Community Indicators and Sustainable Consumption:
A Blended Approach Toward Implementation

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Résumé

Il devient pressant de traiter des enjeux relatifs aux indicateurs communautaires et de consommation. Les gouvernements ont tendance à ignorer les demandes de changement en matière de consommation à moins de pouvoir la quantifier. Cet article examine le traitement de la consommation durable au plan local dans trois collectivités : le processus de *Natural Step* à Whistler, en Colombie-Britannique; un système d'indicateurs de performance à Santa Monica, en Californie, et un processus de mobilisation sous conduite d'experts, réalisé par l'Observatoire urbain régional de Vancouver. Il apprécie les forces et les faiblesses des systèmes d'indicateurs et des processus participatifs, explore les moyens de sensibilisation face à la consommation des ressources et identifie les points d'ancrage reliant les buts aux mécanismes de mise en œuvre. Selon cette étude, tandis que des indicateurs spécifiques abordent la consommation durable, les approches intégrées manquent de cohérence. En améliorant la sensibilisation à l'égard de la consommation, en repensant le système d'incitatifs et en restructurant les processus organisationnels par des mécanismes de régulation, il serait possible d'encourager la conservation, de décourager les pratiques de gaspillage et de réduire la demande de ressources.

Mots clés: indicateurs communautaires, consommation durable, mise en œuvre stratégique, gouvernement local, renforcement des capacités de participation

Abstract

There is an increasing need to address issues related to consumption and community indicator frameworks. Governments may ignore demands for change involving consumption unless they can first measure it in some way. This article reviews how three communities have addressed sustainable consumption at the local level: The Natural Step process in Whistler, British Columbia; a performance indicator framework in Santa Monica, California; and an expert-led engagement process by the Regional Vancouver Urban Observatory. It discusses strengths and weaknesses of indicator frameworks and participatory processes, explores ways to raise awareness about resource consumption, and identifies leverage points linking targets to implementation. Findings suggest that while specific indicators address sustainable consumption in the cases, a blended or holistic approach is inconsistently applied. Increasing awareness about consumption, reconfiguring incentives, and restructuring organizational processes with regulatory mechanisms can encourage conservation, deter wasteful practices, and curb resource demand.

Key words: community indicators, sustainable consumption, strategic implementation, local government, participatory capacity building

Introduction

Governments are generally reluctant to act on problems without quantitative evidence. This presents a particular issue for managing consumption, sustainability's "elephant at the table." Governments and citizens alike too often ignore excessive consumption. Although the movement to develop community indicators has flourished during the past 20 years (Organisation for Economic Co-operation and Development 2006), few reliable indicators address sustainable consumption targets. While sustainable consumption develops as a field involving governments, industry, civil society, and households (Barber and Luskin 2009), it remains uncommon at the municipal level.

This article presents three high-profile case studies that illustrate experience with sustainable consumption and address accompanying awareness and measurement challenges in a North American context. Sustainable consumption is first discussed in relation to local communities, indicators, and procurement. The case studies indicate how community indicator projects have evolved from local efforts to monitor the environment to initiatives aimed at addressing consumption issues through participatory engagement and strategic implementation. A stakeholder framework process devised from crafting indicators and outcomes accompanies each study. A qualitative analysis evaluates the extent to which each case measures sustainable consumption and the barriers facing efforts to integrate such measures

into municipal programs. Research findings identify two broad approaches: strategic implementation and participatory capacity building. Each contributes to framing sustainable consumption within community indicator projects.

Sustainable Consumption

Achieving sustainable consumption is critical for understanding economic, ecological, and social equity approaches to decision-making because the rate of biophysical resource flow exceeds the rate of natural regeneration (Daly 1991; Wackernagel and Rees 1996). Increasing consumption trends indicate the Earth is reaching peak yields from primary ecosystems that sustain life support (Brown 2004). While sustainable production emphasizes supply and improving environmental performance in key economic sectors, sustainable consumption focuses on demand to meet basic needs and improve quality of life by reducing negative impacts on the Earth (Robins and Roberts 2000). Sustainable consumption requires determining appropriate conditions to shift consumption patterns within urban infrastructures as well as question the levels and drivers of consumption (Fuchs and Lorek 2005). This article is primarily concerned with the social practice of sustainable consumption (Hobson 2004), or how sustainable livelihoods might be created within urban environments, both by understanding why North Americans consume, and the meaning they attach to resource consumption and the environment. Community indicators have an opportunity to critique accepted social practices of consumption, show the links with a community, and measure results.

Sustainable consumption focuses on decreasing demand for resources rather than emphasizing supply-sided efficiency gains (Hanley et al. 2009); it aims to use and procure products, services, and land with environmental and social accountability. Achieving these ends requires applying organizational governance practices to the built environment to reduce consumption levels. It offers a vantage point for analysing sustainable consumption at the local level through four principles of practice:

1) Absolute consumption levels, rather than intensity levels, are of primary concern;
2) Resource use is collectively (not individually) maximized, procured, and leveraged, when possible;
3) Consumer activities shift from commodities and materials to products, services, and experiences that reduce resource use and emissions per unit of consumption; and
4) Behavioural, distributional, and ethical considerations focus on demand–sided responses with ecological technology adaptations (Hendrickson and Roseland 2010).

Following the United Nations Summit in Johannesburg, the United Nations Environmental Programme established the Marrakech Process, a ten-year framework of programs on sustainable consumption and production. Alongside national sustainable consumption and production plans in countries such as Germany, Finland, and the UK, the Marrakech Process is stimulating debate on sustainable consumption. While sustainable consumption initiatives are developing at the grassroots level in North America (Barber 2007; Cohen, Comrov, and Hoffner 2005), they barely influence local government authorities. As local governments provide sustainability tangible meaning, for instance through Local Agenda 21 initiatives, sustainable consumption policies should begin to influence local plans and outcomes.

Sustainable consumption offers various entry points for urban planning: low-impact physical infrastructure (e.g., composting organic matter rather than using garborators); individual behaviour change (e.g., using clotheslines instead of dryers); and collective procurement (e.g., neighbourhood food buying clubs rather than large format retail outlets). Sustainable consumption proponents develop targets for citizens to drive less, use alternative transportation more, live closer to work, eat organic and locally grown food, purchase ethical and place-based commodities, and convert to renewable energy sources (Tukker et al. 2008). Sustainable public procurement policies aim to integrate environmental and labour considerations into all stages of the purchasing process with the goal of reducing impacts on human health and the environment while supporting responsible working conditions (DEFRA 2006; ICLEI 2007). Sustainable public procurement has social benefits that include guaranteeing good working conditions for publicly contracted workers, providing new employment opportunities for marginalised groups, and supporting Fair Trade practices (ICLEI 2007). Certification processes can recognize standardization, legitimacy, consistency, and accountability through independent evaluation of procurement practices (Blackburn 2007). As governments work with local suppliers they may encourage environmentally innovative approaches and provide suppliers a competitive advantage.

Strategic Implementation, Participatory Capacity Building, and Community Indicators

The strategic implementation of sustainable consumption requires defining objectives and deciding how to achieve them. The process involves steps that can move sustainable consumption from academic discourse to action: establish a business case for pursuing sustainability, develop a sustainability framework with a vision, conduct an impact assessment to ascertain the gap between the current state and the vision, identify a set of metrics to define the end point, develop an implementation strategy, prioritize projects that help reach the sustainable

state, and provide support systems necessary to achieve the plan (Hitchcock and Willard 2008).

Participatory capacity building can raise awareness that helps to develop sustainable consumption indicators. Community members need political deliberation and personal reflection to navigate between contradictory concepts that on the one hand encourage economic growth, while on the other hand advocate shifts in consumption patterns. Policy makers can reconcile these incongruities by differentiating qualitative development from exponential growth through articulating sustainable consumption concepts and programs. Indicator development can bring different sectors of the community together to work on shared values and common goals that foster alliances across traditional boundaries and redefine notions of prosperity (Smolko 2006). Combining strategic implementation and capacity building strategies into a blended approach identifies actors, targets, and policy documents to foster participatory processes within incentives and regulations to address sustainable consumption.

Community indicators attempt to measure the state of a society's well-being; they are relevant, easy to understand, reliable, practical, and allow sufficient time for implementation (Hart 1999). They address the community's carrying capacity by highlighting links between a community's economic, social, and environmental well-being. Community indicators are often organized into three types: categories to provide overall balance; a goal-indicator matrix that highlight connections between goals and issues; or driving force-state-response linkages that reflect the economic, ecological, and social interconnections that measure and draw connections between issues. Each type has strengths and weaknesses. The indicator selection and development process can involve experts and citizens working together (Meadows 1998). As community members start to appreciate inter-connections, develop new knowledge, and engage in collaborations, they begin to differentiate community development from economic growth.

Converting material consumption and production strategies into more sustainable ones requires targeting consumption patterns. Community indicator literature focuses on design and development, yet few examples link local decision-making to policy outcomes (Astleithner and Hamedinger 2003; Gahin and Paterson 2001; Gahin, Veleva, and Hart 2003; Rydin, Holman, and Wolff 2003). While capacity building, education, and information sharing are important outcomes (Rydin 2002; Becker 2005), supportive educational foundations do not substitute for action. Implementation is critical for tackling sustainability issues (McAlpine and Birnie 2005). Altering consumption patterns requires participatory approaches that embed performance targets—that is, quantitative measurement standards and/or rankings—into planning policies.

Municipal operations traditionally track consumption by monitoring quantitative performance on solid waste, energy, water, transit ridership, and the like.

Assessing sustainable consumption proves more challenging because it involves linking material resources to demand and social equity concerns (Fuchs and Lorek 2005; Lafferty 2001; Jackson 2004). Whereas production-led efficiency gains readily translate into economic gains, environmental gains related to consumption remain negligible. Government rarely takes responsibility to change consumption patterns because geographic, jurisdictional, and administrative lines blur decision-making authority and may produce the appearance of arbitrary policies (Kennett 2003, 7). Producers, who depend on consumer demand for survival, typically regard consumption-based information of potential material benefit, but neglect calculating environmental and social costs. Few requirements or independent certificating bodies currently monitor how materials are sourced, transported, and produced, or calculate carbon output.

Responsible decision-making therefore becomes tangled in a moral and ecological conundrum that often requires complex life-cycle analysis with ethical trade certifications (Christensen et al. 2007). Resistance to applying sufficiency measures include perceived limitations on individual freedom, while constraints provoke perverse social and economic effects (Haake and Jolivet 2001). Community indicators can merge capacity building with strategic implementation approaches to form a blended approach to monitor sustainable consumption in ways that raise awareness and foster effective organizing practices.

Methods

To evaluate contemporary practices, the study investigated three widely recognized community indicator projects (Holden 2006; Brugmann 1997; Cook 2004): The Natural Step systems framework employed by Whistler, BC; a performance-based framework undertaken by Santa Monica, CA; and an expert-led, public engagement process initiated by the Regional Vancouver Urban Observatory. The projects developed at different times: Santa Monica's emerged in 1991; Whistler's began in 2001; and Vancouver's started in 2005. Each case was screened for its framework type, local capacity to regularly monitor and report indicators, procurement policies, and level of perceived staff interest to pursue consumption issues.

Research methods drew on qualitative approaches (Chambliss and Schutt 2006). Municipal indicators and program planning documents were initially identified from community indicator literature. Good practices employed in stakeholder engagement processes from the three cases triangulated data types (Punch 2005, 184). Key variables from the literature identified pertinent content. Snowball sampling recruited 20 respondents for semi-structured telephone interviews lasting 20-45 minutes: the 2007 study surveyed municipal staff, consultants, and regional experts. The author also participated in a study group of the Urban

Observatory and sat on the Observatory's advisory committee from 2005-2007. Using Jensen and Roger's (2001) case study research approach, research focused on the three community indicator projects linked to participatory engagement processes and performance results. Taken together, these methods provided broad analyses for targeting consumption within the investigated cases.

Case Studies

The community indicator movement is closely aligned with the fields of urban planning and sustainable consumption. Community indicator frameworks are based on domains, sectors, goals, issues, and cause and effects, which chart progress toward or away from stated goals accompanied with end points and time lines (Hoernig and Seasons 2005). Frameworks highlighted strengths and weaknesses, blending stakeholder engagement with implementation strategies that balanced practical applications with technical data (Bell and Morse 2008; Parris and Kates 2003). The case studies provided examples of local efforts to target consumption, change procurement policies, and develop sustainable consumption activities capable of subsequent measurement.

Whistler, BC

In 2000, oncologist Karl-Henrik Robèrt introduced The Natural Step framework to Whistler. Having proved successful in industry, The Natural Step was quickly adopted as a guiding sustainability discourse as the community looked for solutions to its environmental challenges. The Natural Step defines a sustainable society as avoiding systematically increasing concentrations of substances extracted from the Earth's crust, concentrations of substances produced by society, and degradation by physical means; it requires eliminating contributions to conditions that undermine people's capacity to meet their basic human needs (Cook 2004). Whistler incorporated The Natural Step into education and training for households and businesses and sponsored a series of sustainability lectures. Once awarded the 2010 Winter Olympic Games, the town developed a comprehensive community indicator plan, Whistler2020. Interviews with Whistler municipal employees outlined the indicator formation process.

Whistler2020 is a long-range planning document that drafted the values, vision, principles, priorities, and strategic descriptions of success that together defined community sustainability. Sixteen task forces comprised of members of municipal staff, businesses, non-profits, and the broader community were trained in a common language of sustainability principles to generate shared understandings of sustainable outcomes. These task forces convened three times a year to define strategy areas, to clarify and interpret strategic realities, and to recommend actions needed to achieve their relevant descriptions of success.

The first workshop identified core indicators and municipal successes in recommended action plans each year. The second workshop involved presenting and interpreting current realities, action updates, key projects, work plans of municipal and community stakeholders, and related indicators. Brainstorming sessions drove conversations designed to articulate strategic opportunities to combine individual and collective thinking in compliance with Whistler's descriptions of success.

Table 1. Example of Indicator Implementation (Whistler)

Dimensions of a Sustainable Community	Theme Area (Task Force)	Description of Success	Current Reality	Actions
Protecting the Environment	Built Environment	In 2020, Whistler's built environment is vibrant, reflects the community's character, contributes to individual health and well-being, and is moving toward its identified sustainability objectives. Limits to growth are understood and respected.	- Buildings currently use large amounts of energy and materials - Pesticides no longer used since the early 1990s, however, ban on pesticide / herbicide use does not go beyond municipal operations. - No guidelines, incentives, or regulations govern the incorporation of low-irrigation landscapes, drought tolerant species, or xeriscaping.	- Publicize the "Whistler Green" building standards to the development community. - Update residential housing construction guidelines to incorporate "Green standards." - Increase staff knowledge and awareness of Whistler2020. - Run/operate Whistler Centre for Sustainability - Open Re-Use it Building Materials Facility.

Source: Adapted from Resort Municipality of Whistler, www.whistler2020.ca

A matrix (see Table 1) outlined and prioritized strategic opportunities for the coming year. Proposed actions assessed four strategic questions: does the project move Whistler toward the shared vision of success; does the project move Whistler toward shared sustainability; is the action a good financial investment; and does the project present a flexible platform or stepping stone for the Whistler2020 vision?[1] Participants assigned priorities for proposed actions by placing stickers under each idea on newsprint to show which ones they preferred. An

impact/resource matrix then assessed whether each of the top 8-10 prioritized actions brought Whistler closer to compliance with all principles of success, led further into the future through a flexible platform, and generated a sufficient return on investment.

The final meeting of the year refined actions for implementing the following year's work plan by stakeholders such as the Chamber of Commerce, Tourism Whistler, local businesses, and non-profits. One lead organization and another assisting one identified and recommended actions to incorporate into work plans. If organizations declined responsibility for implementation, they were asked to explain why to help to instill accountability. Task forces also evaluated past stakeholder responses for subsequent recommendations.

Each of the 16 task forces provided two progress reports during the year. By 2006, task forces cumulatively recommended 375 actions and accepted 259.[2] Secondary outcomes of the three workshops included building local capacity that integrated community visions into stakeholder practices and interpreted indicator trends for progress reports. Stakeholders engaged in constructing their own provisioning indicators to improve data collection and move toward real-time indicators.

In the past decade, Whistler developed a pedestrian oriented village and increased bus service by 2.5 million annual riders. Whistler's capital budget requires sustainability assessments for all capital projects. Nevertheless, the 2020 vision document might be considered as a neoliberal framework guiding "sustainability fixes" to address economic and environmental responsibilities (While, Jonas, and Gibbs 2004). For example, the framework guided actions to close the local landfill to make way for the Winter Olympic athlete village and affordable housing units that invoked controversy and resulted in the transport of Whistler's garbage to the State of Washington. A municipal councillor referred to Whistler as having a housing market failure, where median home prices exceed $1.2 million. A project-evaluation tool structured around The Natural Step's strategic questions provided staff with a protocol to move proposed projects toward 2020. The Whistler2020 website offered an interactive frame of reference for monitoring, updating, and reporting indicators, consolidating strategies, performance, and communications.

Santa Monica, CA

Santa Monica developed evaluation criteria to launch a sustainability program in 1991 to confront unsustainable lifestyles and reduce harm to the natural environment and human health (Brugmann 1997, 68). A seven-member volunteer advisory body comprised of local experts from academic institutions, utilities, planning agencies, and the community developed a set of baseline targets for

2000 in the areas of resource conservation, transportation, pollution prevention and public health, and community economic development.

Interviews with city staff detailed how a larger advisory team from the Chamber of Commerce, Business Improvement District, public schools, and neighbourhood associations re-evaluated Santa Monica's long-term sustainability goals in 2001. Using a community capital framework that focused on natural, human, and social capital, the City Manager's office chaired monthly meetings to coordinate activities and facilitate interdepartmental implementation strategies with community stakeholder groups. City staff employed a gap analysis to compare actual performance with potential future performance and identified opportunities and barriers toward reaching targets. The advisory group developed a statement of interdisciplinary goals and principles to connect natural, human, and social criteria with various departments.

The second phase featured the larger advisory team dividing into sub-committees that targeted three priority goals in resource conservation, environmental public health, and economic development. Action items identified a green business economic development strategy to create a new sustainability staff position and a series of community sustainability forums.

FIGURE 1

Santa Monica Sustainable City Plan
Implementation Plan (IP) Model
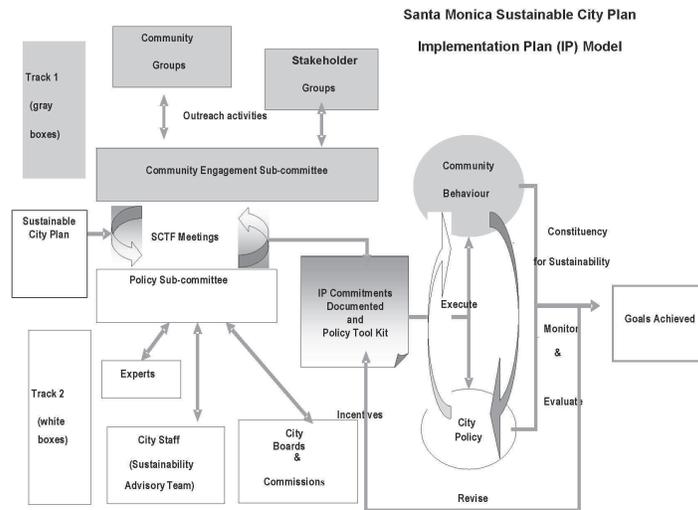
In 2005, a revamped program launched annual progress reports to document linkages between targets and stakeholder work plans (Figure 1). Sustainable consumption targets for the year 2010 identified 25 percent local and renewable

energy. Santa Monica passed bans on polystyrene and non-recyclable plastic bags and established a program that required employers to compensate employees for relinquishing parking spaces.

Santa Monica used an ecological footprint analysis to connect resource management to carrying capacity issues through stakeholder engagement (see Figure 2). By considering its ecological assets carefully Santa Monica reduced its footprint by 0.2 hectares per capita (6%) between 1990 and 2000. Though data challenges remain (Aall and Norman 2005; Chambers et al. 2005; McManus and Haughton 2006), the footprint analysis linked sustainable consumption to targets for land use, transportation, and environmental impact. A staff employee reported:

> "We always end with the footprint slide in our presentations. Very often the general public, new council members, and others are less clear with what sustainability means, but the ecological footprint is a very visual tool successfully communicating the need to reduce."

Despite its progress, Santa Monica, like most cities, has significant challenges ahead to reach a more equitable share of global biophysical resources.

FIGURE 2
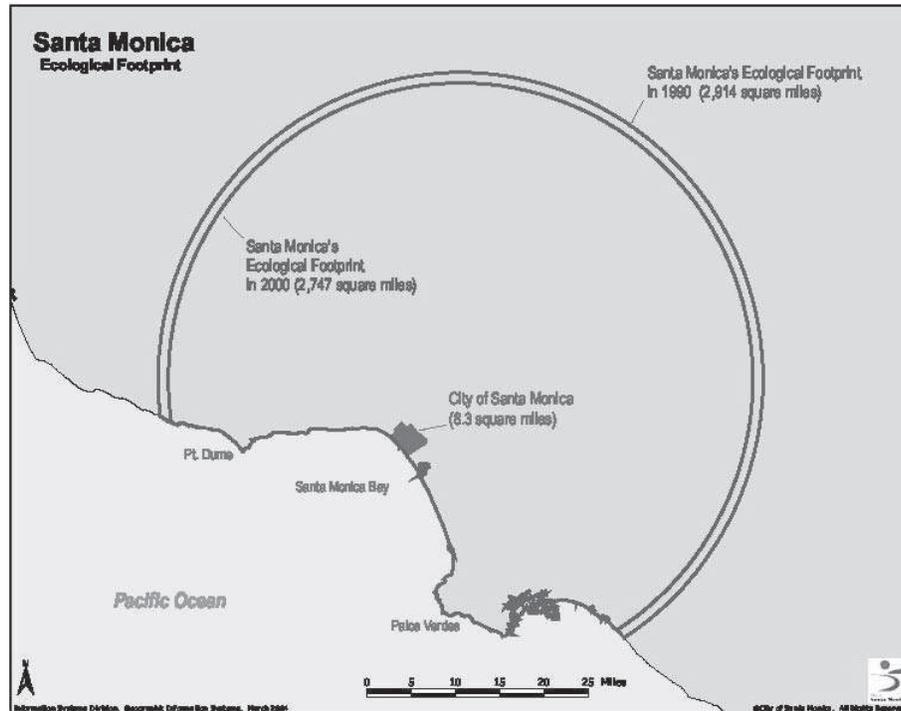
Regional Vancouver Urban Observatory

In 2005, in preparation for the 2006 World Urban Forum, the UN and Simon Fraser University jointly sponsored an "urban observatory" to develop a process for identifying indicators for sustainable development (Holden 2006). Interviews were conducted with the Regional Vancouver Urban Observatory study group participants and notes were taken during and after each study group meeting. Public policy experts also engaged in public consultation to establish a context and boundary around issues with cause and effect relationships. During this consultation, community participants developed headline topic indicators and secondary indicators that they publicly launched for the World Urban Forum.

The Observatory used a driving-force, state-response community indicator framework to integrate adaptive management approaches that fortified links between sustainable consumption issues and root causes by "thinking systemically" (Sterling 2004). For example, if air quality was measured as parts per million for a given pollutant, measurements could quantify how many air permits were issued or vehicle emission standards were set. However, such data did not identify what caused poor air quality. Policy responses to improve air quality included reductions in the number of air permits issued or setting more stringent vehicle emission standards. A challenge using this framework was to develop indicators outside the environmental domain with cause-effect relationships that substituted driving forces linking policy responses with performance outcomes.

In the initial phase, public policy experts conducted an inventory of regional indicator projects using national and international data. In public consultations that followed, local experts recommended indicators in health, environment, governance, immigration, and Aboriginal issues. Community members then organized into eight study groups. Common values and concerns emerged through monthly workshops, on-line discussions, and forums resulting in indicator recommendations promoted during the public launch.

During the launch, some politicians undermined particular committee reports by questioning the relevance of indicators that highlighted negative and controversial issues. For example, opposition mounted when a study group proposed to count land use by-laws that contravened Metro Vancouver's Liveable Region Strategic Plan. Such incidents highlighted planning inconsistencies and power dynamics, but also jeopardized access to data. Innes (1990) wrote about "politicizers" who used indicators for propaganda purposes when data depends on short-term political decisions and "politication" when data is used for immediate political ends to disrupt collection and analysis. Although politicians were reluctant to adopt new indicators that may reveal arbitrary planning policies, autonomous academic support in the Urban Observatory structure might assist

to institutionalize indicators and provide a level of neutrality that governmental bodies did not possess.

The Urban Observatory still has to find ways to integrate sustainable consumption indicators into local government hierarchies and effectively engage businesses. It may contemplate working with a narrower set of end users (e.g., particular municipalities rather than the region) to increase uptake, efficacy, and impact.

Indicator Development Analysis

Addressing sustainable consumption requires community engagement to question current consumption patterns that focus on measuring demand-oriented responses to reduce aggregate resource use and carbon emissions. It proves difficult to measure the amount of saved energy or other material while maintaining a given quality of life. The challenge of establishing causal relationships adds to the complexity of measuring sustainable consumption in local communities.

The extent to which the cases addressed and measured sustainable consumption proved nominal. Only two of 20 interview respondents were familiar with sustainable consumption terminology. Sustainable consumption indicator selection involves finding ways to measure absolute consumption levels; to collectively maximize, procure, and leverage resource use; and to shift from disposable commodities to returnable products, services, and experiences.

Santa Monica and Whistler both launched sustainable public procurement programs that provided decision-making criteria for purchasing and third party certification processes, such as the Responsible Purchasing Network or the EcoLogo Program. Santa Monica banned detrimental materials and publicized its ecological footprint. It based its community indicator framework on system performance indicators and expanded into policy indicators that allowed decision makers to diagnose problems and develop outcomes (Innes and Booher 2000). Performance measures may improve chances of implementation in theory, but in practise many local plans remain out of date and may not affect land use decisions. Santa Monica established a capacity building process in attempts to transfer community indicator ownership to the wider community.

The Vancouver Urban Observatory spearheaded new data collection methodologies to establish causal effects between actors, actions, and outcomes. For instance, they measured local versus imported food consumption. Whereas traditional descriptive indicators measure vehicle occupancy rates and traffic volumes, the Observatory sought to measure transportation modal shares of children walking to school by focusing on social carrying capacity (time). In this way they raised awareness about health, safety, and air quality while highlighting energy and financial savings from driving less and walking more.

Table 2. Case Site Comparison

Community	Region Vancouver Urban Observatory	Santa Monica	Whistler
Framework	- Expert led with public consultation - Driving Force-State-Response	- Performance based - Driving Force-State-Response - Goal-Indicator Matrix	Systems approach (The Natural Step)
Outreach	- Expert–led educational workshops. - Proactive networking with other community indicator projects. - Targeted outreach/ training to municipalities.	1) Sustainability Awards 2) Partnerships with non-profits. - Business greening certification program: provides assessment, recommendations resources for retrofits, energy savings, etc. - Student & residential greening program: reduces waste, water, energy, buy organic/ local food. Information and first step resources provided (farmers market tokens, etc.)	- Bimonthly newspaper articles (community without a daily paper). - Social marketing outreach from diverse partners.
Stakeholder Process	- Advisory board (6-8) - Capacity building meetings. - Independent, third party certification.	- Technical task force (7) - Advisory team (11) - Community experts meet monthly.	- 16 tasks forces (5-12 members) meet 3 times per year. - Interactive web site.
Indicators & Policies addressing SCP	- Measure waste diversion as proportion of waste stream volume . - Differentiate development from growth. - Percent greenfield vs. brownfield development. - Ratio of food items consumed within region compared to amount imported.	- Eco-footprint Analysis - Sustainable procurement policy with 3rd party certification. - Employers compensate employees for transit passes.	- Cap single family dwelling: 5000 sq ft. - Sustainable procurement policy with 3rd party certification. - Waste stream volume opposed to waste diversion.
Indicator Development strategies	- New data sets link actors, actions, and outcomes to the natural environment.	- Eco-footprint analysis. - Strong regulation: ban of polystyrene and non-recycling plastics.	- Make carbon offset information available. - Focus on "Whistler experience" rather than material consumerism *per se*.
Lessons learned	- Mix experts and community members throughout process. - Have feedback loops in place for monitoring data. - Strong leadership necessary from municipalities. - Have business representation.	- Do not locate sustainability office within environmental department, report directly to mayor or city manager. - Do not use too many indicators.	- Do not use too many indicators. - Embed indicators into strategic planning rather than as a separate activity. - Use web site for interactive communication rather than static reports.
Timeframe	2015	2010	2020

Lessons learned from interview respondents of the Urban Observatory included the importance of engaging independent, third-party stakeholders when selecting indicators, and influencing local governments. Involving the business community adds credibility and buy-in to the indicator formation process, but maintaining their participation during the indicator formation process proved challenging. Indicator selection was not necessarily dependent on data availability; the next stage of the Observatory's process will invest in data research, development, and collection.

Overall research findings suggest two areas are critical toward integrating community indicators and sustainable consumption into a blended approach: strategic implementation and participatory capacity building.

Strategic Implementation

Action taken toward strategic implementation is often inhibited by horizontal organizational hierarchies and political paralysis (Dale 2001). Implementation challenges for municipalities generally require processes to shift from a risk-averse, departmentalized mentality to an outward looking, interdepartmental process. Local governments can take several actions in these directions.

Cities struggle with adaptive governance systems to confront local realities; they may need to reorganize municipal department configurations (Lamm 2003; Luhde-Thompson 2004). Organizational structures and integrative strategic planning processes are often constrained within municipal bureaucracies (Brender, Cappe, and Golden 2007). Whistler reorganized departments from traditional municipal tasks (e.g., public works, parks and recreation, and sanitation) to strategic priority areas aligned by a systems approach.[3] Santa Monica's City Manager's office chaired monthly meetings rather than allocate sustainable development activities to one department. Vancouver experimented with integrated permitting processes where designers showed city regulators what they wanted to implement and regulators assessed project goals subject to working out details.

Operational audits can ensure department operations support the vision and goals related to performance, progress, and conduct. Broader than financial accounting audits, operational audits verify that operations accord with protocols, guidelines, process descriptions, modifications, and areas for improvement (Lenzen et al. 2006). Audit components include planning documents, implementation processes, functions, project action plans, and deliverables. Data collection methods require feedback loops to ensure adequate monitoring. A City of Vancouver respondent reflected on energy metrics: "In hindsight we could have sacrificed a little on accuracy to put in place a streamlined data collection methodology. Without a feedback mechanism we have no system in place to take the next step and monitor our indicators."

When departments and agencies set targets they establish a rationale for greater accountability in work plans. It is politically difficult to determine improvement without measuring performance to demonstrate the financial value of reaching environmental, economic, and social targets. Political considerations often mean that programs not capitalized are subject to budget cuts and social issues are challenging to quantify (Oregon Natural Step Network 2003). Performance indicators are valuable in terms of cost savings, but sustainable consumption targets are problematic because of mainstream economic assumptions of unlimited utility, real estate's "highest and best use," and a consumer culture that foregoes increased leisure for increased income (Ropke and Reisch 2004). Santa Monica attempted to foster accountability for results by developing robust targets with detailed work plans, deadlines for goals, personnel responsible for implementation, adequate financial resources, and a monitoring and reporting schedule.

Participatory Capacity Building

Traditional performance targets often fail to incorporate values that foster ownership and buy-in toward a community's vision. Innovative activities draw attention to community indicators and strengthen awareness about the importance of monitoring progress towards a community's definition of success. Participatory capacity building can deepen awareness about sustainable consumption and enhance community indicator project performance through several strategies.

Community/municipality stakeholder task forces allow community and technical groups to perform data reality checks that merge realism with idealism. Community indicator projects cannot expect congruency between existing data and potential issues worthy of measurement. Charettes, focus groups, and integrated planning approaches merge participation into a fluid but structured process. Santa Monica and Whistler institutionalized community values into work plans through community/municipal alliances. Community and municipal advisory groups articulated values and legitimized collective responsibility and reciprocal accountability. Monitoring progress and reporting data created windows of opportunities for dialogue that promoted good practices.

Community indicator outreach involves highlighting measurable actions to promote recognition, services, and demonstration projects. Santa Monica's Chamber of Commerce initiated a sustainability awards competition to recognize businesses achieving excellence in social responsibility, economic development, and environmental stewardship. Its green business certification helped companies divert solid waste and reduce energy, water, toxic chemical use, and transportation impacts. Businesses received technical assistance to implement recommendations, monitor results, and garner recognition.

Local communities can develop meaningful indicators that help reflect the state of their ecosystems (Gasteyer and Butler Flora 2000). For example, Vancouver consolidated plans to use its community energy utility stack into what one interview respondent called, "an iconic reference with animated qualities" to display neighbourhood energy consumption. If the city installs light-emitting diode lamps that glow red when using maximum energy and blue when functioning at a reduced state then residents can quickly assess their energy use with a glance out a window.[4]

Community-based social marketing changes behaviour by requesting a commitment with a prompt or reminder to follow up on an undertaking and thereby reinforce new social norms (Hitchcock and Willard 2006). A Whistler respondent reported,

> "We did an admirable job in providing information; however I would change the emphasis from information to communication through social marketing, which we didn't emphasize sufficiently. Our documents didn't give the types of messages that inspired people to act. We were too focused on providing information."

A Blended Approach (Actors, Targets, and Policy Documents)

Addressing sustainable consumption involves actors, targets, and policy documents that adopt participatory approaches for education and capacity building to reduce consumption levels. Santa Monica and Whistler are arguably North American leaders in monitoring resource consumption; they initiated sustainable consumption programs within procurement policies. Each site periodically re-evaluated program delivery with iterative multi-stakeholder processes systematically measuring, prioritizing, and evaluating actions based on past performance and future goals.

Municipal sustainable consumption examples from the case studies included zero waste programs, building retrofits, green infrastructure, sustainable public procurement, mobility modal shifts, renewable energy credits, carbon offsets, rideshare, environmental product responsibility, and ecological footprint initiatives. Programs tend to focus on reducing resource demand and use third-party certification to encourage renewable, reusable, and efficient natural resource use. Safe and ethical labour practices mitigate the unsustainable methods, rates, and patterns of irreversible damage to ecosystems that deprive future generations of these resources (Tukker et al. 2008).

Whistler engaged a network of actors to produce coordinated outcomes by applying a systems framework. Whistler captured resource areas within energy, water, and waste, but its indicators failed to challenge commodified holiday-making. By its nature, the ski resort encourages commodity consumption.

Policy documents within the three cases attempted to blend actors with targets that included municipal development plans, land use by-laws and capital plans, community stakeholder policies, work plans, and budget line items. These planning mechanisms targeted inefficient infrastructure; they were assumed to influence personal consumption levels. An Observatory participant stated,

> "Our first stab was in passing the ODP [Official Development Plan] with a preliminary set of indicators attached to it. This work will provide us with levels of performance transferred to building code standards, best practices, and by-laws. In going through the rezoning stage, we had the policy objective to rezone by-laws to CD-1 [comprehensive development]. Incrementally and over time, change [in consumption] will then happen."

Nevertheless, building more efficient infrastructure does not necessarily raise public awareness about consumption. Community indicators can be part of a process to educate the public about the carrying capacity of a community's population in relation to its available resources. Provincial/state and federal jurisdictions are failing to reward municipalities sufficiently with blended approaches to target resource consumption through stakeholder participation. Community indicator engagement involves actors such as city councillors, boards of directors, senior staff, non-profits, special commissions, task forces, advisory groups, and public outreach to connect current rates of consumption with the long-term security of a community's natural resources. When community indicator initiatives link resource consumption to the economy and personal well-being, heightened personal awareness can foster conservation.

Conclusion

Sustainable consumption indicator selection focuses on ways to reduce resource use linked to social criteria. Energy efficiency policies emphasizing absolute energy demand (rather than energy intensities) can encourage downsizing and reverse present trends toward more energy consuming infrastructure and equipment. For example, as house sizes increased, Whistler implemented a 5000-square foot limit on single-family dwellings to cap living space. Other sustainable consumption indicators from the cases included transportation demand management, sustainable purchasing policies, ecological footprint reporting, and measuring waste volume rather than diversion percentages. Data availability and access represent an ongoing impediment to measuring sustainable consumption.

Community indicator development and sustainable consumption focuses on a blended approach toward raising awareness about consumption issues and implementing more sustainable options. The three cases accentuate a common

problem with community indicator projects when a community's vision becomes secondary to the measurement strategies employed. While participatory capacity building highlights reasons to conserve resources and increase the quality of life, strategic implementation requires reconfiguring incentives and restructuring organizational processes to deter wasteful practices. Community indicator projects that focus on sustainable consumption can help highlight connections with finite resources and align policies with the goals and aspirations about what residents want communities to become.

Notes

[1] For example, the descriptions of success for the built environment task force included indicators in a chart presented on the x axis: development footprint, housing liveability, landscaped park availability, dwelling density, water usage, transit proximity, services proximity, and community atmosphere. Six "action types" were presented along the y axis: research & studies; regulations; policy and enforcement; economic and financial (dis) incentives; communication; awareness and education; and infrastructure.

[2] In 2005, 40 percent of accepted actions were fully executed, 14 percent partially executed, and 26 percent in progress. Only 15 actions were moved for implementation to the following year and less than 7 percent were not initiated.

[3] Departments restructured into four areas: environmental services (formerly parks and utilities); community life (formerly recreation and housing); resort experience (visitor focused); and economic viability (formerly procurement and finance).

[4] City staff have already invented a three-act sustainability sketch: Act one: "Honey, what's the color of the stack tonight?" Act two: "Looks reddish, dear." Act three: "Well then, I'd better go turn off the lights!"

Acknowledgements

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