

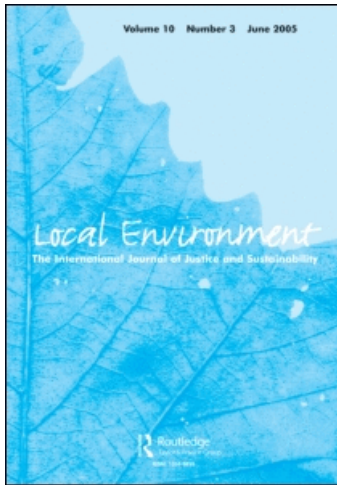
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Adoption of sustainability initiatives in Indiana, Kentucky, and Ohio

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Insights regarding planning for sustainable development have largely focused on cases that highlight communities making dramatic changes to promote the concept. Noticeably absent from the literature, however, has been an examination of what characteristics contribute to the adoption of sustainability-related activities by less celebrated communities. This study attempts to address that deficiency through a survey of planning directors across municipalities and counties in Indiana, Kentucky, and Ohio. The survey, in conjunction with census data and a calculated sustainable activities index (SAI), serves as the foundation for comparative and regression analyses. Findings of the study indicate that the significant contributors to the SAI scores include community population size, familiarity with the concept of sustainability, discussion of the concept by planning staff, and having activities with sustainability as a goal. We offer recommendations based on our findings.

Keywords: sustainable development; implementation; community characteristics

Introduction

Sustainable development, held by some as the planning paradigm for the twenty-first century, has been the focus of debates regarding definitions and relevance (see e.g. Campbell 1996, Wheeler 1996, Davoudi 2000, Houghton and Counsell 2004). In the USA and beyond, debates have taken place largely in the academic realm, punctuated with notable case studies of sustainability success stories. Far less insight has been available on the practical implementation of the concept at the local level, especially in the USA (Conroy 2006). While Local Agenda 21 activities stemming from the 1992 UN Conference on Environment and Development, and the more recent Local Action 21 mandate from the 2002 Johannesburg Conference, help keep the concept on the front burner internationally (Wild and Marshall 1999, Otto-Zimmerman 2002), in the USA there is little understanding of the implementation of sustainability initiatives across the country. This gap between practice and theory with respect to sustainable development will likely expand without a better understanding of both what elements of the paradigm are being adopted at the local level and the characteristics of communities adopting sustainability practices (Mazmanian and Kraft 2001).

According to the 2000 US Census, there are over 13,000 municipalities and counties in the USA with populations of 2000 to 1 million persons, yet very little insight exists on whether or not such places are attempting to implement sustainability concepts and principles. There is a need for basic research on the type of sustainable development related

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activities taking place at the local level as well as characteristics of communities adopting such practices (Conroy 2006). This study examines factors that may influence the adoption of sustainability-related activities in three US states: Indiana, Ohio, and Kentucky.

This work attempts to answer the following research question pertaining to the adoption of activities promoting sustainable development: What demographic and organisational factors influence the adoption of sustainability-related activities in Indiana, Kentucky, and Ohio? To answer this question, we survey communities in Indiana, Kentucky, and Ohio with Year 2000 US Census populations between 2000 and 1 million to determine what sustainability-related activities are being adopted. Further, we analyse activity information with respect to community demographics and other characteristics to evaluate potential exogenous influences on adoption. The survey targets planning directors or other individuals with similar responsibilities. Survey response information provides the means to address the research questions of this work.

We begin the article with a review of implementation issues associated with planning for sustainable development at the local level. Next, we outline the methods used for the study, and then present the results of the survey and our statistical analyses. We conclude the article with a discussion of the findings and their implications for planning practice.

Implementing sustainable development

Sustainable development presents an implementation challenge for communities stemming from two primary issues. First, there is a lack of specificity and unanimity with respect to defining the terminology. In 1997, Murcott noted 57 definitions of sustainable development in the “academic, policy, and environmental literature between 1979 and 1997” (Murcott 1997 cited in Staley 2006, p. 102). In the decade since then, this number has likely increased substantially. Definitions subscribe to consistent themes of environmental protection, economic integrity, and social and intergenerational equity. Researchers Berke and Conroy (2000) have focused on the use of principles derived from definitions to help operationalise the concept for plan evaluation. However, neither definitions nor principles have provided practical guidance on the construction of implementable policies and practices.

Second, there are limited examples of successful implementation, which are complicated by the ambiguity of what constitutes “success”. As with planning in general, establishing a link between policy and on-the-ground changes has been challenging due to a paucity of data, methods, and empirical enquiry (Brody and Highfield 2005). Simple evaluation focuses on verifiable policy or action adoption, as with adoption of indicators of sustainability. Although there is progress to be assessed for communities undertaking various activities, such actions in and of themselves do not present the entire picture with respect to becoming a sustainable community. Other implementation evaluations analyse the effectiveness of the policies and actions that have been adopted. Implementation and evaluation of such policies and actions are decidedly more complicated, as they address not only issues of scale and capacity, but also necessitate anticipating outcomes for comparison, specifying measures of success for evaluation, and understanding the influence of local culture and competing political demands on such evaluations (Talen 1996, Seasons 2003, Cooper and Vargas 2004).

Cooper and Vargas (2004) focus on the “implementation gap” between sustainability policy designs and actions. They spent more than 10 years gathering implementation experience information from international professionals. They formulated a sustainable development implementation framework based on that information called the “feasibility framework”. The framework assesses proposed policies in terms of seven dimensions:

technical feasibility, legal feasibility, fiscal feasibility, administrative feasibility, political feasibility, ethical feasibility, and cultural feasibility. The framework provides an inclusive examination of the practical dimensions of sustainability-related policies and actions; currently used indices of performance, such as the gross domestic product or the ecological footprint, are more focused on a singular measure of success (e.g. poverty, environment). The feasibility framework is undoubtedly a more comprehensive and reasoned approach than what is adopted by most local communities (Staley 2006).

Communities wanting to take steps towards becoming more sustainable are therefore faced with questions of how to proceed and how to know if they are on the right track. While a well-considered and evaluative approach is ideal, adoption of individual sustainability initiatives has been highlighted by noteworthy actions such as Chicago's Green Roof initiative (see Dvorak and de la Fluer 2003). Communities may test the waters of sustainability through the adoption of a demonstration project or pilot programme based on areas of interest and budget allocations. These actions help to shape a local perspective and to lay the foundation for additional actions by public and private sector organisations and actors (Conroy and Beatley 2007). There is no shortage of potential actions or policies for interested local communities to adopt: "Of the 2509 actions identified in *Agenda 21* for achieving greater sustainability, around two-thirds require the active involvement of local government" (Neil *et al.* 2002 cited in Keen *et al.* 2006, p. 202). Additionally, the Clinton administration's President's Council on Sustainable Development (1997) issued a report on sustainability-related activities taking place across the country, both at governmental and non-governmental levels. These and other studies are not only meant to spread the word about state-of-the-art activities, but also to inspire other communities to examine adopting existing or similar practices (Conroy 2006).

As noted in Conroy (2006), various studies have attempted to analyse sustainability-related plans and activities taking place across the USA, including Krizek and Power (1996), President's Council on Sustainable Development (1997), Berke and Conroy (2000), Portney (2003), and Jepson (2004). However, these studies are either on an elite scale (e.g. Berke and Conroy, Krizek and Power, and Portney) or a limited scale (e.g. Jepson, President's Council on Sustainable Development). In fact, Conroy found that while there is general familiarity with the concept, activities that have been adopted are typically mainstream, such as public participation, rather than those that would be considered leading edge or particular to sustainable development. There is, however, little insight into the characteristics of communities adopting any of the activities. Similar research related to sustainability (e.g. Berke and Conroy 2000), plan quality (e.g. Berke *et al.* 1996), as well as environmental protection (e.g. Howell-Moroney 2004) has emphasised the role community context and, to a lesser degree, organisational capacity can play in the adoption of policies. While it is not the only influence, state planning mandates, for example, are significant factors, nor a consistent influence as noted by Howell-Moroney, these factors are applicable irrespective of community size or state locale. A paradigm shift in US planning practice to sustainability will have as its foundation the thousands of communities that have likely neither been notable leaders nor noted implementers of sustainable development. Assessing characteristics of communities adopting related activities in three states provides insight regarding factors that may be conducive to adoption and implementation.

Research methods and data analysis

This research has been conducted in three primary steps, and it relied on a survey as the principal data source. In the first step, a mailed survey was sent to community planning

directors in Indiana, Kentucky, and Ohio. The survey provided data for sustainability activities, respondent information, and organisation information. In the second step, sustainability activity information was combined to determine an overall sustainability activity index (SAI). In the third step, the SAI, along with survey respondent and organisational data, was combined with demographic information to analyse factors that may contribute to the adoption of sustainability-related activities. This section reviews the survey approach, creation of the SAI, and the regression analyses performed to address our research questions.

Survey

We used a mailed questionnaire to survey planning directors, or others responsible for planning-related practices, in all of the communities in Indiana, Kentucky, and Ohio with populations of at least 2000 and less than 1 million. Population parameters were established based on the consideration that communities with populations below 2000 lack the resources to initiate a sufficient sustainability-oriented planning effort and those with populations greater than one million are somewhat unique (Berke and Conroy 2000). Additionally, an exploratory Internet search was conducted of community and non-governmental websites through search engines such as Google, AltaVista, and Dogpile, as well as academic literature-related websites (e.g. Academic Search Premier). The search showed both recognition and initiation of sustainability-related planning efforts in each of the states. While not exhaustive, the review made it apparent that variations exist within the total population (Conroy 2006).

The selection of states is based on geographic and political similarities as noted by Conroy (2006). Ohio and Indiana are part of the US Census' characterisation of Midwest; Kentucky, however, is defined by the Census as a Southern state. It has been included both because of its geographical proximity to Ohio and Indiana and because of an already established planning relationship with Indiana and Ohio through the Ohio-Kentucky-Indiana Regional Council of Governments. Additionally, Kentucky is similar in both land area (40.4 square miles versus Ohio's 41.3 square miles and Indiana's 36.2 square miles) and farmland to suburbs conversion (American Farmland Trust 2002, US Department of Agriculture, Economic Research Service 2005a–c, American Farmland Trust, 2002). Conventional suburban development is at the heart of much of the farmland loss and is therefore a key concern for sustainable development.

According to the 2000 US Census, there were 1154 municipalities and counties in Ohio, Indiana, and Kentucky with populations of at least 2000 and less than 1 million. Of these communities, 975 had associated US mailing addresses identifiable via public records. Planning responsibilities in some of these cases were shared between a county and a municipality, or among multiple municipalities; therefore, to avoid confusion, municipalities and counties are referred to more generally as communities for purposes of this study (Conroy 2006). Of the 975 communities, 355 were in Ohio, 218 were in Indiana, and 202 were in Kentucky.

In October 2002, a survey and accompanying cover letter were sent to each of the community planning related contacts identified through public records (membership lists from the American Planning Association, state planning chapters, and public records data from sources such as the US Census). If a contact felt there was someone in their organisation more appropriate to respond to the survey, s/he was requested to pass the questionnaire along to that person. The letter accompanying the survey noted its intent to help the field of planning understand what sustainability-related activities are taking place, to provide a

resource of information valuable to practitioners, and to assess general patterns of activity among communities in Ohio, Indiana, and Kentucky. If no response had been received three weeks after the initial mailing, reminder follow-up cards were sent to help enhance response rates (Salant and Dillman 1994). The survey was reviewed and approved by the American Planning Association (as informed to the author B. Klein, 2002, Director of Research, American Planning Association, Personal correspondence, 15 October 2002).

A total of 436 surveys were returned, which gave an overall response rate of close to 45% (38% of total study population). Ohio dominated the respondents with 252 (71% of the Ohio communities surveyed; 58% of respondents), followed by 100 from Indiana (46% of the Indiana communities surveyed; 23% of respondents), and 84 from Kentucky (41% of the Kentucky communities surveyed; 19% of respondents). Six of the responses were dropped for the statistical analyses (three from Indiana, three from Ohio) because demographic data were unavailable from the US Census. The high percentage of Ohio respondents may have been due to recognition of The Ohio State University as a research institution, or perhaps because it was the alumni institution of respondents. Analysis of variance (ANOVAs) of community population size and population change from the 1990 US Census showed no geographical bias in the responses. There was some geographic bias in median household income, where Kentucky was statistically different from the Indiana and Ohio, which will be considered with respect to the demographic analysis.

The survey included questions addressing familiarity with the sustainability concept, activities promoting the concept, and background information on the respondent and his/her organisation.¹ We acknowledge that survey responses to questions of familiarity and activities are biased in that they get only the respondent's assessment of an entire organisation – another individual in the same organisation may respond differently. However, since the cover letter informed the potential respondent of its scope and intent, it is assumed that the respondent was the most appropriate and knowledgeable, and hopefully the most accurate, person in the organisation to complete the survey.

In order to examine the familiarity respondents had with the concept of sustainable development, the survey presents a common working definition as offered by Berke and Conroy (2000, p. 23):

Sustainable development is a dynamic process in which communities anticipate and accommodate the needs of current and future generations in ways that reproduce and balance local environmental, social, and economic systems, recognize the limits of these systems, and connect local actions to broader concerns.

Based on the definition, respondents were asked how familiar they were with the concept of sustainability, how applicable they felt the concept was for planning practice, how familiar their organisation was with the concept, and whether the concept had been discussed at the organisational level.

Survey questions addressing activities first asked whether the respondent's community had activities, either underway or in the planning stage, that had some aspect of the predefined sustainable development as a goal (either primary or secondary). Respondents were then asked if sustainability terminology was used in conjunction with the activities. Subsequently, the survey provided a listing of activities commonly associated with sustainable development. Respondents were asked to select whether each activity was underway, in the planning stage, or not underway or planned.

Activities used in this survey were identified following a review of the policies from comprehensive plans that forward sustainable development principles as presented by

Berke and Conroy (2000). The review resulted in the selection of 16 activities: regional coordination; recycling and waste minimisation; green building efforts; mixed use/compact development; environmental constraints; public participation; recruiting green industries; brownfield reuse and infill; promoting alternative transportation; polluters pay; encouraging local employment; pedestrian-oriented development; conservation of natural resources; energy conservation; affordable housing; and dispute resolution. These activities represent a diverse though not comprehensive listing of techniques. Compiling a comprehensive listing is likely an impossible task, as additional activities that may promote goals of sustainable development are limited only by a community's creativity.

Sustainability activity index

In order to compare the communities in this study, we created a SAI based on the level of implementation of the 16 activities in the survey. The scoring scheme was developed as follows: activities that were selected as "currently performed" received a score of 3; those noted as "in planning stage" received a score of 2; activities designated as "done in the past" received a score of 1; and activities that had never been performed, or those for which there was no response, received a score of 0. The basis for this scoring system was to prioritise those communities that were actively supporting sustainability initiatives. Therefore, activities that were done in the past, which may have promoted sustainability concepts, are scored lower than those that are being planned for because the latter may be assumed to remain on the community's policy agenda though there would be a risk that adoption and implementation of the activity may not materialise. Activities that are currently performed are scored highest as they have successfully made it through planning and adoption stages. Survey respondents selected the category of implementation (current, planning, past, or never performed) for each activity. Additionally, they had the option to provide an example of the activities noted as currently performed or being planned. The total possible score was 48, representing all 16 activities as currently performed. Higher scores were indicative of a community with a more active sustainability agenda.

Demographic information

The analysis incorporated relevant community socio-demographic variables to understand the context of each community. There is evidence that economic, social, and physical development characteristics of a community can influence planning for sustainable development (Berke and French 1994, Rees 1995, Berke and Conroy 2000). Community characteristics have played an important role with respect to plan quality as well as plan adoption. Research regarding plan quality, for example, has highlighted the influence of community context factors such as population change, as well as planning capacity (see e.g. Berke *et al.* 1996). Research by Howell-Moroney (2004) explicitly examined the connection between community characteristics and open space preservation; although some findings have been contradictory, such characteristics nonetheless remain an important consideration.

Three variables based on 2000 Census data were selected to characterise each local community: total population, percent population change between 1990 and 2000, and median household income. Population and median household income as measures of community wealth have been shown to have positive effects on measures of plan quality (Berke *et al.* 1996). Larger communities may have more resources at their disposal, adding to their capacity to adopt less traditional sustainability activities; similar findings have occurred with the adoption of e-government technologies (Edmiston 2003, Conroy

and Evans-Cowley 2006). Larger communities may also face more complex planning issues that are appropriate for sustainability-related efforts (Brody 2003).

Community affluence, as measured by median household income level, is an additional measure of community capacity. Community wealth has had a positive influence on plan quality as well as mandate implementation (e.g. Berke *et al.* 1996, White and Boswell 2006). Wealthier communities may have more financial and technological resources to devote to planning in general, adding to their potential planning capacity (Brody 2003, Conroy and Berke 2004).

Percent population change has been used as a measure of community development pressure (Dalton and Burby 1994, Berke *et al.* 1996). Communities experiencing population growth may feel more urgency to control how development responds to the growth. These communities may focus on adopting sustainability-related activities.

Community characteristics and sustainability activities

Conroy (2006) found that while characteristics of sustainability register as seminal to good planning, the concept of sustainability as a whole does not register as a new paradigm. Therefore, sustainability is likely to be adopted only as piecemeal actions that promote select goals or principles. As a result, we examined each of the 16 activities to determine what if any relationship each had with the three community demographic characteristics. Table 1 shows the results of an ANOVA comparison of activity level means for each of the sustainability activities with respect to the three demographic variables. For 12 of the 16 activities, demographic characteristics had a significant influence on the level to which the activity was performed. The four activities for which demographics did not have an influence were (1) recruiting green industries, (2) polluters pay, (3) conserving natural resources, and (4) dispute resolution.

The most consistent factor that significantly influences the performance of an activity is population. Larger communities currently perform and/or are planning to perform nine of the activities. More populous communities may have more resources at their disposal, such as larger staff, more computing facilities, and/or larger budgets. These communities, therefore, may have the capacity to adopt more of the measures, as well as more of the innovative measures. This supports previous research regarding adoption of innovative and environmental planning measures.

Interestingly, percent population change, which has been a consistent and positive influence on sustainability issues (Conroy and Berke 2004), is a significant characteristic for only one activity: public participation. It is not surprising to see communities with generally higher growth pressures actively making accommodations for public participation. Larger positive percentages indicate more development pressure, which in turn may increase the sense of urgency for communities to accommodate input from their expanding citizenry. The high population change percentage for communities not addressing participation is due primarily to two communities with percentage increases of 540 and 1500, respectively; these have been examined via a residual plot, and they were determined not to be significant outliers.

Median household income levels as an indicator of community wealth played a significant factor in the activity level of five of the sustainability activities: recycling, environmental constraints, local employment, energy conservation, and affordable housing. With the exception of local employment and affordable housing, it is the most affluent communities that are currently performing these activities. This again supports existing research regarding adoption of innovative planning measures (e.g. Berke and Conroy 2000,

Table 1. Significance of demographic variables on activity levels by sustainability activity.

Sustainability activity	Demographic variable	Activity level mean				<i>F</i> -statistic (<i>p</i> > <i>F</i>)
		Currently performed	In planning stage	Not being addressed	Done in the past	
Regional cooperation	2000 population	47,651	18,183	12,164	13,362	5.53 (0.001)***
	Population change (%)	18.99	9.69	10.18	4.97	0.48 (0.697)
	Median household income	40,038.45	37,118.16	37,980.05	39,629.04	1.32 (0.268)
Recycling/waste minimisation	2000 population	31,393	22,367	17,258	14,721	0.89 (0.445)
	Population change (%)	14.52	7.90	10.11	43.27	0.65 (0.581)
	Median household income	39,964.18	31,301.47	38,039.30	35,401.43	3.38 (0.018)**
Green building efforts	2000 population	15,109	59,278	27,466	27,249	2.94 (0.033)**
	Population change (%)	7.96	6.39	15.91	17.80	0.16 (0.925)
	Median household income	39,567.80	37,736.52	39,230.69	39,308.00	0.11 (0.957)
Mixed use/compact development	2000 population	54,138	21,894	13,817	10,560	6.65 (0.0002)***
	Population change (%)	16.02	20.32	6.11	5.02	0.55 (0.651)
	Median household income	39,905.03	39,093.50	38,575.23	45,211.50	0.65 (0.584)
Environmental constraints	2000 population	50,162	16,011	16,071	22,066	5.77 (0.0007)***
	Population change (%)	22.59	6.49	4.18	3.25	1.49 (0.218)
	Median household income	40,665.89	37,125.01	36,702.88	43,313.64	3.27 (0.021)**
Public participation	2000 population	41,238	20,830	10,985	11,707	2.67 (0.047)**
	Population change (%)	12.65	6.13	45.96	5.39	2.19 (0.088)*
	Median household income	39,414.79	36,596.95	38,555.00	41,230.38	0.82 (0.485)
Recruiting green industries	2000 population	38780	27516	30781	35841	0.27 (0.848)
	Population change (%)	39.75	7.99	11.82	-0.43	1.74 (0.159)
	Median household income	37,770.23	36,108.33	39,571.13	36,420.67	1.12 (0.343)
Brownfield reuse, infill	2000 population	64,325	19,983	21,933	22,278	7.59 (<0.0001)***
	Population change (%)	18.21	12.69	12.20	9.95	0.14 (0.939)
	Median household income	38,963.63	36,879.94	38,426.19	40,451.29	0.86 (0.460)
Promote alternate transportation	2000 population	65,987	23,177	22,084	17,952	7.36 (<0.0001)***
	Population change (%)	12.34	7.79	18.04	45.49	0.90 (0.439)
	Median household income	38,732.14	39,943.53	39,078.31	42,920.65	0.69 (0.558)
Polluters pay	2000 population	23,648	25,006	36,689	18,918	1.35 (0.258)
	Population change (%)	11.30	11.97	16.07	4.58	0.14 (0.937)
	Median household income	39,459.47	38,649.94	38,043.18	37,906.89	0.35 (0.787)

Local employment	2000 population	34,585	27,423	31,474	12,434	0.45 (0.72)
	Population change (%)	17.03	9.01	13.24	5.31	0.20 (0.894)
	Median household income	37,454.93	37,320.78	42,581.01	38,260.54	4.33 (0.005)***
Pedestrian-oriented development	2000 population	54,230	29,986	17,016	18,487	4.48 (0.004)***
	Population change (%)	11.32	14.38	23.37	8.01	0.45 (0.718)
	Median household income	39,295.81	39,937.51	36,446.15	41,160.11	2.03 (0.109)
Conserving natural resources	2000 population	41,922	29,144	23,022	16,014	1.38 (0.248)
	Population change (%)	16.19	10.71	14.54	9.51	0.10 (0.96)
	Median household income	38,387.76	38,278.32	40,243.03	47,225.60	1.94 (0.122)
Energy conservation	2000 population	45,785	34,350	27,943	56,544	1.23 (0.298)
	Population change (%)	19.36	7.68	15.11	-0.42	0.27 (0.847)
	Median household income	39,123.87	35,810.18	39,632.27	30,438.14	2.77 (0.041)**
Affordable housing, social equity	2000 population	44,714	25,145	21,518	11,033	2.60 (0.052)*
	Population change (%)	17.90	7.57	13.69	11.26	0.33 (0.805)
	Median household income	36,149.17	39,228.67	43,410.34	39,493.50	9.24 (<0.0001)***
Dispute resolution	2000 population	34,149	20,071	30,640	18,173	0.52 (0.671)
	Population change (%)	23.89	3.88	9.59	6.75	1.01 (0.389)
	Median household income	39,440.89	37,219.37	39,402.33	36,676.36	0.42 (0.738)

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (in case of Homogeneity, significance of Welch statistics used).

Brody, 2003). It is reasonable that less affluent communities are significantly more likely to adopt local employment and affordable housing activities to meet the critical needs of their population. This may be also due in part to the characteristics of communities, which noted that they had not addressed either of these activities. In each case, the most affluent communities apparently did not find that these activities satisfied the pressing needs of their citizenry.

Most of the individual sustainability-related activities in this study are influenced by community demographics, and especially by population size. Activities that were not influenced by demographic variables (recruiting green industries, polluters pay, conserving natural resources, and dispute resolution) do not appear to have a common connection. They vary with respect to implementation levels, although all but conserving natural resources are among the least currently planned activities. They also vary with respect to the ease of instituting them; conserving natural resources is likely an existing component of environmental related efforts, while the remaining activities may require additional or specialised staff (dispute resolution, recruiting green industries) or the assessment of fees or other measures on entities that cause environmental or public service strains on each community.

Influences on the SAI

Individual sustainability activities do not provide a good sense of the level to which communities may be adopting a sustainability agenda, even if that adoption is piecemeal. The SAI provides an aggregate measure of the level of adoption of each of the 16 activities. Table 2 presents the SAI scores by activity and total both for each state and overall. As seen in Table 2, the highest scores were generally associated with recycling and public participation. The popularity of recycling efforts may stem from economic interests, landfill space concerns, or some combination thereof (Conroy 2006). Participation, which scored highest for Indiana and Kentucky and second highest for Ohio, is a planning staple that likely has been indoctrinated absent sustainability considerations for many communities.

Activities that may be considered leading edge for sustainable development, such as green building efforts and recruiting green industries, have much lower scores. Green industries and green building efforts lack a general awareness level on the part of many respondent communities (Conroy 2006). Interestingly, energy conservation efforts, if surveyed in 2007, would likely show an increase in activity levels given the rise in oil prices following the completion of the original survey. In general, there are no significant differences among the states with respect to the SAI activity scores, although brownfield reuse/infill and, to a lesser degree, recruiting green industries and the overall total do demonstrate significant variation among the means.

In order to test the influence of the demographic characteristics and additional factors on the cumulative SAI scores for each community, we ran a regression analysis with the SAI scores as the dependent variable. The independent variables in the analysis included the demographic variables discussed previously, as well as planning characteristics as determined through the survey. Planning characteristics included six questions related to sustainability usage (respondent familiarity with the concept, respondent assessment of practicality of the concept, pervasiveness of the concept in the organisation, discussion of the concept in the organisation, organisation activities with sustainability goal, and explicit use of the concept) and four questions related to the organisation and respondent characteristics (organisation type, organisation size, primary focus, and respondent education level).

Table 2. Sustainability activity index scores overall and by state.

Activity promoting sustainable development	Overall mean (standard deviation)	State means (standard deviation)			<i>F</i> -statistic (<i>p</i> > <i>F</i>)
		Indiana	Kentucky	Ohio	
Recycling/waste minimisation	2.55 (0.99)	2.59 (0.99)	2.48 (0.96)	2.56 (1.00)	0.27 (0.762)
Public participation	2.53 (0.94)	2.63 (0.89)	2.61 (0.86)	2.46 (0.98)	1.53 (0.217)
Environmental constraints	2.23 (1.05)	2.28 (1.04)	2.19 (1.13)	2.22 (1.04)	0.15 (0.864)
Local employment	2.19 (1.22)	2.16 (1.28)	2.06 (1.28)	2.24 (1.17)	0.66 (0.518)
Regional coordination	2.19 (1.12)	2.11 (1.16)	2.15 (1.07)	2.24 (1.12)	0.56 (0.571)
Conserving natural resources	2.16 (1.17)	2.32 (1.11)	2.11 (1.14)	2.10 (1.20)	1.14 (0.321)
Affordable housing, social equity	2.08 (1.20)	2.01 (1.20)	2.17 (1.12)	2.07 (1.23)	0.37 (0.692)
Mixed use/compact development	2.02 (1.14)	2.05 (1.15)	2.04 (1.19)	2.00 (1.12)	0.08 (0.928)
Pedestrian-oriented development	1.85 (1.19)	2.02 (1.15)	1.69 (1.24)	1.84 (1.19)	1.55 (0.213)
Brownfield reuse, infill	1.75 (1.24)	2.02 (1.18)	1.18 (1.27)	1.82 (1.20)	10.08 (<0.0001)***
Polluters pay	1.37 (1.32)	1.40 (1.34)	1.42 (1.34)	1.35 (1.32)	0.11 (0.893)
Promote public transportation, park and ride lots, carpooling	1.34 (1.37)	1.30 (1.40)	1.29 (1.38)	1.37 (1.36)	0.13 (0.879)
Dispute resolution	1.19 (1.39)	1.34 (1.45)	0.96 (1.33)	1.21 (1.38)	1.55 (0.214)
Energy conservation	0.79 (1.19)	0.82 (1.24)	0.82 (1.15)	0.77 (1.19)	0.09 (0.917)
Recruiting green industries	0.64 (1.13)	0.79 (1.23)	0.82 (1.23)	0.53 (1.05)	2.76 (0.065)*
Green building efforts	0.38 (0.93)	0.45 (0.99)	0.33 (0.85)	0.37 (0.93)	0.38 (0.684)
Total	24.88 (9.27)	26.21 (10.58)	23.20 (8.95)	24.92 (8.76)	2.40 (0.092)*

p* < 0.1, **p* < 0.01.

Due to the categorical nature of many of the survey questions, the potential number of variables for a multivariate regression analysis was 32. Therefore, we followed the three-step data reduction process, using correlation and preliminary regressions based on variable categories set forth by Rohe and Gates (1985) and Berke and Beatley (1992). That process led to the inclusion of four independent variables for the regression analysis. The variables with their associated overall and by state means, and source information are found in Table 3. Interestingly, the only demographic variable to make it through the reduction was community population in 2000. While median household income was a significant factor for four activities individually, it did not play a significant role in the broader perspective of the index. Organisationally, the explicit use of the terminology “sustainable development” also does not remain as a significant contributor to SAI scores, supporting Conroy’s (2006) assertion that it is not registering as a distinct paradigm.

The most important sustainability-related variables were related to rhetoric. That is, whether or not the concept was discussed and if there were activities underway that had sustainability (or some aspect thereof) as a goal were critical elements of high SAI scores. Finally, none of the variables that focused on characterising the organisation, including organisational size and focus, were part of the reduced model. This indicates that organisational capacity may not significantly influence adoption of sustainability-related activities. This may also be a result of the diversity of respondent organisations, where approximately 40% were classified as something other than “planning”.

The regression model fits the aforementioned independent variables, plus dummy variables for two of the three states, to the sustainability activity scores (Table 4). Although this model does not have a high level of explanatory power (adjusted $R^2=0.24$), it is similar to Portney’s (2003) “serious” cities analysis. The low adjusted R^2 indicates that there are considerations beyond the demographic and organisational factors that we considered that play a significant role in the adoption of sustainability-related activities. Variables that may have been useful to the model include, for example, organisation budget and time since last comprehensive plan.

The three most significant contributors to a high SAI score are population size, whether or not the organisation had discussed the concept, and whether or not the organisation had

Table 3. Variable means comparison between states and variable source.

Variable	Overall mean*	State means* (standard deviation)			Source
		Indiana	Kentucky	Ohio	
<i>Demographic</i>					
Population 2000	34,005 (80,683)	33,452 (86,913)	33,299 (85,054)	34,327 (76,742)	US Census
<i>Sustainability related</i>					
Very familiar with concept	0	0	0	0	Survey
Organisation has discussed concept	1	1	1	1	Survey
Activities underway with sustainability goal	1	1	1	1	Survey
Sustainable activity index [†] (maximum 48)	24.88 (9.27)	26.21 (10.58)	23.20 (8.95)	24.92 (8.76)	Survey
<i>N</i>	430	97	84	249	

Note: Comparison of mean scores across states for each variable was not significant at a $p < 0.05$ level.

*Mode is used for categorical variables.

[†]Dependent variable.

Table 4. Influence of key variables on sustainability activity index.

Independent variable	Regression coefficients		<i>T</i> - statistic	<i>P</i> > <i>T</i>
	Unstandardised	Standardised		
Population in 2000 (ln)	1.72	0.22	5.10	<0.0001***
Respondent is very familiar with concept	2.65	0.11	2.44	0.015**
Organisation has discussed concept	4.59	0.25	5.24	<0.0001***
Activity with sustainability as a goal	4.04	0.19	4.31	<0.0001***
Indiana	3.41	0.15	2.75	0.006***
Ohio	1.72	0.09	1.66	0.097*
Adjusted $R^2 = 0.24$ $p > F = <0.0001$				

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

activities underway with sustainability as a goal. While community size has a well-established influence on planning-related issues, and in this study it may have a substitution effect for some of the organisational issues, the influence of sustainability discussion on the SAI scores provides insight into the process by which activities are adopted. Communities with planning personnel who are familiar with the concept of sustainability and whose organisations have discussed it are doing a better job at implementing elements of a sustainable development action agenda than communities that have not. Relatedly, the significance of the variable which notes having an activity, either underway or in the planning stage, that has as a goal some aspect of sustainable development indicates that a high SAI score is not an accidental achievement.

Findings from Berke and Conroy (2000) focused on the relative newness of the sustainability concept to explain its lack of impact on planning policies. Our results indicate that a transition may be afoot, supporting the importance of integrating the concept into both planning education and practice. The value of discussing the concept may be that practitioners can develop a collective interpretation of sustainable development and focus on actions to implement it in their communities. Discussions move the concept from individual familiarity, which is also an important element, to a forum in which sustainable development may become an action agenda issue (Conroy 2006).

Talking the talk

Sustainable development has been a well-discussed “big idea”, but planners have been challenged to focus on practical implementation (Campbell 1996). Critics contend that an implementation gap between policy design and action continues to hinder progress in planning for sustainable development (Seasons 2003, Cooper and Vargas 2004). We have attempted to assess the “gap” by examining demographic and organisational factors that influence the implementation of specific sustainability-related planning activities in three US states. Results of the study provide two key findings for local planners to consider when trying to close the sustainability implementation gap.

First, larger communities have more sustainability-related activities underway or planned for than their less populated counterparts. Other demographic factors, such as median household income and percent population change, have an influence on individual activities. These characteristics may highlight community capacity and resources for sustainability-related activities or, as in the case of affordable housing and social equity

activities, may be indicative of community needs that inspire the consideration and adoption of such activities. In either case, these are given elements that local planners must consider, but they do not paint a complete picture with respect to the influences on adoption of sustainability activities.

Second, communities whose local planning organisations are more overtly aware of sustainability are significantly more likely to be planning for and implementing sustainability activities. While larger communities have the most significant influence in higher sustainability activity scores, communities with planning organisations whose staffs are discussing the concept and associating it with planning activities are also having greater success planning for and implementing sustainability-related activities. This supports the notion that the concept remains pertinent for practitioners in many local communities in the USA. It also suggests that planners in local communities are consciously selecting activities that will promote goals of sustainable development, at least as it has been defined by Berke and Conroy (2000). It is unlikely that the organisational discussions are spending time deliberating the definitional nuances of the concept, but instead are establishing active links between a general conceptualisation of sustainability and the needs and goals of their communities.

It is important to acknowledge that our findings do not imply a coordinated or even overt agenda to plan for sustainable development. We have selected a limited set of programmes or policies that give insight into whether and how the concept resonates at the local level. The majority of the communities in this study do not have activities underway or planned for that explicitly mentioned sustainable development. Staley (2006, p. 101) notes, "Without an overarching consensus on a framework for defining sustainable development and implementing its principles, applications have tended to be pragmatic and incremental". This study supports that assertion with a strong caveat: communities may be moving towards consensus through dialog among planning professionals. However, the process is not linear. We can infer from the findings that local planners may be multi-tasking as they strive towards a more sustainable future; that is, they are simultaneously working on a framework and implementing action items. This approach may be effective to reach "low-hanging fruit" ideas, but it does little to address the reality of a fragmented policy and implementation of decision-making environment (Keen *et al.* 2006).

Based on these findings, we recommend that additional structure be provided at the local level to enhance the discourse within the context of an integrated sustainability agenda. Piecemeal adoption of individual activities without an overarching agenda may not only be a slow means to achieving successes, but a sustainability goal may be inadvertently undermined if the activities are not evaluated in relation to each other. An institutionalised framework that is sufficiently general to allow for community customisation offers a template whereby local planning officials can get a ready start on a coordinated plan. This approach may take the form of a planning mandate, already shown to positively influence planning for sustainable development (Conroy and Berke 2004), or an enhanced policy guide, as was developed by the American Planning Association (2002) on smart growth.

Our findings provide some insight into existing shortcomings related to elements of sustainability theory with respect to implementation. The concept rests on the integration of fundamental goals of environmental protection, social equity, and economic development. It will not be translated into practice without radical shifts in governing structure and policy decision-making processes (Beatley 1995, Rees 1995). These changes may be unlikely given economic uncertainties, long-standing departmental budget constraints, and political fiefdoms at the local level. However, this study has shown that the piecemeal activities promoting sustainable development have, if not initiated, at least promoted a dialog. This may

present a relevant starting point for promoting organisational learning related to sustainability by governments and their citizenry both in terms of “incremental and fundamental learning” (Albrecht *et al.* 2007, p. 412) as activities are planned for, adopted, and implemented.

There are three primary limitations of this study. First, as the regression model makes obvious, there are additional factors that likely influence a community’s adoption of sustainability-related activities. These factors may include additional organisational insights (e.g. budget), and also, given the diversity of responding entities, factors beyond the organisation such as citizen-based leadership for the general concept or a particular activity. Case studies would help elucidate such persons, as well as other organisational structures which may promote the concept. Second, this study looked at an arguably constrained list of activities as demonstrating community sustainability efforts. As noted earlier, the intent of the list was to provide examples since an exhaustive activity inventory would be impossible; respondents had the opportunity to add other activities, though those were not calculated for the SAI score. The list may have inadvertently biased the results, penalising communities with other initiatives. Third, the study did not examine community-based documents such as a comprehensive plan to examine the institutionalisation of the concept. Such a review (see e.g. Berke and Conroy 2000), would undoubtedly provide a more complete understanding of community efforts.

This study has examined the influence of demographic and organisational factors on the implementation of sustainability-related activities in Indiana, Kentucky, and Ohio. There are encouraging findings that suggest a sustainability dialog exists in many local planning organisations, which positively influences activity planning and adoption. The key will be for academics and practitioners to focus on providing a structure to the dialog that will encourage an integrated planning effort.

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Note

1. In addition to questions pertaining to the implementation of the 16 sustainability activities, the survey instrument included questions addressing: respondent’s personal familiarity with concept; respondent’s view of the applicability of concept to planning; whether or not the respondent’s organisation had discussed the concept; the estimated level of pervasiveness of familiarity with the concept in the organisation; whether or not there were activities underway or planned with sustainability as a goal; whether or not the terminology was explicitly used in conjunction with the activities; whether the respondent was part of a planning department; the primary focus of the organisation; the size of the organisation; and the education level of the respondent (specifically, if s/he held a masters degree in planning and if s/he was AICP [American Institute of Certified Planners] certified).

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