Environmental Management (2009) 44:228–242
DOI 10.1007/s00267-009-9315-7

RESEARCH

A Template for Integrated Community Sustainability Planning

Christopher Ling · Kevin Hanna · Ann Dale

Received: 16 May 2007 / Accepted: 9 May 2009 / Published online: 4 June 2009

Abstract This article describes a template for implementing an integrated community sustainability plan. The template emphasizes community engagement and outlines the components of a basic framework for integrating ecological, social and economic dynamics into a community plan. The framework is a series of steps that support a sustainable community development process. While it reflects the Canadian experience, the tools and techniques have applied value for a range of environmental planning contexts around the world. The research is case study based and draws from a diverse range of communities representing many types of infrastructure, demographics and ecological and geographical contexts. A critical path for moving local governments to sustainable community development is the creation and implementation of integrated planning approaches. To be effective and to be implemented, a requisite shift to sustainability requires active community engagement processes, political will, and a commitment to political and administrative accountability, and measurement.

Keywords Integrated planning · Sustainability · Sustainable development · Community involvement · Participatory planning · Implementation

C. Ling · A. Dale
School of Environment and Sustainability, Royal Roads University, Victoria, BC, Canada

K. Hanna (✉)
Geography and Environmental Studies, Wilfrid Laurier University, 75 University Ave., Waterloo N2L 3C5, Canada
e-mail: khanna@wlu.ca

Introduction

Sustainable community development is beyond the capacity of any one sector, discipline or level of governments to implement (Dale 2001). It requires new commitments to cooperation among government agencies, integrated policy approaches, and the alignment of economic and other incentives. In some jurisdictions this is now starting to emerge. It has also become clear that municipal governments are on the front line of implementing sustainable community development. In Canada, the Federal Government introduced an innovative policy instrument in 2005 when it provided funding to municipalities through the Gas Tax Funding Program. In order to receive funds municipalities must develop an Integrated Community Sustainability Plan (ICSP) (Department of Finance 2005; Infrastructure Canada 2005). But there are no specific templates provided through the program that outline what such plans should contain. While this has created uncertainty about what constitutes an integrated approach to sustainability planning, it has also provided an opportunity for developing new ways of planning, possibilities for local community innovation, and introduces a new requirement that local governments implement the sustainability imperative.

This article describes a flexible ICSP template. The template emphasises community engagement and outlines a basic framework for developing an ICSP capable of reconciling community ecological, social and economic dynamics—a planning imperative in achieving sustainability (Dale 2001; Robinson and Tinker 1997). Brief descriptions of mechanisms that promote accountability and effective implementation are interwoven throughout the framework.

The template is presented as a series of steps and needs. It is informed by the Canadian experience, but the tools and

techniques described have validity and applicability to a range of planning and municipal governance contexts around the world. This not is a proscriptive attempt to create a "one-size-fits-all" approach to building an integrated sustainable community plan. Integrated planning ideally engages and challenges communities. It responds to the complex ecological settings within which communities grow and thrive. Thus, there is a strong focus on participatory techniques— particularly ones that allow for full involvement and engagement with the rich range of socio-economic dynamics and sectors in a community, while acknowledging the natural systems on which communities depend. The template should be seen as a map, to be used by communities to help move through an ICSP process (summarized in Fig. 1). It begins with a statement of principle and sets out stages, each of which contain ideas and suggestions for application and implementation. Ultimately, it is for a community to decide, through dialogue and review, which methods and priorities are most appropriate, useful and tractable.

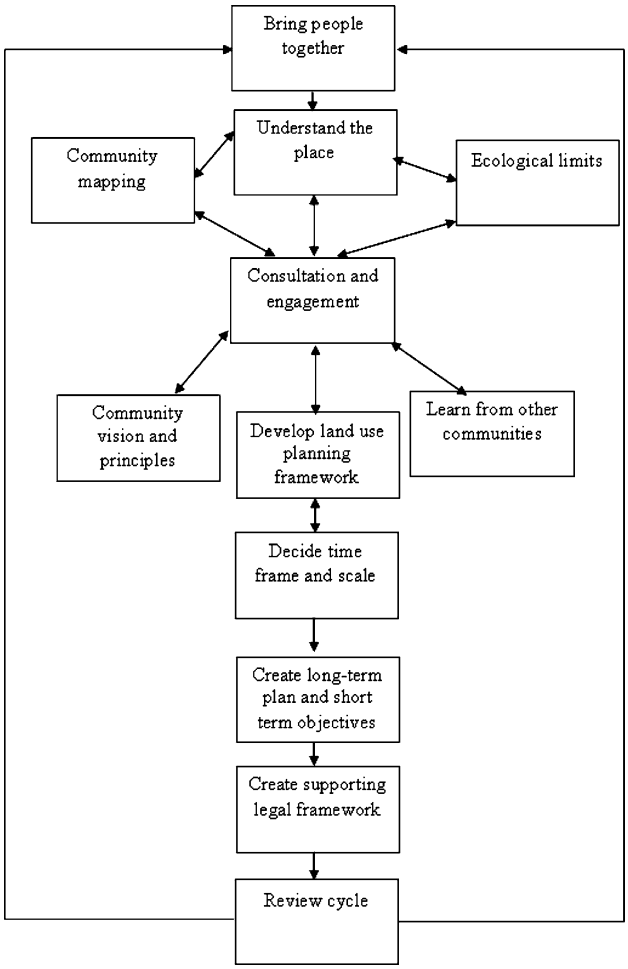

Fig. 1 ICSP process outline

Methods

The ICSP template is one outcome of a research project, which examines the provision and development of sustainable infrastructure in Canada (www.sustainableinfrastructure.org). The methodology is case study and "e-Dialogue" (see Dale 2005) based and explores many types of sustainable infrastructure innovative practices, community types, in a broad range of ecological and geographical contexts. The e-Dialogues used a modified Delphi Method by bringing together researchers, experts and practitioners in infrastructure investment and interested communities and municipalities to develop case studies, which are then used to stimulate synchronous on-line dialogue and asynchronous public forum discussions. Both of these tools foster shared learning (Kurtz and Snowden 2002)—the sharing of knowledge between organizations and between sectors.

Twenty case studies from five sectors were chosen—waste management, transportation, land-use planning (which included attention to integrated transportation issues, residential and commercial land development), energy and governance and first developed by a transdisciplinary research team which included specialists from economics, community development, forestry, planning, and geography—they also brought government policy experience to the review process. This set of individual case studies was designed to provide an opportunity for analytical generalization (e.g., Yin 2003, p. 37); focusing on the processes communities can adopt in order to realize sustainable forms of infrastructure development. Of particular interest here are the typical gaps in knowledge and expertise that communities often must deal with in order to achieve some form of sustainability planning. The information used for the cases was gathered from publicly available documentation and through a series of interviews with key leaders involved in the case communities and programs.

The themes that emerged from the case studies informed a series of five real-time on-line dialogues that brought together twenty-two specialists, public policy experts and practitioners from across Canada. These e-Dialogues explored the tools used, solutions adopted and the barriers and challenges faced in Canadian communities in their attempts to implement sustainable infrastructure. Based on these data, the structure and focus of an ICSP template was developed. The draft ICSP template was then posted through a project website and widely circulated for review and comment to municipal associations, and community planning and development practitioners across Canada. In addition, an on-line e-focus group of seven planning experts evaluated the usefulness and applicability of the proposed template (e-Dialogues are archived on the project website http://crcresearch.royalroads.ca/edialogues).

In all over 600 individuals were involved in the project, and their views contributed to the development of the ICSP template presented here. This includes those interviewed for the case study development, took part in the series of dialogues and contributed to the review process. Throughout the paper we refer to the contributors as participants or respondents.

The analysis and review process highlighted four common challenges to the realizing sustainable communities:

1. Integration: While individual projects are happening in many communities throughout Canada, they are frequently stand-alone. They contribute to sustainability, but rarely set a pattern for overall community development and planning practice, nor are they commonly integrated into general planning policy. As a result there can be an implementation gap—between plans and on-the-ground actions, compounded by poor knowledge diffusion within and between communities.
2. Scale: Sustainability projects frequently take the form of geographically bounded, individual initiatives. But these rarely impact municipal systems as a whole, nor do they often demonstrate a capacity to link municipal planning decisions to the wider landscape scale or to adjacent municipalities—the larger common socio-economic/ecological system.
3. Governance: Sustainability planning may be reactive and appended to existing planning processes, rather than serving as a proactive, catalytic and strategic approach through which ecological, social and economic decisions are integrated and measured against indicators. Without a governance structure that embraces and adopts sustainable development as a guiding planning principle, implementation of sustainability objectives becomes difficult and inevitably ineffectual. Local governments may rarely incorporate a sustainability ethos into their planning until circumstances force them to. Rather than merely planning for sustainability, as seems common, governments should be planning sustainably (Boyle and others 2004). In practice this entails a new planning imperative organized around a sustainability ethic as its guiding principle, rather than as a faintly decorative accessory to established processes.
4. Inclusion: Sustainable community development is meaningless without early and full community engagement. Timely participation, consultation and shared decision making leads to stronger support, partnerships and implementation efficiency. The community and the local government will support a process that helps the realisation of communally defined long term goals, rather than a plan that reflects a short term political/economic agenda established with poor attention to pluralism.

The Conceptual Context

The integration of sustainable development concepts into planning has evolved over the last 40 years, and while it has not always been explicitly explained in terms of 'sustainable development,' the principles are evident. Generally, these have focused on three main areas, ecological principles (e.g., McHarg 1969; Zube and others 1975; Selman 1993; Flores and others 1998; Pauleit and Duhme 2000; Register 2006), participatory planning or critiques of participation (e.g., Arnstein 1969; Healey 1997; Davidson 1998; Wates 2000; Tippet 2005a), and the social impacts of urban form and design (e.g., Jacobs 1961; Congress of the New Urbanism 1999). Each of these movements has become part of the weave that forms the sustainability planning discourse.

Ecological Principles

Incorporating ecological principles into sustainable community planning often focuses on limits to growth; whether spatial limits where ecologically sensibility is determined by physical environmental constraints (Stone 2004), or the more enlightened recognition that boundless growth disrupts ecological systems (Ewan and others 2004). But it also refers to the carrying capacity of the local environment, with an emphasis on the ability of soil, water and air quality to support the growth—whether seen in terms of new activities or population growth that the community already has experienced or wants to realize (Anderson 2005; Wackernagel and others 2006). The ideal goal of community sustainability is not growth at any cost, but the optimization of economic opportunity and quality of life within the real ecological limits imposed by the environment in which the community is situated (Boyle and others 2004).

Accessible natural spaces are important for human physical and psychological health, and they have a direct impact on quality of life, the social aspect of sustainable development and the success of cities and towns (Groenewegen and others 2006; Hanna and Walton-Roberts 2004); especially as such spaces become scarce. In community planning identifying an ecological carrying capacity for the maintenance of greenspace and integrating such limits into decision making helps maintain the resilience and adaptability of communities within their particular ecological context (Pickett and others 2004; Andersson 2006). Integrated planning also has the potential to enhance the economic competitiveness and desirability of a community as a place to live and work.

It is helpful to link ecological principles in planning to the other imperatives of sustainable development (economy and society) when notions such as landscape ecology and principles of multifunctionality are considered and

used in the design of human places (Ling and others 2007; Selman 2002). Such approaches can help ecological planning (which can often seem "people-less") become a more practicable tool for integration—one that equally considers people and the environments in which they and their communities are situated.

Participatory Planning

If the integration of ecological principles requires the incorporation of physical environmental characteristics into a plan, then engagement and consultation with the human community will be a necessary focus of the social and economic imperatives (Rydin and Pennington 2000). Such a dynamic community process, ecologically, socially and economically, is an essential component of any integrated sustainable development plan supporting new forms of participatory planning.

The aim of participatory planning is to move the role of planners from one of expert knowledge provider, toward a more inclusive part as facilitator or coordinator of community needs (Wates 2000). The democratization of planning, which is certainly still evolving, has gradually come with the advance of participation and engagement theory. The ideal is that participatory planning helps ensure that the 'plan' is grounded in the pluralistic socio-economic and bio-physical context of the community. However, having a participatory function in the planning process is no guarantee of success; other dynamics will often emerge, and these may become dominant (Hanna 2000).

Although the use of participatory mechanisms can be costly, at least initially, in the long term such an investment is likely to reduce conflict and strengthen the potential, for successful implementation of the decision, or plan (Yencken 2001). It is the long term perspective that is an essential and distinguishing feature of integrated sustainability planning (Næss 2001). Participation reinforces community commitment to change, and helps build support for new approaches and implementing difficult policy decisions. When effective, participation will make implementation "easier."

Community Form and Design

The built environment impacts the well being of a community, and the stability of natural systems, within urban areas, and beyond (Alberti 1999, Troy 2003). Urban places are now home to the great majority of Canadians and soon the majority of the world's citizens (United Nations Population Find 2007). In terms of supporting sustainable community development, urban form reflects the approach and vision that local government has in delivering public services, it affects a community's ability to attract new and innovative economic opportunity (Cerverro 2001; Engel-Yan and others 2005). The growing recognition that conventional approaches to urban design, so common in North America and very much focused on cars, are no longer sustainable, are falling short on all three imperatives. Not unexpectedly, built form has emerged as a central theme in envisaging sustainable communities (Christoforidis 1994; Churchill and Baetz 1999).

The ideals of sustainable urban form are simple—the optimization of social and economic interaction, and support of diversity and resilience, all without compromising the ecological limits and carrying capacity of the landscape (Kenworthy 2006). Certainly this is a tall order, but increasingly it is an urgent one. From an applied perspective moving from the "business as usual" paradigm of urban planning and design, toward sustainable community development, also requires new approaches to infrastructure—ones that build resiliency (quality of structures, innovative materials, efficiency in cost and service delivery) and sustain the integrity of ecological systems rather than erode them, access to facilities by all parts of the community and creates vibrant conditions for economic entrepreneurship, this may be especially true for transportation and energy infrastructure.

Transport networks and similar linear structures not only impact ecological connectivity, they may be the most important determinants of urban form (Wheeler 2003). They facilitate growth and help determine form at multiple scales. These diverse scales include the design and operation of buildings as well as the planning and operation of larger infrastructure. While the largest influence of an ICSP will be over municipal infrastructure, linear and otherwise, there is also a significant role for ICSPs in improving the sustainability contribution of residential and other private building developments (Crabtree 2005).

Integration

In some ways it is helpful to define integrated sustainable community planning as a process of reconciliation; where environmental, economic and social imperatives are bought together through discourse, perhaps a discourse on anticipating and responding to change, not the least of which is climate change. Sustainable development can be a reactive notion, brought forward and embraced when conditions (social, environmental, economic) seem threatened (Hanna 2005). It is increasingly evident that sustainability requires a new way of thinking—it demands integrated decision-making and new management regimes for overseeing and allocating the impacts and benefits of human activity—within society and for natural systems.

The identification of integration as important aspect of environmental planning is not especially new (Slocombe

and Hanna 2007). It was a key part of McHarg's (1969) approach to vision landscapes and it has been recurrent regularly since–often linked to a systems perspective (e.g., Petak 1980; Barrett 1985; Cairns 1991; Born and Sonzogni 1995; Margerum and Born 1995, 2000) (Slocombe and Hanna 2007 p1). In recent years, other dimensions—participation, institutional integration, and communication dimensions have become integral parts of the ideal of integrated planning. Integration remains a prominent theme in the management and planning rhetoric of resource and environmental management agencies around the world, and it has become a key theme in regional and urban planning, albeit often implicitly.

But fragmentation remains a substantial obstacle to improving planning and environmental management—the fragmentation of interests, jurisdictions, ownership, management responsibility, social and ecological systems, information and knowledge all contribute to modern resource and environmental management challenges (Slocombe and Hanna 2007; Dale 2001). Thus in many respects fragmentation, solitudes, *silos* and *stovepipes*, implementation gaps (Dale 2001) remain a central challenge to creating and implementing an ICSP.

For most landscapes and for different aspects of municipal life there can be a myriad of government levels and agencies responsible for management, and not uncommonly they work at cross-purposes to each other; fighting for resources and influence, and pushing conflicting mandates. At the local level, municipal government can find themselves at odds with the mandates and agendas of other levels of government, or with nearby municipalities. Many other practical problems ultimately derive from this one: data access, monitoring conflicts, boundary issues, jurisdictional battles, funding and personnel shortages, conflicting or duplicate legal requirements, contesting social and economic pressures, weak and/or single use-oriented legal frameworks, political agendas and short-term perspectives (Slocombe and Hanna 2007). Within the ICSP context, dealing with such these issues certainly came to fore from the case studies, and the review process; but within the review process here, there was also an overarching recognition that integration, to be meaningful and sustainable, will have to address issues at a landscape level—which will usually transcend municipal boundaries.

Sustainable development, after all, requires a new approach to thinking about and planning for the well being of ecological, social and economic imperatives (Dale 2001; Robinson and Tinker 1997). It can be argued that the understanding of integration issues is perhaps strongest at the municipal scale, especially within planning systems where community members are fully engaged and where the understanding of systems extends to a wider scale than the local (Boyle and others 2004). This means that a strong regional perspective is necessary in sustainability planning—substantive links between municipal governments in the creation, management and delivery of plans on an integrated and regional scale, or in the form of strong regional governance with the necessary responsibility and authority. But this is often resisted by local governments and the greater public who may see regionalism as a *relocation of power* away from local accountability, even if it is more effective (Baldassare and others 1996). There may be no universal "right solution." Context will often dictate needs, and a certain adaptive capacity is also essential in integration—but it may help to acknowledge that it can be easier to achieve an *effect* in a small area, but that "success" is best achieved at a wider scale (Forman 1995 p 488).

In Canada, there are examples of frameworks that approach integrated community sustainability planning (e.g., The Sheltair Group 2001; Seymoar 2004; Roseland 2005; Alberta Urban Municipalities Association 2006). But these can be proscriptive, quite technical, and some simply provide lists of desirable principles rather than plans for action and implementation, and most have not been implemented on the ground in communities, or in only one community. Frameworks are also frequently presented as computerized models or decision support systems (e.g., Hyrynyshyn 2002; Banai 2005). They have some utility, but they are limited and of course depend on the assumptions used to inform the model, capacity of users, and flexibility in absorbing data and providing solutions. While such approaches can be helpful, they are not an easy route to developing an ICSP. Communities need not only a certain will to do things differently, which we would suggest is the fundamental tenet of sustainability, but, as Gorobets (2006) notes they also need knowledge and capacity to develop local and unique solutions to achieve planning for sustainability. Other necessary and sufficient requirements are agency (or capacity) and social capital (Newman and Dale 2005), which are beyond the scope of the paper.

The template developed here recognizes the issues outlined above. But it is not a universal remedy. It does provide is an outline, based on case study research, vetted by those working in the front lines of planning and plan implementation, with the recognition that capacity is an issue for many communities and thus the tools selected must be responsive, functional, pluralistic, and ultimately tractable.

Implementation Dynamics

For some time it was assumed that when it came to program or policy efficacy, it was the quality of the idea that

mattered and not so much its execution (Hanna 2007). Some agencies still approach the policy process under this assumption. But the implementation literature has matured, and while ideas matter, it is broadly accepted that effective implementation is integral to the success of policy ideas.

Implementation can largely be defined in two ways: first, as the stage between decision and action (Hessing and Howlett 1997) where the causal issue is whether or not the decision can, actually be realized in a manner consistent with planning objectives (Brekke 1987) and second, as a progressing activity where the focus is on understanding and adjusting the way that policies function (Brekke 1987; Freeman 1980; Rossi and Freeman 1985). Implementation is a dynamic process, one that often involves negotiation, compromise, and shifting goals (Ham and Hill 1993, Hanna 2007). It is not a purely administrative event that can be evaluated in terms of which components do or do not perform as expected or required; rather implementation is a policy/action continuum in which an interactive process evolves, often involving negotiation (Ham and Hill 1993). Such elements emerge especially when there are innovative or adversarial aspects to a policy process. Since integration, and sustainability planning, often requires a change in agency relationships—and even the most modest efforts will mean some change in power relationships—adversarial dynamics can be an important consideration when an ICSP is conceived and implemented.

Overlapping themes have been common in discussions of the challenges to plan implementation. These can be variously described as "activities common to the (implementation) process" (Jones 1984), "obstacles to be overcome" (Mitchell 2002), 'conditions to be met for implementation success' (Sabatier and Mazmanian 1981), essential factors that determine policy success (Van Meter and Van Horn 1975), or factors that shape instrument choice (Linder and Peters 1989). Whatever the title or rubric they are gathered under, common elements (or macro-obstacles) can be assembled into a framework that has particular relevance to integrated approaches.

The characterization of implementation is not a simple matter of defining a single model (Hanna 2007). With respect to integrated planning and implementation process is frequently evolutionary, even ad hoc, and certainly adaptive. It is affected by inconsistencies in budgets, statutory authority, political imperatives, public interest and communication and information—common issues in planning. A common criticism of environmental agencies centre on their role as supporters or detractors of policy and the ineffectiveness of bureaucratic structures in understanding and addressing environmental problems (Dryzek 1990; Hanna 2007; Paehlke 1990; Torgerson 1990a, 1990b). This is all reflected in the fragmented nature of the environment and resource management processes—the ongoing challenge to integrated planning. Responsibilities for economic, social, and environmental management are divided among civic agencies, and across levels of government.

By its very nature sustainability challenges traditional approaches to planning, rooted in growth, whether it be managing it, advancing it, promoting it, or channeling it, planning rarely about stopping growth, or reforming it. Sustainability, despite the contradictions that may be inherent in the word, is in many respects a call for substantive change in approaches to and the conceptualization of growth. As planning scholars have shown (e.g., Berke and Conroy 2000; Conroy 2003), there is variation in the interpretation and implementation of sustainability objectives, and it is hardly an easy process. Regardless, such research also shows the permeability of the sustainability idea, despite hesitant or uneven application. The advantage of the ICSP approach is that it is required. In this sense the power of participation is not just in the articulation of objectives and vision, but as an integral part of building support for eventual implementation. Participation, through an ICSP supports the development of what Burby (2003) so compelling calls "plans that matter." The requirement function, that is to say if communities want the gas tax money they much develop and ICSP, has the impact of *making governments plan* (Burby and May 1997).

It may be that the most substantive challenge to implementing an integrated approach is not in convincing decision makers that integration is needed, but rather is in achieving a better understanding of how to implement such approaches (Hanna 1999 and 2007). From a critical perspective, this requires a change in power. Overcoming this challenge requires the construction of venues for deliberative practice, but without unnecessarily dismantling authority structures; in this vein the ICSP outlined here provides pragmatic promise.

An ICSP Template

It is perhaps most useful to define community as being the people living within a municipal boundary, though community can be certainly defined a variety of ways. It is a practical dynamic that planners work within, but it does not excuse decision makers from thinking about and accounting for the greater landscape. The plan is best linked to a regional vision, which can better reflect (though not perfectly) the integrative scale of natural and human systems.

The template below outlines four steps that can help guide the development of an ICSP; engagement, understanding place, creating the plan, and plan implementation.

Engaging the Community

Representation: Determine Who the Community Members Are, Their Interests and Values

Communities, regardless of scale, are amalgams of interest, values and sectors. A deliberative process will identify and engage key people—from business, community organizations, conservation groups, developers and government agencies within the community, as well as researchers. Identifying the sectors and individuals who need to be involved in building an integrated community sustainability plan is requisite. In turn, these people form a human capital pool from which representative planning committees can be organized, and they provide links to the wider community. At this stage, building an *image* of networks, maps of organizations and groups, and how they are connected, can help form the basis for understanding existing collaborative systems, enhancing connectivity and dialogue, as well as identify key community leaders who should be at the table. It is important at this stage to ensure participants are representative of the community, taking into account marginalized and minority groups.

Establish the Principles of Community Engagement

In order to actively and successfully engage with the community, it is helpful to consider the principles developed by Wates (2000), which provide a decent guide:

Acceptance: when community members choose to become involved in local planning, it is not uncommon that they will often do so for different reasons. Individuals and organizations can have diverse agendas, make different levels of commitment and time, and have different priorities. These differences need to be acknowledged and the process flexible enough to accommodate diversity. Even if the plan is in part a response to a unifying issue of concern, the values and visions of the community will often be diverse, and so will the solutions proffered.

Active Listening: The role of planners and other municipal officials is *first to actively* listen to their community and to help achieve goals desired. But balance is needed. In this respect planners and other policy actors also serve to provide advice, measured expertise, or act as "voices of what is possible" (Hanna 2005, p. 38)

Collaboration: Cooperation and partnerships between interest groups and community members will aid plan development and implementation. The ICSP process can be structured to encourage and support these relationships and build new networks. As they form they may become lasting and provide long-term strategic support for sustainability planning policy—a support that can transcend political timelines, and provide continuity.

Follow up, communication and dissemination: Publicity, reporting to the community and dissemination of results of any process is vital to ensure continued engagement and the development of trust between the community and decision makers. A collaborative and deliberative process will provide this function throughout the process, and not just at the end. In this sense, the ICSP is inter-disciplinary, seeking synthesis and exchange of knowledge from the outset, and not only when results are being tallied.

Inclusiveness: A small group representing diverse sectors of a community is more valuable than large group of like minded people. Far from being a "difficulty," diversity is a strength of planning. Accounting for varied perspectives will help reduce conflict and improve the chances of successful implementation once a plan is adopted.

Ownership: Process and plan credibility and ease of implementation require that an engagement process needs to be owned by local people, not by planners, consultants, political decision makers, or narrow interests (economic or environmental).

Scale: A number of smaller neighborhood activities are more valuable than a single large city or regional activity. Small events tend to bring out more people, though this can be variable, and participants may be more likely to participate by commenting on issues and information, talking at events, challenging ideas and information, and offering help.

Timing: The earlier community engagement occurs, the more likely an efficient process will ensue and (relative) consensus can be reached. Engagement, in its many forms should not be reactive, or an "after thought;" it is the foundation for successful ICSP development, and as such it should occur from the start.

Transparency: The purpose of the exercise, the identity of the people and groups involved and the limitations of the exercise need to be openly and honestly stated using plain language. This will help avoid frustration, uncertainty and distrust; it reduces surprises and conflict, and ultimately supports implementation.

Vision and Realism: Expectations should be high, but not to the extent that the discussion "revolves around an unattainable utopia" (a comment offered during the case study review process). Some actions can be restricted by legal, budgetary, or political realities. In this vein, the planners and other officials serve not to constrict community action, and limit sustainability dialogue, but rather to frame it within the context of innovation and possibilities (Hanna 2005).

Visualisation: Graphic presentations are powerful; sometimes more so than only text or speech. Providing images of growth and community change will help diverse community members visualize scenarios and facilitate discussions about preferences.

Techniques and Tools

Community sustainability requires a planning process that fully engages with and involves all sections of the community and gives them actual influence in decision making and not just "consultation" or information sessions. The involvement of as many people as possible from the community is desirable, although broad representation is more important than absolute numbers to ensure marginalized and minority elements of society are included, and there needs to be full engagement from the start and involvement in all decisions concerned with the plan. Community engagement can be achieved through a range of tools, some often sued and some perhaps more recent even innovative and unique to local culture and settings. Tools can include town hall meetings, a range of social survey techniques, community planning workshops, visioning exercises, and other interactive mechanisms (See Table 1)—even on-line participation and internet real-time dialogues (e.g., Dale 2005).

Learn from Others

A "scan" of existing frameworks and research tools can be done to identify tools and experiences used in other places that might be adaptable to the unique aspects of the community. As one reviewer in the study commented, "there's no need to reinvent the wheel" compare the community to others; in terms of environmental characteristics, socio-economic needs, and available resources, plan implementation, cost and impacts. But avoid the template trap. It can be tempting to wholly adapt the plans of others, and some consultants are adept at this, just because it seems to have worked elsewhere does not mean that a concept is entirely appropriate for other communities. Learn from others, but be sure to recognize and map community needs, and its unique attributes and challenges.

Understanding Place: Mapping the Community

A community can be seen as a series of systems with unique components—ranging from the city-region, down to individual neighborhoods and single buildings. Such scales have a diversity of population, cultural uses, economic activity and other unique attributes that need and support sustainable development. Human developed systems are also linked with natural systems, though the inter reliance is often not well acknowledged by development interest, agencies or planning practice. By developing an exercise to better understand the distribution of ecological, social and economic systems and services, such knowledge building can also reveal where access to resources, places, and information are lacking or inequitable.

Communities are not isolated from their broader environment and an ICSP needs to consider how broad its scale needs to be to sustain essential ecological services such as: regulation of local and global climate and energy balance; the hydrological cycle (e.g., water catchments and groundwater recharge); formation of topsoil and maintenance of soil fertility; prevention of soil erosion and sediment control; food production by food webs; biomass production; storage and recycling of nutrients and organic matter; assimilation, storage, and recycling of waste; maintenance of habitats for migration and rearing (e.g., estuarine resources, ravines, riparian corridors); and biodiversity.

There are also important social and economic service and systems that need to be mapped and understood in the context of place to ensure equitable and accessible distribution—the provision of historic, spiritual, religious, aesthetic, educational, and scientific information, cultural and artistic inspiration, and critical infrastructure and services. This reflects the minimum area that would be required to support a vibrant and sustainable society and economy within the ecological limits imposed by the environment in which the community is located.

These systems have a carrying capacity; where increases in development or population beyond a limit will cause the system to fail. Calculating a community's ecological footprint (Wackernagel and Rees 1996; Sustainable Calgary 2004; Wilson and Anielski 2005) could be a useful step in understanding a community's baseline environmental impacts. While it has its limitations, the footprint provides a helpful graphic tool for illustrating impacts and the broader costs of consumption and lifestyle.

Mapping Tools

A comprehensive audit of the community's current ecological, social and economic capital base line provides a baseline against which to measure progress, and provides invaluable information to the community. It may help decision-makers to see this as a part of asset management. Community green mapping (Common Ground Community Mapping Project and others 2005) shows locations defined by communities; the choice for inclusion is up to local people but can include ecologically, socially or economically important locations from parks and nature reserves to markets and favorite stores.

There are also widely accessible internet-based tools such as the easily available and user friendly *Google Earth and Map* (Bradwell and others 2007) which have been used to assist the planning process in North American (e.g., Durango, Colorado and San Jose, California). These can inform the development and protection of essential green and social infrastructure by providing access to detailed spatial information and deep local community knowledge

Table 1 Some existing approaches (tools and frameworks) for the development of integrated community sustainability plans

Approach	Summary
The Natural Step for Communities (James and Lahti 2004, http://www.naturalstep.ca)	The integration of social, environmental and economic decision making within a holistic, scientific framework
Smart Growth (Tomalty and Alexander 2005, http://www.smartgrowth.ca)	An approach to planning based on a series of principles focused on integrated and sustainable land use, seeks higher densities and reduction in sprawl form
New Urbanism (CNU 1999, http://www.cnu.org)	Community design philosophy that encourages walkable neighborhoods, emphasis on scale and design features
Adaptive management (Olson and others 2004, http://www.adaptivemanagement.net)	Allows a process to evolve over time as a result of lessons learned, experience based and flexible
EcoCities (Register 2006, http://www.ecocitybuilders.org)	Design of cities to focus on the health of human and creation 'natural cities' where planning responds to ecological imperatives
Search conferences (Weisbord and Janoff 2000, Rehm and others 2002, http://www.futuresearch.net)	Methods for planning conferences that bring community members together to discuss and define visions, address local issues, or develop implementation and operational strategies
Forecasting (Armstrong 2001, http://www.forecastingprinciples.com)	Methods used to help answer the question 'given certain scenarios (see below), what will the future look like?' And 'how can we crate the desired future?'
Scenario building (Galt and others 1997, http://scenariothinking.org)	Use of the 'creative foresight' found in communities to develop possible visions for how a community will develop and change. Based on scenario creation
Planning for Real (Gibson 1991, http://www.nif.co.uk/planningforreal)	Interactive planning discussion based around a real 3D model of the local neighborhood or areas
Integral City (Hamilton 2006, http://www.integralcity.com)	Considers the city as a whole system where the city is a human habitat, and should be managed holistically
Design charrettes (CMHC 2002)	A forum for bringing together diverse interests, community members and expertise to explore options and generate visual ideas and potential solutions to community planning and design challenges
Designways (Tippett 2005b)	A toolkit that brings together techniques of mind mapping with holistic systems thinking that provide a framework for stakeholder discussion around the topic of sustainable neighbourhood development and ecological planning
Future Search (Weisbord and Janoff 2000)	Interactive planning process designed for large groups of people meeting over three days around a particular topic, leading to a solution for a particular task
MetroQuest (Hyrynyshyn 2002)	Planning support tool that used as the focus for workshops, stakeholder dialogue and consultation. A software models scenarios in a local context allowing the exploration of future option and policy

even in those areas where resources are limited. But internet based resources are only one tool, and they depend on capacity and technology access.

Land Use and Landscape Planning

Perhaps the easiest way for communities to develop ideas for approaching land use and landscape is to look at existing frameworks. Such frameworks, some briefly summarized in Table 1, are typically either models of guides for incorporating sustainable land use perspectives into a community plan, or they are pictured as ways in which discussions and visioning can be structured, managed and made actionable. Three themes were recurrent:

1. move from designing urban infrastructure for the car to designing infrastructure for humans;
2. emphasize community and stakeholder involvement in the design and/or planning process before developers present their ideas or visual representations, and
3. include sustainability principles (bringing together ecological, social and economic imperatives) throughout the planning process; integrated planning requires early consideration of diverse needs, values, opportunities and knowledge.

Though each has specific limitations and there can be arguments about relative impact and ease of implementation, they have utility, at the very least for helping to frame the community sustainability discourse. Such approaches

are in many respects methods; around which discussion on the future direction of communities can be made by disparate groups which come together for the purpose. They differ in the detail, focus and scale and from low to high tech, just like the problems and planning issues seen across a range of communities.

Creating the Plan

Defining a Community Vision and Principles

The planning vision reflects the values the community places on things like diversity; self-sufficiency, accessibility to services, liveability, the nature of its development, current and future. Planning charts desired attributes—integrated sustainability planning also examines the links between these attributes:

- chosen growth scenarios (population, demographic profile);
- preferred form (built versus un-built space, area and location of parkland and natural area, vernacular qualities, building heights, materials)
- mix of residential, business, and agricultural space (location, connectivity, scale of uses, limits on uses);
- achievable densities; and
- environmental requirements for new development (energy, water, space consumed, public transportation, access and affordability, and material qualities).

Setting Goals

What does a community want to achieve? Whether these goals are the preservation of natural areas, densification of urban areas, improved transit options, attractiveness of the community to business, or population increase/stabilization, the plan will serve as the mechanism for linking vision to action to result.

Define the Terms

Terms can be divisive and the ICSP process will have to define what ideas and words mean. This can be an ongoing process. For example, as sustainability is discussed it will have different meanings to different interests, but as discourse evolves the definition can become more cohesive (Hanna 2005). The engagement process will help define what words (or terms) mean and what values and interests lay behind them. These meanings, in turn, reflect community values and objectives, and they form a strong foundation for the eventual ICSP.

Timeframe

Planning needs to be sufficiently long term to transcend short term economic and political cycles, and it should reflect a time frame that maintains critical infrastructure, and yet remains flexible enough to adapt to trends and emergent, unanticipated challenges. A long term view needs to be linked to intermediate and short term cycles and goals in order to allow for ongoing implementation, accountability and evaluation of plan performance. Evaluation in turn feeds back into plan maintenance and supports adaptive capacity

An adaptive quality, one that allows for the dynamic interplay between the long term planning and short or intermediate actions/needs, will also facilitate response to uncertainty, evolving ecological limits and new community desires, knowledge, and technology.

The Planning Cycle

An expanded and adaptive timeframe will mean changing the traditional view of the planning cycle. Simple 5 or 10 year plans no longer suffice—a sore issue for many practitioners. As one planner we spoke with commented, "long range planning is essential, but short term planning is easy." The ICSP is a strategic long term document; amendable, flexible and adaptive to be sure, but inherently stable in its vision of sustainability needs. This long term view needs to be strongly linked to intermediate and short term cycles in order to provide an understandable and coherent delivery mechanism, and a mechanism that is flexible to allow for changes in community desires, knowledge of technology and ecological limits, and the always present uncertainty of the future.

This linkage can be achieved by developing a series of shorter term action plans analogous to the typical 5 or 10 year planning cycles (or shorter), but which are subservient to the long term vision and can be evaluated on the degree to which they move the community towards that long term vision.

Scale

If we accept that the community is part of a complex system, then the scale of attention must have a diversity of population, uses (human and other) and a flexibility that can respond to a sustainable development imperative. And since natural and human sustainable systems are interdependent, the ICSP scale needs to be broad enough to sustain essential diverse inherently connected services as climate, energy, water, soils, food, waste, biodiversity, cultural, social and economic assets, as well as the critical

infrastructure needed to maintain them and support their activities.

A consideration for the scale of an ICSP is whether to concentrate on land use planning at a jurisdictional level or to move to a larger scale of attention such as through ecosystem planning or landscape level ecological planning (McHarg 1969; Steiner 2000). A community might also need to define what is not included (out of necessity, authority or for information reasons) in the plan by setting physical and administrative boundaries, or leaving certain activities and services to the "free" market.

Identify Institutional Needs

Institutional needs require a balance between the comprehensiveness that sustainable development demands and the strategic demands of local government which are necessarily focused and limited by *real* tractability issues. In considering barriers to achieving ICSP objectives, working toward comprehensiveness will require integration with the programs and plans of other levels of government. As one respondent noted, "If the local house is not in order, it's difficult to approach senior levels to ask for change, new resources or new authority."

Identify Strategic Areas

For each community planning priorities will be different, depending on the ecological, social and economic conditions found there. Each integrated plan will therefore have a number of key strategic focuses that represent the critical needs of a community. However, many communities share common characteristics and therefore by examining other integrated community sustainability plans from similar places a process of adaptation rather than invention can speed the development process. Strategic areas should include the non-built and the built environment, as well as the social uses of place and space, and how they interact to support sustainable community development.

Determine Commitments

Actions to be undertaken during the period of the plan to achieve the related outcomes and that contribute to the goals and objectives. Commitments are delineated by resources needed, who provides them, over what time period, and through which decision making or authority mechanisms.

Outcomes

Once the long-term plan has been set in motion, and after agreement has been reached with community members as to the goals of the process, regular reporting occurs to measure progress and provide feedback to the larger community. Progress may be best measured against desired outcomes, which of course means that outcomes have to be identified and embedded in the plan.

Reporting cycles should be linked to both short term action plans and monitoring the progress toward long term goals. If progress is not being made, or conditions have changed, then modifications can then be made to the next cycle of short term actions.

Implementation

Review Planning Policies, Bylaws and Regulations

The implementation of an ICSP may be limited, or weakened by existing policies and regulations. These impediments are often some of the greatest barriers to sustainable community development, and as one reviewer commented, they are all too commonly found only after implementation is initiated. Concurrent with creating the plan, a review of institutional mechanisms is undertaken to identify problematic and contradictory regulations, policies, bylaws, standard or programs that will obstruct sustainability planning. A range (scale and activity types) of examples were provided through the comment and review process:

- zoning/bylaws limiting or discouraging mixed use development;
- curvilinear form;
- excessive parking requirements;
- bylaws promoting or requiring low densities;
- neighborhood aesthetic restrictions or bylaws, such as a ban on clothes lines, that discourage sustainable practices;
- unnecessary set back requirements (e.g., suburban versus older city core setback forms);
- investments in road widening, while public transit funding is cut or remains stagnant;
- restrictions or prohibitions on innovative landscape design;
- road width bylaws; and
- material bylaws (particularly important, as sustainable building practices such as green roofing might not have existed when the original guidelines were drafted),
- building codes that support poor quality construction, rather than maximizing reasonable standards. This was noted with reference to Canadian residential construction.

The required review could include creating a multi-stakeholder task force—composed of elected officials, business leaders and officials to identify barriers, and to serve as an educational process for both the political and official levels. Planners and other officials should have to

justify unsustainable polices. Often, they cannot. One comment noted a house scale example; "why ban clothes lines, there's no justification, we know the energy savings are potentially great." Another example provided was year round parking bylaws in some communities that prohibit overnight parking on streets in suburban areas. One respondent commented; "this might make sense in some places for snow removal—though it doesn't seem to prevent snow clearing in older city centers where garages and front yard parking is scarce"—but for the "rest of the year it makes the driveway and garage essential, and exists to pander to a suburban aesthetic that wants clean empty streets at night, it's wasted space." And another stated "some issues seem small, but their cumulative impact in a large centre or a cluster of smaller places can be large… it is because they seem small we ignore them, but we're missing opportunities for small scale actions with big benefits."

The Plan as Policy and Law

Making the plan legally enforceable and accountable is an essential piece of the ICSP process. If the plan has no legal authority the community members involved in the process will be disillusioned and reluctant to support future planning activities, and the content of the plan will be compromised by day to day economic imperatives, not the integrated, long-term imperatives of sustainable community planning. The ICSP cannot be a parallel document to other official plans; as an integrative product it should form the basis of planning policy, guide bylaws, zoning and regulation, and form the foundation for community actions and governance.

Implementation will also need strategic alliances and partnerships—ones that can be developed to enhance commitment and execution of the plan. Partnerships, whether they are public-public or private-public, have other positive impacts on a community, often through the development of a variety of forms of social capital and the expansion of agency or capacity. These can manifest by:

- influencing decision-makers
- educating community leaders
- efficient implementation
- ongoing communication and outreach
- a better community sustainability commitment

By developing a community outreach and communications strategy for plan dissemination, the community will support implementation through awareness of the provisions and rationales. Knowledge and information also helps secure community commitment which can be essential in putting new policies and practices into place, especially since the ICSP inevitably requires a change to "business as usual."

Outline an Evaluation Process

It was suggested by a respondent that evaluation be conducted just before each election "in order to hold elected officials accountable to the plan [ICSP] and justify changes or performance issues." Evaluation supports ongoing implementation and institutional accountability. The assessment process needs to consider the progress towards sustainable development objectives, goals and targets set by the community. Thus evaluation itself, though certainly requiring a degree of expert knowledge, must also be deliberative and inclusive.

Conclusions

A transdisciplinary approach was used to develop an experience based template for integrated community sustainability planning. The template reflects practitioner experience provided through cases studies and the analysis of cases by experts, as well as participation in an iterative series of expert online dialogues. Integrated community planning requires novel ways of managing both intellectual and physical capital of the built and non-built environment. "To make an infrastructure operate efficiently requires knowledge of local practices that may differ radically from place to place. Organizational structures that facilitate the operation of physical capital in one setting may be counterproductive in another. Local knowledge is essential to building effective social capital" (Ostrom 2000).

Integrated planning requires unique levels of collaboration between levels of government, strategic partnerships across sectors, and alliances between the private-public sectors to achieve implementation of new approaches, technologies, and governance systems. The case studies show that the success is most likely to occur where such collaboration is present. But as the review process suggests, there are common barriers to such and integrated planning and decision-making is limited by several persistent challenges—poor frameworks for integration, inadequate scales of attention, the need for new governance approaches, and the challenge of inclusion. Increasingly it seems that these can only be overcome by participatory community planning and interdisciplinary or transdisciplinary research.

The development and implementation of an integrated community sustainability plan can be an important tool for realizing sustainable community development. But it requires active community engagement processes, political will, and an ongoing commitment to accountability and oversight. Political and administrative accountability are essential ingredients in closing the gap between the rhetoric of sustainability, and making it actionable and achievable

(Dale and Robinson 1995). The template advanced here can help advance both the sustainability discourse at the local level and develop an integrated plan. By providing a template which links to techniques and examples of innovative practice around Canada and the world key people within organizations can demonstrate the validity of change, and demonstrate possibilities. The next step is to evaluate the template approach in practice.

Acknowledgments Support for this work has been provided by Infrastructure Canada and the Social Sciences and Humanities Research Council. The authors would like to thank the practitioners in planning and community development, who provided review comments, experience, and insight, for their help in this research. The time, comments and insight provided by the peer reviewers are also greatly appreciated.

References

Alberta Urban Municipalities Association (2006) Comprehensive guide for municipal sustainability planning. AUMA, Edmonton, 113 pp

Alberti M (1999) Urban patterns and environmental performance: what do we know? Journal of Planning Education and Research 19:151–163

Anderson JM (2005) Blueprint for a greener city: growth need not cost the earth. Water Science and Technology 52:61–67

Andersson E (2006) Urban landscapes and sustainable cities. Ecology and Society 11:Article 34

Armstrong JS (ed) (2001) Principles of forecasting: a handbook for researchers and practitioners. Springer, New York, 864 pp

Arnstein SR (1969) A ladder of citizen participation. Journal of the American Planning Association 35:216–224

Baldassare M, Hassol J, Hoffman W, Kanarek A (1996) Possible planning roles for regional government: a survey of city planning directors in California. Journal of the American Planning Association 62:17–28

Banai R (2005) Land resource sustainability for urban development: spatial decision support system prototype. Environmental Management 36:282–296

Barrett GW (1985) A problem-solving approach to resource management. Bioscience 35(7):423–427

Berke PR, Conroy MM (2000) Planning for sustainable development: measuring and explaining progress in plans. Journal of the American Planning Association 66:21–33

Born SM, Sonzogni WC (1995) Integrated environmental management: strengthening the conceptualization. Environmental Management 19(2):167–181

Boyle M, Gibson RB, Curran D (2004) If not here then, perhaps not anywhere: urban growth management in British Columbia's capital regional district. Local Environment 9:21–43

Bradwell P, Johar I, Maguire C, Miner P (2007) Future planners: propositions of the next age of planning. Demos, London, 28 pp

Brekke JS (1987) The model-guided method for monitoring program implementation. Evaluation Review 11(3):281–299

Burby RJ, May PJ (1997) Making governments plan: state experiments in managing land use. Johns Hopkins University Press, Baltimore, 192 pp

Cairns J Jr (1991) The need for integrated environmental management. In: Cairns J Jr, Crawford TV (eds) integrated environmental management. Lewis Publishers, Chelsea, MI, pp 5–20

Canada Mortgage and Housing Corporation (2002) Sustainable community planning and development: design Charrette planning guide. CMHC, Ottawa, 6 pp

Cerverro R (2001) Efficient urbanisation: economic performance and the shape of the metropolis. Urban Studies 38:1651–1671

Christoforidis A (1994) New alternatives to the suburb: neo-traditional developments. Journal of Planning Literature 8:429–440

Churchill CJ, Baetz BW (1999) Development of decision support system for sustainable community design. Journal of Urban Planning and Development 125:17–35

Common Ground Community Mapping Project, Mapa Verde Americas and Green Map System (2005) Mapping our common ground – a community and green mapmaking resource guide. Green Map System, New York

Congress of the New Urbanism (1999) Charter of the New Urbanism. McGraw-Hill, New York, 320 pp

Conroy MM (2003) The process of planning for sustainable development: dimensions, comparisons, and insights. International Journal of Sustainable Development 6(4):460–477

Crabtree L (2005) Sustainable housing development in urban Australia: exploring obstacles to and opportunities for ecocity efforts. Australian Geographer 36:333–350

Dale A (2001) At the edge: sustainable development in the 21st Century. UBC Press, Vancouver, 232 pp

Dale A (2005) A perspective on the evolution of e-dialogues concerning the interdisciplinary research on sustainable development in Canada. Ecology and Society 10:37–46

Dale A, Robinson J (1995) Achieving sustainable development. UBC Press, Vancouver

Davidson S (1998) Spinning the wheel of empowerment. Planning April 3:14–15

Department of Finance (2005) The Budget Plan 2005. Department of Finance, Ottawa

Engel-Yan J, Kennedy C, Saiz S, Pressnail K (2005) Toward sustainable neighbourhoods: the need to consider infrastructure interactions. Canadian Journal of Civil Engineering. 32:45−57

Dryzek JS (1990) Designs for environmental discourse: the greening of the administrative state. In: Paehlke R, Torgenson D (eds) Managing leviathan. Broadview, Peterborough, 380 pp

Ewan J, Fish ER, Burke R (2004) Building ecology into the planning continuum: case study of desert land preservation in Pheonix, Arizona (USA). Landscape and Urban Planning 68:53–75

Flores A, Pickett STA, Zipperer WC, Pouyat RV, Pirani R (1998) Adopting a modern ecological view of the metropolitan landscape: the case of a greenspace system for the New York City region. Landscape and Urban Planning 39:295–308

Forman RTT (1995) Land mosaics: the ecology of landscapes and regions, 2nd edn. Cambridge University Press, Cambridge, 632 pp

Freeman H (1980) The present status of evaluation research. In: Evaluating social action projects. UNESCO, New York, pp 9–46

Galt M, Tait D, Chicoine-Piper M (1997) Idon scenario thinking: how to navigate the uncertainties of unknown futures. IGI Publishing, Minneapolis, 145 pp

Gibson T (1991) Planning for real: the approach of the neighbourhood initiatives foundation in the UK, pp 29-30 in IIED. RRA Notes 11: Proceedings of a local level adaptive planning workshop, IIED, May 1991. IIED, London, 86 pp

Gorobets A (2006) An eco-centric approach to sustainable community development. Community Development Journal 41:104–108

Groenewegen PP, van den Berg AE, de Vries AES, Verheij RA (2006) Vitamin G: effect of green space on health, well-being, and social safety. BMC Public Health 6:149

Ham C, Hill M (1993) The policy process in the modern capitalist state. Harvester Wheatsheaf, Toronto, 256 pp

Hamilton M (2006) Integral metamap creates common language for urban change. Journal of Organizational Change Management 19:276–306

Hanna KS (1999) Integrated resource management in the Fraser River estuary: stakeholder's perceptions of the state of the river and program influence. Journal of Soil and Water Conservation 54(2):490–498

Hanna K (2007) Implementation in a complex setting: integrated environmental planning in the Fraser River Estuary. In: Kevin S, Hanna, Scott Slocombe D (eds) Integrated resource and environmental resource and environmental management: concepts and practice. Oxford University Press, Oxford, 265 pp

Hanna K (2005) Planning for sustainability, two contrasting communities. Journal of the American Planning Association 71(1): 27–40

Hanna K (2000) The paradox of participation and the hidden role of information: a case study. American Planning Association Journal 66:398–410

Hanna K, Walton-Roberts M (2004) Quality of place and the rescaling of urban governance: the case of Toronto. Journal of Canadian Studies 38(3):37–67

Healey P (1997) Collaborative planning, shaping places in fragmented societies. Macmillan, Basingstoke, 338 pp

Hessing M, Howlett M (1997) Canadian natural resource and environmental policy. UBC Press, Vancouver, 342 pp

Hyrynyshyn J (2002) City of dreams. New Scientist 175:38–39

Infrastructure Canada (2005) Agreement on the transfer of federal gas tax revenues under the New Deal for Cities and Communities. Infrastructure Canada, Ottawa

Jacobs J (1961) The death and life of great American cities. Random House, New York, 458 pp

James S, Lahti T (2004) The natural step for communities. New Society Publishers, Gabriola Island, BC, 304 pp

Jones CO (1984) An introduction to the study of public policy. Brooks Cole, Monterey, 276 pp

Kenworthy J (2006) The eco-city: ten key transport and planning dimensions for sustainable city development. Environment and Urbanization 18:67–85

Kurtz C, Snowden D (2002) The new dynamics of strategy: sense making in a complex-complicated world. IBM Systems Journal 42(3):462–483

Linder SH, Peters BG (1989) Instruments of government: perceptions and contexts. Journal of Public Policy 9:35–58

Ling C, Handley JF, Rodwell J (2007) Restructuring the post-industrial landscape: a multifunctional approach. Landscape Research 32 (3):285–309

Margerum RD, Born SM (1995) Integrated environmental management: moving from theory to practice. Journal of Environmental Planning and Management 38(3):371–391

Margerum RD, Born SM (2000) A co-ordination diagnostic for improving integrated environmental management. Journal of Environmental Planning and Management 43(1):5–21

McHarg IL (1969) Design with nature. The Natural History Press, Garden City, New York, 208 pp

Mitchell B (2002) Resource and environmental management. Prentice Hall, Harlow, 504 pp

Næss P (2001) Urban planning and sustainable development. European Planning Studies 9:503–524

Newman L, Dale A (2005) The role of agency in sustainable local community development. Local Environment 10:477–486

Olson P, Folke C, Berkes F (2004) Adaptive comanagement for building resilience in social-ecological systems. Environmental Management 34:75–90

Ostrom E (2000) Social capital: a fad or a fundamental concept? In: Dasgupta P, Serageldin I (eds) Social capital: a multifaceted perspective. The World Bank, Washington, DC, pp 172–214

Paehlke R (1990) Democracy and environmentalism: opening a door to the administrative state. In: Paehlke R, Torgerson D (eds) Managing Leviathan 35–58. Broadview, Peterborough, 380 pp

Pauleit S, Duhme F (2000) Assessing the environmental performance of land cover types for urban planning. Landscape and Urban Planning 52:1–20

Petak WJ (1980) Environmental planning and management: the need for an integrative perspective. Environmental Management 4(4): 287–295

Pickett STA, Cadenasso ML, Grove JM (2004) Resilient cities: meaning model, and metaphor for integrating the ecological, socio-economic, and planning realms. Landscape and Urban Planning 69:369–384

Register R (2006) Ecocities: rebuilding cities in balance with nature–revised edition. New Society Publishers, Gabriola Island, 373 pp

Rehm R, Cebula N, Ryan F, Large M, Devane T (2002) Future that Work. New Society Publishers, Gabriola Island, BC, 224 pp

Robinson J, Tinker J (1997) Reconciling ecological, economic, and social imperatives: a new conceptual framework. In: Schrecker T (ed) Surviving globalism: social and environmental challenges. Macmillan, London, pp 71–94

Roseland M (2005) Toward sustainable communities. New Society Publishers, Gabriola Island, 256 pp

Rossi P, Freeman H (1985) Evaluation: a systemic approach. Sage, Newbury, 484 pp

Rydin Y, Pennington M (2000) Public participation and local environmental planning: the collective action problem and the potential of social capital. Local Environment 5:153–169

Sabatier PA, Mazmanian DA (1981) The implementation of public policy: a framework for analysis. In: Mazmanian DA, Sabatier PA (eds) Effective policy implementation. Lexington Books, Lexington, MA, pp 3–36

Selman P (1993) Landscape ecology and countryside planning–vision, theory and practice. Journal of Rural Studies 9:1–21

Selman P (2002) Multi-function landscape plans: a missing link in sustainability planning. Local Environment 7:283–294

Seymoar NK (2004) Planning for long-term urban sustainability: a guide to frameworks and tools. +30 Network, Vancouver, 112 pp

Slocombe DS, Hanna KS (2007) Integration in resource and environmental management: towards a framework. In: Hanna KevinS, Scott Slocombe D (eds) Integrated resource and environmental resource and environmental management: concepts and practice. Oxford University Press, Oxford

Steiner FR (2000) The living landscape: an ecological approach to landscape planning, 2nd edn. McGraw-Hill, New York

Stone B (2004) Paving over paradise: how land use regulations promote residential imperviousness. Landscape and Urban Planning 69:101–103

Sustainable Calgary (2004) State of Our City Report. Sustainable Calgary, Calgary

The Sheltair Group (2001) Green municipalities: a guide to green infrastructure for Canadian Municipalities. Federation of Canadian Municipalites, Ottawa, 46 pp

Tippet J (2005a) Participatory planning in river catchments, an innovative toolkit tested in South Africa and North West England. Water Science Technology 52:95–105

Tippet J (2005) A participatory protocol for ecologically informed design within river catchments. A thesis submitted to the University of Manchester for the Degree of Ph.D. in the Faculty of Arts. University of Manchester, Manchester, 537 pp

Tomalty R, Alexander D (2005) Smart growth in Canada: implementation of a planning concept. CMHC, Ottawa, 251 pp

Torgerson D (1990a) Obsolescent leviathan: problems of order in administrative thought. In: R. Paehlke and D. Torgerson (eds), Managing Leviathan, 17–34. Peterborough: Broadview, 380 pp

Torgerson D (1990b) Limits of the administrative mind: the problem of defining environmental problems. In: Paehlke R, Torgerson D (eds) Managing Leviathan, 115–164. Broadview, Peterborough, 380 pp

Troy P (2003) The structure and form of the Australian City: prospects for improved urban planning. Urban Policy Research Paper No. 1. Griffith University, Nathan, 21 pp

United Nations Population Find (2007) State of the World Population 2007: unleashing the potential of urban growth. UNFPA, New York, 108 pp

Van Meter DS, Van Horn CE (1975) The policy implementation process, a conceptual framework. Administration and Society 6(4):445–488

Wackernagel M, Kitzes J, Moran D, Goldfinger S, Thoman M (2006) The Ecological Footprint of cities and regions: comparing resource availability with resource demand. Environment and Urbanisation 18:103–112

Wackernagel M, Rees WE (1996) Our ecological footprint: reducing human impact on the earth. New Society Publishers, Gabriola Island, BC, 176 pp

Wates N (2000) The community planning handbook. Earthscan, London, 232 pp

Weisbord M, Janoff S (2000) Future search–an action guide to finding common ground in organization and communities, 2nd edn. Berrett-Koehler, San Francisco, 240 pp

Wheeler SM (2003) The evolution of urban form in Portland and Toronto: implications for sustainability planning. Local Environment 8:317–336

Wilson J, Anielski M (2005) Ecological footprints of Canadian municipalities and regions: prepared for the Federation of Canadian Municipalities. Anielski Management Inc., Edmonton

Yencken D (2001) Scoping a metropolitan strategy. Urban Policy and Research 19:243–250

Yin RK (2003) Case study research: design and methods, 3rd edn. Sage Publications, Thousand Oaks, CA, 181 pp

Zube EH, Brush RO, Fábos JG (eds) (1975) Landscape assessment: value, perceptions, and resources. Dowden, Hutchinson and Ross, Stroudsburg, 367 pp