

Sustainable Development and the Rural-Urban Fringe: A Review of the Literature

Issues in Urban Sustainability No. 3

**by Kenneth B. Beesley
1993**

The Institute of Urban Studies





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Published 1993 by the Institute of Urban Studies, University of Winnipeg

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Note: The cover page and this information page are new replacements, 2015.

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PUBLICATION DATA

Beesley, Kenneth B.
Sustainable Development and the Rural-Urban Fringe

(Issues in Urban Sustainability; 3)

ISBN: 1-

I. The University of Winnipeg. Institute of Urban Studies II. Title. III. Series: Issues in Urban Sustainability (The University of Winnipeg, Institute of Urban Studies); 3.

This publication was funded by the Canada Mortgage and Housing Corporation, but the views expressed are the personal views of the author(s) and the Corporation accepts no responsibility for them.

Published by:

Institute of Urban Studies
The University of Winnipeg
515 Portage Avenue
Winnipeg, Manitoba
R3B 2E9

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ISBN: 1-

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SUSTAINABLE DEVELOPMENT AND THE RURAL-URBAN FRINGE: A REVIEW OF THE LITERATURE*

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1. INTRODUCTION

Sustainable development is a concept which has captured the imagination of scholars, practitioners, and politicians at all geographical scales. While Dykeman (1990a, p. 3) suggests that the sustainable development concept consists of "older, established ideas that are wrapped in new terminology," he does not suggest in even the slightest way that the concept should be withdrawn or ignored. Rather, Dykeman (1990b) used the concept as a central focus for an important international conference and a major publication. Recognition must be given to the fact that the sustainable development concept does offer fundamental contributions to an important framework, a framework which is still developing.

The essence of this paper is to examine the linkage and contradictions within and between the terms sustainable development and the rural-urban fringe. The literature reviewed is necessarily wide-ranging, however I will admit a personal bias towards perspectives from geography, environmental studies and agriculture. To present this review, a preliminary task is to set the context through a brief discussion of the principal terms, i.e. sustainable development and rural-urban fringe. The key document on sustainable development remains the report *Our Common Future* prepared by the World Commission on Environment and Development (WCED) (1987), which must surely rate as one of the most cited documents of the late 1980s and early 1990s. Discussion of the rural-urban fringe will draw substantially on recent reviews and research documents (Beesley, 1991a, b, 1993; Beesley and Bowles, 1993; Beesley and Macintosh, 1993; Bowles and Beesley, 1991; Macintosh and Beesley, 1993).

1.1 SUSTAINABLE DEVELOPMENT

The WCED defines sustainable development as meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 8). It notes that to approach this goal will require "that those who are more affluent adapt life-styles within the planet's ecological means," e.g., in use of energy (WCED, 1987, p. 9). This signals that sustainable development concepts are important in the industrialized Western world as well as in developing nations.

*This paper represents the author's views and interpretations and not necessarily those of the Nova Scotia Department of Agriculture and Marketing.

However, sustainable development "can only be pursued if population size and growth are in harmony with the changing productive potential of the ecosystem" (WCED, 1987, p. 9), harkening back to earlier environmental revolutions and highlighting the overt linkages to economic (productive) concerns (Dykeman, 1990a). Thus, sustainable development is "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs" (WCED, 1987, p. 9). But the WCED recognizes the reality that "in the final analysis, sustainable development must rest on political will" (WCED, 1987, p. 9). However, political will can be difficult to generate, beyond a rhetorical level, and this problem must be accepted and dealt with sincerely.

In the Canadian context, the National Task Force on Environment and Economy has echoed the call for "development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations" (National Task Force on Environment and Economy, 1987, p. 3). Manning (1990, p. 291) adds that "development" needs to be envisioned as "qualitative improvements, and it must include social, economical measures," not just economic growth, because the "concept underlying sustainable development is . . . a human perspective relating to human use of the biosphere." Indeed, one can suggest that sustainability must include humanistic dimensions, regardless of scale from global through national to local, urban, rural or fringe.

To approach sustainable development in the rural-urban fringe, some understanding of both urban and rural perspectives is required. Cities represent one major component of the larger sustainable development framework, an important component given the strength and pervasiveness of urbanization and urban problems. Indeed, the WCED notes that cities in industrial countries "face problems—deteriorating infrastructure, environmental degradation, inner-city decay, and neighbourhood collapse" (WCED, 1987, p. 17). In part, these problems are a function of social, economic, and political circumstances that contribute to self-reinforcing and negative situations. For example, the WCED describes how the "unemployed, the elderly, and racial and ethnic minorities can remain trapped in a downward spiral of degradation and poverty, as job opportunities and the younger and better-educated individuals leave declining neighbourhoods" (WCED, 1987, p. 241). Further, structural problems are mounting, cumulating in many cases. "City or municipal governments often face a legacy of poorly designed and maintained public housing estates, mounting costs, and declining tax bases" (WCED, 1987, p. 241).

The WCED perspective on sustainable development in cities in much of the industrialized Western world is that much has already been accomplished and improved, and the "problems that remain are serious but they affect relatively limited areas, which makes them much more tractable"

(WCED, 1987, p. 242). The silver lining is sought, and to a limited extent found, in the cloud of urban decline:

Certain aspects of urban decline even provide opportunities for environmental enhancement. The exodus of population and economic activities, while creating severe economic and social difficulties, reduces urban congestion, allows new uses for abandoned buildings, protects historic urban districts from the threat of speculative demolition and reconstruction, and contributes to urban renewal. The de-industrialization of these cities is often counterbalanced by the growth of the services sector, which brings its own problems. But this trend creates opportunities to remove heavy industrial pollution sources from residential and commercial areas (WCED, 1987, p. 243).

Industrialized nations are seen to be in the enviable position where the "combination of advanced technology, stronger national economies, and a developed institutional infrastructure give resilience and the potential for continuing recovery to cities of the industrial world. With flexibility, space for manoeuvre, and innovation by local leadership, the issue for industrial countries is ultimately one of political and social choice" (WCED, 1987, p. 243).

But will political and social choice prove to be a stumbling block for sustainable development and sustainable cities? The WCED advocates a proactive role for governments. It suggests, especially in developing nations, but arguably in developed countries as well, that: "Governments will need to develop explicit settlement strategies to guide the process of urbanization, taking the pressure off the largest urban centres and building up smaller towns and cities, more closely integrating them with their rural hinterlands," and that there is a need to examine and change "other policies—taxation . . . transportation, health, industrialization—that work against the goals of settlement strategies" (WCED, 1987, p. 17).

Finally, the WCED states that "cities of the industrial world . . . account for a high share of the world's resource use, energy consumption, and environmental pollution" (WCED, 1987, p. 241), implying that because of these patterns the cities of developed nations have a responsibility to act toward not only economic but also environmental improvement. This sense of responsibility is pressed further through the recognition that "Many [cities of the industrial world] have a global reach and draw their resources and energy from distant lands, with enormous aggregate impacts on the ecosystems of those lands" (WCED, 1987, p. 241). What happens in developed countries is of far-reaching importance. If we can improve environment-economy relations at home, we will be contributing to improved environment-economy relations throughout the global context.

While cities are central to the sustainable development theme, rural areas too have become a focus for much research (Beesley, 1991a). Here, the focus of much activity involves two concerns:

(1) sustaining the environmental resource base for agriculture (Francis *et al.*, 1990; Gliessman, 1990a; Paoletti *et al.*, 1989; Reichelderfer, 1991); and (2) sustaining rural communities in the face of restructuring dynamics in resource industries and urban growth (Barker and Selman, 1990; Dykeman, 1990a; Fisher *et al.*, 1991). Recent events in Canada point to the pressing nature of change in the resource sector, *viz.*, the virtual elimination of much of the Atlantic fishery and forestry conflicts in British Columbia. The plight of rural communities is perhaps no better illustrated than by the absolute decline of Saskatchewan's population and the potential for a new resettlement program in Newfoundland.

The rural-urban fringe presents a locus for a series of interrogative contradictions in the context of sustainable development. Does "development" refer to urban development, the perceived need of cities to grow and add to their tax base? Or, does it mean development of the surrounding countryside and communities, retaining a rural character and rural resource (including agricultural) economy? To some extent, these questions are associated with the fundamental character of the rural-urban fringe.

1.2 THE RURAL-URBAN FRINGE

The rural-urban fringe is well recognized as a region of ambiguity (Bunce, 1981). On the one hand, it is an area characterized by an existing degree of rurality which is commonly associated with agriculture and small communities, a social and economic landscape markedly different from the city. On the other hand, it is a zone of urban encroachment and influence, where the city extends itself into the countryside through isolated, block, and tentacular invasions. The nature of the fringe is change, rurality under varying degrees of urban-centred pressures.

Is the rural-urban fringe urban or rural? It is, of course, both. But the question is not merely rhetorical. Of significance is the perspective taken, *i.e.*, the urban or the rural, particularly in the context of sustainable development.

An urban perspective is likely to view the rural-urban fringe as an extension of the city, an area which can simultaneously serve as a land resource for sustained urban development and for sustained access to green spaces and leisure opportunities. For example, the Royal Commission on the Future of the Toronto Waterfront (the Crombie Commission) embraced the need for urban-regional thinking and understanding. Crombie (1990, p. 65) cites Schumacher to support this position:

Human life, to be fully human, needs the city, but it also needs food and raw materials gained from the country. Everybody needs ready access to both countryside and city. It follows that the aim must be *pattern* of urbanization so that every rural area has a nearby city, near enough so that people can visit it and be back the same day. No other pattern makes human sense.

Crombie even cites the venerable Lewis Mumford:

The regionalist attempts to plan such an area so that all of its sites and resources, from forest to city, from highland to water level, may be soundly developed, and so that the population will be distributed so as to utilize, rather than nullify and destroy, its natural advantages. It sees people, industry and the land as a single unit . . . Regional planning sees that the depopulated countryside and the congested city are intimately related . . . (1990, p. 106).

The perspective taken is dramatically urban-centred. That is, urban problems must be considered and addressed in an urban-regional context. They are not limited to intra-urban, isolated, independent concerns which can be idiosyncratically approached.

What is the rural perspective on sustainable development in the rural-urban fringe? If one assumes that sustainable refers to the complex of environments represented in rural-urban fringe space—natural, economic and social—then a rural perspective on sustainability is likely to embrace a protectionist position (Bryant *et al.*, 1982). That is, the rural must be protected from the urban. Embodied in such a position are culturally rooted sentiments that the countryside and rural life are good (Bunce, 1981; Walker, 1987) and that the city is bad, and the bigger the city the worse it is (Wirth, 1938).

The human dimension of an overtly rural perspective is offered by Simmons (1981, p. 71) in a brief story:

Jim bent over to pick a stone from the soil as he prepared the ground once again for planting. The sun shone warmly through the clouds as the tall firs and cedars swayed gently in the cool spring air. The ground had thawed; winter was over. He moved to a side field and began shovelling fresh horse manure that he had been fortunate to obtain from a neighbouring hobby farmer. Normally, mulched leaves from the woodlot were supplemented by chicken manure purchased at the poultry farm down the road. Every year the area of intensive cultivation increases. The soil is poor; but constant effort has improved it significantly. Today, Jim works his garden as he does every day. This is his life; this is his seven acre world.

This morning he looked up, spoke to one of his cats and noticed a car being driven up to the house. He smiled; his favourite cat and mouse game was about to begin. Another real estate man had come to offer to buy his property. Such offers are frequent and lucrative since his farm is on the edge of the rural-urban fringe and is being surrounded progressively by suburbia. This young man was trying to sell one of the houses down the road, a comfortable, ordinary tract house, a place in the country for the average, suburban middle class family. Yes, Jim listened to the real estate man's sales pitch. He played with him like a cat with a half-dead mouse, batting it with its paws. The young man offered Jim a large sum of money as they all do. Some of the more creative ones offer land farther away from the city too. Soon, Jim becomes bored with the game. No, he will not sell; he will never sell. Where would he go? The land is his life.

Jim enjoys frustrating real estate agents. He knows they will return with other offers and, again, he will refuse. Inevitably, however, the mice will overrun the fields. Jim's son will sell. The farm is doomed. The house will be razed; the trees will be cut; the soil—so carefully picked of stones—will be covered by houses, asphalt and lawns. Jim knows in his heart that his years of effort and care improving his land are for naught.

While Jim's tale lacks optimism in terms of sustainability, it does portray real life concerns and potential futures in the Fraser Valley of British Columbia.

A third dimension of the rural perspective addresses not just the fringe, but the macro-rural environment and the issue of survival (Haigh and Murri, 1990). The focus of this work is rural change, recognition of the decline of agriculture as a major employer, associated decline in rural population, the mixed success of non-agricultural rural regional development strategies, and the need for a paradigmatic shift from isolationism, local autonomy and self interest to inter-community co-operation and survival strategies centred on regional interdependence.

In sum, an urban perspective on sustainable development and the rural-urban fringe incorporates urban-regional and environmental emphasis. So does a rural perspective, but with more stress on the need for rural environments to be protected, to survive, not just in an environmental sense but also socially and economically.

2. SUSTAINABLE DEVELOPMENT AND THE RURAL-URBAN FRINGE

The literature associated with sustainable development has blossomed since the emergence of the WCED (1987) report, evidenced in part by this series of papers (see also: Batie, 1989; Gow, 1992; Parker, 1990; Pierce, 1992; Redclift, 1987; Reid, 1989; Roseland, 1991; Rubenstein, 1993; Sachs and Silk, 1990; Science Council of Canada, 1988; Smit and Brklacich, 1989; Troughton, 1990). This brief review cannot address the complete literature, but will highlight selected emergent ideas as background to further discussion of urban and rural perspectives on sustainable development and the rural-urban fringe.

Doyle (1991), for example, examines urban-rural relationships, the global economy, issues of resource management and management strategies. The need for long-term action plans is identified, as well as the need for resource managers to function in both an interdisciplinary and transgenerational manner. Both Doyle (1991) and Giampietro and Bukkems (1992) recognize the need for moral and ethical questions to be addressed, as bases for plan making and for human development.

Veeman (1989) argues that sustainable development is an elusive concept that is hard to define and difficult to operationalize because it is multi-faceted. The challenge for those active in sustainable

development, Veeman (1989) suggests, is to develop projects and policies that simultaneously encourage economic growth, the alleviation of poverty and inequality, and environmental improvement. Manning (1990) takes that challenge further. Particularly important are two sets of concerns which will be briefly noted here, i.e., a list of "practical interpretations" identified as "specific steps or approaches which lead towards a society that is both economically productive and environmentally sound," and a "structure for sustainable development initiatives" depicted graphically as a pyramid, building upon information and leading to the goal of sustainable development (Manning, 1990, pp. 293-300).

In the first instance, Manning (1990, p. 293) offers a set of six building blocks, or practical approaches, designed to contribute to the ultimate achievement of a sustainable future (Table 1). While none of these building blocks is put forward as a panacea to the challenge of sustainable development, the blocks collectively represent "first steps in implementation" toward programs and policies which do promote a sustainable future (Manning, 1990, p. 293).

To describe a structure for sustainable development initiatives, Manning (1990) presents a revised version of a pyramidal model designed to guide research and implementation of sustainable resource and environmental management (Manning and McCuaig, 1984). The model is composed of six layers or tiers of activity which build cumulatively toward the goal of sustainable development (Figure 1). Underpinning the model is

. . . the hypothesis that, through better information, leading to better decisions, it will be possible to manage the demands placed on the environment so that they are consistent with the long-term ability of the environment to supply them, and also that it will be possible to modify the impacts of humans on the environment in a way that will limit and ultimately control degradation (Manning, 1990, p. 293).

The principal components of the model are as follows.

- **Data/Information.** The base layer is characterized by the need to build upon "knowledge of the natural environment and the human condition" (Manning, 1990, p. 294).
- **Analysis of Facts and Trends.** Building on information is the requirement for better methods of analysis and the "ability to translate information into advice or to provide better understanding of the implications of decisions" (Manning, 1990, p. 295).
- **Identification and Evaluation of Problems.** Emergent from higher quality data and analyses should be a better definition and assessment of what problems are to be addressed while on the sustainable development path.
- **Developing Solutions.** Included as challenges to the development of solutions are, for example,

TABLE 1
FIRST STEPS IN SUSTAINABLE DEVELOPMENT

1	<i>Anticipate and prevent.</i>	Plan and act to avoid problems and reduce the risk of negative implications associated with decisions and actions.
2	<i>Build environmental concerns integrally into the decision-making process at all levels.</i>	That is, include environmental concerns into the forefront of deliberations, but not at the expense of "social, and other non-traditional factors, such as inter-generational equity, ecosystem diversity, quality of life, health, and socio-cultural system viability."
3	<i>Manage renewable resources on a sustained-yield basis.</i>	This is, of course, a long-standing position consistent with much of the resources management literature.
4	<i>Manage non-renewable resources.</i>	Some emphasis is noted here for the reduction of impacts associated with resources production and transformation, the minimization of waste, and an increased use of renewable substitutes for non-renewable resources where possible and presumably where economically feasible.
5	<i>Minimize negative impacts on other sectors and regions deriving from our decisions and actions</i>	That is, recognize the interdependence of economic and environmental systems.
6	<i>Build greater understanding of the limits and opportunities associated with the environmental resource base.</i>	To do this Manning argues, perhaps too condescendingly, if accurately, that it is essential to "present information in ways accessible and readily understandable to decision makers."

Source: Manning (1990, p. 293)

the need for improved assessment methods, a better understanding of policy impacts, integrated ecosystem planning, multisectoral resource management, regional approaches to sustainable development objectives, a better understanding of "success stories" in the integration of economic and environmental goals, and environmental education (Manning, 1990, p. 298-99).

- **Implementation.** Modifying decision processes to integrate environment and economy. The objective of this tier of the model is to *risk-reduce decisions* across all dimensions.
- **Goal.** Sustainable Development.

Among the more attractive features of this model of a structure for sustainable development initiatives are: it is goal oriented; it is information and analysis based; and yet it is sufficiently general to allow for it to be useful in a variety of circumstances. In this sense, Manning has made a genuine contribution to the conceptualization of sustainable development, a contribution which can be of value in approaching the problem of sustainable development in rural-urban fringe environments.

2.1 AN URBAN-REGIONAL PERSPECTIVE ON SUSTAINABLE DEVELOPMENT AND THE RURAL-URBAN FRINGE

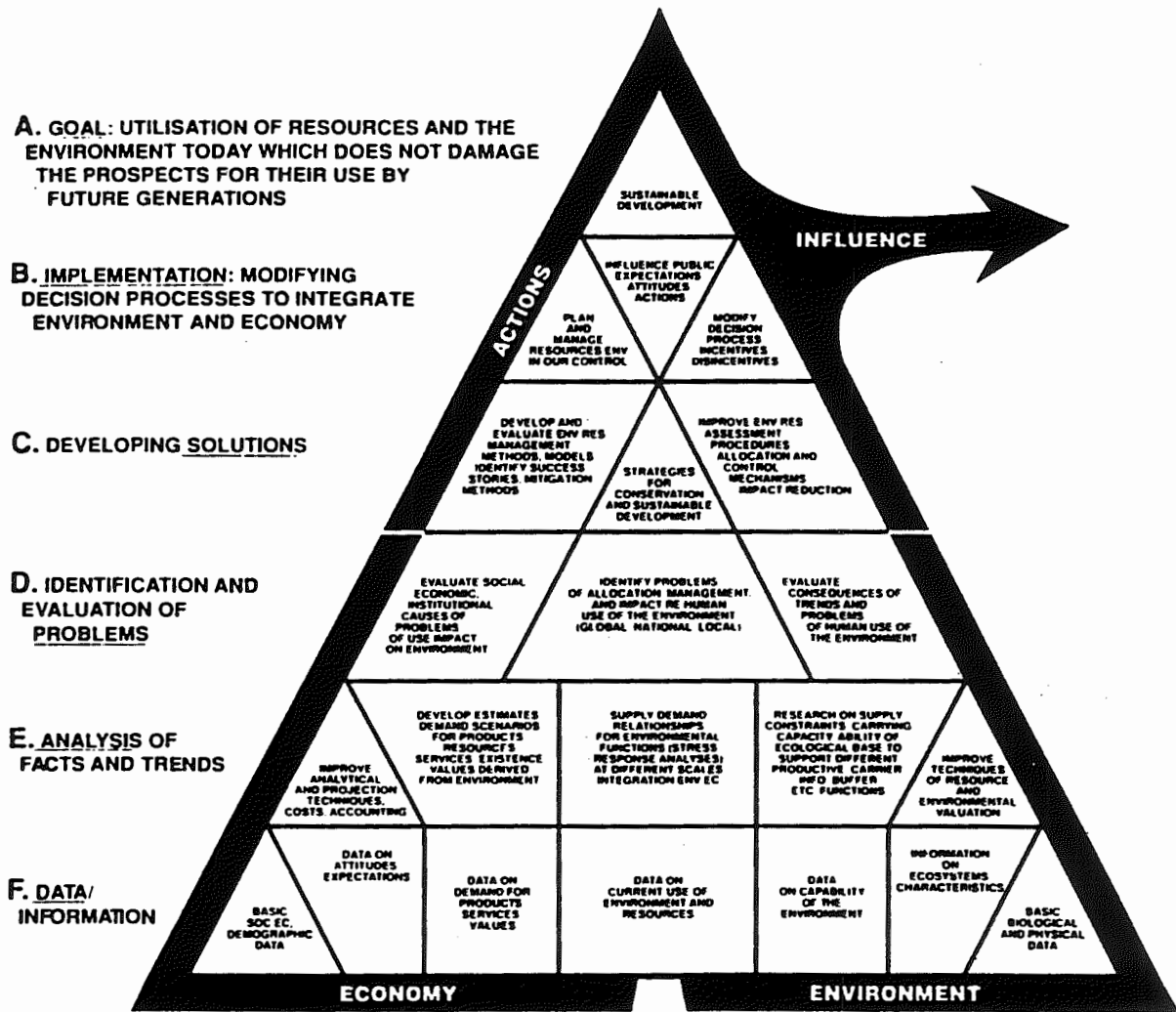
Earlier reference was given to the Crombie Commission's work on the Toronto region. Underpinning elements of this work are the urban-regional perspective adopted and the notion that "the problem" must be approached regionally.

What is the problem? In the Toronto region it includes but is not limited to the following:

Rivers, creeks, and the lakes are polluted and unfit for swimming, and cannot be used for drinking water unless they are treated. Persistent organic chemicals and heavy metals are found in the air, water, wildlife, and soils of the region. The pressure of development continue to pose a threat to wildlife habitat and species diversity. Landfills are nearing capacity and more sewage and stormwater run-off is generated than can be effectively treated. Transportation networks are at, or above, capacity. Prime agricultural land and green space are being lost to apparently relentless urbanization, and . . . a precious resource for groundwater, wildlife, and open space is threatened by development pressures (Crombie, 1990, p. 45-46).

It is encouraging to witness the high political profile, through the Crombie Commission, given to urban environmental concerns, and sustainable development concepts, largely through the overt use of an ecosystems approach. Indeed, the Commission suggests that the Toronto region "is an ecosystem that, to a larger degree, is literally "dis-integrated," one in which the carrying capacity—the ability of air, land, and water to absorb the impact of human use—is clearly strained,

FIGURE 1
BUILDING BLOCKS TOWARDS SUSTAINABLE DEVELOPMENT



(Source: Manning, 1990, p. 294)

and cannot be sustained over the long term unless fundamental changes are made" (Crombie, 1990, p. 46).

The Crombie Commission may well ultimately end up as a relatively lame-duck commission, a body which makes wondrous recommendations but has very few teeth with which to ensure real action. Nevertheless, it has reached some important and useful conclusions which echo the spirit of sustainable development in the context of a major urban region:

There is an urgent need for regeneration of the entire . . . Bioregion to remediate environmental problems caused by past activities, to prevent further degradation, and to ensure that all future activities result in a net improvement in environmental health. In a region experiencing dramatic economic growth and rapid urbanization, it is crucial to heed the warning signs of ecosystem stress, so that the quality of life that attracted people here can be restored and maintained, for existing and future generations (Crombie, 1990, p. 47).

The Crombie Commission was not alone in advocating urban-regional sustainable development approaches. A symposium sponsored by the Urban Studies Program at York University in Metropolitan Toronto (Keall, 1986), focused attention on the theme "Development at the Edge" and the potential to integrate conservation strategies with planning and development processes in the urban region. At this symposium a featured speaker was Jim Maxwell of Environment Canada and he set the context, the sustainable development context, for much of that symposium:

. . . can a better job be done in forming strategies that simultaneously promote sustainable development, a quality environment, and an enhanced quality of life? . . . implicit in [that question] is the assumption that development, environment and human welfare are intimately linked. . . . Each day our media bombard us with stories about the industrial impact of the economy on human welfare. . . . At the same time we are getting more and more stories about the economic consequences of a degraded resource space [*sic*], about the consequences that come from land use conflicts, and also the costs of scattered low-density sprawl development in urban regions (Maxwell, 1986, p. 2).

Maxwell's support of sustainable development concepts, through overt recognition and praise for the work of the WCED, was *not* well received or agreed to by *all* those in attendance.

Indeed, one developer's perspective took a very pragmatic business-directed view of development at the edge of the city. Bruce Kerr, Vice President (Land Development) with Bramalea Ltd., argued that: "there is a strong push and desire for single-family residential development on the growth frontier; i.e., there is a market." To the developer it is important to respond to market demand. Further, he suggested that "we must not let ourselves get carried away by concentrating on a small part of the whole picture [e.g., agricultural land loss]. It's important to see the whole picture objectively; comprehensively—provincially, regionally and municipally." Put in more direct terms, Bramalea Ltd. was

fed-up with battles which pitted the firm against grass-roots environmental groups attempting to protect prime agricultural land the firm proposed to develop, largely for single-family dwellings, to meet market demands. Mr. Kerr did suggest, however, that it was time to "work together to achieve realistic and practical target goals and objectives for development at the growth frontier" (Kerr, B. in Keall, 1986, p. 15).

Michael Hough, a landscape architect and environmental advocate, approached part of the problem of development at the edge quite clearly:

There seems to be a real need for putting the concepts of urbanism and nature together in ways that will produce a distinctive identity to places and create varied and satisfying places to live in. There have to be ways in which official planning and the private sector can be induced to create environmental quality and avoid the meaningless sprawl that plagues development at the edge (in Keall, 1986, p. 24).

Critical in Hough's remarks is the recognition given to the need for public-private co-operation in attempts to improve the quality of the environment and the quality of life. This is, of course, a fundamental part of the sustainable development concept.

In the tradition of crystal-ball gazing, Paul Stagl (Director, IBI Associates) addressed some concerns about the next generation of development and planning. Underpinning this perspective is the fact that in Ontario, many communities, urban and rural alike, are only now (late 1980s early 1990s) working towards their second, or in rare cases their third, official plan review. The next generation of plans and development options are likely to address concerns which previous versions did not. For example, Stagl suggested that there "will be continuing growth . . . , and it will continue to be urban growth. . . . It will be limited in nature. It will also result in competition among municipalities to attract that limited growth." The premise that growth, or development in the more general sense, will be competitively sought-out is an accurate reflection of situations, particularly in recessionary times, and in the context of seeking environmentally-friendly development. Stagl goes on to envision a "major trend towards intensification" in urban land use, though he suspects that debate will continue "as to what density is acceptable" in core urban areas and at the edge. Given these two notions, Stagl speculates that the next generation of plans will have to include a "balancing or rationalization of previous plan objectives and impacts" and that this "is going to represent a very major problem for planners on all sides as second and third generation plans evolve in a limited growth environment" (in Keall, 1986, pp. 21-22).

The IBI Group has, in fact, been very active in research focused on sustainable development in the urban region through work commissioned by the Greater Toronto Area Coordinating Committee. Reference is offered here to the *Greater Toronto Area Urban Structure Concepts Study: Summary*

Report (IBI Group, 1990) as a useful review of background to and options for urban development in the urban region, including the rural-urban fringe, within a sustainable development context. This report presents its position as advocating sustainable urban development, within and beyond the build-up core of the city, as part of the larger process leading toward aggregate sustainable development. Recognition is given to the fact that:

. . . important decisions on the density, structure and mix of land uses and the types and locations of infrastructure will be required in order to maintain and enhance, if possible, the quality of life (in terms of measures such as housing and urban amenities, economic opportunities, transportation, water supply and sewage/waste disposal, preservation/enjoyment of green areas, quality of the urban and rural environment, and availability of human services) now enjoyed . . . (IBI Group, 1990).

It is within this context that the IBI presents three alternative futures for urban structure in the Greater Toronto Area (GTA). While the three options are discussed as independent alternatives, realities may well determine a mix of elements from different options, all collectively designed to enhance the sustainability of the urban region and the quality of life in that region.

The three alternatives offered by the IBI Group are (i) spread, (ii) central, and (iii) nodal. The names summarize the fundamental emphasis of each option's land use and density structure.

i. Spread

This is a *status quo* concept, a continuation of existing trends, and involves on-going low-density suburbanization with office concentrations in the downtown and selected other areas. This option is the least compatible with sustainable development, and with the rural-urban fringe, because it would: (a) consume the most rural land and have negative impacts on agricultural productivity and the natural resource base; (b) use the greatest quantity of energy and generate the most air pollution because of the high reliance on automobiles and the greater travel effort necessary overall; and (c) provide less opportunity to maintain and enhance environmental quality. This is also the least risky option relative to politics, administration and planning *because* it is *status quo*. However, it is an unacceptable option for the very same reason.

ii. Central

This concept is characterized by population growth and intensification in core built-up and mature areas of the city, intensification of employment activities, and a significant reduction in the rate of urban/suburban development beyond the built-up city.

This option makes the most efficient use of resources (e.g., land and energy) and places the least negative load on the environment. It therefore represents the best chance to achieve sustainable development in the urban region.

However, this option is far from the *status quo*. It would require substantial government intervention to divert population growth from suburban and fringe areas back to the core successfully. It would also necessitate significant changes in population densities and housing types, transit use, and growth management policies and programs. Finally, at least in the Greater Toronto Area, all this would require super-metropolitan co-operation and co-ordination, no mean feat in itself.

iii. Nodal

This alternative is an intermediate concept which allows for residential development and employment growth, but in compact forms and primarily in existing communities, and offers a reduced consumption of rural land.

This option offers the greatest range of choice in terms of population densities and housing types, community size and character, suburban and downtown lifestyles, transportation modes, and integrated service delivery. Relative to the spread option, it is also less likely to generate environmental problems and more likely to reduce *per capita* resource (e.g., energy) requirements.

The nodal option is intermediate, relative to the spread and central alternatives, not only in spatial form but also in its compatibility with sustainable development and required levels of government regulation.

On the basis of assessments of these three options conducted by the IBI Group (1990), and secondary analysis undertaken by Beesley (1991c), two things are clear. First, the *status quo* is unsatisfactory. A summary assessment of the spread option identified it as inefficient, costly, and not environmentally friendly. Secondly, the central and nodal options are preferable. The former is superior relative to transportation measures, while the latter emerges as a generally "good idea" in no small part because it is marketable to municipal councils, developers, planners and the public.

2.2 A RURAL PERSPECTIVE ON SUSTAINABLE DEVELOPMENT AND THE RURAL-URBAN FRINGE

Rural perspectives on sustainable development tend to be less concerned with urban structure and form, and more concerned with rural resources and communities. In many cases the practical reality of the rural-urban fringe continues to be characterized by its ambiguous nature. That is, the fringe serves the city in many ways (e.g., as a productive natural resource area) and profits from relations with the city. At the same time, the city threatens the integrity and existence of fringe activities and communities.

This give and take relationship is stronger between the rural-urban fringe and the city, and weaker between the fringe and more rural areas. However, the fringe does possess links to the rural,

evidenced by the ability to attract residents from urban and farm environments (Beesley and Walker, 1990a). As a complex regional environment, the rural-urban fringe is characterized by diversity, mixes of land use, people, and activities with varied needs fulfilling many social and economic roles (Beesley and Russwurm, 1981; Russwurm, 1977).

Two rural themes serve as the focus for much research interest in the rural-urban fringe, that is: (1) interactions between agriculture and urbanization (Beesley, 1991a, b, 1993); and (2) life in the fringe (Beesley and Walker, 1990a, b). In the context of sustainable development both themes are appropriate for consideration, the former relative to sustaining productive agriculture and natural environmental quality (at times conflicting themselves), and the latter relative to sustaining a satisfactory life for different social groups and economic interests (again, with internal conflicts).

2.2.1 Agriculture in the Rural-Urban Fringe and Sustainable Development

To discuss sustainable development and the rural-urban fringe it is necessary to address agriculture as a land use and as an economic activity in the urban region. This brief discussion is limited to two major concerns, i.e., the interaction of agriculture and urbanization, and sustainable agriculture.

Agriculture and Urbanization

Substantial literature on interactions between urbanization and agriculture in Canada exists and cannot all be reviewed here (see Beesley, 1991a, b, 1993; Bryant, 1992; Bryant and Johnston, 1992). Suffice it to say for the moment that the fundamental relationship is characterized as urban development threatening productive agriculture through the direct consumption of high quality farmland and various indirect ways such as trade policies (Bryant *et al.*, 1982; Bryant and Russwurm, 1979). There is little doubt about the importance of direct land conversion. Much research confirms it as a significant post-World War II process which continues at varying rates across the nation (Beesley, 1993; Beesley and Bowles, 1993; Gayler, 1982a, b, 1990, 1991; Krueger, 1959, 1977, 1978, 1982, 1984; Krueger and Maguire, 1984, 1985; Rodd, 1976a, b; Warren and Rump, 1981; Yeates, 1985). This negative portrayal of the rural to urban land conversion process, together with social attitudes giving high value to farmland and agriculture as a way of life, underpin proposals to force urban development into more compact forms (as discussed for the GTA earlier).

At the same time evidence exists that identifies farmers as adaptable to new circumstances, responding to the anticipation and reality of urbanization in diverse fashions. From part-time farming through to roadside stands and pick-your-own operations, some farmers have found advantages in

locations proximate to the city (Bryant and Johnston, 1992; Fuller and Mage, 1976; Johnston and Bryant, 1987; Troughton, 1976; Walker, 1979). Walker (1984) has also identified farmers in the fringe as highly political and able to mobilize quickly against threats to agriculture.

The issue of land conversion is, of course, more sensitive and important in rural-urban fringe areas characterized by specialized agricultural activities, e.g., the Niagara Peninsula, the Okanagan Valley and the Annapolis Valley. In British Columbia the approach to sustaining agriculture, including in rural-urban fringe zones, focuses on delineating higher quality farmland and prohibiting urban development with the creation of Agricultural Land Reserves (Pierce, 1981a, b; 1982). In the Niagara region of Ontario sustaining agriculture does include recognition of special productive lands, but focuses on the delimitation of areas within which urban development is permissible (Gayler, 1991). In Nova Scotia's Annapolis Valley, land-use planning serves as the principal means to regulate land conversion. In all cases, however, the approach taken has achieved mixed results. At times farmland is protected only subsequently to experience increased pressure for conversion. On other occasions municipal boundaries are "leap-frogged" to a locality where urban development is allowable. To sustain agriculture in the rural-urban fringe requires more than land-use planning (Richardson, 1989) and development control, it requires a comprehensive approach to sustainable agriculture.

Sustainable Agriculture

Concerns about sustainable agriculture pre-date the WCED (1987) report (e.g., Gliessman, 1984; Jackson, 1984; Knorr, 1983; Logsdon, 1984). However, research has grown substantially in the late 1980s and early 1990s (Beesley, forthcoming). Much of this literature is of a relatively general nature, attempting to define the context, nature and future of sustainable agriculture within the broader concept of sustainable development (Francis, 1990; Francis and Youngberg, 1990; Francis *et al.*, 1990; Gliessman, 1990a, b,c; Nams, 1991; Science Council of Canada, 1992; Young, 1991a, b,c). Within this framework emphases have emerged on LISA, low input sustainable agriculture, and questions related to the sustainability of agriculture near cities (Ikerd, 1990; Lockeretz, 1987, 1989b, 1990; Pimental *et al.*, 1989; Stenholm and Waggoner, 1990).

LISA can be characterized as an example of the "thinking globally—acting locally" paradigm associated with the most recent environmental revolution. It is also a response to market demands for farm products described as organic or (synthetic) chemical free. In this context LISA represents a significant thrust in the environmental movement and an attempt to take advantage of economic potentials (Blobsaum, 1987). Sustainable agriculture, however, does face many challenges.

To achieve a sustainable agriculture requires resource conservation and environmentally sound

practices, as well as a socially supportive and economically profitable environment (Ikerd, 1990; Lockeretz, 1989a; Stenholm and Waggoner, 1990). Indeed, Thomas and Kevan (1993) argue that farmers need to have societal support and encouragement to remain long-term operators of agroecosystems and to maintain the biodiversity of the land. Jackson (1984, 1987) also identifies the important role for farmers as stewards of the land.

Sustaining agriculture in the rural-urban fringe is no less challenging. The near-urban farmer must cope with rising pressures emanating from the city, work to protect the productive resource base and environmental quality, all while attempting to adapt to new technologies, opportunities, and initiatives (Bryant and Johnston, 1992; Ilbery, 1991; Lockeretz, 1987; Vail, 1987).

2.2.2 Life in the Rural-Urban Fringe

Two principal issues emerge related to life in the rural-urban fringe and its relationship with sustainable development concepts. First, are fringe communities sustainable with or without substantial in-flows of urban people and activities? Secondly, is satisfaction with life and community in the fringe sustainable? In other words, what are some of the social dimensions of sustainable development and rural-urban fringe relations?

Sustainable Communities

Communities in fringe areas are subject, variously, to threats of urban/suburban development or demise. In some cases it is clear that fringe communities benefit from their location near the city. Dahms (1985) correctly notes that many rural communities are not dying, but changing to meet new demands. Some communities within the urban field of metropolitan centres, e.g., Toronto, have taken advantage of environmental amenities and leisure/tourism activities to enhance their economic sustainability (Coppack *et al.*, 1990; Dahms and Hallman, 1991). Other localities have found a rural location with ready access to a city to be an opportunity to develop retirement communities (Beesley, 1989; Beesley *et al.*, 1993; Bowles and Beesley, 1991).

At the same time, small rural communities in the Prairie and Atlantic regions face the reality of, or potential for, precipitous population decline. Spurred by larger farms and fewer farm people, and by substantial declines in the fishing industry, some rural communities may not survive despite an urban proximate location. While tourism and eco-tourism offer opportunities, amenity environments are not equally distributed and some rural-urban fringe communities must seek alternative paths to survival (Coppack, 1990). In fringe areas where agriculture is viable, sustaining agriculture will contribute to sustainable communities by retaining at least a minimum threshold rural-farm population (Flora, 1990a,

b). Right-to-farm laws have the potential to help maintain that minimum (Lapping and Leutiviler, 1987; Lisansky and Clark, 1987). In other rural-urban fringe areas a potential key to survival may well be the acceptance, however reluctantly, of a dormitory and service to the city role.

Satisfaction

Research on satisfaction in rural-urban fringe environments has produced several findings pertinent to sustainable development concerns. First, rural-urban fringe residents are generally satisfied with their lives and their communities (Beesley, 1988; Beesley and Bowles, 1992; Beesley and Walker, 1990a, b). This has been found in metropolitan and nonmetropolitan environments, among farm and nonfarm residents, and across cultural groups (Beesley, 1990a; Beesley and Bowles, 1992; Beesley and Macintosh, 1993; Macintosh and Beesley, 1993). However, it is also clear that among the reasons for the strength of that satisfaction are the sense of rurality or small town life achieved and the level of access to both the countryside and the city gained by a rural-urban fringe residence. When the rural environment's quality is impaired, either subjectively or objectively (e.g., poorer quality water, more traffic), and when development encroaches on the fringe resident's idyllic world, that satisfaction is threatened (Beesley, 1990b; Beesley and Walker, 1990b; Dahms and Hallman, 1991).

Residents of rural-urban fringe areas exhibit a sense of environmental awareness and recognize local problems associated with rural-urban conflicts and urban origins. To some extent conflict is simply part of the way of life in the rural-urban fringe, and part of the conflict is within the individual resident. Living in rural or small town settings outside of the city helps to achieve a residential environment characterized by social and natural environmental amenities, away from the ills of urban life. Once this is achieved, however, it is instantaneously jeopardized. The natural environment becomes a bit less natural, the small community is a little larger. Recognition of this leads to the desire to inhibit, if not stop, anyone else from taking away from what has been gained (Beesley, 1990b). To sustain the fringe as they know it, residents are inclined to support policies which restrict further development (e.g., through minimum lot sizes) and allow the fringe to become not just exclusive but also exclusionary (Punter, 1974; Russwurm, 1977).

3. PROPOSALS, PROSPECTS AND CONCLUSIONS

The final sections of this paper are designed to raise questions about and call for continued actions concerning sustainable development ideas and the rural-urban fringe, and to reach general conclusions. In the first instance, let us briefly address the interaction between sustainable development actions, the multidimensional nature of sustainable development, and the diverse character of the rural-urban fringe.

3.1 ACTION, SUSTAINABILITY AND THE FRINGE

Many communities across the nation—from large ones like Metropolitan Toronto or Winnipeg (see Patterson, 1993a, b), to medium-sized ones like Peterborough or Guelph, through to smaller ones like Truro or Lakefield—have become engaged by the concept of sustainable development. In the Greater Toronto Area, as we have seen, regional planning has resurfaced and presented alternatives to the admittedly less sustainable *status quo* for development in the GTA. In Peterborough, Ontario, a local Task Force on Sustainable Development has produced a report which outlines a series of recommended actions to be taken to enhance the sustainability of the Peterborough area (1991). Sustainable development is "trendy," it is "green," it is "environmental friendliness." In short, it is "good."

We have noted, however, that sustainable development is far from simple. It is environmental, but it is also economic, social, and in need of political will and power. The complexity of sustainable development is well illustrated in the case of agriculture. To sustain agriculture and food production, as they currently exist, is likely to require continued chemical inputs and will continue to generate an array of environmental problems (e.g., water pollution from non-point sources). To change agriculture, some argue, to a more "natural" process of food production—a process less dependent on synthetic chemicals, large machines, and large tracts of land—will help to create a more sustainable agriculture and a more sustainable environment. However, there may well be economic problems encountered *en route* to a more organic agriculture and an agriculture less dependent on new technologies. Not all farmers view their role as that of environmental protector. Some are business people with a primary interest in making a profit. Some view their land as a means to survive, and if survival requires selling it off to the highest urban bidder, then so be it.

The rural-urban fringe, where urban and rural sustainable development interests meet, overlap, and sometimes conflict, is a region where issues must be addressed comprehensively. Is it possible to sustain agriculture and rural communities in fringe areas under pressure from the city? Is it possible to sustain urban development without deleteriously affecting the environments of the rural-urban fringe?

Is compromise possible? The answer to the last question is: Yes, because that is what has to be. Rurality, or some semblance of it, cannot be preserved at the expense of all urban economic development. Nor can the city be allowed to expand and consume rural lands and communities at will. Actions do need to be taken, locally and regionally, which will make every effort to attain the balanced goal of sustainable development.

4. CONCLUSION

Sustainable development is a valuable conceptual framework for the analysis and planning of change in rural-urban fringe regions. The value of the concept is enhanced when the point of view taken is extended beyond the bounds of urban or rural perspectives to a synthesis which recognizes the ambiguous, diverse and complex nature of both the rural-urban fringe and the sustainable development concept. The need in the rural-urban fringe, as in other environments, extends beyond the environmental to the social and economic dimensions of sustainability. Conflicts will need to be resolved among the varied actors in the fringe, e.g., farmers and nonfarmers, urban and rural inhabitants, conservationists and developers.

A rejuvenated regional planning approach is a good start. Though encumbered by conflicting municipal self-interests, an urban-regional approach can recognize the rural-urban fringe as contributing to the quality of life and environment in the city. Too often, however, it views the fringe as only an extension of urban life space, an area where urban-focused interests are paramount. A more rural perspective gives emphasis to rural life and activities which happen to be near cities. Resource based rural communities have associated lifestyles and livelihoods. Such communities are also small and coherent, though potentially ephemeral. The rural view of the rural-urban fringe is that of rural space, society and economy, invaded by the city, threatened with dramatic change or even destruction of "what was." In short, there is a need to recognize the different perspectives held towards the rural-urban fringe, because urban and rural views will often conflict on the issue of the future of fringe society, economy and environment.

Sustainable development in the rural-urban fringe requires a synergy attained through concurrent and directed actions at local and regional scales. Concerns and activities should range from regional decision-making through to waste management and recycling. Actors will include regional plan makers, local administrators, special interest groups, and individuals. In aggregate, the total effect can be greater than the sum of spokes in the wheel of sustainable development, and once that wheel is rolling in the right direction and momentum is allowed to build, it will be a positive force for change.

ACKNOWLEDGEMENTS

I am pleased to acknowledge the assistance of Ms. Pamela Macintosh and Ms. Patricia Johnson for their determined and capable efforts. Pam and Trish have been supported by grants received from the Social Sciences and Humanities Research Council of Canada and the Nova Scotia Department of Agriculture and Marketing respectively. This paper has benefitted from responses to earlier papers presented at: the Institute of Urban Studies (The University of Winnipeg); the Department of Geography, Bishop's University; and at assorted conferences. To all those who made remarks please know that they were heard and appreciated. The Department of Humanities, Nova Scotia Agricultural College, has supported this and other work in a variety of ways for which I am most grateful. Finally, thanks go to Mary Ann Beavis and the IUS for the opportunity and encouragement to take on this task.

REFERENCES

- Barker, A.J. and P.H. Selman. 1990. "Managing the Rural Environment: An Emerging Role for Planning Authorities." *Journal of Environmental Management*, 31: 185-96.
- Batie, S.S. 1989. "Sustainable Development: Challenges To the Profession of Agricultural Economics." *American Journal of Agricultural Economics*, 71: 1083-1101.
- _____. 1988. "Living in the Urban Field," pp. 131-56 in P.M. Coppack, L.H. Russwurm and C.R. Bryant, eds., *Essays on Canadian Urban Process and Form, Volume III: The Urban Field*. Waterloo: University of Waterloo, Department of Geography Publications Series No. 30.
- _____. 1989. *Social Well-Being in Planned Retirement Communities: A Review and Pilot Study*. Peterborough: Trent University, Department of Geography, Occasional Paper No. 13.
- _____. 1990a. "Satisfaction with Life and Community: City-Suburban Variations in Metropolitan Toronto. Paper presented at the Association of American Geographers, Toronto.
- _____. 1990b. "Rural-Urban Fringe Issues: Examples From Peterborough, Ontario. Paper presented at the joint meeting of the Canadian Association of Geographers, Ontario Division, and the Association of American Geographers, East Lakes Division, St. Catharines, Ontario.
- _____. 1991a. *Rural and Urban Fringe Studies in Canada*. Toronto: York University, Atkinson College, Geographical Monographs No. 21.
- _____. 1991b. "Rural and Urban Fringe Studies in Canada: Retrospect and Prospect," pp. 1-42 in K.B. Beesley, ed., *Rural and Urban Fringe Studies in Canada*. Toronto: York University, Atkinson College, Geographical Monographs No. 21.
- _____. 1991c. "Sustainable Development—Sustainable Cities? Paper presented at the Institute of Urban Studies, The University of Winnipeg.
- _____. 1993. *The Rural-Urban Fringe: A Bibliography*. Peterborough: Trent University, Department of Geography, Occasional Paper No. 15.
- _____. Forthcoming. *Sustainable Development and Sustainable Agriculture: A Bibliography*. Truro: Nova Scotia Agricultural College, Department of Humanities, Rural Studies Working Papers.
- _____ and R.T. Bowles. 1992. "Satisfaction with Life and Community in the Urban Region." Paper presented at the Canadian Association of Geographers, Vancouver.
- _____ and R.T. Bowles. 1993. *Metropolitan-Nonmetropolitan Variations in Agriculture and Population Change*. Truro: Nova Scotia Agricultural College, Department of Humanities, Rural Studies Working Papers No. 1.
- _____, R.T. Bowles and C. Johnston. 1993. *Life and Community Satisfaction in a Retirement Village: Bobcaygeon, Ontario*. Truro: Nova Scotia Agricultural College, Department of Humanities, Rural Studies Working Papers No. 3.

- _____ and P.J. Macintosh. 1993. *The Quality of Life in Urban Fringe Environments: Farm—Non-Farm Comparisons in Southwestern Ontario*. Truro: Nova Scotia Agricultural College, Department of Humanities, Rural Studies Working Papers No. 4.
- _____ and L.H. Russwurm, eds. 1981. *The Rural-Urban Fringe: Canadian Perspectives*. Toronto: York University, Atkinson College, Geographical Monographs No. 10.
- _____ and G.E. Walker. 1990a. "Residence Paths and Community Perception: A Case Study From the Toronto Urban Field." *The Canadian Geographer*, 34,4: 318-30.
- _____ and G.E. Walker. 1990b. "Local Satisfaction and Concerns in Urban Fringe Areas." *Ontario Geography*, 34: 23-36.
- Blobaum, R. 1987. "Farming On the Urban Fringe: The Economic Potential of the Rural-Urban Connection," pp. 3-8 in W. Lockeretz, ed., *Sustaining Agriculture Near Cities*. Ankeny, IA: Soil and Water Conservation Society.
- Bowles, R.T. and K.B. Beesley. 1991. "Quality of Life, Migration To the Countryside, and Rural Community Growth," pp. 45-66 in K.B. Beesley, ed., *Rural and Urban Fringe Studies in Canada*. Toronto: York University, Atkinson College, Geographical Monographs No. 21.
- Bunce, M. 1981. "Rural Sentiment and the Ambiguity of the Urban Fringe," pp. 109-20 in K.B. Beesley and L.H. Russwurm, eds., *The Rural-Urban Fringe: Canadian Perspectives*. Toronto: York University, Atkinson College, Geographical Monographs No. 10.
- Bryant, C.R. 1992. "Farming at the Urban Fringe," pp. 275-304 in I.R. Bowler, ed., *the Geography of Agriculture in Developed Market Economies*. London: Longman.
- _____ and T.R.R. Johnston. 1992. *Agriculture in the City's Countryside*. Toronto: University of Toronto Press.
- _____ and L.H. Russwurm. 1979. "The Impact of Nonagricultural Development On Agriculture: A Synthesis." *Plan Canada*, 19,2: 122-39.
- _____, L.H. Russwurm and A.G. McLellan. 1992. *The City's Countryside*. London: Longman.
- Coppack, P.M. 1990. "The Urban Field, Amenity Environments and Local Community Development: Some Ideas On the Economic Survival of Small Communities in the City's Countryside," pp. 79-100 in F.W. Dykeman, ed., *Entrepreneurial and Sustainable Rural Communities*, Sackville, N.B.: Mount Allison University, Department of Geography, Rural and Small Town Research and Studies Program.
- _____, K.B. Beesley and C.J.A. Mitchell. 1990. "Rural Attractions and Rural Development: Elora, Ontario Case Study," pp. 115-28 in F.W. Dykeman, ed., *Entrepreneurial and Sustainable Rural Communities*, Sackville, N.B.: Mount Allison University, Department of Geography, Rural and Small Town Research and Studies Program.
- Crombie, D. 1990. *Watershed*. Toronto: Royal Commission on the Future of the Toronto Waterfront.

- Dahms, F.A. and B. Hallman. 1991. "Population Change, Economic Activity and Amenity Landscapes At the Outer Edge of the Urban Fringe," pp. 67-90 in K.B. Beesley, ed., *Rural and Urban Fringe Studies in Canada*. Toronto: York University, Atkinson College, Geographical Monographs No. 21.
- Doyle, D. 1991. "Sustainable Development: Growth without Losing Ground." *Journal of Soil and Water Conservation*, 46: 8-13.
- Dykeman, F.W., ed. 1990a. *Entrepreneurial and Sustainable Rural Communities*. Sackville, NB: Mount Allison University, Department of Geography, Rural and Small Town Research and Studies Program.
- _____. 1990b. "Developing an Understanding of Entrepreneurial and Sustainable Rural Communities," pp. 1-22 in F.W. Dykeman, ed., *Entrepreneurial and Sustainable Rural Communities*. Sackville, NB: Mount Allison University, Department of Geography, Rural and Small Town Research and Studies Program.
- Fisher, J., F.M. Helleiner and K. Wehrenberg, eds. 1991. *Greenways and Green Space on the Oak Ridges Moraine: Towards Co-operative Planning*. Peterborough: Trent University, Department of Geography, Occasional Paper 14.
- Flora, C.B. 1990a. "Sustainability of Agriculture and Rural Communities," pp. 343-59 in C.A. Francis et al., eds., *Sustainable Agriculture in Temperate Zones*. New York: Wiley.
- _____. 1990b. "Policy Issues and Agricultural Sustainability," pp. 361-79 in C.A. Francis et al., eds., *Sustainable Agriculture in Temperate Zones*. New York: Wiley.
- Francis, C.A. 1990. "Future Dimensions of Sustainable Agriculture," pp. 439-66 in C.A. Francis et al., eds., *Sustainable Agriculture in Temperate Zones*. New York: Wiley.
- _____, C.B. Flora and L.D. King, eds. 1990. *Sustainable Agriculture in Temperate Zones*. New York: Wiley.
- _____ and G. Youngberg. 1990. "Sustainable Agriculture—An Overview," pp. 1-23 in C.A. Francis et al., eds., *Sustainable Agriculture in Temperate Zones*. New York: Wiley.
- Friend, G. 1983. "The Potential for An Alternative Agriculture," pp. 28-47 in D. Knorr, ed., *Sustainable Food Systems*. Westport, CT: AVI.
- Fuller, A.M. and J. Mage, eds. 1976. *Part-Time Farming: Problem or Resource in Rural Development*. Norwich: Geo Abstracts.
- Gayler, H.J. 1982a. "Conservation and Development in Urban Growth: The Preservation of Agricultural Land in the Rural-urban Fringe of Ontario." *Town Planning Review*, 53: 321-41.
- _____. 1982b. "The Problems of Adjusting To Slow Growth in the Niagara Region of Ontario." *The Canadian Geographer*, 26: 165-72.
- _____. 1990. "Changing Aspects of Urban Containment in Canada: The Niagara Case in the

- 1980S and Beyond." *Urban Geography*, 11: 373-93.
- _____. 1991. "The Demise of the Niagara Fruit Belt: Policy Planning and Development Options in the 1990s," pp. 283-313 in K.B. Beesley, ed., *Rural and Urban Fringe Studies in Canada*. Toronto: York University, Atkinson College, Geographical Monographs No. 21.
- Giampietro, M. and S.G.F. Bukkems. 1992. "Sustainable Development: Scientific and Ethical Assessments." *Journal of Agricultural and Environmental Ethics*, 5,1: 27-57.
- Gliessman, S.R. 1984. "An Agroecological Approach To Sustainable Agriculture," pp. 160-71 in W. Jackson *et al.*, eds., *Meeting the Expectations of the Land*. San Francisco: North Point Press.
- _____, ed. 1990a. *Agroecology: Researching the Ecological Basis for Sustainable Agriculture*. New York: Springer-Verlag.
- _____. 1990b. "Agroecology: Researching the Ecological Basis for Sustainable Agriculture," pp. 3-10 in S.R. Gliessman, ed., *Agroecology: Researching the Ecological Basis for Sustainable Agriculture*. New York: Springer-Verlag.
- _____. 1990c. "Quantifying the Agroecological Component of Sustainable Agriculture: A Goal," pp. 366-70 in S.R. Gliessman, ed., *Agroecology: Researching the Ecological Basis for Sustainable Agriculture*. New York: Springer-Verlag.
- Gow, D.D. 1992. "Poverty and Natural Resources: Principles for Environmental Management and Sustainable Development." *Environmental Impact Assessment Review*, 12: 49-65.
- Haigh, R.J. and D.G. Murri. 1990. *Survival Strategies in Rural Canada: The Need for New Paradigms*. Edmonton: University of Alberta, Department of Rural Economy, Staff Paper 90-08.
- IBI Group. 1990. *Greater Toronto Area Urban Structure Concepts Study: Summary Report*. Toronto.
- Ikerd, J.E. 1990. "Agriculture's Search for Sustainability and Profitability." *Journal of Soil and Water Conservation*, 45 (January/February): 18-23.
- Ilbery, B.W. 1991. "Farm Diversification as An Adjustment Strategy On the Urban Fringe of the West Midlands." *Journal of Rural Studies*, 7,3: 207-18.
- Jackson, W. 1984. "A Search for the Unifying Concept for Sustainable Agriculture," pp. 208-30 in W. Jackson *et al.*, eds., *Meeting the Expectations of the Land*. San Francisco: North Point Press.
- _____. 1987. *Altars of Unhewn Stone*. San Francisco: North Point Press.
- _____, W. Berry and B. Coleman, eds., 1984. *Meeting the Expectations of the Land*. San Francisco: North Point Press.
- Johnston, T.R.R. and C.R. Bryant. 1987. "Agricultural Adaptation: The Prospects for Sustaining Agriculture Near Cities," pp. 9-21 in W. Lockeretz, ed., *Sustaining Agriculture Near Cities*. Ankeny, IA: Soil and Water Conservation Society.

- Keall, M.J., ed. 1986. *Development at the Edge*. Toronto: York University, Urban Studies Program.
- Knorr, D., ed. 1983. *Sustainable Food Systems*. Westport, CT: AVI.
- Krueger, R.R. 1959. "Changing Land Use Patterns in the Niagara Fruit Belt." *Transactions of the Royal Canadian Institute*, 32: 39-140.
- _____. 1977. "The Destruction of a Unique Renewable Resource: The Case of the Niagara Fruit Belt," pp. 132-48 in R.R. Krueger and B. Mitchell, eds., *Managing Canada's Renewable Resources*. Toronto: Methuen.
- _____. 1978. "The Urbanization of the Niagara Fruit Belt." *The Canadian Geographer*, 22: 179-94.
- _____. 1982. "The Struggle To Preserve Specialty Cropland in the Rural-urban Fringe of the Niagara Peninsula of Ontario." *Environments*, 14,3: 1-10.
- _____. 1984. "The Urbanization of Canada's Fruitlands: The Niagara Fruit Belt and the Okanagan Valley." *the Operational Geographer*, 4: 33-34.
- _____ and G. Maguire. 1984. "Changing Urban and Fruitgrowing Patterns in the Okanagan Valley, B.C." *Environments*, 16: 1-9.
- _____ and G. Maguire. 1985. "Protecting Specialty Cropland From Urban Development: The Case of the Okanagan Valley, B.C." *Geoforum*, 16,3: 287-300.
- Lapping, M.B. and N.R. Leutiviler. 1987. "Agriculture in Conflict: Right-to-Farm Laws and the Peri-urban Milieu for Farming," pp. 209-18 in W. Lockeretz, ed., *Sustaining Agriculture Near Cities*. Ankeny, IA: Soil and Water Conservation Society.
- Lisansky, J. and G. Clark. 1987. "Farmer-Nonfarmer Conflicts in the Urban Fringe: Will Right-to-Farm Help? pp. 219-29 in W. Lockeretz, ed., *Sustaining Agriculture Near Cities*. Ankeny, IA: Soil and Water Conservation Society.
- Lockeretz, W. 1986. "Trends in Farming Near Cities." *Journal of Soil and Water Conservation*, 41,4: 256-62.
- _____, ed. 1987. *Sustaining Agriculture Near Cities*. Ankeny, IA: Soil and Water Conservation Society.
- _____. 1989. "Problems in Evaluating the Economics of Ecological Agriculture," pp. 67-76 in M.G. Paoletti et al., eds., *Agricultural Ecology and Environment*. Amsterdam: Elsevier.
- _____. 1989. "Secondary Effects On Midwestern Agriculture of Metropolitan Development and Decreases in Farmland." *Land Economics*, 65,3: 205-16.
- _____. 1990. "Major Issues Confronting Sustainable Agriculture," pp. 423-38 in C.A. Francis et al., eds., *Sustainable Agriculture in Temperate Zones*. New York: Wiley.

- Logsdon, G. 1984. "The Importance of Traditional Farming Practices for a Sustainable Modern Agriculture, pp. 3-18 in W. Jackson *et al.*, eds., *Meeting the Expectations of the Land*. San Francisco: North Point Press.
- Macintosh, P.J. and K.B. Beesley. 1993. *Cultural Perspectives on Farmers' Perceptions: Mennonite—Non-Mennonite Farmers in Southwestern Ontario*. Truro: Nova Scotia Agricultural College, Department of Humanities, Rural Studies Working Papers No. 2.
- Manning, E.W. 1986. *Towards Sustainable Land Use: A Strategy*. Ottawa: Environment Canada, Lands Directorate, Working Paper No. 47.
- _____. 1988. *The Analysis of Land Use Determinants in Support of Sustainable Development*. Laxenburg, Austria: International Institute for Applied Systems Analysis, Collaborative Paper 88-1.
- _____. 1990. Presidential Address: Sustainable Development, the Challenge." *The Canadian Geographer*, 34,4: 290-302.
- _____ and J.D. McCuaig. 1984. "Planning Operational Research: A Conceptual Approach and Applications To Land Research." *The Operational Geographer*, 5.
- Maxwell, J. 1986. "Conservation and the Economy: Setting the Stage," pp. 1-9 in M.J. Keall, ed., *Development at the Edge*. Toronto: York University, Urban Studies Program.
- Nams, V.O., ed. 1991. *Reducing the Non-Renewables*. Truro: Nova Scotia Agricultural College.
- National Task Force on Environment and Economy. 1987. *Report of the National Task Force on Environment and Economy*. Ottawa.
- Paoletti, M.G., B.R. Stinner and G.G. Lorenzoni. 1989. *Agricultural Ecology and Environment*. Amsterdam: Elsevier.
- Parker, J.K. 1990. *Strands in the Web of Life: Human Dimensions of Sustainable Development and Global Survival*. Paper presented at SAF National Convention, Washington, D.C.
- Patterson, J. 1992. "A Quarter Century of Canada's Metropolitan Fringe Development." *Sustainable Cities*, 4: 1-6.
- _____. 1993a. "An Ordering of Preferred Environmental Actions." *Sustainable Cities*, 5: 1-6.
- _____. 1993b. "Urban Public Transit and Sustainable Cities." *Sustainable Cities*, 6: 1-10.
- Pierce, J.T. 1981a. "The Land Conversion Process within B.C.'S Agricultural Land Reserves: A Critical Look," pp. 314-24 in K.B. Beesley and L.H. Russwurm, eds., *the Rural-Urban Fringe: Canadian Perspectives*. Toronto: York University, Atkinson College, Geographical Monographs No. 10.
- _____. 1981b. "The B.C. Agricultural Land Commission: A Review and Evaluation." *Plan Canada*, 21: 48-56.

- _____. 1982. "British Columbia's Approach To Farmland Preservation." *Nordia*, 16: 149-55.
- _____. 1992. "Progress and the Biosphere: The Dialectics of Sustainable Development." *The Canadian Geographer*, 36,4: 306-20.
- Pimental, D., T.W. Culliney, I.W. Butler, D.J. Reinemann and K.B. Beckman. 1989. "Low-Input Sustainable Agriculture Using Ecological Management Practices," pp. 3-24 in M. Paoletti *et al.*, eds., *Agricultural Ecology and Environment*. Amsterdam: Elsevier.
- _____ and M. Pimental. 1983. "The Future of American Agriculture," pp. 3-27 in D. Knorr, ed., *Sustainable Food Systems*. Westport, CT: AVI.
- Punter, J.V. 1974. *The Impact of Exurban Development on Land and Landscape in the Toronto-Centred Region*. Ottawa: Central Mortgage and Housing Corporation, Policy Planning Division.
- Redclift, M. 1987. *Sustainable Development: Exploring the Contradictions*. New York: Routledge.
- Reichelderfer, K.H. 1991. "Agriculture and Resource Sustainability: Can Economics Help?" pp. 53-63 in *Understanding the True Cost of Food: Considerations for a Sustainable Food System*. Washington, DC: Institute for Alternative Agriculture.
- Reid, W.V.C. 1989. "Sustainable Development: Lessons From Success." *Environment*, 31,4: 7-9.
- Richardson, N. 1989. *Land Use Planning and Sustainable Development in Canada*. Ottawa: Canadian Environmental Advisory Council.
- Rodd, R.S. 1976a. "The Use and Abuse of Rural Land." *Urban Forum*, 2,3: 5-12.
- _____. 1976b. "The Crisis of Agricultural Land in the Ontario Countryside." *Plan Canada*, 16: 160-70.
- Roseland, M. 1991. "Social Equity and Sustainable Development: The Implications of Global Thought for Local Action," pp. 89-100 in R. Lorimer *et al.*, eds., *To See Ourselves/To Save Ourselves: Ecology and Culture in Canada*. Montreal: Association for Canadian Studies, Canadian Issues Vol. 13.
- Rubenstein, D.B. 1993. "Accounting for Sustainability." *Policy Options*, 14,7: 20-24.
- Russwurm, L.H. 1977. *The Surroundings of Our Cities*. Ottawa: Community Planning Association.
- Sachs, I. and D. Silk. 1990. *Food and Energy: Strategies for Sustainable Development*. Tokyo: United Nations University Press.
- Science Council of Canada. 1988. *Environmental Peacekeepers: Science, Technology and Sustainable Development in Canada*. Ottawa.
- _____. 1992. *Sustainable Agriculture: The Research Challenge*. Ottawa: Report 43.

- Simmons, T. 1981. "The Challenge of Rural Perspectives On the Rural-Urban Fringe," pp.71-86 in K.B. Beesley and L.H. Russwurm, eds., *the Rural-Urban Fringe: Canadian Perspectives*. Toronto: York University, Atkinson College, Geographical Monographs No. 10.
- Smit, B. and M. Brklacich. 1989. "Sustainable Development and the Analysis of Rural Systems." *Journal of Rural Studies*, 5,4: 405-14.
- Stenholm, C.W. and D.B. Waggoner. 1990. "Low-Input, Sustainable Agriculture: Myth or Method?" *Journal of Soil and Water Conservation*, 45 (January/February): 13-17.
- Task Force on Sustainable Development for the Peterborough Area. 1991. *Report*. Peterborough, Ontario.
- Thomas, V.G. and P.G. Kevan. 1993. "Basic Principles of Agroecology and Sustainable Agriculture." *Journal of Agricultural and Environmental Ethics*, 6,1: 1-19.
- Troughton, M.J. 1990. "Decline to Development: Towards a Framework for Sustainable Rural Development," pp. 23-31 in F.W. Dykeman, ed., *Entrepreneurial and Sustainable Rural Communities*. Sackville, NB: Mount Allison University, Department of Geography, Rural and Small Town Research and Studies Program.
- Vail, D. 1987. "Suburbanization of the Countryside and the Revitalization of Small Farms," pp. 23-36 in W. Lockeretz, ed., *Sustaining Agriculture Near Cities*. Ankeny, IA: Soil and Water Conservation Society.
- Veeman, T.S. 1989. "Sustainable Development: Its Economic Meaning and Policy Implications." *Canadian Journal of Agricultural Economics*, 37: 875-886.
- Walker, G.E. 1979. "Farmers in Southern Simcoe County, Ontario: Part-time, Full-time Comparisons." *Ontario Geography*, 14: 59-67.
- _____. 1987. *An Invaded Countryside: Structures of Life on the Toronto Fringe*. Toronto: York University, Atkinson College, Geographical Monographs No. 17.
- Warren, C.L. and P.C. Rump. 1981. *The Urbanization of Rural Land in Canada: 1966-1971 and 1971-1976*. Ottawa: Environment Canada, Lands Directorate, Land Use in Canada Series.
- Wirth, L. 1938. "Urbanism as a Way of Life." *American Journal of Sociology*, 44: 1-24.
- World Commission on Environment and Development. 1987. *Our Common Future*. New York: Oxford University Press.
- Yeates, M. 1985. *Land in Canada's Urban Heartland*. Ottawa: Environment Canada, Lands Directorate, Land Use in Canada Series.
- Young, M.D., ed. 1991a. *Towards Sustainable Agricultural Development*. London: Belhaven.
- _____. 1991b. "Introduction: Conceptual Framework," pp. 1-5 in M.D. Young, ed., *Towards Sustainable Agricultural Development*. London: Belhaven.

Young, M.D. 1991c. "Overview: The Integration of Agricultural and Environmental Policies," pp. 337-42 in M.D. Young, ed., *Towards Sustainable Agricultural Development*. London: Belhaven.