RETRIEVED MATERIAL

TOWARDS A SUSTAINABLE COMMUNITY:
A NEW PLANNING FRAMEWORK FOR COMMUNITY DEVELOPMENT

By

Young-Tae Kim

A PLAN B PAPER

Submitted to
Michigan State University
in partial fulfillment of requirements
for the degree of

MASTER OF URBAN AND REGIONAL PLANNING-URBAN STUDIES

Urban and Regional Planning –Urban Studies Program
College of Social Science

2000

Dr. June Manning Thomas

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

There have been numerous attempts to define the concept of a sustainable community since the term sustainability gained its popularity around two decades ago. A lot of communities have been devoting to achieve sustainable communities in a variety of ways since they acknowledged there is a limit to grow on the planet. These efforts include a set of movements to achieve self-reliant cities, green cities, eco-cities, compact cities, bioregionalism, and so on. However, these examples do not show that the term sustainability can be easily achieved in our society. Instead the numerous examples present that we have to continuously review the process of community's activities to achieve the goal of sustainability.

One of the important things that makes the community more sustainable is to recognize whether the community is sustainable over time. To determine whether communities are sustainable over time, a number of communities have tried to develop a set of sustainability indicators. A sustainability indicator is a sign that shows whether the community makes sustainable progress over time. Indicators are used not only to monitor existing conditions or trends of the community, but also to set specific targets for the community.

Sustainable community indicators are different from traditional economic, environmental, and social indicators because the concept of sustainability requires a more integrated view of the community. Sustainability indicators can help people identify and quantify current conditions of the community and to point the way towards more sustainable conditions.

This study identifies several principles of sustainability indicators from experiences in Jacksonville, Seattle, and Oregon. This study also attempts to apply sustainability indicator exercises to the community development planning process. The study outlines a planning framework for sustainable community development from the experiences of three cases. The framework incorporates the processes and principles of indicator development identified in formulation of policies and strategies for sustainable communities.

The sustainable community is not a fixed reality but requires ongoing efforts to achieve sustainability. Sustainability indicators can help the community measure its progress and set specific targets and activities for the future. The study concludes that sustainability indicators can provide a useful framework for the community development process. This study hopes to facilitate communities to think more about their future and to act more progressively toward sustainability.

I. INTRODUCTION

There have been numerous attempts to define the concept of a sustainable community since the term sustainability gained its popularity around two decades ago. Different viewpoints on the concept have brought a variety of its definitions in the planning field. Despite these efforts, there is no commonly accepted single definition of the sustainable community because of the complicated and even incompatible relationships among its dimensions, such as the environment, the economy, social justice, and so on.

The most well known definition of sustainable development is that of the World Commission on Environment and Development (WCED, 1987):

> "Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs (43)."

Despite its simplicity, the definition, as Hoff points out, contains two controversial concepts: the equitable use of resources and preservation of resources due to limitations on the environment's ability (1998: 6). The controversial concepts of sustainability have been key theme in the ongoing debate on defining sustainable development.

The difficulty and complexity in defining the concept does not necessarily mean that sustainability is a useless concept. At the practical level, we can find a variety of meaningful examples of sustainable community initiatives. Also, a number of scholars, practitioners, and

individuals that are deeply concerned about our future have been trying to find a pathway toward sustainability. There is no doubt that the term sustainability is used increasingly to describe the goal of our future.

A lot of communities have been devoting to achieve sustainable communities in a variety of ways since they acknowledged there is a limit to growth on the planet. These efforts include a set of movements to achieve self-reliant cities, green cities, eco-cities, compact cities, bioregionalism, and so on. However, these examples do not show that the term sustainability can be easily achieved in our society. Instead the numerous examples present that we have to continuously review the process of community's activities to achieve the goal of sustainability.

One of the important things that makes the community more sustainable is to recognize whether the community is sustainable over time. To determine whether communities are sustainable over time, a number of communities have tried to develop a set of sustainability indicators. A sustainability indicator is a sign that shows whether the community makes sustainable progress over time. Indicators are used not only to monitor existing conditions or trends of the community, but also to set specific targets for the community. It is not new for communities to develop a set of sustainability indicators. According to Beatley and Manning, more than forty communities in the U.S. have developed some forms of sustainability indicators (1997: 203). Most examples are locally initiated either by community-base organizations or by local authorities in partnerships with local communities (Pinfield, 1997: 62). These initiatives include "Sustainable Seattle Indicators" and "Jacksonville's Quality Indicators for Progress" at

the local level and "Oregon's Benchmarks" at the state level.

This study is an attempt to identify common principles from various sustainability indicator initiatives and apply them to the planning process. As mentioned above, sustainability indicators are not only for measuring existing conditions of communities. Many initiatives show that indicator exercises are ongoing processes in which communities can evaluate their existing conditions and identify development strategies to achieve sustainable development. Most cases employ a variety of community activities in the process of indicators development; for example, establishing community networks and visions, setting measurable standards, gathering data, evaluating existing conditions, educating community members, planning further activities, and so on. Also, as Maclaren points out, the sustainability indicator exercise is not a linear process, but is portrayed as circular containing several feedback loops (1996: 188). These characteristics of sustainability indicator exercises provide an opportunity to develop a new planning framework for community development.

The main goal of this study is to develop a new planning framework for sustainable communities based on sustainability indicator initiatives. To accomplish the goal, this study will explore the concept and characteristics of sustainable communities and sustainability indicators. Also, this study will identify important principles for developing sustainability indicators based on experiences in Jacksonville, Seattle, and Oregon. This study hopes to facilitate communities to think more about their future and to act more progressively toward sustainability.

II. SUSTAINABILITY AND COMMUNITIES

The concept of sustainable development, which concerns about the use and allocation of available resources, has been evolving as a new paradigm for development since the 1980s. The seriousness of global environmental problems made people acknowledge that development alone cannot guarantee the sustainable future of the human society. Also, the growing disparity of resource allocation within a population and across regions shows that the current pattern of growth cannot provide prosperity for all people. These concerns brought about the new paradigm, sustainability, in the development field. This section will explore origins of the new paradigm and introduce the concepts of sustainability and sustainable communities.

1. THE CONCEPT OF SUSTAINABILITY

1) The Global Environmental Crisis and A New Paradigm

The development pattern based on the modern materialism has provided the quantitative expansion of the wealth to the human society, but, at the same time, caused a lot of problems such as destruction of the global environment, exhaustion of available resources, and disparity of the wealth within a population and across the regions. Because of the limitation on the quantitative growth, the human society has to reexamine the traditional pattern of development and find a new way to harmonize development with the environment.

The traditional development pattern has made serious negative impacts on the earth environment in a variety of ways. The decrease in the amount of wetlands and the number of species resulting from development activities is threatening the entire global ecology. In the U.S., more than half of wetlands that existed in Pre-Columbus times have been filled or destroyed and, without changing the development patterns, this trend will be continued. The traditional development pattern has resulted in a significant decrease in the number of biological species on the planet, too. According to a study, by the year 2020, the earth will have lost as many as one-quarter of the species that existed in 1980 (Wilson, 1992). Air pollution is also a big issue in the earth environment. The ozone layer continues to diminish in size despite the effort to regulate chlorofluorocarbon (CFC) uses. Increases in the emission of carbon dioxide and other greenhouse gases have lead to changes in global temperature, the sea level, and precipitation patterns. Besides, the loss of topsoil, extraction of groundwater, and deforestation have had negative impacts on the global ecosystem[1].

The continuous population growth is another factor that threatens the earth environment and the human society. According to a study, the earth population will grow up to some 8 billion in 2025 and to 9 to 10 billion by the year 2050 (WRI, 1994). The prediction raises a real question about the ecological carrying capacity of the earth to support the growing population. The continuous population growth and the global environmental crisis have called for the new

[1] The Unites States loses some 3 billion tons of topsoil yearly and extracts groundwater faster than it is recharged.

development paradigm. The effort to develop the new paradigm has been brought up by the field of the environmental movement. Despite the effort, the traditional environmental movement did not have significant impacts on the development field until the 1960s because it considered development and the environment as incompatible concepts. In an effort to overcome the limitation of the traditional environmental movement, the concept of sustainability, which harmonizes development with the environment, has been evolved as the new development paradigm. The new paradigm concerns not only about the environment, but also about human interactions with the environment, and, thus, requires a more integrated view of human society.

2) Sustainable Development

The history of thinking about sustainability is closely related to the history of environmental concerns and natural resource management. The origin of current notions of sustainability lies in the "sustained yield" concept of forest management developed by German foresters in the late 18th centuries. The sustained yield concept refers to techniques of selectively cutting certain mature trees while leaving others to grow for future harvest. The principle of this concept is the management of a resource for maximum containing production, consistent with the maintenance of a constantly renewable stock. The concept of the sustained yield has been transferred to the United State and applied to management of natural resources.

Even though there had been conscious efforts to protect the earth environment, it was the global environmentalism that evolved in the 1960s that integrated the environmentalism and

developmental thinking for the first time. The UN Conference on the Human Environment (UNCHE) held in 1972 was the landmark event in the emergence of global environmental concerns. Attended by 113 nations, the Conference discussed a wide range of issues such as human rights, environmental problems of industrialization, whaling, nuclear weapon testing, the Vietnam War, the conflicts between developed countries and developing countries, and so on. After bitter debating, the Conference reached in agreement on 26 principles and 109 recommendations for action. Despite its effort to solve the environmental and developmental problems, those principles and recommendations did not fully address the issue of integration of environmental protection and development. Different views between the First and the Third Worlds on the problems associated with the environment and development remained as another issue to be solved. These issues were mainly discussed later on in the effort of the United Nations Environment Program (UNEP), which was created by the Conference.

The concept of sustainability, which began appearing in the literature in the 1970s, emerged as a significant theme in the 1980s and became a widespread term. The most significant origin of the concept was the World Conservation Strategies (WCS) adopted by the International Union for the Conservation of Nature and Natural Resources (IUCN) in 1980. The WCS, which aimed at resource conservation for sustainable development, is considered as a watershed in challenging the idea that conservation and development were intrinsically opposed and in shifting conservation to center stage as a fundamental prerequisite to economic development (Selman, 1996: 5). However, according to Selman, the WCS was essentially a

scientific rather than a sociological analysis and did not fully address the inequalities associated with international trade, wealth and gender (6). This limitation was overcome by the Brundtland Report (World Commission on Environment and Development: WCED, 1987) and the Second World Conservation Strategy document, *Caring for the Earth* (ICUN, 1991).

The most important publication to define the concept of sustainability was the Brundtland Report (WCED, 1987). This report popularized the idea of sustainable development as a three-legged stool relying equally on the economy, the environment, and social equity. More recently, the National Commission on the Environment defined sustainable development as

> "a strategy for improving the quality of life while preserving the environmental potential for the future, of living off interest rather than consuming natural capita. Sustainable development mandates that the present generation must not narrow the choices of future generations but must strive to expand them by passing on an environment and an accumulation of resources that will allow its children to live at least as well as, and preferably better than, people today. Sustainable development is premised on living within the Earth's means (National Commission on the Environment, 1993: 2)."

From these definitions, we can draw some important principles of sustainable development. Haughton and Hunter identified three basic principles of sustainable development. These include inter-generational equity, intra-generational equity, and transfrontier responsibility (Haughton and Hunter, 1994: 16). The principle of inter-generational equity is referred to as the principle of futurity, and means that one generation should hand on the earth to the next generation in at least as good a condition as it inherited it. The second principle is referred as the principle of social justice. In this principle, sustainability requires that control over distribution

of resources be more evenly exercised, taking account of basic needs and common aspirations. The principle of transfrontier responsibility states that sustainability in one locality, region, or country cannot be achieved at the expense of environmental conditions elsewhere. Even though there have been more attempts to identify the principles of sustainable development, these are considered as the basic principles that should underpin the process of sustainable development.

The concept of sustainability emphasizes not only the importance of the environment, but also the integration of the environment and development. As discussed above, the concept of sustainability addresses the importance of resource conservation and environmental protection for the future, and social and geographic equity. This concept suggests that sustainable development requires the systems approach, which takes into account the whole system of the planet as well as the sub-systems, such as the economy, the environment, and society.

2. SUSTAINABLE COMMUNITIES

1) The Concept of Sustainable Communities

Current development patterns of our society are not sustainable in the long term. In the planning field current land use patterns, which are simply characterized by the sprawling growth of urban and suburban areas with high auto dependency, do not acknowledge the limits to growth. Also, several case studies illustrated that there are tremendous costs associated with current growth patterns. As Beatley and Manning addresses, "many of these costs are economic, including the escalating expense of car ownership and the ongoing investment in highways and infrastructure. Other costs, while ultimately manifesting themselves in economic terms, are more difficult to measure: the expense of mitigating pollution, time lost through commuting, or a community's inability to attract tourism or business due to diminished natural and social amenities. (1997: 10)"

Sustainability is a useful concept to resolve problems associated with current development patterns, but achieving it will not be a simple task. The challenge of sustainable communities is to modify socio-economic systems as well as people's living patterns and behavior. As Beatley and Manning points out, the new agenda for sustainable communities takes "a more holistic and comprehensive view of planning and of communities; it is not simply concerned with the way a parcel of land is used, or whether certain infrastructure exists to accommodate growth" (Beatley and Manning, 1997: 19).

According to them, "the paradigm of sustainability views the community in its entirety: its environmental impact and how they can be minimized; how well its citizens are living and how programs and policies can be coordinated and implemented to enhance quality of life; its resource needed and how they are being met; and the environmental and social impacts of meeting those needs (Beatley and Manning, 1997: 19)." In this approach, a community must be seen as a system in which its parts, economic, natural, and social structures are directly or indirectly interrelated.

2) Assessment of Community's Sustainability

Some may still doubt what a sustainable community exactly looks like and whether it can be achievable. It may be necessary to acknowledge that the true sustainable community may never be achievable. The reason may come from the complexity of the concept of sustainability. The difficulty in achieving community's sustainability, however, does not necessarily mean that sustainability is a useless concept. It should be acknowledged that the sustainable community does not mean a fixed reality but refers to the process of human activities, or the progress toward the sustainable future. In this viewpoint, understanding whether the community is sustainable over time is the first step of sustainable community development. The remaining problem then is how we can measure sustainability at the various levels. Many local initiatives present that a set of sustainability indicators is a useful tool to measure local progress towards sustainability.

Development has been traditionally defined in terms of economic growth. The most

widely used indicator of social well-being was the gross national product (GNP), which is used to measure the total output of goods and services in the economy. However, GNP has many limitations as a measure of development. First, as Redclift points out, GNP measures productive activities in a very narrow way excluding the informal sector of the economy (1987: 16). It does not capture the benefit from informal economic activities such as household activities, voluntary activities, and other activities for people's own consumption because it is a measure of only formal sector activity. Another problem is that it includes expenditures that damage the environment and cannot capture social and economic costs resulting from environmental degradation and reduction of nonrenewable resources.

Sustainable community indicators are different from traditional economic, environmental, and social indicators because the concept of sustainability requires a more integrated view of the community. Maclaren described well the difference between sustainability and traditional indicators. According to Maclaren, sustainable community indicators have four basic characteristics, which can distinguish them from traditional indicators. First, "sustainability indicators are integrating in the sense that they attempt to portray linkages among economic, environmental, and social dimensions of sustainability". Second, "they must be forward-looking if they are to be used in measuring progress towards achieving intergenerational equity". Third, "they should be able to take into account the distribution of conditions (social, economic, environmental) within a population or across geographic regions". Finally, they should be "developed with input from multiple stakeholders in the community (Maclaren, 1996:

186–188)."

The main purpose of sustainability community indicators is to help people identify and quantify current conditions of the community and to point the way towards more sustainable conditions. Monitoring local sustainability indicator initiatives, the Community Environmental Council, Inc. further identified four main functions of sustainable community indicators: enabling a community to identify what it values and to prioritize those values; holding individuals and a larger group accountable for achieving the results they want; democracy building; and allowing people to measure what is important and make decisions based on those results (Zachary, 1995: 7).

III. SUSTAINABILITY INDICATOR INITIATIVES

This section discusses several sustainability indicator initiatives. As Pinfield addressed, recent examples to develop sustainability indicators are locally initiated either by community-based organizations or by local authorities in partnership with local communities (Pinfield, 1997: 62). According to Beatley and Manning, more than forty communities in the U.S. have developed some forms of sustainability indicators (Beatley and Manning, 1997: 203). More recently, a number of communities have begun to measure their progress towards sustainability. These examples include the cases of Sustainable Seattle and Jacksonville at the local level and the Oregon Benchmarks Program at the state level.

1. JACKSONVILLE'S QUALITY INDICATORS FOR PROGRESS

1) Background

Jacksonville's Quality Indicators have been known as one of leading efforts in measuring community sustainability at the local level. The indicator project was begun by a nonprofit citizen group, the Jacksonville Community Council Inc. (JCCI), with financial support from the Jacksonville Chamber of Commerce in 1985. The main purpose of the project was "to make citizens of Jacksonville, Florida[2], more aware of important aspects of quality of life, so that

[2] Jacksonville is situated in the northeastern part of the State of Florida, and its total population is about 800,000.

citizens can celebrate the positives as well as work on areas that need improvement (JCCI, 1999)." Since then, the JCCI has produced an annual report, *Quality of Life in Jacksonville: Indicators for Progress*, which presents trends in Jacksonville's quality of life.

The JCCI is a nonprofit citizen organization, which was established in 1975 as a result of the Jacksonville Community Planning Conference, so called the Amelia Island Conference (AIC). In 1974, 100 Jacksonville community leaders gathered on Amelia Island to discuss the problems facing Jacksonville and their potential solutions. After the conference, the participants created the JCCI, whose goal was to improve the quality of life in Jacksonville through informed citizen participation in public affairs. Since its creation, the JCCI has provided a variety of services, such as open dialogue, impartial research, and consensus building, to involve citizens in community development issues. The JCCI has, also, tried to develop community leadership for identifying and mediating community conflicts through providing workshops and training programs. Furthermore, the JCCI has studied a variety of issues, such as local governance finance, pollution, education, and teen pregnancy, and worked on these issues with other organizations.

In 1985, the JCCI began the quality of life project, which aimed at measuring annual improvement of the quality of life in Duval County[3]. The project developed quantitative indicators to monitor community performance in following nine areas: education, the economy,

[3] Duval County forms the Jacksonville metropolitan area with Baker County and Clay County. Its population was 673,000 according to the 1990 U.S. Census and accounts for more than 84% of the total population of the Jacksonville metropolitan area.

public safety, the natural environment, health, the social environment, government and politics, culture and recreation, and mobility. More specific objectives of the project include: producing an annual report card on community progress; highlighting community success stories and giving credit for work well done; identifying areas of decline or concern where community action is needed, educating residents about their community and the factors that citizens consider important to their quality of life; and encouraging citizens to take an active part in addressing community problems (Community Sustainability Resource Institute, 1998: 29).

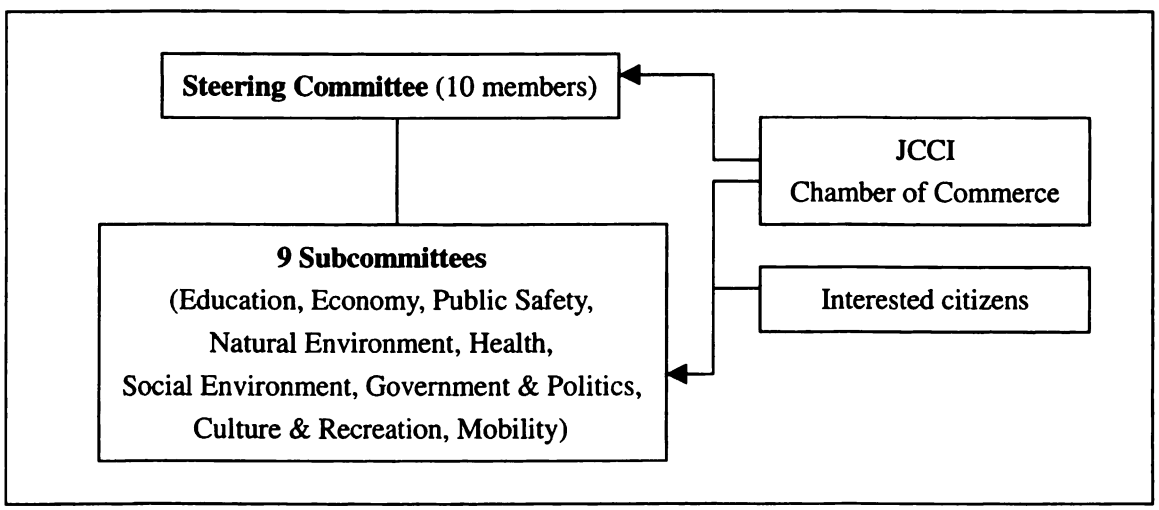
2) The Process of Indicator Development

Jacksonville's indicator project was initiated by the JCCI with financial support from the local Chamber of Commerce. In 1985, the JCCI in consultation with the Chamber created a 10-member steering committee, which was responsible for the indicator project. Members of the steering committee except a chair served as the chairs for nine subcommittees organized to develop indicators in nine specific areas. Participation on the subcommittees was open to members of the JCCI, the Chamber, and other interested citizens. More than 100 people participated in the subcommittees to develop indicators through the summer of 1985. Figure III-1 illustrates the organizational structure of the indicator project in 1985.

Each subcommittee met four times on a weekly or biweekly basis to develop specific indicators in a given topic area. The subcommittees incorporated citizens' opinion into the process of indicator development by using background information provided by the JCCI staff.

The information includes "responses to a questionnaire published in the local newspaper and suggestions sent in by community members in response to public interest announcements on the local television stations (Community Sustainability Resource Institute, 1998)." Each committee selected specific indicators within the specific topic area based on agreed upon criteria. Most data for indicators came from publicly available data sources, but several came from a random, telephone opinion survey. Data were collected for each indicator from the mid-1970 through 1984 or 1985. Beginning with the 1986 update, data for all indicators have been reported starting with 1983. Data on personal perceptions and behaviors were collected through the telephone survey. In 1985, the committee developed 75 indicators to assess community sustainability in the nine areas. Since then, the JCCI has produced the annual report that shows the result of indicator analysis.

Figure III-1 Organizational Structure for Indicator Development in 1985



In 1991, the JCCI organized new task forces involving over 140 volunteers to review the indicators. The task forces eliminated several indicators and added several other indicators based on the careful examination of the indicator performance. Others were revised for clarity. A new set of 71 measurable indicators[4] was established through the review process. The task forces set priorities among indicators to provide citizens a sense of relative importance. They also set targets for each indicator for the year 2000. Each target represented a goal set at a level felt to be both desirable and attainable by the year 2000. In addition, the task forces prioritized each of the nine topic areas, selecting a top-priority indicator in each area for community action during 1990s. Table III-1 describes the top-priority indicator in each area and targets for the indicator for the year 2000.

Table III-1. The Top-priority Indicators and Targets for the Year 2000

Area	Top-priority Indicator	89-90	97-98	Target for 2000
Education	Public high-school graduation rate	72.6%	69.2%	90%
Economy	Net job growth	7,402	18,896	Avg. 7,000 annually for 70,000 total
Public Safety	% of people surveyed who report feeling safe walking alone at night in their neighborhood	50%	62%	60%
Natural Environment	Number of days that the Air Quality Index is in the good range	260	284	325
Health	Resident infant deaths per 1,000 live births	11.8	9.8	8.1
Social Environment	% of people surveyed who report that they believe racism to be a local problem	51%	51%	26%
Government/ Politics	% of people surveyed who rate the quality of local-government leadership good or excellent	33%	67%	65%
Culture/ Recreation	City financial support per capita of arts organizations	$1.88	$2.17	$2.42
Mobility	% of working people surveyed who report commuting times of 25 minutes or less	69%	73%	70%

Source: Modified from Jacksonville Community Council Inc. 1999.

[4] See the Appendix1 for 71 indicators.

Each year, a citizen committee reviews and monitors the project giving different areas either gold stars to indicate progress or red stars to indicate digression. Its members are selected to represent a range of interests and expertise. Each incoming chair of the Jacksonville Chamber of Commerce serves as chair of the committee. The committee helps oversee the data collection process and provides comments and recommendations on the specific results. The JCCI is about to begin a rethinking process for indicators that will include consideration of the interrelationships among indicators as well as difference among neighborhoods with Jacksonville. After several years, the funding for the project shifted from the Chamber of Commerce to city government, and the City began to take certain indicators into account in its annual budgeting process.

3) Quality Indicators for Progress

The set of quality indicators for progress uses an issue-based framework[5] falling within nine different topic areas. According to Maclaren, the issue-based framework is organized around a listing of the sustainability issues (1996: 192). Table III-2 describes the nine areas and their scope. The issue-based framework is readily understandable and easy to construct, but has limitations of integrating the economic, environmental, and social dimensions of sustainability

[5] Maclaren identifies six general frameworks that can be used for developing sustainability indicators by reviewing current practices. These frameworks include domain-based frameworks, goal-based frameworks, sectoral frameworks, issue-based frameworks, causal frameworks, and combination frameworks (Maclaren, 1996). The issue framework identifies the key sustainability issues in the community and then develops indicators for each issue.

into each indicator. The lack of integrating is a main reason why the JCCI is currently undertaking the rethinking process to identify interrelationships among indicators.

Table III-2. The Quality of Life Model: Nine Areas and Their Scope

Areas	Scope
Education	The system of public education (kindergarten through 12th grade) and higher education, including adult education
Economy	The standard of living for local residents including individual economic well-being and community economic health
Public safety	The perception of personal safety and the quality of law enforcement, fire protection, and rescue services
Natural Environment	The earth's ecosystem including the quality and quantity of water and air, as well as visual aesthetics
Health	The fitness and health of residents and the local system of medical and health care
Social Environment	Collective or group concerns such as equality of opportunity, racial harmony, family life, human services, philanthropy, and volunteerism
Government/ Politics	Participation in public affairs, an informed citizenry, as well as leadership and performance in local government
Culture/ Recreation	The available supply and use of sports and entertainment events, the performing and visual arts, public recreation, and leisure activities
Mobility	Opportunities for and convenience of travel within Jacksonville and between Jacksonville and other locations

Sources: Modified from Jacksonville Community Council Inc. 1999.

Jacksonville's Quality Indicators were selected based on seven guidelines and three additional factors, which the citizen task forces developed to define good indicators. The seven guidelines are following.

- Validity: Does the indicator measure a factor or issue, which is directly related to the quality of life? If the indicator moves, would a diverse group of people agree on how the movement affects the quality of life-positively or negatively?
- Availability and timeliness: Is the indicator readily available on an annual basis? If it is no compiled in one place, can the JCCI staff readily collect and compile the data on an annual basis?

- Stability and reliability: Can we be confident that the statistic will be compiled using systematic and fair method and that that same method will be used each year?
- Understandability: Is the indicator simple enough to be interpreted by the general user and the public?
- Responsiveness: Does the indicator respond quickly and noticeably to real changes?
- Policy relevance: Does the indicator have relevance for public decisions? Is it possible to do anything about it?
- Representativeness: Do the indicators as a group cover important dimensions of the element?

Additional three factors taken into account include the following:

- Is the indicator leading, coincident, or lagging relative to the occurrence of a problem? Leading indicators are more valuable, since they allow a proactive, rather than a reactive response to a situation.
- Is it preferable to state the indicator as a rate or relative to population, rather than as an aggregate figure?
- If money is involved, it is preferable to state it in terms of constant dollars, eliminating the effect of inflation. (JCCI, 1999)

Jacksonville's Quality Indicators have several characteristics. First, they are forward-looking indicators. An annual report on Life in Jacksonville: Quality Indicators for Progress contains historical trends that provide indirect information about future sustainability. The forward-looking capabilities of trend indicators were enhanced when specific targets for each indicator for Year 2000 were established in 1991. Thus, Jacksonville's indicators function not only as measuring standards but also as target indicators. Currently, the JCCI considers

establishing the next set of targets for Year 2005. Second, some indicators take into account the distribution of socio-economic conditions within the region. For example, the gap between total and black unemployment and the percentage of elected officials who are people of color or female are some forms of distributional indicators. Third, Jacksonville's Quality Indicators were developed with input from a broad range of multiple stakeholders within the community. Initially, a large volunteer group of over 100 people worked to develop sustainability indicators in 1985. In 1991, a new committee of over 140 volunteers reviewed the performance of quality indicators. Each year, a citizen Quality of Life Committee, whose members are selected to represent a rage of stakeholders and expertise, assesses the community's progress and identifies the community actions needed to achieve the targets. These characteristics distinguish Jacksonville's Quality Indicators from other types of traditional indicators.

4) Implication of Jacksonville's Quality Indicators

The main purpose of Jacksonville's indicator project is to evaluate the quality of life in Jacksonville and signal where a particular course of action might be needed. According to Community Sustainability Resource Institute, Jacksonville's Quality of Life project has provided useful information on community performance in a number of key areas (1998: 27).

The project helps community members acknowledge the importance of sustainable development. The annual report on the project provides general citizens knowledge about their community. The report uses specific signs, "gold stars" and "red flags", to help public

understanding on community performance. Some indicators that show significant progress are given "gold stars". "Red flags" are given to other indicators that show current or emerging problems. Targets for each indicator for Year 2000 help local governments and other community groups set proactive policies and community activities.

Jacksonville's Quality Indicators have been widely used by a variety of groups in the community including local government agencies. According to the Institute for Sustainable Development, the City of Jacksonville began specifically to take certain indicators into account in its annual budgeting process (1999). Community Sustainability Resource Institute also introduces two successful applications of indicators:

> "A continuing decline in water quality indicators from 1983 to 1987 resulted in a citywide campaign and the establishment of a group, Stewards of the St. Johns River, which worked with local jurisdictions and private citizens to improve water quality; similarly, a decline in high school graduation rates from 1984 to 1989, led to the development of a very successful "Cities in School" program in which local citizens and businesses worked with school personnel, students, and parents to improve educational performance (1998: 28)."

Another important aspect of the project is the participatory approach, which has played a vital role for the project to be successful. The quality indicators developed by the JCCI have been supported by a volunteer-based development process. One reason for the large participation in the process is that the JCCI is a large, established organization with 500~600 members. Many members of the JCCI have voluntarily participated in the project. They have also tried to put citizens' voices in the project advertising the project in media and through

interest group contacts. The strong organizational structure of the JCCI and its partnerships with community groups, local business, government agencies and general citizens have led to diverse supports including technical and financial supports for the project. Jacksonville's ongoing effort in measuring the community's progress over time has not only made an impact on the local government's policy, but also improved citizen's awareness and understanding of the importance of sustainable development.

2. SUSTAINABLE SEATTLE INDICATORS

1) Background

The Sustainable Seattle Indicators Program, which was initiated in 1990, is one of the notable local sustainability indicator initiatives. Sustainable Seattle is the name of a volunteer civic forum comprised of a variety of stakeholders ranged from business, government, environmental groups, and other sectors of Seattle. The group published a report, entitled *1993 Indicators of Sustainable Community* after three years of work. The report examined 20 key indicators over the past two decades and each indicator assessed whether Seattle was moving towards or away from sustainability (Sustainable Seattle, 1993).

Sustainable Seattle was established as a product of a one-day civic forum held in November 1990 (Sustainable Seattle, 1999). At the forum sponsored by the Global Tomorrow Coalition and organized by a small local team, over 70 community leaders discussed about

definitions of sustainability and how citizens might develop their own ways to measure Seattle's long-term sustainability. After the forum, participants agreed to create a new volunteer civic network called Sustainable Seattle and decided to develop a set of sustainability indicators as its first task.

The Sustainable Seattle Indicators Program, initially funded by small grants from the US Environmental Protection Agency (EPA) and other organizations, is a multi-year effort to identify and develop specific indicators of sustainable community for the Seattle region. In 1993, Sustainable Seattle released 20 indicators in the following four areas: Environment, Population and Resources, Economy, and Culture and Society. An additional set of 20 indicators was released two years later. The target audiences of the sustainability indicator program were the media, decision-makers, the business community, and the general public. Sustainable Seattle is now using the indicators to influence public policy and planning and to implement programs that promote sustainable development.

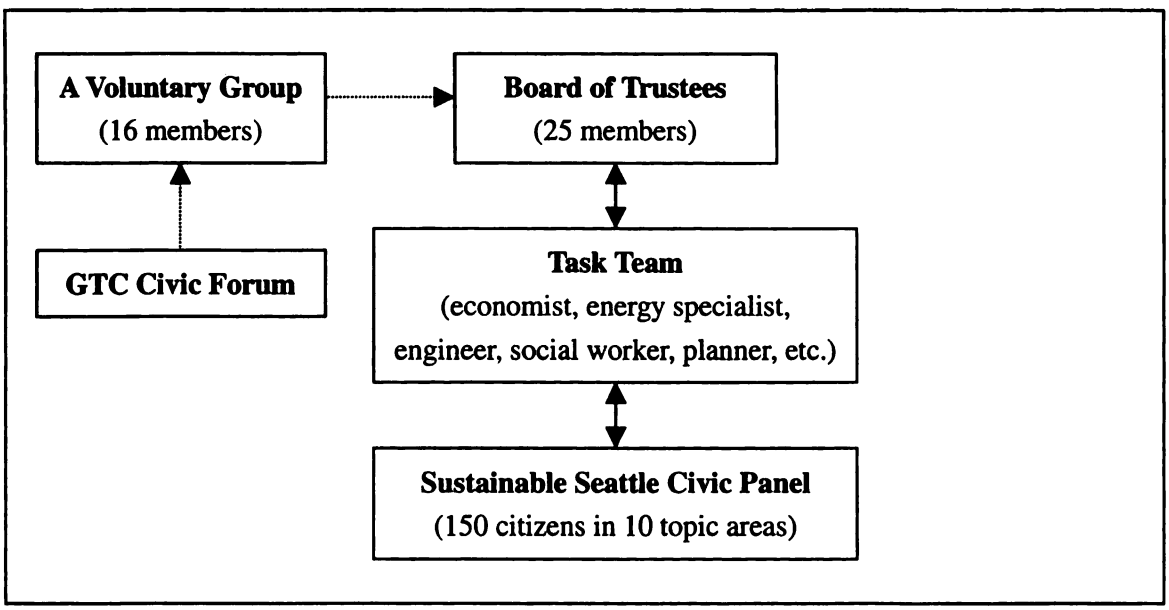
2) The Process of Indicator Development

Sustainable Seattle undertook several steps to develop a set of indicators (Zachary, 1995: 10). After the civic forum, a group of 16 people gathered together to define the concept of sustainability and provided an initial effort to develop sustainability indicators. Based on the group's effort, a group of 25 trustees that represent all sectors of the community was created to advise the indicator project. At the same time, an Indicators Task Team made up of individuals

with diverse backgrounds was created to research possible indicators. Acknowledging the need of a broad based community involvement in developing indicators, the team organized a civic panel, which consisted of individuals from a variety of sectors in the community, to provide the project legitimacy and to enhance the quality of indicators. Figure III-2 illustrates the organizational structure of the indicator project.

At the beginning, the voluntary group of 16 people defined the concept of sustainability as "long-term cultural, economic, and environmental health and vitality (Sustainable Seattle, 1993: 2)." Based on the definition, the Indicators Task Team developed 29 key indicators with a number of other secondary and provocative indicators in the beginning of 1992. The draft indicators were reviewed and refined throughout four participatory workshops of the civic panel (Sustainable Seattle, 1999: 2).

Figure III-2. Organizational Structure for Indicator Development



At the first meeting, civic panelists went through a visioning process, which aimed to envision one generation from now. After the meeting, participants reviewed the draft indicators individually and sent their opinions via a written feedback survey. After receiving the feedback from civic panelists, the task team prepared a set of revised key indicators, which would be discussed in the next meeting of the civic panel. At the second meeting, dividing into the ten topic groups, civic panelists worked to develop and refine a list of 10 indicators for each topic area. The topic areas were resource consumption, the education, the economy, transportation, the natural environment, health, the social environment, culture & recreation, population, and community participation. In the third workshop, participants worked for refining a set of indicators for each topic area and developed a set of 99 indicators based on criteria the task team had developed. In the fourth workshop, panelists discussed the linkages between key indicators and discussed strategies for the indicators to be used in various areas in the community.

After the successful completion of civic panels, the task team narrowed the draft list of 99 indicators to 40 indicators for research and publication based on consideration of measurability, data availability, and professional credibility. Some of these indicators were revised or changed in the process of research and data collection because of the lack of data availability and professional credibility. In 1993, Sustainable Seattle produced the first report, which contained an initial subset of 20 indicators. Two years later, the second report, which

contained all 40 key indicators[6], was published. Since then, Sustainable Seattle with voluntary group's input has continuously measured the community's performance updating the report. In 1998, the group published the Indicators of Sustainable Community Update. By the year 2001, the Millenium Update will be published.

3) Indicators of Sustainable Community

Sustainable Seattle sustainability indicators use a domain-based framework. According to Maclaren, the domain-based framework organizes indicators within the key dimensions of sustainability such as the environment, the economy, and society (1996: 190). The domain-based framework is most effective for ensuring coverage of the dimensions of sustainability. Sustainable Seattle indicators initially presented four dimensions of sustainability: Environment, Population and Resources, Economy, and Culture and Society. In the 1995 Update, the group revised the dimensions adding one more dimension, Youth and Education. However, most indicators in "population and resources" and "youth and education" can be classified under the heading of "environment" and "society" respectively. Table III-3 presents five dimensions, an indicator for each dimension.

Sustainable Seattle developed several principles to develop sustainability indicators. These principles could be used by other communities as an example of a method for indicator development. Table III-4 presents these principles.

---

[6] See Appendix 2 for the list of 40 indicators.

Table III-3. Indicators for the Key Dimensions, and their Descriptions and Linkages

Dimension	Indicator	Description
Environment	Wild Salmon	Wild Salmon are an important economic resource and fundamental environmental indicator, as well as a cultural symbol to those living in the Northwest.
Population & Resources	Vehicle Miles and Fuel Consumption	An increase in the number of miles traveled reflects growing dependence upon non-renewable natural resources, an increased amount of time allocated to a stressful activity, and a declining ability to work, live and participation in a neighborhood or community. Gasoline-fueled vehicle use creates air and water pollution as well as traffic congestion.
Economy	Children Living in Poverty	Children living in poverty are defined by the Federal Government as those living in families with income below the poverty line.
Youth & Education	Youth Involvement in Community Service	Youth involvement in community service builds the foundation for a lifetime of community activity, engaging the idealistic impulses of youth to make positive contributions to their communities' civic and social life.
Health & Community	Voter Participation	The level of voter turnout reflects the commitment that people have to the political system and the extent to which all segments of society participate in key decision-making. It is also a measure of citizen confidence in social and political institutions.

Source: Modified from Sustainable Seattle. 1995.

Table III-4. Principles of Indicator Development

Principle	Discussion
Use existing data	Existing data is useful because it can provide immediate information on methods to quantify sustainability indicators. However, existing data may not have been gathered or presented in a manner useful for sustainability issues.
Reevaluate underlying assumption	Existing data carries assumption that may be contrary to sustainability. Understanding these assumptions and the way they influence data collection can reveal alternative methods to define and quantify sustainability indicators.
Integrate long-term focus with short-term change	Identify indicators that are sensitive enough to show change within a one-year period so that progress can be easily monitored, but also pursue indicators that require long-term data gathering and monitoring.
Relate indicators to the individual	Identify indicators that can be measured on a per-capita basis, can bring large numbers down to earth, are easy for individuals to identify with, and can be extrapolated out to the entire population.
Identify the direction of sustainability	Without a model of sustainable society, predicting a particular level of sustainability is impossible. Avoid setting targets and instead identify each indicator's direction of change-either moving toward or away from sustainability.
Present indicators as a whole system	Indicators presented in isolation fail to depict the health of the whole community.
Determine the linkage	Identifying and evaluating the links between indicators is key to presenting a broad measure of community sustainability. Linkages show that a change in one indicator is usually accompanied by changes in others.

Source: Sustainable Seattle. 1993.

The group also developed four criteria to select good sustainability indicators. The four criteria are following.

- Reflectiveness: Indicators should reflect something basic and fundamental to the long-term economic, social, or environmental health of a community over generations.
- Comprehensiveness: Indicators can be understood and accepted by the community as a valid sign of sustainability or symptom of distress.
- Measurability: Indicators should be statistically and practically measurable in a geographic area, preferably comparable to other communities, and yield valid data.
- Attractiveness to media: Indicators should have interest and appeal for use by local media in monitoring, reporting and analyzing general trends toward or away from sustainable community practices.

The principles of indicator development present several characteristics of Sustainable Seattle indicators. First, indicators show the links between two or more dimensions of sustainability. For example, "wild salmon runs through local streams" is relevant both environmental and economic sustainability of the community. The health of salmon runs is linked to the economy, tourism, recreation, and food production as well as to the environment, especially, quality of water. Second, Sustainable Seattle indicators are forward-looking indicators even though the group did not set specific targets or goals for each indicator. The indicator report identifies each indicator's direction of change and shows the direction is either moving toward or away from sustainability. Currently, the group is attempting to set specific targets for each indicator. Third, Sustainable Seattle indicators take into account the distribution of socio-economic conditions within the community. For example, the housing affordability

ratio, children living in poverty, and ethnic diversity of teachers reflect the distribution of socio-economic conditions. Finally, as the process of indicator development shows, Sustainable Seattle indicators were developed with input from a variety of sectors in the community. Initially, over 200 people from a variety of sectors participated in developing a set of 40 indicators for two years. These indicators have been reviewed and measured with input from a voluntary civic group over time. These characteristics distinguish Sustainable Seattle indicators from other types of traditional indicators.

4) Implication of Sustainable Seattle's Indicators of Sustainable Community

The main purpose of Sustainable Seattle's indicators program is to track the community's progress towards the goals of sustainable living and development and to facilitate local actions that make the community healthy and sustainable over time. The program also provides an open forum for cross-community dialogue around critical issues of sustainability by involving citizens in its process and by informing necessary information to the community.

Sustainable Seattle indicators have been widely used as basic information, which can guide decision makers and general citizens in making the community sustainable over time. Although the indicators have not been officially adopted by the City, they enhanced policy maker's awareness of sustainability and influenced the City's policy. The information was used, by the City's Planning Department, for updating its general plan, *Toward a Sustainable Seattle* (Zachary, 1995: 15). The indicators program also facilitated the government's effort in

developing its own set of sustainability indicators. In 1999, the group completed an indicator development project for a coalition of local governments, agencies, and other organizations in King County.

Sustainable Seattle's effort in developing sustainability indicators shows that broad-based community's participation is essential in achieving sustainable community over time. With hundreds of volunteers involved, the indicator program has stimulated dialogue throughout and the vision for the entire community. The broad participation has provided the project legitimacy and made it possible to enhance the community's capacity to reach desired goals of the community.

The group also identifies several key messages from the indicators program and these messages show the meanings and values of the program. The key messages are following:

- Presenting economic, environmental, and social indicators together is an effective way to visualize and understand the interdependence and links between these three areas;
- Collaboration between citizen's, government, and business interests in defining indicators build awareness of common values;
- Patient, effective facilitation of this process can develop indicators that exemplify the process of democratic governance; and
- The idea of people taking charge of their own measurements of progress is a powerful and far-reaching innovation that can bring about a new sense of civic engagement (Sustainable Seattle, 1999).

A set of sustainability indicators developed and supported by the volunteer-based

process is one of leading efforts to measure community's economic, environmental, and social sustainability. Sustainable Seattle sustainability indicators became seen as a model and have been adopted by a number of communities around the world (Sustainable Seattle, 1999). In 1994, a number of communities around the world from Europe to Taiwan expressed their interest in adapting the indicator project. The project was presented to the U.S. President's Council on Sustainable Development, the Global Forum in Manchester, England, and other international forums. Sustainable Seattle was recently recognized by the United Nations Centre for Human Settlement with an Excellence in Indicators Best Performance by the Community Sector.

3. OREGON BENCHMARKS

1) Background

Oregon Benchmarks[7] Program is a well-known example of a state level initiative in developing indicators. In 1989, the State of Oregon developed a vision plan for the future, called *Oregon Shines*, involving more than 150 business, government, and community leaders. The state legislature established the Oregon Progress Board, which is required to report to the legislature on progress towards achieving goals of *Oregon Shines*. In 1991, the board initially developed 259 benchmarks and they were enacted into law.

The statewide strategic plan, *Oregon Shines*, was developed in the late 1980s in

[7] Benchmarks can be defined as something that serves as standards by which others may be measured or judged.

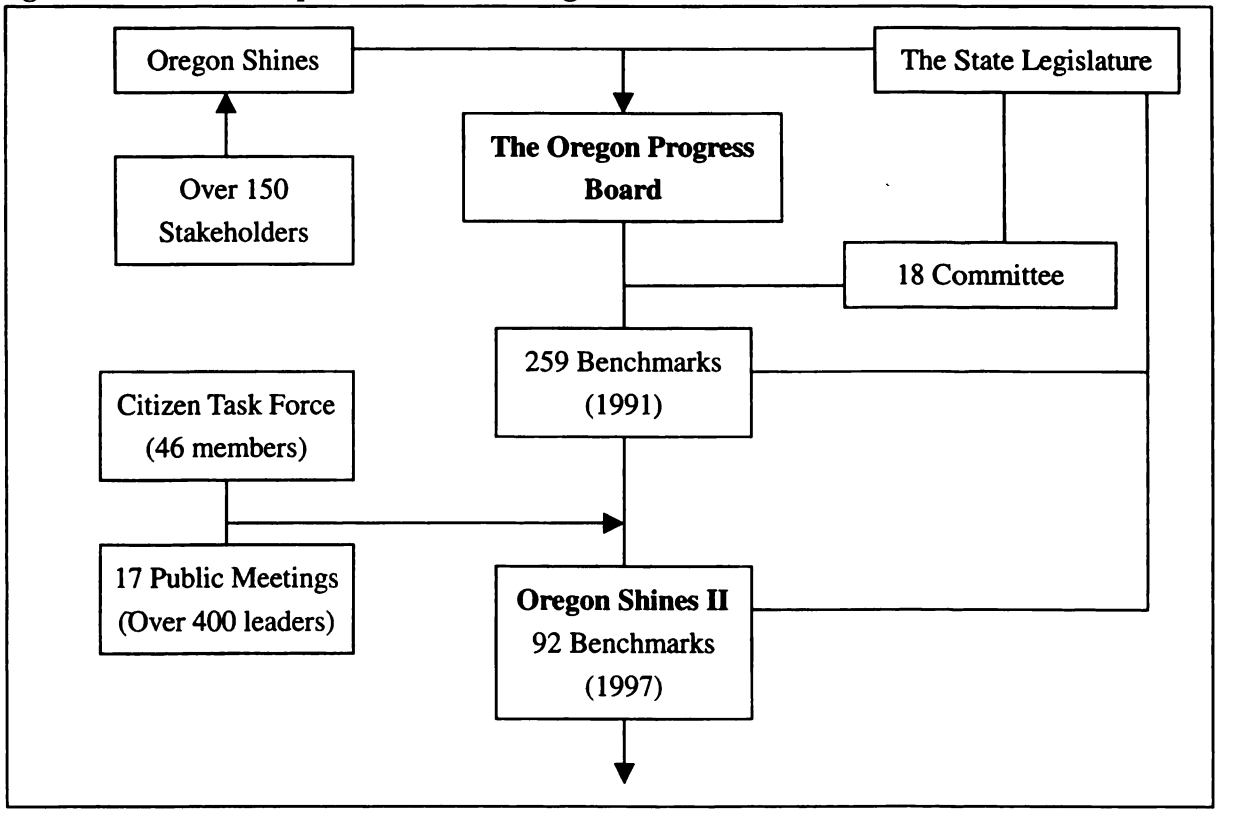
response to the socio-economic situation of Oregon. In the early 1980s, Oregon's timber-dependent economy experienced a bust when high interest rates led to a sharp drop in housing construction across the nation (The Oregon Progress Board, 1997: 13). The State lost thousands of jobs in the timber industry and average incomes fell far below the national average. Between 1979 and 1982, the State lost more than 25,000 jobs in the forest products industry along with many other jobs that relied on them (The Oregon Progress Board, 1997: 29). Jobs had been gradually created throughout the mid-1980s, but average incomes were still below the national average. In response to this situation, the State created the revitalization plan, *Oregon Shines*, which contained three statewide goals, a superior workforce, an attractive quality of life, and an international frame of mind.

With its goals and strategies, *Oregon Shines* recommended the creation of a board, which can "serve as the long-term caretaker of Oregon's strategic vision, identify key activities that need to be undertaken, and then measure progress over the next several decades (The Oregon Progress Board, 1997: 14)." In response to the recommendation, the State legislature established the Oregon Progress Board in 1989 as an independent state planning and oversight agency. The board, chaired by the governor, is made up of citizen leaders. Since its establishment, the Board has sponsored public dialogues, developed indicators to measure progress toward the State's goal, and identified strategies to achieve these goals.

2) The Process of Indicator Development

The Oregon Progress Board has developed benchmarks in collaboration with other agencies and general citizens. An initial set of 259 benchmarks was developed with input from various committees of the State Legislature and legally adopted in 1991. In 1996, a citizen Task Force took charged of assessing the State's progress towards the original goals of *Oregon Shines* and updating the original vision. The Task Force and the Progress Board introduced a revision of the original strategic plan, *Oregon Shines II*, with a revised set of 92 benchmarks in collaboration with other agencies and community leaders. Figure III-3 presents the development process of Oregon Benchmarks.

Figure III-3. The Development Process of Oregon Benchmarks



The Progress Board articulated the State's goals, developed with input from over 150 community leaders, as a set of 259 measurable indicators in a coherent plan in 1991. During 1990, the Board defined the scope of issues that indicators would cover, and developed a draft set of benchmarks. The draft list of benchmarks was reviewed by other community members. In 1991, 18 committees of the State Legislature reviewed the draft list of benchmarks and made several modifications. The modified set of benchmarks was unanimously adopted by the State Legislature as a state policy. Every other year since then, the Board has issued an Oregon Benchmarks report, measuring the State's performance towards the State's goals.

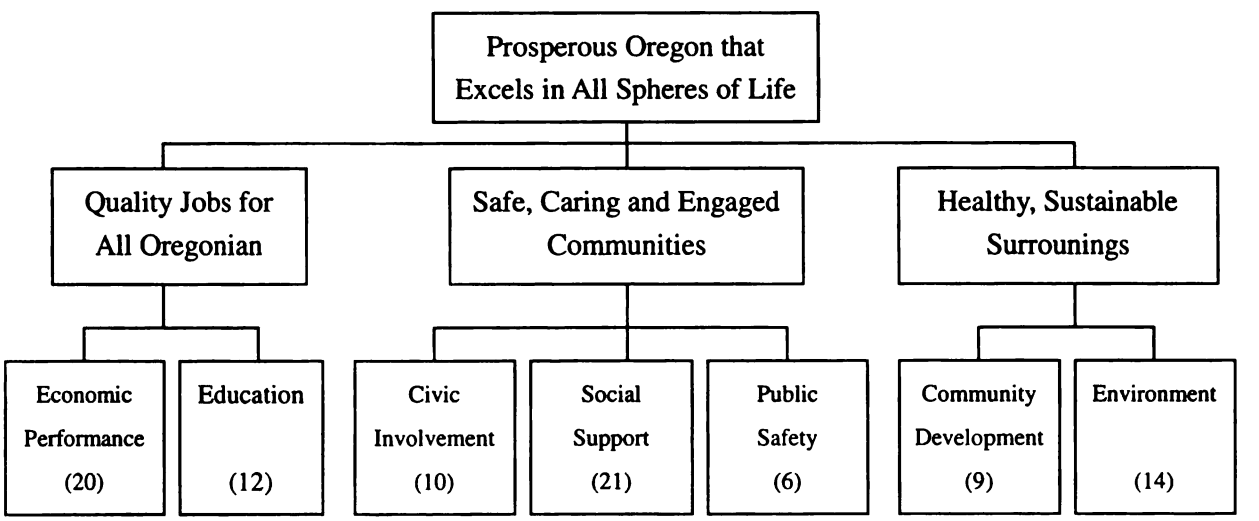
The original set of benchmarks was revised with extensive community's input in 1997. In 1996, the 46-member citizen Task Force was established to assess the performance of benchmarks and to update the original vision. The Task Force initially worked to examine the benchmarks with experts and researchers at the University of Oregon. The Task Force then held meetings with community leaders to hear their aspirations for the State's future. The Task Force heard a number of issues and concerns for the future from over 400 business and community leaders in 10 meetings. The Task Force held seven other public meetings with state agencies and other interested groups and citizens to evaluate the effectiveness of the original set of benchmarks. These public meetings were held based on seven topics of the Oregon Benchmark system: Public Safety, Independence & Productivity, Education, Healthy Environment, Business Development, Community Development, and Governance. Based on the recommendations made by the meetings, a number of benchmarks were either revised or discarded and a new set of

92[8] revised benchmarks was introduced in 1997.

3) Oregon Benchmarks

Oregon Benchmarks use a combination framework, which brings together a goal-based framework[9] and a domain-based framework. Oregon Benchmarks define the State's strategic goals as measurable outcomes, with targets for improvement. The benchmarks are divided into three categories that represent three goals of *Oregon Shines II*: Quality Jobs for All Oregonians, Safe, Caring and Engaged Communities, and Healthy, Sustainable Surroundings. These categories are consistent with three dimensions of sustainability: the economy, society, and the environment respectively. Figure III-4 presents the structure of Oregon Benchmarks.

Figure III-4. Oregon Shines Vision, Goals and Benchmark Topic Areas



Source: Modified from The Oregon Progress Board (1997: 71)

---

[8] See Appendix 3 for 20 key benchmarks.

[9] Goal-based framework: This framework first identifies sustainability goals for the community and then creates one or more indicators for each goal.

The original set of Oregon Benchmarks measures the State's performance towards the statewide goals. Some benchmarks measure progress toward sustainable future, such as improving the readiness of young children for school, improving air quality, and raising per capita income. Some benchmarks measure aspects of life that should not be deteriorated, such as housing affordability and access to outdoor recreational opportunities. Some benchmarks measure problems that should be reduced, such as the crime rate and the teenage pregnancy rate. Other benchmarks measure the distribution of the State's success.

In 1997, the citizen Task Force created a revised vision for *Oregon Shines* II: "a vital, prosperous Oregon that excels in all spheres of life (The Oregon Progress Board, 1997: 27)." The Task Force reviewed the original goals for *Oregon Shines*, and adopted three revised goals: quality jobs for all Oregonians, safe, caring and engaged communities, and healthy, sustainable surroundings. The Task Force also recommended several guidelines in evaluating the effectiveness of Oregon Benchmarks. These guidelines include:

- Appropriate number of benchmarks: The number of benchmarks should be reduced from 259 to approximately 100,
- Linkages between Benchmarks: The Board should develop a system that shows how benchmarks are related,
- Measurability: The Board should only adopt benchmarks that can, and will be measured,
- Locally available data: The Board should develop accurate, understandable and timely local data for all benchmarks by 2002,
- Leadership responsibility: The Oregon Legislature should encourage state agencies to

play a leadership role in achieving the benchmarks, and

- The Board should facilitate the development of strategies that impact the benchmarks (The Oregon progress Board, 1997: 69-71).

Based on these recommendations, the Board developed a new set of 92 benchmarks. Table III-5 presents some examples of Oregon Benchmarks[10] and their rationales.

Table III-5. Examples of Oregon Benchmarks

Goals	Benchmarks	Rationales
Quality Jobs for All Oregonians	% of Oregonians employed outside the Willamette Valley and the Portland tri-county area	This benchmark underscores the importance of maintaining the geographic diversity of the state's economy and employment.
Self, caring and Engaged Communities	% of Oregonians who volunteer at least 50 hours of their time per year to civic, community, or nonprofit activities	This benchmarks is intended to measure the extent to which Oregonians seek to improve the quality of life in their communities by actively participating in civic, community, and nonprofit activities.
Healthy, Sustainable Surroundings	% of miles of limited-access highways in Oregon urban areas that are heavily congested during peak hours	Congestion exacts a toll in terms of driver frustration, lost work time, more air pollution, more gasoline use, and higher cost of goods and services.

Source: The Oregon Progress Board. 1997.

Oregon Benchmarks have several characteristics, which can distinguish them from other traditional indicators. First, Oregon Benchmarks are forward-looking. The Benchmarks measure trends for each benchmark and set specific targets for the benchmark for the future. The Progress Board set performance targets for Benchmarks for the years 1995, 2000, and 2010 in consultation with citizen, experts, and decision-makers. Second, Oregon Benchmarks attempt to show links between the economic, social, and environmental dimensions of sustainability. For

[10] For a set of key Benchmarks in *Oregon Shines*, see Appendix 3.

example, the geographic diversity of the economy and employment links the economic conditions of the State with the social dimension. The Board is further trying to establish a system that shows how benchmarks are related to each other. Third, Oregon Benchmarks take into account the distribution of the economic, social, and environmental conditions within a population and across geographic regions. For example, the geographic diversity of the State's economy and employment deals with the geographic distribution of the economy. Finally, Oregon Benchmarks have been developed with input from a number of community leaders and experts in the process. The statewide goals established by the community leaders and interested citizens played a very important role in benchmark development. Meetings with community leaders and consultation with experts made it possible to develop more influential, valid, and reliable indicators.

4) Implication of Oregon Benchmarks

Oregon Benchmarks were created as a means of monitoring progress towards the goals set forth in *Oregon Shines*, a citizen-based strategic plan. Oregon Benchmarks have not only provided information on the State's performance towards the sustainable future, but also played as reference guide for the State's policy and individual or collective activities. The benchmarks have been widely used by the State's agencies, local governments, and community groups.

The State Legislature has used Benchmarks to support policy changes since legal adoption of the Benchmarks as a State policy. One of notable legislation was "State Agency

Performance Measurement and Budget Policy (1993 Senate Bill 1130)", which applied benchmark planning to agency performance and budget policy for the State (The Progress Board, 1999: 4). The bill requires State agencies to develop their missions, goals, and objectives, identify Benchmarks applicable to their missions, and develop performance measures to track efficiency and effectiveness of their programs and activities. Under the State policy, over 30 State agencies use Benchmarks in strategic planning, budgeting, and/ or internal management systems.

Oregon Benchmarks facilitated local communities to use them or develop their own benchmarks. Some counties have used Benchmarks in their overall strategic planning process. Several local governments, such as Multnomah County, Wasco County, Eugence City, and Dalles City, developed their own indicators similar to Benchmarks and used them in their strategic planning process (The Oregon Progress Board, 1999: 6-7). Oregon Benchmarks has been also used by a number of community groups throughout the State. For example, Rural Development Initiatives, Inc., a nonprofit corporation, strongly encourages its client communities to use Benchmarks in their planning. The First Local Progress Board in Baker County used Benchmarks to articulate its economic development strategies. Besides, a number of communities initiated community-based efforts to identify and address policy issues through Benchmarks.

Another important lesson derived from Oregon Benchmarks is the establishment of an organizational structure, the Oregon Progress Board, which is responsible for implementing the

State's strategic plan, *Oregon Shines*, and undertaking the ongoing assessment of the State's performance. It is necessary to build the organizational capacity or structure for repeated measurement to determine trends over time and results-oriented management. The Progress Board, established by the State Legislature, has played as a vehicle to develop Benchmarks, ongoing measurement, and adjusting goals and Benchmarks over time.

The Progress Board, consisting of civic leaders as well as government officials, also helps stakeholders and general citizens involve in the process of setting the statewide vision and developing measurable standards. The need to involve all key stakeholders in decision-making process is fundamental to sustainable development. Even though the Benchmark program was initiated by the State government, the participatory approach of the program brought about a new sense of civic engagement and increased the transparency of decision-making.

4. Comparison of Three Cases

Three cases in Jacksonville, Seattle, and Oregon display both similarities and differences in the indicator development process. This subsection compares three cases and identifies the key features of each case. Table III-6 summarizes the key differences among three cases.

First, the indicator projects of Seattle and Jacksonville were initiated by community-based organizations while the State government initiated the Oregon Benchmarks Program. Despite the difference, all three cases developed new organizational structures, which are

responsible for indicator development. Jacksonville and Seattle created new organizational structures at the beginning stage of indicator development. The new organizational structures were crated in a manner that allowed for meaningful communities' participation. The steering committee in Jacksonville was created with nine subcommittees, in which more than 100 people participated to develop sustainability indicators. The Indicators Task Team in Seattle organized a civic panel, which consists of 150 citizens from a variety of sectors in the community. Oregon established the Oregon Progress Board as a State agency, which is responsible for development of Benchmarks and the ongoing assessment of the assessment. The Progress Board established the citizen Task Force to assess the performance of Benchmarks and to update them. The new organizational structures function as vehicles to create organizational partnerships or nexus in the community, and thus to develop community capacity for the ongoing assessment of the communities' progress.

Table III-6. Comparison of Three Cases

Factors	Jacksonville	Seattle	Oregon
Leading Organization	Nonprofit citizen group	A civic forum	State government
New organizational structure for the project	The steering committee	The Indicators Task Team	The Oregon Progress Board
Funding sources	Chamber of Commerce and local government	EPA grant & sale of the reports	State government
Framework	Issue-based	Domain-based	Combination
Number of indicators	75 (71)	40	259 (92)
Time Frame for assessment	1 year	Mostly 3 years	2 years
Specific goals & objectives	Yes	No/ in process	Yes
Linkages among indicators	Weak/ In process	Yes	Weak/ In process
Community participation	Yes (subcommittees)	Yes (civic panel)	Yes (citizen task force & public meeting)
Data sources	Existing data & survey	Existing data	Existing data & survey
Link to the strategic plan	No/ Community agenda	No	Yes (*Oregon Shines*)
Key assessment	Broad-based community participation	Broad-based community participation	Legal adoption of the Benchmarks

Another important factor of community capacity is financial resources available for the ongoing assessment of community's sustainability. Jacksonville and Oregon have received strong financial support for the indicator projects from the public or private agencies. The financial capacity played a vital role to assess communities' performance on the regular basis, annually or biannually. On the other hand, Sustainable Seattle hasn't much relied on the external funding sources. The Sustainable Seattle Indicator program was initially funded by small grants from the EPA and other organizations, but mostly relied on the funding from sale of the sustainability indicators reports for the continuous management of the project (Sustainable Seattle, 1999). The lack of financial capacity might have hindered the group from the more intensive assessment of the community's sustainability.

There are differences in both the number of indicators and the ways that indicators are organized. While Sustainable Seattle developed a set of 40 indicators, Oregon initially developed 259 Benchmarks. Even though there is no ideal number of indicators, Bossel suggests that the number of indicators should be as small as possible, for the intended audience to efficiently absorb (1999: 7). The three cases also use different frameworks for indicator development. The case studies show that the domain-based framework, which was used by Sustainable Seattle, is more useful to express the linkages among the dimensions of sustainability.

The indicator's linkage to the goals and objectives of the community is also an important factor in comparison of the cases. Even though all three cases are linked to the vision and goals of the community, Sustainable Seattle indicators are not directly linked to the specific

objectives or targets. In the Seattle case, indicators intended to provide a snapshot of the concept of sustainability rather than assign objectives or targets for indicators (Zachary, 1995: 13). On the other hand, in the two cases of Jacksonville and Oregon, indicators are directly linked to their objectives or targets. The case studies present that clearly defined objectives and targets for each indicator are effective to identify policies and strategies necessary for the sustainable future of the community.

Finally, the study outlines key features of the three indicator projects. The key feature of Jacksonville and Seattle cases is the broad-based community participation in the process of indicator development. According to the Community Sustainability Resource Institution, the most important lesson of Jacksonville's case is that tenacious and active community participation, partnership between local community and state organization, and assistance from local and national grassroots organizations are important for making the community sustainable over time (1998: 30). Also, as the Institute for Sustainable Development (1999) and Zachary (1995: 30) point out, intense public involvement of the Sustainable Seattle project is a key factor in developing the tools for achieving community sustainability. The broad-based community participation can make it possible to develop a sense of responsibility and legitimacy of the project. On the other hand, the key feature of the Oregon case is the legal adoption of Oregon Benchmarks as a State policy. Oregon incorporated the Benchmarks into the State's strategic plan, *Oregon Shines*, to guide the State's policy and strategies towards progress. In summary, these two key features of the cases, the broad-based community involvement and incorporation

of sustainability indicators into the strategic plan, will be the most important themes of indicator development initiatives.

VI. A NEW PLANNING FRAMEWORK FOR COMMUNITY DEVELOPMENT

A set of sustainability indicators is a very useful tool for measuring community's progress towards sustainable development. Sustainability indicators can build community consensus on the community's future and lead to individual or collective action to achieve community sustainability. The three initiatives in Jacksonville, Seattle, and Oregon clearly present the role that indicators can play in the development and implementation of policies and planning decisions at the various levels. This section will articulate several principles of indicator development from these initiatives and their application to the planning process, especially, at the community level.

1. PRINCIPLES OF INDICATOR DEVELOPMENT

Sustainability indicators incorporate economic, environmental, social dimensions of the community in evaluating the community's performance towards sustainability. Sustainability indicators require the holistic view of the community and a complicated process in which all key stakeholders involve over time. The holistic approach and the complicated process require more sophisticated guidelines for indicator development.

As cases studies illustrates, three cases in Jacksonville, Seattle, and Oregon developed their own guidelines or principles of indicator development. Jacksonville established seven

guidelines and three additional factors[11] to define good sustainability indicators. Sustainable Seattle developed seven principles and four criteria[12] for indicator development. Oregon recommended six guidelines[13] in evaluating the effectiveness of Oregon Benchmarks. Besides these cases, Hart also identifies eight characteristics to define effective sustainability indicators. These characteristics include:

- Address carrying capacity of community capital;
- Relevant to the concept of sustainability;
- Understandable to the community at large;
- Developed and accepted by the people in the community;
- Link economy, society, and environment;
- Focus on long range view;
- Advance local sustainability, but not at the expense of others; and
- Based on reliable and timely data (Hart, 1998).

In addition, the International Institute for Sustainable Development suggests a complete set of ten principles for indicator development, called the Bellagio Principles for Assessment[14] (1997: 2-4).

Based on the review of those guidelines and principles, this study articulates six basic principles of indicator development. These principles include:

- Systems Approach: Assessment of community's sustainability should take a systems approach, in which the whole system of the community as well as its sub-systems, the

[11] See p. 20-21 for these guidelines and additional factors for indicator development.
[12] See p. 29-30 for these principles and criteria.
[13] See p. 38-39 for these guidelines.
[14] See Appendix 4 for these principles.

economy, the environment, and society, is taken into account.

- Linkages to the vision and goals of the community: Sustainability indicators should be linked to the vision and goals of the community to ensure that a desirable direction for change and policies and activities for the direction can be identified.
- Redistribution of Community Resources: Sustainability indicators should measure redistribution of community resources to ensure that development can give benefits to all members of the community.
- Broad-Based Participation: Indicator development should include all key stakeholders in the process to ensure that indicators represent the vision and goals of the entire community.
- Understandability and Effective Communication: Indicators should be clearly defined and easy to understand and require effective means to communicate with all community members.
- Community Capacity for Ongoing Assessment: Community's sustainability should be assessed over time and thus the process requires the organizational and financial capacity for the ongoing assessment.

1) Systems Approach

Traditionally, social indicators did not measure the dynamics and interrelationships between the sub-systems of the community, such as the economy, the environment, and society. Those indicators measure the community's well being in only one dimension of the community and often encourage decisions that improve one area at the expense of another. On the other hand, as cases in Jacksonville, Seattle, and Oregon show, sustainability indicators attempt to measure progress in all dimensions of the community. In those cases, many indicators are multi-

dimensional themselves, and, otherwise, show links between the different dimensions of the community.

Sustainable development requires the systems approach, in which the wholeness of the community as well as its sub-systems is taken into account. The systems approach is a way of thinking and describing an issue or problem in respect to the entity where the issue or problem is grounded. The concept of sustainability suggests that economic, social, and environmental dimensions of the community are all linked to each other, and interrelated in the given community. Sustainable development is possible only if sub-systems as well as the whole system are sustainable. Therefore, it is necessary to develop appropriate indicators that can provide information about sustainability of each sub-system as well as the whole system. Those indicators would be holistic themselves, showing links between the sub-systems.

2) Linkages to the Vision and Goals of the Community

Sustainability indicators should be linked to the vision and goals of the community to ensure that a desirable direction for change and policies and activities for the direction can be identified. All three cases in Jacksonville, Seattle, and Oregon linked indicators to visions and goals that they established. As three cases show, clearly defined visions and goals provide information about what to be measured for the community's progress. Assessment of the community's change or trends based on visions and goals of the community makes it possible to judge whether the community is heading to the desirable future the community identified. It can

also provide information about what kind of activities has to be taken for the desirable future.

The vision and goals reflect the community's consensus on how the community should appear at some specified future date as a sustainable community. In any case, the establishment of the vision and goals of the community is the first step of indicator development. This step requires broad-based community involvement to make sure that the vision and goals reflect the interests of the entire community. All key stakeholder groups should be identified and invited in the process of the establishment of the community's vision and goals. The participatory process can make the vision and goals legitimate and supportable by the community.

3) Redistribution of Community Resources

Sustainability indicators should measure the redistribution of community resources within a population or across geographic areas to ensure that development can give benefits to all members of the community and other communities. The community would not be sustainable if some groups of the community were continuously marginalized while others were getting better off. Indicator sets in all three cases, Jacksonville, Seattle, and Oregon, measured not only the communities' prosperity, but also the distribution of the prosperity. As the cases present, disaggregating certain information by factors such as age, gender, ethnicity, class, and location would be helpful to measure the distribution of the community's progress.

Another important aspect of the distribution is to distinguish between local and non-local sources of costs of generating benefits. If the community generated benefits from the costs

borne by other communities, the global community would not be sustainable in the long-term. Sustainability indicators should not measure the community's progress at the expense of other communities. Therefore, sustainability indicators should possibly measure local and nonlocal sources of environmental degradation to ensure geographic equity of development.

4) Broad-Based Participation

Indicator development should include all key stakeholders in the process to ensure that indicators represent the vision and goals of the entire community. Based on the experiences in all three cases, Jacksonville, Seattle, and Oregon, it is evident that community participation can be a key factor in developing the tools for moving towards a more sustainable community. In all cases, a number of stakeholders and interested citizens have participated in indicator development.

Traditionally, the assessment of social conditions heavily relied on experts and did not involve all stakeholders in the decision making process. This tendency resulted in the public's distrust in information generated by such a process and failed in bringing about the community's collective actions to make the community better. This can be overcome by the democratic process of indicator development, in which all key stakeholder groups are identified and invited. The broad-based community participation can make the information generated by indicator exercises legitimate. The democratic process also makes all community members accountable for the decisions they made. This process may require an excellent facilitation skill and patience

in the complicated nature of community participation.

5) Understandability and Effective Communication

Indicators should be clearly defined and easy to understand and require effective means to communicate with all community members. Traditionally, social or environmental indicators have been too technical or complicated for the general public to understand. The technical difficulty associated with traditional indicators has limited for the public to use indicators in their decision-making. Sustainable development requires the community's participation in the process, so indicators should be understandable for all community members. For example, wild salmon in Sustainable Seattle Indicators can provide enough information on water quality as well as the economic condition of the community to those who does not have scientific knowledge associated with the issues.

As indicators need to be understood by the general citizens, it is also important to develop effective means to present information generated by the indicator exercise to the general citizens. For example, the Sustainable Seattle report card, which shows whether the community is moving towards or away from sustainability, can be a very effective communication tool. In the Jacksonville's case, the annual report uses specific signs, "gold stars" and "red flags", to help public understanding on community performance. A short summary paper can be also helpful to communicate information with the community members.

6) Community Capacity for Ongoing Assessment

Community's sustainability should be assessed over time and thus the process requires the organizational and financial capacity for the ongoing assessment. The concept of sustainability suggests that the sustainable community is not a fixed reality but requires continuous efforts to make the community sustainable over time. So, it is essential to assess the community's performance periodically to know whether the community is heading on the right direction and to take actions associated with existing or emerging problems.

All three cases of Jacksonville, Seattle, and Oregon assess the community's sustainability annually or biannually. This process requires the community capacity to ensure that the community's sustainability can be measured over time. The community capacity refers to community's ability to carry out its desired goals and purposes. It means not only physical or financial resources available to the community, but also the community's organizational capability to carry out its goal. In the cases of Jacksonville and Seattle, they created organizational partnerships or nexus to assess the community's performance over time. Oregon established an independent agency, the Oregon Progress Board, which is responsible for indicator development and the ongoing assessment of the State's performance towards progress. The organizational capacity can be developed through collaboration within and between community-based organization before and throughout the process of indicator development.

2. A NEW PLANNING FRAMEWORK FOR A SUSTAINABLE COMMUNITY

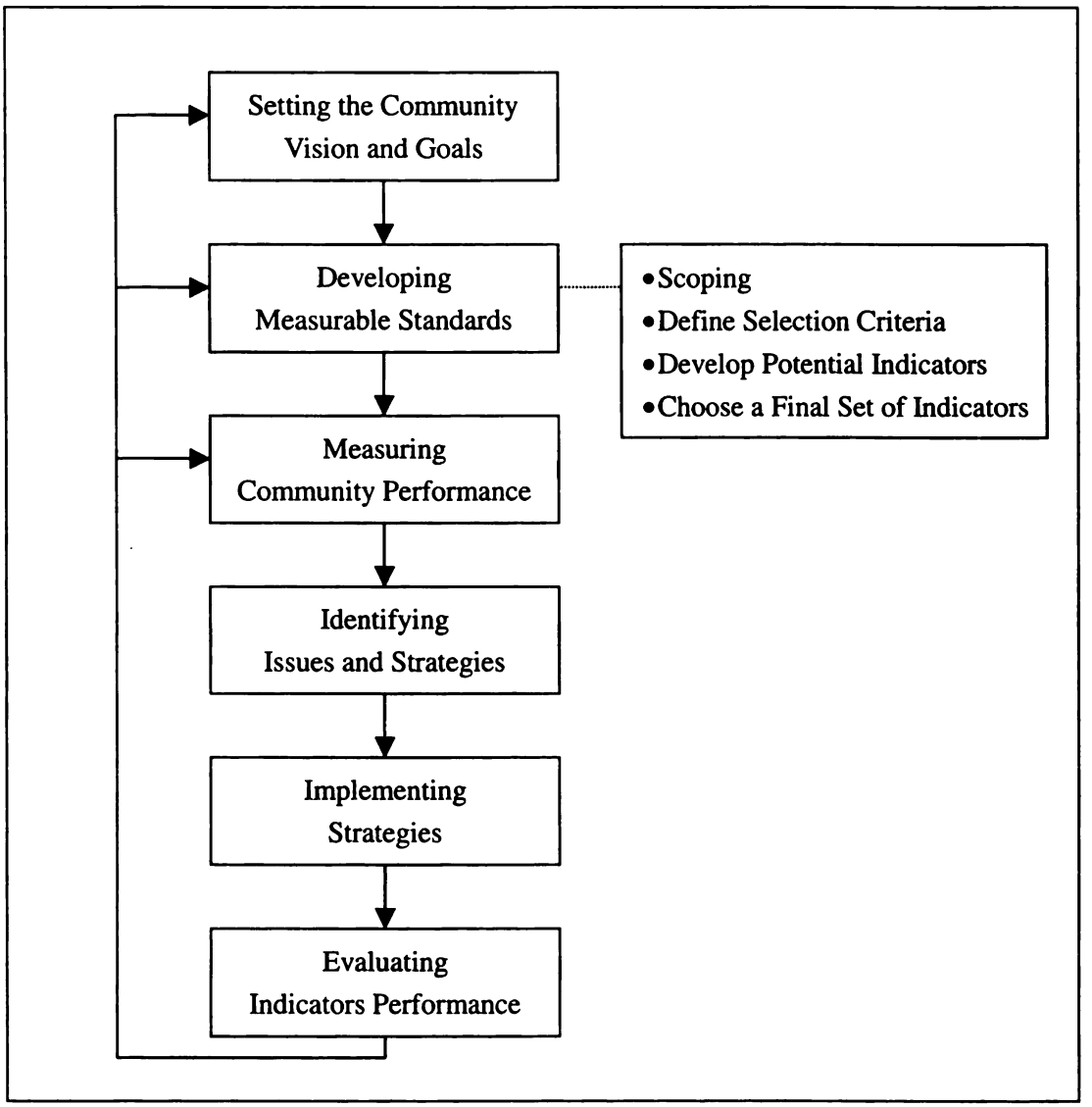
Sustainability indicators are used not only to assess existing conditions or their trends of the community, but also to set specific targets for the community's progress. As three cases in Jacksonville, Seattle, and Oregon present, the assessment of the community's sustainability can help the community set the new vision and goals of the community and plan further activities for the community's progress. This means that sustainability indicator initiatives can be applicable to the planning process of community development. In the Oregon case, indicators are directly linked to the statewide strategic plan, *Oregon Shines*, as a tool of monitoring progress towards the goals set forth in the plan. In the other two cases of Jacksonville and Seattle, indicators have been widely used as basic information that can guide decision-makers and community members in changing public policies and identifying alternative activities to achieve sustainable development.

This study outlines a planning framework for sustainable community development from the experiences of three cases. Figure VI-1 presents the framework, which incorporates the processes and principles of indicator development in formulation of policies and strategies for sustainable communities. The framework consists of six steps, which are following:

- Setting the community vision and goals for the future;
- Developing measurable standards;
- Measuring community performance towards the vision and goals;
- Identifying issues and strategies towards the community's goals;

- Implementing strategies; and
- Evaluating indicator performance.

Figure VI-1. A New Planning Framework for Community Development



At first glance, the planning framework outlined here may not be much different from others. In fact, the framework is a bit similar to other planning frameworks, which generally consist of goal formulation, identification of problems and issues, selection of best alternative

strategies, implementation of strategies, and evaluation. However, the principles[15] and activities of the framework make it different from other planning frameworks. The framework requires a more holistic view of the community and collective actions from the beginning stage of the planning process. In addition, the framework attempts to incorporate sustainability indicator initiatives, which basically aim at evaluating communities' progress towards sustainability, into the community development planning process. The framework can be used for most communities to establish the strategic plan for community development.

1) Setting the Community Vision and Goals for the Future

Sustainable community development starts from a visioning process: a process of thinking and visualizing its desirable future. The visioning process creates an image of what the community would like to become at the future through collaboration and consensus building processes. The visioning process allows community to stretch beyond what exists now to reach new potential for the future. In this process, all stakeholder groups should be brought about to deliberate and make consensus on the community's desirable future. The stakeholder input is essential because the issues associated with the community's future are complex and many parties are involved in the issues.

As three cases in Jacksonville, Seattle, and Oregon present, a community forum is a useful tool to bring community leaders and interested citizens together to discuss, debate, and

[15] The principles refer to six principles of indicator development outlined before.

deliberate a desirable direction for the community. If the community forum is successfully organized, new relationships among individuals, stakeholder groups, and organizations can be developed within the community. The new relationships can improve the community capacity to assess the community's sustainability over time and to implement plans and activities identified by the assessment process.

The participatory and collaborative nature of the visioning process makes it possible to develop the vision and goals of the entire community. The vision can be articulated as a single mission statement, and the goals can be developed by identifying key issues, which are relevant to achieving the community's vision. The vision and goals of the community provides information what to be measured to determine whether the community is sustainable. The process is not easy and requires the careful design of the community's involvement and excellent facilitation skills.

2) Developing Measurable Standards

Sustainability indicator development embraces many issues and dimensions. In order to develop a set of sustainability indicators relevant to the vision and goals of the community, several sub-steps are necessary. These sub-steps include the processes of scoping, defining criteria for selecting indicators, developing potential indicators, and choosing a final set of indicators.

The scoping process deals with the framework of organizing indicators, the number of

indicators, and the time frame over which indicators are to be measured. First, an appropriate indicator framework should be chosen based on the system in which the goals of the community are organized. According to Maclaren, there are six frameworks that can be used for indicator development. These include:

- Domain-based framework: This framework uses the key dimensions of sustainability, such as the economy, the environment, and society, and identify indicators for each dimension;
- Goal-based framework: This framework first identifies sustainability goals for the community and then creates one or more indicators for each goal;
- Sectoral frameworks: This framework develops indicators for each sector over which local governments typically have responsibility, such as housing, transportation, economy, public facilities, recreation, land use, and so on;
- Issue frameworks: This framework identifies the key sustainability issues in the community and then develops indicators for each issue;
- Causal frameworks: This framework introduces the notion of causes and effects in developing indicators and creates indicators based on the notion; and
- Combination frameworks: This framework brings together two or more of the individual frameworks (Maclaren, 1996).

The commonly used frameworks for developing sustainability indicators are the domain-based framework and the goal-based framework. In any case, the framework can be chosen based upon the system in which the community develops and organizes its vision and goals. The second issue in the scoping process is to determine how many indicators are enough for assessing the community's sustainability. Sustainable Seattle developed a set of 40 indicators

while Jacksonville and Oregon initially developed 75 and 259 indicators respectively. Oregon reduced the number of indicators to 92 in 1997 because of the difficulty in tracking and setting priority. There is no ideal number of indicators in assessing the community's sustainability, but developing too many indicators should be avoided. The last issue in scoping is the time frame over which indicators are to be measured. The time frame can be determined based on the community's capacity for the ongoing assessment of the community's sustainability. In most cases, communities assess their progress on the annual basis.

The second sub-step in indicator development is to develop criteria for selecting indicators. The indicator selection criteria can be defined based on the community's agreement on what are good and effective indicators in assessing the community's sustainability. All three cases in Jacksonville, Seattle, and Oregon defined their own indicator selection criteria. Hart also identifies eight characteristics[16] that effective indicators have in common (1999). In most cases, the six principles of indicator development articulated in this study would a good starting point of defining the selection criteria. The selection criteria should be continuously reviewed by the participants of indicator development.

The third sub-step in indicator development is to identify potential indicators. As the three cases illustrate, there are several ways to identify potential indicators or a draft list of indicators. In the Jacksonville case, the 9 subcommittees went through the brainstorming process to develop potential indicators in the given topic area. Sustainable Seattle created the

Indicators Task Team to research potential indicators. Oregon also created an independent organizational structure, the Oregon Progress Board, which is responsible for indicator development and the Progress Board developed a draft set of Benchmarks. In most cases, indicators used by other communities could provide useful information in developing potential indicators.

The forth sub-step in indicator development is to choose a final set of indicators. The final set of indicators should be chosen through the collective process in which experts, key stakeholder groups, and interested citizens are involved. In all three cases in Jacksonville, Seattle, and Oregon, draft indicators were reviewed by community members based on the selection criteria they established. An indicator evaluation matrix is a useful way to determine the final set of indicators. The evaluation matrix has been used by many communities because of the simplicity of organizing the information needed to evaluate indicators. In addition, experts and scholars should be involved in this process to determine the scientific validity and the measurability of indicators.

3) Measuring Community Performance

Once the final set of indicators has been chosen, the next step is to measure the community's sustainability by using indicators. An important issue in this process is to determine whether data for each indicator is available. In most case, the information can be

---

[16] See p. 44 for these characteristics.

obtained from existing sources, and used for each indicator after simple modification of the information. Therefore, it is necessary to identify existing sources of the data and to create partnerships with existing sources of information in the process of indicator development.

In some cases, it is necessary to collect new data. The costs and time for collecting new data should be determined in the process of indicator development. In any case, indicators that require long time and expensive costs for data collection should be avoided. As three cases show, data on personal perceptions and behaviors can be easily collected through a telephone survey.

4) Identifying Issues and Strategies towards Community's Goals

This step deals with identifying issues and strategies based on information obtained from indicator results. In this step, sustainability indicators can function as both diagnostic and target indicators. First, sustainability indicators can help identify the nature and magnitude of the community's problem. Indicator results may show whether the community is moving towards or away from sustainability. Second, the community can set specific targets for each indicator in order to achieve the community's goals. The cases of Jacksonville and Oregon established specific targets for each indicator for the certain time period.

The problems identified by indicator results and targets for each indicator can guide the community in setting set proactive policies and strategies to achieve the community's vision and goals. Indicator results should show which problems are to be given priority in order to find out key issues of the community. Targets for each indicator should be established with consideration

of both whether targets can be attainable in the given time period and which are the most promising alternative actions to achieve targets. In addition, the indicator results should be effectively informed to the decision-makers as well as the community members in order to find out alternative actions.

5) Implementing Strategies

Once the alternative actions are established, the next step is to put the actions into practice. The implementation step involves a wide range of practical activities, which all community members will undertake. The changes made by the activities should be periodically measured to ensure that the community is heading on the right direction.

In the implementation step, the role of leading agencies is very important to carry out the community's collective actions. Food and Agriculture Organization (FAO) developed several guidelines for implementation of the plan. These guidelines include:

- Ensure that the changes recommended in the plan are correctly applies in the plan: be available for technical consultations; discuss with implementing agencies any suggested modification.
- Help to maintain communications between all people and institutions participating in or affected by the plan, i.e. land users, sectoral agencies, government, non-governmental organizations, and commercial organizations.
- Assist in coordination of the activities of the implementing agencies.
- Assist in institution-building by strengthening links between existing institutions, forming new bodies where necessary and strengthening cooperation.
- Focus on the participation of the land users; ensure adequate incentives.
- Organize research in association with the plan; ensure that results from

research are communicated and, where appropriate, incorporated into the plan.

- Arrange for education and training of project staff and land users. (FAO, 1993)

The guidelines developed by FAO and experiences in sustainability indicator initiatives suggest general principles to successfully carry out the collective activities of the community. These principles include:

- The leading organization should carefully coordinate the activities of the community members to ensure that all important bodies of the community are involved in the implementation step;
- The leading organization should also provide necessary tools and techniques in collaboration with other agencies to ensure that changes recommended in the plan are correctly applied to the practice;
- The leading organization should maintain effective communications among organizations and the community members participating in to minimize conflicts resulting from the activities;
- Creating partnerships among existing groups and forming new organizational structures where necessary throughout the implementation process should be necessary in order to improve community capacity; and
- Education and training should be provided to ensure that all community members are empowered through the process.

6) Evaluating Indicator Performance

The purpose of this process is to evaluate indicator performance in assessing the community's sustainability. As the three cases in Jacksonville, Seattle, and Oregon present,

indicator performance should be evaluated periodically in order to improve quality of indicators. This process, like the indicator development process, also requires broad-based community's participation. Indicators may be eliminated, modified, or added based on the evaluation of indicator performance. Existing or new indicator selection criteria can be used to carry out the evaluation process.

The continuous evaluation of indicator performance is essential in maintaining or improving quality of indicators because people's knowledge of the entire ecosystem is not perfect and can be developed over time. Also, as Bossel addresses, "sustainable development implies constant change, and the indicator set itself have to be adapted to changing conditions (1999: 68)." Communities can establish a specific time frame, over which indicators are to be reviewed and updated, base on the community capacity.

V. CONCLUSION

There have been numerous efforts to realize sustainable development both in theory and in practice since the concept of sustainability became one of the most important issues in the human society. As sustainable development became a long-term goal that communities have to pursue, measuring the progress has also become an important issue.

Sustainable community indicators are different from traditional economic, environmental, and social indicators because the concept of sustainability requires a more integrated view of the community. Sustainability indicators can help people identify and quantify current conditions of the community and to point the way towards more sustainable conditions.

This study identifies several principles of sustainability indicators from experiences in Jacksonville, Seattle, and Oregon. These principles include:

- Systems Approach: Assessment of community's sustainability should take a systems perspective, in which the whole system of the community as well as its sub-systems, the economy, the environment, and society, is taken into account;
- Linkages to the vision and goals of the community: Sustainability indicators should be linked to the vision and goals of the community to ensure that a desirable direction for change and policies and activities for the direction can be identified;
- Redistribution of Community Resources: Sustainability indicators should measure redistribution of community resources to ensure that development can give benefits to all members of the community;

- Broad-Based Participation: Indicator development should include all key stakeholders in the process to ensure that indicators represent the vision and goals of the entire community;
- Understandability and Effective Communication: Indicators should be clearly defined and easy to understand and require effective means to communicate with all community members; and
- Community Capacity for Ongoing Assessment: Community's sustainability should be assessed over time and thus the process requires the organizational and financial capacity for the ongoing assessment.

This study also attempts to apply sustainability indicator exercises to the community development planning process. The study outlines a planning framework for sustainable community development from the experiences of three cases. The framework incorporates the processes and principles of indicator development identified in formulation of policies and strategies for sustainable communities. The framework consists of six steps, which are following:

- Setting the community vision and goals for the future;
- Developing measurable standards;
- Measuring community performance towards the vision and goals;
- Identifying issues and strategies towards the community's goals;
- Implementing strategies; and
- Evaluating indicator performance.

The sustainable community is not a fixed reality but requires ongoing efforts to achieve sustainability. Sustainability indicators can help the community measure its progress and set

specific targets and activities for the future. The study concludes that sustainability indicators can provide a useful framework for the community development process.

Bibliography

Beatley, Timothy and Manning, Kristy. 1997. *The Ecology of Place: Planning for Environment, Economy, and Community*. Washington, D.C.: Island Press.

Bossel, Hartmut. 1999. *Indicators for Sustainable Development: Theory, Method, Applications*. Manitoba, Canada: The International Institute for Sustainable Development (IISD).

Community Sustainable Resource Institute and Concern, Inc. 1998. *Sustainability in Action: Profiles of Community Initiatives Across the United States*. Revised/Updated edition: June 1998.

Pinfield, Graham. 1997. "A Sustainability Indicators: A New Tool for Evaluation." in. *Evaluating Local Environmental Policy*. ed. Stuart M. Farthing. England: Ashigate Publishing Co.

Hart, Maureen. 1999. *Guide to Sustainability Community Indicators*. Second ed. North Andover. MA/Hart Environment Data.

Haughton, Graham and Hunter, Colin. 1994. *Sustainable Cities*. Bristol. PA: Jessica Kingsley Publishes.

Hoff, Marie D. ed. 1998. *Sustainable Community Development: Studies in Economic, Environmental, and Cultural Revitalization*. Washington, D.C.: Lewis Publishers.

The Institute for Sustainable Development, 1999, *Sustainable Indicators: A Review of National Methods and Suggestions for Long Island*. [On Line] Available: http://www.liunet.edu/sustain/si04e.html [28 August 2000]

The International Institute for Sustainable Development. 1997. *Assessing Sustainable Development: Principles in Practice*. Manitoba, Canada: The International Institute for Sustainable Development.

Jacksonville Community Council Inc. 1999. *Quality of Life in Jacksonville: Indicators for Progress*. [On Line]. Available: http://www.jcci.org/qol [28 August 2000]

Maclaren, Virginia W. 1996. Urban Sustainability Reporting. *Journal of the American Planning Association*. 62(2): 184-202.

National Commission on the Environment. 1993. *Choosing a Sustainable Future: The Report of the National Commission on the Environment*. Washington, D.C.: Island Press.

Oregon Progress Board. June 1999. *A Brief History of the Oregon Progress Board.* Salem, Oregon: Oregon Progress Board.

Oregon Progress Board. March 1999. *Achieving the Oregon Shines Vision: the 1999 Benchmark Performance Vision Highlights.* Salem, Oregon: Oregon Progress Board.

Oregon Progress Board. 1997. *Oregon Shines II: Updating Oregon's Strategic Plan.* Salem, Oregon: Oregon Progress Board.

Selman, Paul. 1996. *Local Sustainability: Managing and Planning Ecologically Sound Places.* New York, N.Y.: St. Martin's Press.

Sustainable Seattle. 1999. Paper. *A History of Sustainable Seattle: The Indicators of Sustainable Community.* Seattle, Washington: Sustainable Seattle.

Sustainable Seattle. 1995. *Sustainable Seattle Indicators of Sustainable Community: A Status Report on Long Term Cultural, Economic, and Environmental Health.* Seattle, Washington: Sustainable Seattle.

Sustainable Seattle. 1993. *Sustainable Seattle Indicators of Sustainable Community: A Report to Citizens on Long Term trends in Their Community.* Seattle, Washington: Sustainable Seattle.

United Nations Commission on Environment and Development (UNCED). 1992. *Agenda 21.* New York: UNCED.

Wilson, E.O. 1992. *The Diversity of Life.* Cambridge, MA: Harvard University Press.

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

World Resources Institute. 1994. *World resources 1994-95.* New York: Oxford University Press.

Zachary. 1995. *Sustainability Community Indicators: Guideposts for Local Planning.* Santa Barbara, CA: The Community Environmental Council, Inc.

Appendix 1. Jacksonville's Indicators for Progress

Areas	Indicators
Education	Public high-school graduation rate
	Average of median achievement-test percentile scores in public schools
	Public-school educational expenditures per student
	Average public-school salary
	Percentage of public-school teachers holding advanced degrees
	Percentage of public-students attending desegregated schools
	Percentage of higher-education faculty holding terminal degrees
	Higher-education degrees awarded
	Total student participation in credit/noncredit higher-education programs
Economy	Net job growth
	Gap between total and black unemployment
	Effective buying income per capita
	Retail sales per capita
	Total taxable value of real estate
	New housing starts
	Affordability of a single-family home
	Percentage of public-school students participating in the free or reduced-cost lunch program
	Tourism as measured by Bed-Tax revenues
	Cost of 1,000 kilowatt hours of electricity
Public Safety	Percentage of people surveyed who report feeling safe walking alone at night in their neighborhood (telephone poll)
	Index crimes per 100,000 population
	Percentage of people surveyed who report having been victims of a crime within the last year (telephone poll)
	Average rescue call response time
	Average fire call response time
	Average Priority-One police call response time
	Residents deaths from accidents or poisoning per 100,000 population
	Motor vehicle accidents per 1,000 population
Natural Environment	Number of days that the Air Quality Index is in the Good range
	Frequency of compliance in the St. Johns River and mounths of major tributaries with water standards for metals
	Frequency of compliance in the St. Johns River and tributary streams with water standards for dissolved oxygen
	Water level in Floridan-Aquifer wells monitored by the City
	Average potable City water consumption per household account
	New septic-tank permits issued
	Sign permits issued
	Per-capita tons of solid waste deposited in City landfills
Health	Residents infant deaths per 1,000 live births
	Age-adjusted resident deaths per 100,000 population
	Resident deaths due to heart disease per 100,000 population
	Resident deaths due to lung cancer per 100,000 population
	Packs of cigarettes sold per capita

	Total newly diagnosed cases of AIDS per 100,000 population
	Alcohol use reported by youth
	Percentage of people surveyed who rate the health and medical-care system "good" or "excellent" (telephone poll)
	Percentage of people surveyed who report having no health insurance (telephone poll)
Social Environment	Percentage of people surveyed who report that they believe racism to be a local problem (telephone poll)
	Substance-exposed newborns per 1,000 live births
	Substantiated reports of child abuse and neglect per 1,000 children under 18
	Resident live births to females under 18 per 1,000 live births
	Employment-discrimination complaints filed with the Jacksonville Equal Opportunity Commission
	Percentage of people surveyed who report having volunteered time in the community during the past year (telephone poll)
Government/ Politics	Percentage of people surveyed who rate the quality of local-government leadership "good" or "excellent" (telephone poll)
	Percentage of population 18 and over registered to vote
	Percentage of registered voters who vote in scheduled general elections
	Percentage of elected officials who are people of color, Percentage of elected officials who are female
	Percentage of people surveyed who can name two current City Council members (telephone poll)
	Percentage of people surveyed who report keeping up with local government news "frequently" (telephone poll)
	Percentage of people surveyed who feel that local public services are effectively provided "frequently" (telephone poll)
Culture/ Recreation	City financial support per capita of arts organizations
	City parks and recreation operating expenditures per capita
	Public park acreage per 1,000 population
	Public library materials per capita
	Public library book circulation per capita
	Total event/days of bookings at major City facilities
	Symphony attendance per 1,000 population
	Zoo attendance per 1,000 population
Mobility	Percentage of working people surveyed who report commuting times of 25 minutes or less (telephone poll)
	Total weekday commercial flights in and out of the Jacksonville International Airport
	Destinations served by direct flights to and from the Jacksonville International Airport
	Average weekdays ridership per 1,000 population on Jacksonville Transportation Authority buses
	Average weekdays miles of Jacksonville Transportation Authority bus service
	Percentage of JTA bus headways within 30 minutes during peak hours and 60 minutes during nonpeak hours

Source: Jacksonville Community Council Inc. 1999.

Appendix 2. Sustainable Seattle Indicators

Area	Indicators
Environment	Wild salmon runs through local streams
	Specific area/ecosystem health
	Biodiversity
	Soil erosion
	Number of good air quality days per year
	Percentage of Seattle streets meeting "Pedestrian-Friendly" criteria
	Open space in urban villages
	Impervious surfaces
Population And Resources	Total population of King County
	Gallons of water consumed per capita in King County
	Tons of solid waste generated and recycled per capita per year in King County
	Pollution prevention and renewable resource use
	Farm acreage
	Vehicle miles traveled per capita and gasoline consumption per capita
	Renewable and nonrenewable energy (in BTUs) consumed per capita
Economy	Percentage of employment concentrated in the top ten employers
	Real unemployment
	Distribution of personal income
	Per capita health care expenditures
	Hours of paid work at the average wage required to support basic needs
	Housing affordability for median- and low-income households
	Percentage of children living in poverty
	Emergency room use for non-emergency purposes
	Community capital
Youth and Education	Adult literacy rate
	High school graduation
	Ethnic diversity of teachers
	Arts instruction
	Volunteer involvement in schools
	Juvenile crime rate
	Youth involvement in community services
Health and Community	Equity and justice
	Percentage of infants born with low birth weight
	Asthma hospitalization rate for children
	Percentage of population voting in odd-year (local) primary elections
	Library and community center usage rates
	Public participation in arts
	Gardening
	Neighborliness in King County
	Perceived quality of life

Source: Sustainable Seattle. 1995.

Appendix 3. Key Benchmarks in *Oregon Shines II*

Area	Key Benchmarks
Economy (20)	Employment Dispersion (Percentage of Oregonians employed outside the Willamette Valley and the Portland tri-county area)
	Percentage of professional services exported (imported) relative to Oregon's industry demand
	Oregon's national rank in new companies
	Industry research and development expenditures as a percentage of gross state product
	Per capita personal income as a percentage of the U.S. per capita income
Education (12)	Percentage of children entering school ready-to-learn
	High School dropout rates
	Percentage of 8th graders who achieve establishing skill levels (Reading, Math)
	Percentage of Oregon adults (25+) who have completed a college degree
	Percentage of all adult Oregonians with intermediate literacy skills (Prose, Document, Quantitative)
Civic Engage-ment (10)	Percentage of Oregonians who volunteer at least 50 hours of their time per year to civic, community, or nonprofit activities
Social Support (21)	Pregnancy rate per 1,000 females age 10-17
	Percentage of 8th grade students who report using alcohol in the previous month, illicit drugs in the previous month, and cigarettes in the previous month
	Number of children abused or neglected per 1,000 persons under 18
	Percentage of Oregonians with incomes below 100% of the Federal poverty level
	Percentage of Oregonians without health insurance
Public Safety (6)	Overall reported crimes per 1,000 Oregonians
	Total Juvenile arrests per 1,000 juvenile Oregonians per year
Community Development (9)	Percentage of miles of limited-access highways in urban areas that are congested during peak hours
	Percentage of low income households spending more than 30 percent of their household income on housing (including utilities)
Environment (14)	Percentage of Oregonians living where the air meets government ambient air quality standards
	Percentage of Oregon wetlands in 1990 still preserved as wetlands
	Percentage of Oregon agricultural land in 1970 still preserved for agricultural use
	Percentage of Oregon forest land in 1970 still preserved for forest use
	Percentage of wild salmon and steelhead populations in key sub-basins that are at target levels

Source: Oregon Progress Board. March 1999

Appendix 4. The Bellagio Principles for Assessment

1. Guiding Vision and Goals
   - be guided by a clear vision of sustainable development and goals that define that vision

2. **Holistic Perspective**
   - Include review of the whole system as well as its parts
   - consider the well-being of social, ecological, and economic sub-systems, their state as well as the direction and rate of change of that state, of their component parts, and the interaction between parts
   - consider both positive and negative consequences of human activity, in a way that reflects the costs and benefits for human and ecological systems, in monetary and non- monetary terms

3. **Essential Elements**
   - consider equity and disparity within the current population and between present and future generations, dealing with such concerns as resource use, over-consumption and poverty, human rights, and access to services, as appropriate
   - consider the ecological conditions on which life depends
   - consider economic development and other, non-market activities that contribute to human/social well-being

4. **Adequate Scope**
   - adopt a time horizon long enough to capture both human and ecosystem time scales thus responding to needs of future generations as well as those current to short term decision-making
   - define the space of study large enough to include not only local but also long distance impacts on people and ecosystems
   - build on historic and current conditions to anticipate future conditions-where we want to go, where we could go

5. **Practical Focus**
   - An explicit set of categories or an organizing framework that links vision and goals to indicators and assessment criteria
   - A limited number of key issues for analysis
   - A limited number of indicators or indicator combinations to provide a clearer signal of progress
   - Standardizing measurement wherever possible to permit comparison
   - Comparing indicator values to targets, reference values, ranges, thresholds, or direction of trends, as appropriate

6. **Openness**
   - make the methods and data that are used accessible to all
   - make explicit all judgements, assumptions, and uncertainties in data and interpretations

7. **Effective Communication**
   - be designed to address the needs of the audience and set of users
   - draw from indicators and other tools that are stimulating and serve to engage decision-makers
   - aim, from the outset, for simplicity in structure and use of clear and plain language

8. **Broad Participation**
   - obtain broad representation of key grass-roots, professional, technical and social groups, including youth, women, and indigenous people-to ensure recognition of diverse and changing values
   - ensure the participation of decision-makers to secure a firm link to adopted policies and resulting action

9. **Ongoing Assessment**
   - develop a capacity for repeated measurement to determine trends
   - be iterative, adaptive, and responsive to change and uncertainty because systems are complex and change frequently
   - adjust goals, frameworks, and indicators as new insights are gained
   - promote development of collective learning and feedback to decision-making

10. **Institutional Capacity**
    - clearly assigning responsibility and providing ongoing support in the decision-making process
    - providing institutional capacity for data collection, maintenance, and documentation
    - supporting development of local assessment capacity

Source: The International Institute for Sustainable Development, 1997