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THE CONCEPT OF SUSTAINABILITY*

by

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SUMMARY

Sustainability and sustainable are terms and concepts that have been used in renewable resource management for quite some time. Today, however, they are being used in many other fields and contexts, ranging from agriculture to development theory. Consequently, they have acquired significantly different (and often confusing) connotations. There is a need to clarify the semantic issues, identify the underlying normative assumptions, and understand the multi-dimensional nature of the concept of sustainability. One can then begin to talk about ways in which each of these dimensions may be enhanced.

The layperson's definition of sustainability is the ability to sustain

or maintain. Three questions arise: "What is to be sustained ?", "How long is it to be sustained ?" (both mainly normative questions), and "How can it be sustained ?" (a question of strategy and method). Sustainable use of renewable resources is usually taken to mean maintenance of productivity for an indefinite length of time, and the basic strategy is to harvest at a rate less than the regeneration rate of the resource (Tivy and O'Hare, 1982). In agriculture, which has a much greater social component, there is no such common framework (Conway, 1984; Altieri, 1983; and CASDC, 1987). On the one hand, sustainability has been confused with or linked to other normative ideas such as human well-being and social equity. On the other hand, various ecological properties are suggested as necessary to make an agro-ecosystem system last indefinitely. Similarly, conservationists have argued for preservation of biological diversity as both a goal and a strategy for preserving future options (IUCN, 1980). In the broader socio-economic context, people have talked about sustainable economies (Daly, 1981) and societies (Brown, 1981). Self-sufficiency crops up as a major component of sustainability, but there is no theoretical framework in which one can examine these issues.

From an ecological point of view, for a system to maintain its level of productivity for a long time, it needs to be in dynamic equilibrium, and it needs to be reliable, resilient, and flexible. Ecology may prove to be helpful in devising strategies for enhancing these properties (e.g., Holling, 1973), and it has been suggested that these attributes be included in the multi-objective function that represents the objectives of any natural resource system. Water resources systems analysts have actually attempted to do so (Hashimoto et al., 1982).

Questions of system boundaries as well as temporal boundaries are crucial to thinking about sustainability, and will have to be addressed

carefully if the concept is to be operationalized. It might be possible to extend this concept to human-ecological systems, if one takes into account intangible flows (such as economic flows) across system boundaries. Such an approach ~~framework~~ might also throw some light on the question of whether or not self-sufficiency is desirable by transforming it into ~~the question of~~ the question of what nature and degree of self-sufficiency might enhance ^{the above} these components of sustainability.

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