

Introduction

Sustainable Regional Development

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This issue of the *Canadian Journal of Regional Science* highlights what appears to be one of the most important development concepts to be introduced in the last few decades, *Sustainable Regional Development*. What exactly is sustainable regional development? Is it really an important development concept or simply a vague, diffuse abstraction of questionable applicability?

There is little question that definition and measurement of sustainable development have proved elusive, although some would argue that the strength of the term lies in its ambiguity because it recognizes that development is spatially and temporally unique (and constructed). The more cynical among us might claim that it is a term invented by big business, their idea being that it would take the environmental community at least two decades to figure out its meaning, and we could proceed with business as usual. But despite the critics, all must recognize that sustainable development, as a planning concept, now pervades discussions of environment and development from boardrooms to classrooms. However, even those of us who support the concept of ecologically sustainable development, at times feel uncomfortable with the uncritical acceptance of the term and, in turn, its implications. The regional science community *should* be playing a major role in this debate; unfortunately, it has been notably quiet and ineffectual. This special issue is an attempt to stimulate regional scientists to become more active in the discussions and analyses required by the adoption of sustainable development as a planning goal. Included are a diverse group of papers which outline the theoretical, conceptual and analytical issues involved in the present debate. These papers present a

Editor's Note: The idea for this special issue originated with the previous editor, Jacques Ledent.

mixture of reviews, conceptual articles and empirical studies to provide regional scientists with a sense of the breadth of the literature and its importance to the regional science community. I hope it will also offer enough of a stimulus to entice more regional scientists to work in the sustainable development area.

The term sustainable development had its origins in the 1972 Stockholm Conference on Environment and Development. This conference was important in recognizing the key linkage between environment and development objectives, and was pivotal in promoting greater awareness of this linkage. However, explicit recognition of sustainable development as the guiding principle of all development was not popularized until the publication of *Our Common Future* the report of the World Commission on Environment and Development (1987) (the so-called "Brundtland Report" named after the chair of the Commission, then Norwegian Prime Minister Gro Harlem Brundtland). This report, and the subsequent debate over the definitions of sustainable development, sustainability, sustainable economic development and the like, has stimulated an enormous literature and the concept has now become the accepted "buzz word" of the 1990s, despite its ambiguous meaning. The Commission defined sustainable development as "...development which meets the needs of present generations without sacrificing the ability of future generations to meet their needs." This is a very simple concept, it seems, and one which is intuitively appealing to almost everyone. But what does this definition *mean*? Should we not use *any* nonrenewable resources? Is any additional carbon dioxide in the atmosphere unacceptable?

When asked to define this term, I generally draw on six key principles of sustainable development adopted by the Ontario Roundtable on the Environment and the Economy to support the simple definition given by the Brundtland Commission. These are: intergenerational equity, full cost pricing, anticipation and prevention, informed decision making, living off the interest, and emphasizing quality of development over quantity.

1. **Intergenerational Equity**

Explicit in the Brundtland definition is the notion of intergeneration equity, but not simply from an anthropocentric focus. Not only must the total stock of natural and human capital be non-declining over time (this issue -- natural versus human capital -- is the source of much debate in the newly emerging field of "ecological economics"), but essential ecological processes must be maintained as well.

2. **Full Cost Pricing**

Although an old argument in the economics literature, full cost pricing is, nevertheless, a key principle for sustainable development. All costs, including environmental, social and resource

depletion costs, must be included -- or internalized -- in all cost accounting. This issue is part of a larger policy literature which revolves around the "polluter pays principle".

3. **Anticipation and Prevention**

This principle represents a number of subtle, but crucial, issues. Individuals, institutions and firms must be held accountable for their actions. We must deal with the underlying causes of problems (which will require more structuralist approaches to analysis) while recognizing that these are individual *and* cumulative impacts.

4. **Informed Decision Making**

Decision making should reflect the interests and needs of all stakeholders in the process. This necessarily implies the need for decentralized decision making, a movement towards consensual decision making and direct access to policy making by multi-stakeholder groups, etc.

5. **Living off the Interest**

We must treat our "national assets" as we do capital goods, recognizing that they depreciate and need to be replaced. Consumption must be limited and materials recycled. More importantly, depletion of non-renewable resources must be balanced with our ability to produce renewable substitutes.

6. **Quality of Development Over Quantity**

Future development must focus on more environmentally conscious consumption patterns, energy efficiency, product durability and a more efficient spatial distribution of activities.

While these principles are useful in augmenting the discussion on the definition of sustainable development, the *key issue* which needs to be addressed and, therefore, the *key challenge* for our society, is, unquestionably, how to attain a more equitable society, nationally, internationally, and intergenerationally.

- Equity within nations -- ensuring a more equitable distribution of productive assets and better opportunities for women and the dispossessed.
- Equity across nations -- narrowing the gap between the richest and the poorest nations which has increased over the past twenty years.

- Equity over time -- ensuring that future generations have the possibility of achieving the same livelihoods as we have enjoyed.

These are all useful guiding principles for achieving a sustainable society. But how can we *measure* sustainable development? Or, if we are unable to measure sustainable development, how do we know when we have achieved a sustainable society? And why the focus on sustainable *regional* development? This last question is the easiest to answer. Although the generic definition of sustainable development implies no spatial uniqueness, the application of the term -- and the principles noted above -- does vary considerably by region. Since development is historically and spatially constructed, the element of space in any analysis of sustainable development is crucial. As important, natural environments are regional in nature (for example, airsheds, watersheds, etc.). In British Columbia, the province is divided into eco-regions and eco-districts. Sustainable development must be defined, and applied, according to a specific spatial context.

The *measurement* of sustainable regional development, however, is more problematic, and reflects the themes of many of the papers presented in this issue. To date, most of the empirical work has focused on either developing indicators of sustainable development (of various types) or natural resource accounting, which ranges from physical based sets of information accounts to incorporating natural resource depletion in systems of national accounts. Prior to any decision on indicators versus accounts, or any measurement and analysis, the issue of information systems for sustainable development must be addressed. The major constraint to the application of sustainable development concepts is one of information; problems include the use of different metrics, the lack of measurement, and inconsistent spatial units. Walter addresses the question of information systems in the first article in this issue, and concludes that without an appropriate information system in place, planning processes aimed at achieving sustainable development will be *ad hoc* in nature and oriented toward past problems rather than future needs.

One information system which has received much publicity in recent years is natural resource accounting, particularly at the national level, where the emphasis has been on expanding the UN System of National Accounts to include natural resources. Much of this interest has been on developing "green GNP" measures both as comprehensive information systems and to assist in changing our perceptions -- and measurement -- of national wealth. This work has a considerable inheritance from the ecological input-output analysis done by Isard, Leontief, Daly, Cumberland, Victor and others in the early 1970s. In some cases, environmental accounts can be incorporated into input-output models and used for impact assessment purposes. Prudham and Lonergan present a review of natural resource accounting models in this issue, and develop a model for regional based accounting at the sub-provincial level in British Columbia. In another article, Butterfield and Kubursi demonstrate the

applicability of incorporating environmental satellite accounts into a provincial input-output table and use this technique for estimating the economic effects of waste management strategies in Ontario.

One of the key problems facing modellers in the early 1970s, that has remained unresolved, is the need to value ecosystem services and processes. The measurement question is intertwined with the issue of valuation. Most of the recent work in this area has focused on indicators: of environmental change, of sustainable development, of human development, etc. As Manning illustrates in his paper, the problems in measuring the value of ecological services is one of the key constraints to the further development of resource accounting. He draws on five years of experience with a wetland evaluation project to reveal the problems in deriving functional relationships for ecosystem processes. Another aspect of the valuation question is the problem of cumulative effects. Under the principle of anticipation and prevention noted above, individual *and* cumulative effects must be considered. This has led to the notions of "cumulative environmental change" and, correspondingly, "cumulative effects analysis", which attempt to assess the cumulative impacts of development projects. In his paper, Cocklin emphasizes the inadequacies of present conventional approaches to environmental assessment and management and the need to incorporate cumulative effects analysis in any consideration of sustainable development. While there is a need to further develop methods appropriate to the task of measuring cumulative environmental change, it is crucial that cumulative effects are considered.

The last two papers in this issue focus on specific sectors of the economy, notably forestry and agriculture. Walker assesses deforestation processes in developing countries and compares them to historical patterns of deforestation in the developed countries. Smit and Smithers, on the other hand, examine the agriculture sector where the concept of sustainability has been crucial for over at least a century. They review four prominent themes in the field of sustainable agriculture -- ecofarming, agroecology, food sufficiency and equity -- and assess prospects for sustainable agriculture in Canada.

The eight papers presented in this issue represent the breadth of the literature on sustainable regional development at present. Much of the writing has been anecdotal or policy focused, with only a few empirical analytical studies on which to draw. Better measurement and modelling are required, and the regional science community should be directly involved in the ongoing discussions and studies. It is hoped that this issue will stimulate many of you to redirect your energies to this debate.

References

- World Commission on Environment and Development. 1987. *Our Common Future*. Oxford: Oxford University Press.