledge and Western scientific knowledge could facilitate a greater understanding of sustainability. Research and support for both forms of knowledge is needed to better address the full range of issues related to the sustainable

CITATION —

Higgins, C. 2000. Indigenous knowledge and occidental science: How both forms of knowledge can contribute to an understanding sustainability. *In* Proceedings, From science to management and back: a science forum for southern interior ecosystems of British Columbia. C. Hollstedt, K. Sutherland, and T. Innes (editors). Southern Interior Forest Extension and Research Partnership, Kamloops, B.C., pp. 147–151.

management of ecosystems for all resources and values. The co-existence and use of both forms of knowledge will help to develop holistic sustainable management models.

SUSTAINABILITY: DEFINITIONS AND PERSPECTIVES

An Indigenous Perspective

Sustainability has been defined as: “the ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time” (Dunster and Dunster 1996).

Sustainability from one Indigenous perspective is synonymous with survival. Sustainability is inextricably linked to a dependence on the land and resources, and use is based on a holistic spiritual and respectful approach. There is a spiritual, ecological, economic, and social bond between the land and the people. Aldo Leopold, a leading ecologist in the early 1950s and a founder of the conservation movement, termed this connectivity—one in which there is no separation between the soils, water, plants, animals, and people—the *land ethic* (Leopold 1949). He stated that: “a land ethic could not prevent the alteration, management and use of these resources, but that it did affirm their right to continued existence, and at least in spots, their continued existence in a natural state.”

Sustainability in this context is not just about the environment and development, it is about the survival of people who depend on the land. Thus, strategies developed to promote sustainability should focus on the importance of meaningful, local participation (Barkin 1998). Because of the close link between the social and economic elements of sustainable management, policies for strengthening the economic development of the various resource sectors are unlikely to be successful in the long run if they do not integrate environmental, social, and cultural concerns. Another way of looking at this is to view sustainability as composed of three overlapping components: economic, environmental, and social; the area of overlap represents a balance or achievement of sustainability (Figure 1). Environmental policies and cultural values need to be integrated with both economic and social elements. The achievement of balance and the integration of the social, cultural, economic, and environmental values into practices at the management level will, of course, involve trade-offs—choices will have to be made.

There is increasing recognition that the use of Indigenous knowledge and the application of Indigenous natural resource management systems provide effective strategies for the sustainable use of natural resources (Posey 1996). Several reasons exist to incorporate IK into the planning and management of ecosystems: IK is holistic; Indigenous Peoples’ systems of traditional use tend to have a low impact on biological diversity; management approaches are based on self-regulation and are

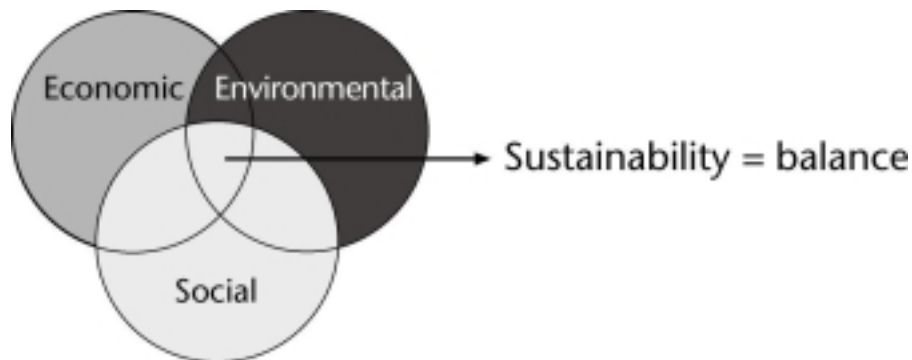


FIGURE 1 Sustainability is composed of three overlapping components.

decentralized, built on consensus, and enforced through social sanctions according to customary law, cultural tradition, and local knowledge (IUCN 1997).

Comparison of Indigenous Knowledge and Occidental Science

Science is defined as: (1) knowledge acquired by study, mastery, trained skill; (2) a body of knowledge, laws or principles; and (3) the state of fact of knowing; knowledge in the sense as opposed to belief or opinion.

All of these definitions are applicable to Indigenous knowledge (Augustine 1997). Indigenous knowledge is a disciplined approach to knowing and understanding the nature of reality, systems of relationships, and the processes of the universe. However, it cannot be separated from other aspects of daily existence, such as ethics and spirituality (Peat 1994). Seeking truth and coming to understanding require the study of cycles, relationships, and connections between things (Augustine 1997). Knowledge of medicines provides an example of how Indigenous wisdom can be applied in a Western scientific context. For instance, more than 100 Native medicines exist, aspirin being one of them (Augustine 1997). Knowledge of medicines requires precise information about the environment, the seasonal patterns of the plants, and their ecological requirements. Thus, the acquisition of this knowledge and the use of these medicines by Indigenous Peoples demonstrates the use of their knowledge in a scientific context. This example highlights the non-random and precise nature of Indigenous knowledge. Use of fire, farming methods, hunting methodologies, and knowledge of the natural ecology and biology of wildlife are other examples of Indigenous knowledge as a base of expertise associated with observation, classification, and comparison (Augustine 1997). For these reasons, Indigenous knowledge must be classified as a science.

Use of Indigenous Knowledge in Resource Management

The environmental field became interested in Indigenous knowledge when researchers began to look for alternative approaches to Western science and technology, and studies shifted from theoretical to applied approaches (Simpson 1999). As both the global and local communities search for new ways to manage natural resources and solve environmental crises, Indigenous knowledge is increasingly sought after. However, despite this recognition by some members of society and academia, it is still rare that IK is accepted on *par* with occidental science. Unlike classic Euro-centric science, it is seldom perceived as objective quantifiable knowledge. Much of mainstream society still believes that Western scientific knowledge is “better” or more “reliable” than knowledge generated by Indigenous systems (Simpson 1999). In most cases, non-Western knowledge and traditions are only accepted when they support approved orthodox doctrines (Deloria 1997).

Indigenous knowledge must be used as it is, for what it is, and not changed to fit Western scientific paradigms. A fundamental component of the use and incorporation of Indigenous knowledge is that the knowledge holders control how it is used. This will minimize the chance of assimilation, misappropriation, and exploitation, and bring forth a greater desire by Indigenous communities to share this knowledge and participate in co-management of the land and resources. Indigenous knowledge holders must be respected as experts; this knowledge must be respected for what it is on Indigenous terms, including its spiritual basis, ethics, and its dynamic and creative nature (Simpson 1999). Most importantly, Indigenous communities must have complete control over the documentation and use of their knowledge.

Future Steps and Challenges

A greater move toward the co-management of natural resources that fully involves Indigenous Peoples would permit the co-existence of knowledge and practices which would enhance sustainability and

include ethical concerns. Developing policies and practices to use Indigenous knowledge will contribute to sustainable resource management and the conservation of biological diversity. To guarantee the successful incorporation of Indigenous knowledge, as well as the protection of this information, Indigenous Peoples must control the collection and use of this information for resource management. Article 8(j) of the Convention on Biological Diversity states that arising from the utilization of such knowledge, innovations, and practices, provisions shall be made for the equitable sharing of benefits with the holders of this knowledge. Through the use and incorporation of IK, Indigenous Peoples can make unique contributions to stabilizing and sustaining the use of the world's ecosystems.

The following recommendations promote the co-existence of Indigenous knowledge with Western science.

- Research should be requested by the Indigenous community to ensure it meets their needs. Research and documentation are needed to conserve and protect IK.
- Community ownership and prior informed consent over the use of the information (Article 8(j) and Article 15 of the Convention on Biological Diversity [CBD]). The survival of IK will be best achieved through its use.
- Identification of regimes to protect Indigenous knowledge, innovations, and practices from misappropriation and exploitation. Research and documentation by the knowledge holders will help to conserve and protect Indigenous knowledge, innovations, and practices. There is an urgency to do this while the Elders are still alive.
- Support for the involvement of all members of the community including Elders, women, and youth. This will strengthen the Indigenous language and community identity.
- Training for Elders, women, and youth to ensure that the expertise remains in the community, and that data collection and analytical skills are taught to Indigenous researchers.
- Access to the equitable sharing of benefits derived from the use of Indigenous knowledge, innovations, and practices (Article 8(j) CBD). This would provide Indigenous communities with the means to develop capacity and pursue their own development.
- Case studies on co-management systems that would examine the ways and means of managing natural resources, while supporting the co-existence of knowledge regimes.

CONCLUSION

Indigenous knowledge is often neglected, but can be vital in the holistic management of biodiversity. To protect biodiversity, Indigenous knowledge also needs protection. Research and documentation are necessary before Indigenous knowledge can be incorporated into resource management. Documentation is also an important element in conserving and protecting this knowledge. Experts and Elders, from both Aboriginal and scientific backgrounds, must be involved in the use of Indigenous knowledge in the sustainable management of forests, and the long-term conservation of the biological diversity of ecosystems. Sustainability can only really be achieved when both the environmental, traditional, and cultural diversity of particular communities and their regions are protected and understood in unique specificity.

There is a general agreement among practitioners that sustainable development policies cannot be designated or implemented from above. Some scientists recognize that partnerships and collaborative management are essential for understanding and striking a balance of risks and successes in sustaining ecosystems as a whole (Holder and Andersen 1994). To be successful, they require the direct participation of the intended beneficiaries and others who might be affected (Barkin 1998). In this formulation, sustainability is not just about economics or the environment—it is about the active participation of people.

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