COMMUNITIES FOR ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT

FINAL REPORT

TO THE

COMMISSION ON ENVIRONMENTAL COOPERATION

Submitted by

The International Institute for Sustainable Development (Canada)
Pro Habitat (Mexico)
Sustainable Seattle (United States of America)

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EXECUTIVE SUMMARY

I. INTRODUCTION

Many towns and cities have realized that in order to make sustainable development a reality, they need to quantify some of its measurable components. Many communities set up measurement and reporting systems. Learning from the experience, successes and challenges of others can be a strong catalytic force in this process. This cross cultural, community-based project intends to achieve two objectives:

- Help a Mexican community to launch its own initiative for assessing progress toward sustainable development by developing an indicator set and a reporting system.
- Analyze the similarities and differences and synthesize the experience of three communities in each of the three countries and provide recommendations for others pursuing similar work.

The participants were two grassroots organizations, Pro Habitat from Guadalajara (Jalisco, Mexico), Sustainable Seattle (S2) from Seattle (Washington, U.S.A.), and a non-governmental policy analysis organization, the International Institute for Sustainable Development (IISD) in Winnipeg (Manitoba, Canada). Each organization is a non-profit, non-governmental organization with a commonly held commitment to promote sustainable development.

The project was funded by a grant from the North American Fund for Environmental Cooperation (NAFEC) with other financial and in kind contributions provided by the participants. The project work started in November 1996, and finished in November 1997. The outputs from this study include an ongoing indicator program, the first set of sustainable development indicators and the publication of the first thorough, indicator-based sustainable development progress report in Guadalajara.

II. THE PROJECT

Cooperation characterized the implementation of this project. While IISD was the initiator and the coordinator of the project, all the work, including design, implementation and evaluation, is the result of joint activities. All decisions were made on a consensus basis and all written documents have been reviewed and approved by all participants.

Project implementation followed four phases over the course of a year. In the first phase Pro Habitat's team visited Seattle and Winnipeg for discussions regarding the workplan and the indicator selection process leading to the definition of a jointly designed indicator selection process. In the second phase Pro Habitat implemented and documented its indicator project. This involved finalizing the indicator selection process with participating communities, a visit by the IISD and S2 teams to Guadalajara, data collection and analysis, and several stakeholder meetings to evaluate the findings. During the third phase the teams synthesized their case study experiences and made recommendations about methodologies. The fourth phase included a final meeting of the teams in Winnipeg to consider the lessons of the project and clarify the structure of the final report, and the release of the report.

III. SOCIAL, CULTURAL AND GEOGRAPHICAL CHARACTERISTICS

Pro Habitat's project was situated in the Guadalajara Metropolitan Zone (GMZ). Guadalajara is situated in the western side of Mexico. The city was founded in 1542. The climate of the region is mild with warm days and cool nights. The winter and spring seasons are primarily dry with rainy periods in the summer. Guadalajara is an important commercial and trading centre in Mexico. Nearby areas produce sugar cane and maize. More than 20 colleges and universities have been attracted to the area. Small and medium size businesses are predominate local industries. Urban growth in the area has been rapid. The population of the GMZ is now over 3,500,000 inhabitants.

Sustainable Seattle's project focused on Seattle, a city located in the northwestern corner of the United States of America, in the state of Washington, near the border with Canada. The city is a seaport and the main urban center of the larger Puget Sound area. The project focussed on the urban zone of Seattle known as the Emerald City. The natural environment in the area ranges from tide water beaches to high alpine meadows. The region's economic base includes aerospace and software companies. Seattle has a population of 500,000 and the greater Puget Sound region has a population of 2.7 million.

IISD's project was situated in the Prairie ecozone, a rural area located in the southern part of the City of Winnipeg, in the Province of Manitoba, Canada. The Prairie ecozone is dominated by plains and foothills covered by tall and mixed grassland and aspen parkland. Human activities that followed settlement of the prairies have transformed native prairie into a cultivated agricultural landscape. Cold winters, warm summers and moderate to minimal precipitation characterize the local climate. The Manitoba portion of the Prairie ecozone is situated in the south-western portion of the province. The Prairie ecozone encompasses most of the province's rich farmlands and a varied industrial and manufacturing base of economic activity. The Manitoba Prairie ecozone had a population of 944,552 people based on a 1991 census, this included 616,790 people who live in Winnipeg.

IV. THE PROCESS

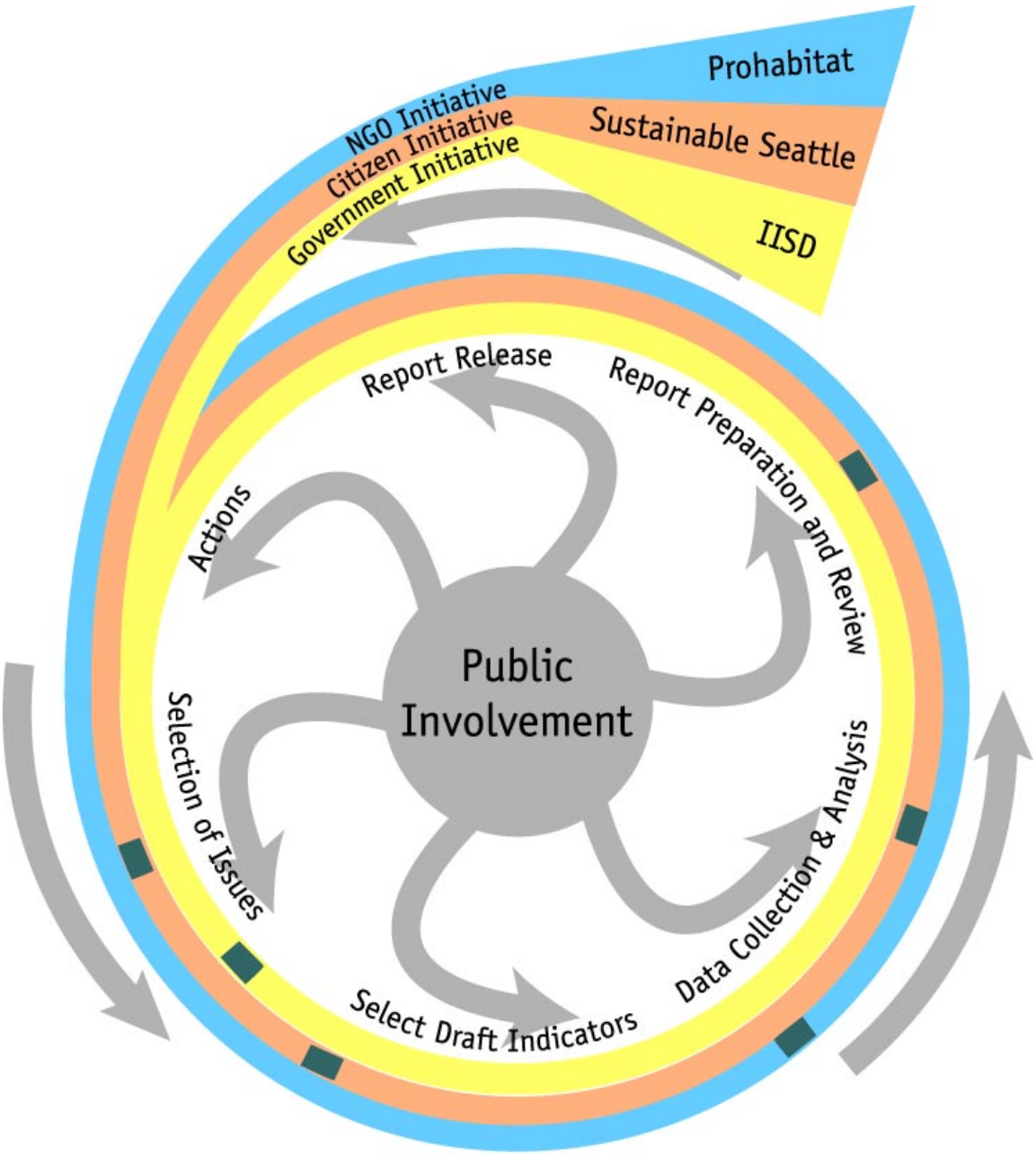
Each group used an iterative process to establish a measurement system. Starting with a qualitative statement defining sustainable development each group intended to develop a quantitative, measurable set of indicators.

Process Analysis Framework

Although each group's process to identify and report indicators was different, it is possible to identify some commonality in the steps they all went through. These steps provide an outline for a measurement process, template and a framework for analysing and comparing the approaches used by the initiatives. The template outlines an ongoing cycle of measurement, interpretation of indicators and corrective policy action that was largely followed by each group. Although the groups followed this cycle they often used different approaches at each stage. The main steps in this process template are shown in **Figure 1**.

Evaluation

Choosing the group that initiates and leads a measurement exercise is a critical issue. Each of the group had already had or developed the capability to run and manage the measurement



Indicators Process Comparison

Where public involvement occurs

Figure 1: General measurement process outline.
exercise. In addition, each group had some level of understanding for sustainable development prior to their involvement in measurement and indicator development.

Each groups' experiences emphasize the importance of visualizing the entire measurement process from start to end. A comprehensive assessment of costs, human resource needs (paid or unpaid), relationship to media and officials, and the identification of potential allies and supporters is important.

The criteria used to select indicators varied. S2and Pro Habitat identified explicit criteria and the case of Manitoba the criteria were implicit. S2's criteria suggested that an indicator be (1) bellwether tests of sustainability; (2) accepted by the community; (3) attractive to local media; (4) statistically measurable; and (5) logically and scientifically defensible. Manitoba's implicit list is similar, with policy relevance, feasibility, and cost added. Pro Habitat identified three essential criteria, including (1) relevance, (2) relationship with public policies and (3) potential for capturing the public's attention and creating debate.

Report preparation in all three cases was the task of the core project team. Each report went through a review process. In all three cases, the audience of the indicators was defined very broadly and included key decision-makers and the general public. All three projects had a communication strategy that tried to reach this broad audience through the electronic and print media. Both S2 and especially Pro Habitat, developed good connections with the local media, and the indicators received good coverage. Manitoba's report was part of the government's regular State Of Environment Report, and was guaranteed some level of publicity. The lesson from these exercises is that media attention does not simply happen, it needs to be planned and managed.

Credible reporting facilitates to achieve the goal to make decision-making more responsive and adaptive to emerging challenges. All three initiatives set out to identify links between indicators and particular policies. They intend to follow up their reports. Manitoba and Seattle have both completed more than one reporting period, while Pro Habitat has completed only its first reporting period.

V. LESSONS LEARNED

V.1. Public involvement

Public involvement was key to the efforts of each group. The groups in their approaches to include the public shared a number of common components. Pro Habitat had an existing group of people with ties to areas relevant to sustainability. S2 used a workshop method to refine and develop sustainability indicators. IISD has created focus groups to provide initial guidance, to select the important issues related to sustainability, and the preliminary list of indicators.

An important aspect of this process is nurturing public trust and being careful about how public interests are represented. They should be continually aware of and open to unvoiced public interests. Each group was well positioned for the development of sustainability indicators.

Volunteer involvement in each of the projects raised a number of issues. There is a need to be clear about the types of work available and the time needed. Numerous volunteers were available to S2

due to the high level of environmental awareness and a strong economy in Seattle. In Guadalajara far fewer volunteers were available largely due to the harsh existential conditions and a population with limited volunteer time.

Expert groups assisted the indicator development process in drafting preliminary lists of indicators or providing measures in their area of expertise. Expert groups can also be a part of the public discussions and peer reviewers of the final product, ensuring that the report is sound and the analyses justifiable.

Media relations need attention from the very start of the project. They can provide advice on how to approach the public with sustainability indicators; and by involving them at an early stage the project will probably gain better coverage.

V. 2. Capacity support

For a community to initiate a measurement process and maintain it over time, certain key capacities and elements of support must exist. Community support for measurement efforts was evident for all three projects by the involvement of the public. The political and institutional support garnered by each of the indicator projects varied.

In Guadalajara the reputation and respect for Pro Habitat's leaders has led to political and institutional support. In Seattle, S2's efforts have been volunteer based but critical support was obtained from several organizations and businesses from the beginning. In Manitoba, IISD's indicator project is distinct in receiving the most direct political support.

Financial resources are important to the creation of sustainability indicators. Each group had varying levels and sources of financial resources. Pro Habitat received funding for its sustainability indicators work as part of the NAFEC funding for the tri-lateral sustainability indicators project. Pro Habitat also receives funding from one of its leaders. Financial support will be a key issue in determining the continuation of indicator analysis in Guadalajara. S2 is a volunteer driven organization and staff resources are obtained from various organizations and individuals, small grants, and sales of publications. In Manitoba, IISD's indicators work for the prairie ecozone was mandated and funded by the government of Manitoba.

The technical quality of sustainability indicators is critical to their usefulness and success. In Guadalajara, Pro Habitat received help from a few university students and journalists. S2 volunteers were often working in a professional capacity, donating their expertise in addition to their time.

V. 3. Data and analysis

The experiences of each group in collecting and evaluating data provides some insight into the difficulties confronting other sustainable development measurement efforts. The whole process of doing performance measurement for sustainable development assumes we are looking at a broad landscape of data where there will naturally be inconsistencies, lack of data, mismatching of data, data not allowing meaningful disaggregation and many of the data problems mentioned. This is true with most new things and only after this type of work is done for quite a while, will

some of data anomalies begin to be resolved. One of the first steps is to note where the problems are. Some of the most important findings are listed here.

Data sources: Primary and secondary data sources were used in all three initiatives, ranging from governmental agencies to private organizations and in some cases survey questionnaire. Combining these different sources into one report created some problems due to a lack of consistency in the definition and classification of available sets

Data availability: A lack of historic data existed for many indicators in all three projects, while data sets were not as recent or complete as hoped for. Data availability problems suggests that further work studying the methods of data collection is necessary and would improve sustainable development reporting. It also reveals the reality of the data world we must work in and the need to develop feasible data collection procedures before a pilot project or study is attempted, if the pilot study is specifically concerned with the effectiveness of measuring sustainable development performance itself.

Data collection methodologies: Some of these existing data may have been collected based on criteria not appropriate for the indicator study in question. The lack of control over the data collection often creates special problems for the researchers in pinning down the exact meaning of the data, so the conclusions drawn might be less reliable, adequate, or consistent than they hoped for. For the long term process it will be important and necessary to collect data specifically related to sustainable development in order to address the most important issues as defined by the communities.

Disaggregation problem: All three projects had to cope with poor fits between the area for which the data were collected, and the area of project focus. The need for appropriate data collection procedures should be addressed at the very local or micro level rather than within political boundaries. Thus separate data monitoring or collection procedures should be needed for the rural and urban regions. While such an outcome would be nice and maybe possible in certain cases, yet we need to work within the constraints of larger data collection efforts such as national census.

Trend and statistical analysis: Trend analysis was one of the major analytical tools used in the three projects. In situations where data were unavailable or available just for a specific year, no trend could be have been determined. In the future, all teams might apply standard statistical methods (such as regression analysis) to provide additional proofs of the empirical significance of the results.

Recommendations: Given the need for data quality and reliability, recommendations for future work have been made, such as: Improve the graphic presentation of data; organize information from all contacts or sources; modify existing data collection procedure if possible to suit the data needed to address sustainable development problems; and make the assessment process ongoing and secure resources for continuation.

V. 4. Communication and impact

Good communication between the public and the project teams is necessary for achieving the objectives of the project. The final report should be available to libraries. Electronic versions of the final report should be given broad accessibility in all 3 countries. In addition, the detailed

project works should be published and made available to local communities with appropriate media coverage. Follow-up periodic progress reports should be presented to the authorities and released to the media to keep the public informed about the progress in implementation and corresponding results of recommendations. The impact of the indicator project on the community should be measured.

Media coverage can create credibility for the project in the eyes of the public and keeps the public informed about the progress of the project and encourages their participation. The media can be used to raise the consciousness of the public regarding certain quality of life issues and provide a forum for proposing new ideas, orientation and focus. Relationships with sympathetic reporters can prove useful in the transformation of mentality. There is a need to limit scientific and technical jargon in project reports to maintain their accessibility to all people. Finally, report recommendations need a mixture of short term and long term actions in order to maintain public support for the project.

Time series data are best at comparing current data to historical trends while category series data focus on the immediate situation and portrays possible relationships between factors. This is often more useful for understanding some critical issue needing immediate action.

VI. CONCLUSIONS: RECOMMENDATIONS FOR NEW BEGINNINGS

This was a unique, cooperative study where three different groups in three countries shared their experiences in their work to promote and measure sustainable development. There are numerous ways to approach the process of developing a set of sustainable development indicators. The collaborative approach taken in this study involved taking the experiences of two different initiatives in Canada and the United States and launching a project in a culturally and socially different setting in Mexico. The project experiences have resulted in a great deal of learning by all partners, especially in the area of societal base which is still bound by cultural values of great importance for sustainability. Local cultures, beliefs and values of the people are taken into account in implementing the project. Perceptions of reality shape behavior and influence action more statistical figures and hard facts. These have been the important lessons for the project partners during the year of cooperation.

The stages of assessment completed through this project will be very useful as a part of an ongoing, continuous review process. The data collection was a very valuable part of the Mexican work, completed under severe time limitation and with limited human and financial resources. It will be used, without doubt, for other projects. The experiences gained through organized process planning, group work and community participation, may be of significant help to other groups and communities launching similar programs.

A further lesson is that communities must be aware of the impediments confronting sustainable development performance evaluations. These include, an absence of issues to mobilize public interest, a lack of participation from deprived groups of society due to economic costs and a reluctance to cooperate with government agencies, and problems created by the translation of technical terms. A critical understanding of the task ahead will enable community groups to plan more effective projects in the future.

I. INTRODUCTION

How can communities in Mexico, the USA and Canada establish sustainable development goals and measure progress towards them? Over the last few years an increasing number of towns and cities realized that in order to make sustainable development a reality, they need to try and put numbers on some of its measurable components. Many communities set up measurement and reporting systems, and there is probably a lot more of them that will do so in the future. Learning from the experience, successes and challenges of others can be a strong catalytic force in this process. Just as communities themselves, the measures of progress are different case by case across communities on the continent. Beyond differences, however, there are underlying similarities in terms of how measurement systems can be set up, who should do it, at what cost and so on. It is important that we find these and other points of commonality and make an effort to learn from each other.

What is this project about?

It is a cross cultural, community-based effort designed to achieve two objectives:

1. Help a Mexican community to launch its own initiative for assessing progress toward sustainable development by developing an indicator set and a reporting system.
2. Analyze the similarities and differences and synthesize the experience of three communities in each of the three countries. By documenting and integrating the experiences, the participants hoped to provide useful recommendations to others interested in building similar processes to find their own answers.

Who are the participants?

Two grassroots organizations, Pro Habitat from Guadalajara (Jalisco, Mexico), Sustainable Seattle (S2) from Seattle (Washington, U.S.A.), and a non-governmental policy analysis group, the International Institute for Sustainable Development (IISD) in Winnipeg (Manitoba, Canada) agreed to jointly develop and implement the project. The location of the three organizations is shown on **Map 1**.

Map 1: The Location of the three projects in North America

IISD, S2, and Pro Habitat are not-for-profit organizations with strong commitment to sustainable development and substantial experience in its implementation. S2 developed an indicator set to measure progress toward sustainability in Seattle and King County, one of the first such efforts in the United States; IISD developed the first sustainable development report for the Prairie Ecozone in Manitoba, while Pro Habitat, relying on its 24 years of experience in environmental protection and urban development, launched the first indicator program in Guadalajara.

How was the project started?

In the summer of 1996, the participants submitted a proposal to the North American Fund for Environmental Cooperation, and subsequently received a grant. This funding, combined with the participants' financial and in kind contribution, made project implementation possible. The project work was started in November 1996, and finished in November 1997.

What are the outputs?

The outputs include an ongoing indicator program, the first set of sustainable development indicators and the publication of the first thorough, indicator-based sustainable development progress report in Guadalajara. The written report provides analysis of the lessons of the three community projects, recommendations for other North American communities for participatory measurement programs and discussion of technical aspects of indicator design and implementation. Project results and analysis will also be published on IISDnet, IISD's award winning Internet site.

What does this report present?

The first part of the report presents a chronological description of the three community programs to establish sustainable development indicators, report on progress, and channel the findings into decision-making. The second part provides a detailed analysis of the similarities and divergence of the projects, synthesizes the cross-cutting issues and the lessons of geographically, politically and culturally different experiences, offering recommendations for future work. The report is complemented with a document set including three indicator reports, meeting minutes, photos, and media clippings. A detailed expense report is attached.

II. THE PROJECT

This sustainability indicators project, designed to be completed in one year, was implemented in four phases. After the approval of the CEC grant, in the **preparatory phase** of the project communication channels were established between project participants., and basic information on relevant experience was shared by project partners.

In the **first phase,** special attention was paid to the needs of the Mexican team and the working conditions in Guadalajara. This stage included Pro Habitat team's visits to Seattle and Winnipeg, a thorough discussion of the workplan and synthesis of the proposed processes. An indicator selection process was jointly designed and basic design criteria were had been established.

In the **second phase**, the Pro Habitat team implemented and documented its indicator project. First, they finalized the indicator selection process with the representatives of the participating communities in Guadalajara, then they generated academic, public, media and official governmental support for the project. Actual work started with the visit of the IISD and S2 teams to Guadalajara; the visit also helped to raise awareness for the project. After Pro Habitat completed data collection and analysis, several stakeholders meetings were held to evaluate the findings. A comprehensive sustainability report has been published based on the indicator set.

In the **third phase**, the project team synthesized experiences from the Canadian, US, and Mexican case studies and made recommendations about methodologies that take cross-cultural aspects into consideration. A final meeting of the three teams took place in Winnipeg where the lessons of the project were evaluated and the structure of the final report was clarified. After the meeting, using electronic communication and a private web site, the final report was jointly produced.

The report was released both in hard copy as a working paper and electronically on IISDnet. Plans have been prepared for the dissemination of project results and follow-up activities. Active media involvement will be sought for the outreach campaign.

A genuine cooperation among the three teams was a most significant characteristic of the entire project. While IISD was the initiator and the coordinator of the project, all the work, including design, implementation and evaluation, is the result of joint activities. All decisions were made on a consensus basis and all written documents have been reviewed, commented and approved by all participants. The final report is also a product of teamwork. Though the report chapters were written by different teams, they were outlined, discussed and edited together into a single document. This process has seemed to work very well in capturing the cultural diversity, plurality of views and range of experiences of the participants.

Participating teams

The participants in this three-country project are all non profit, non governmental organizations with commonly held commitments for promoting development towards a sustainable development, and how this commitment can promote actions for change in citizens attitudes and proposals in government policies in order to achieve it.

The three organizations are Pro Habitat, A.C., Sustainable Seattle, and the International Institute for Sustainable Development.

Pro Habitat, A.C.
Pro Habitat is a non profit citizen group founded in January 12, 1973 in Guadalajara, Mexico with the objective of working to preserve, improve and increase the natural, cultural, artistic and historical heritage.

Since their beginning, Pro Habitat has a proactive orientation, creating activities which promote information gathering concerning ecological aspects in the community, as well as organizing special activities at the community level, such as the "ecology month", the "world environment day" and special recognition presentations for the people and institutions which they judge as having made contributions in the ecological field. In addition, specially programs of environmental education for school children and local citizen groups, taking advantage the media.

Key Pro Habitat members participate in consultative positions for environment departments of local, state and federal level governments. Pro Habitat was suggested by IISD to participate in the presently described 3-country Indicators project.

Sustainable Seattle (S2)
S2 was initially formed in 1991 by a group of volunteers as a volunteer network and civic forum. Their work, in addition to creating opportunities for dialogue among a diversity of local citizens, is increasingly focused on outreach and action: developing a Guide to Sustainable Living for individuals and families, creating a Sustainability Study Course, working with the city's Neighborhood Planning Process to incorporate sustainability concepts, and collaborating with local groups on important current local issues. .

S2 has published two important documents related to their work: *Indicators of Sustainable Community* (1995), and *A Primer for Creating New Measurements of Progress* (1996).

They received regional recognition from the Puget Sound Regional Council and United Nations recognition for their valuable innovative contribution in the field.

International Institute for Sustainable Development (IISD)
IISD is a non governmental policy analysis/advisory group established in 1990 in Winnipeg, Canada. The major objective of the Institute's work is to influence decision makers both in the public and private sectors to implement sustainable development principles in everyday practice The Institute works with a broad spectrum of organizations, including Canadian federal and provincial governments, governments of other countries, international organizations, academic institutions, NGOs and the private sector.

IISD programs include business strategies for sustainable development, development and The Measurement and Indicators for Sustainable Development is one of the many programs of the Institute This program runs actual field work in Manitoba and Winnipeg as well as in third world countries. At the same time it leads international efforts to define general guidelines for assessing progress toward sustainable development. The Program also established an electronic Compendium for sustainable development measurement initiatives, including an annotated bibliography.

As a recognition of the Program's achievements, IISD has been selected as the Canadian collaborating center of excellence by UNEP.

Participating individuals

Pro Habitat
Juan Manuel Carrillo (member)
Maria Casparius (General Coordinator), Lead Participant
Margarita Castaneda (member)
Eva Kras, Consultant
Leticia Maldonado (member)
Rene Solinis (member)

Sustainable Seattle
Mark Aalfs (Trustee), Project Coordinator
Richard Conlin (Trustee)
Lee Hatcher (Trustee)
Kara Palmer (Program Manager)

IISD
Stephan Barg (Special Advisor)
Hernan Fernandez, Project Coordinator
Peter Hardi (Director, Measurement and Indicators Program), Project Manager
Juanita Huletey (Program Officer)
Laszlo Pinter (Program Officer)

III. SOCIAL, CULTURAL, AND GEOGRAPHICAL CHARACTERISTICS

The context of the three projects shows significant differences. The character of the teams differ as much as the social and cultural milieu in which they operate. The focus of their activities is influenced by the ecological and geographic characters of their immediate and broader surroundings. The economic potentials and the financial situation of the three regions vary in a great extent. Without understanding and take these characteristics into account, no meaningful joint work could have been initiated and implemented.

Characteristics of ProHabitat's project

The ProHabitat project took place in the metropolitan zone of Guadalajara. The State of Jalisco and the MZG are shown on **Map 2** and **3**. Guadalajara, known as the "Pearl of the West" and "The City of the Roses", in addition to its international recognition through the song by the same name whose descriptions capture its beauty and fascination, is the second largest city in Mexico, located in the western region of the country on the high plateau. (1,500 meters altitude).

Historically, Guadalajara was founded in 1542 as the capital city of the Kingdom of Nueva Galicia. The country of Mexico was formed in the beginning of the sixteenth century with the union of the Spanish conquers and the indigenous people; so most Mexicans are "mestizos," and of the Roman Catholic faith.

Traditionally Guadalajara has had a strategic commercial and trading position, situated between Mexico City in the Center and the Pacific Coast (San Blas being originally a focal point), and also near the fertile plateau known as "El Bajío" and areas which traditionally produced large quantities of maize and sugar cane.

In addition to the increase in commerce in recent years, the Guadalajara zone has developed and attracted educational institutions (currently totaling more than 20) offering college- and university-level education. In addition, small and medium sized companies, and a few large enterprises have flourished. Very recently Guadalajara has been crowded with foreign electronics companies, including the international "maquiladoras" (off shore companies).

Attending these activities had been rapidly expanding urban growth and its related challenges. Since 1960 urban growth has encompassed the municipalities of Zapopan, Tlaquepaque, and Tonalá, resulting in the formation of the Metropolitan Zone of Guadalajara (ZMG).

Geologically, the Zone is located in an active seismic area, with the San Andrés Fault to the north, and the Continental Clarion Fault to the South.

Map 2: State of Jalisco, Mexico

Map 3: Metro Zone Guadalajara

Guadalajara is blessed with a rich natural environment, and an exceptional climate , with the dry season during winter and spring, and a rainy season in the summer. With an altitude of 1,500 meters, the area enjoys warm days and cool nights. The climate of Guadalajara is influenced by two important ecological systems. One is the La Primavera forest, on the west of Guadalajara, which was declared Forest Protected Area and Wild Animal Refuge in 1980, as well as possessing an abundance of natural volcanic aquifers with both hot and cold water. Bordering the northeast of the city is the Barranca (canyon) of Oblatos - Huentitán, (declared Protected Area by the city of Guadalajara, the 5th of June, 1997). The Río Santiago, a mayor river system in the region, flows through the canyon, on its way to the Pacific Ocean. The other major ecological system is the Chapala Lake, the largest in México, which serves as a climate control as well as the most important source of drinking water.

The population of the Metropolitan Zone of Guadalajara is now over 3,500,00 inhabitants, and covers more then 39,000 Hectares. It also comprises 54% of the population of the State of Jalisco, 70% of its industry, 59% of its commerce, 67% of its services and 90% of its educational institutions.

In terms of Gross Domestic Product, Guadalajara is in third place after Mexico City and Monterrey, with major emphasis on manufacturing and Services.

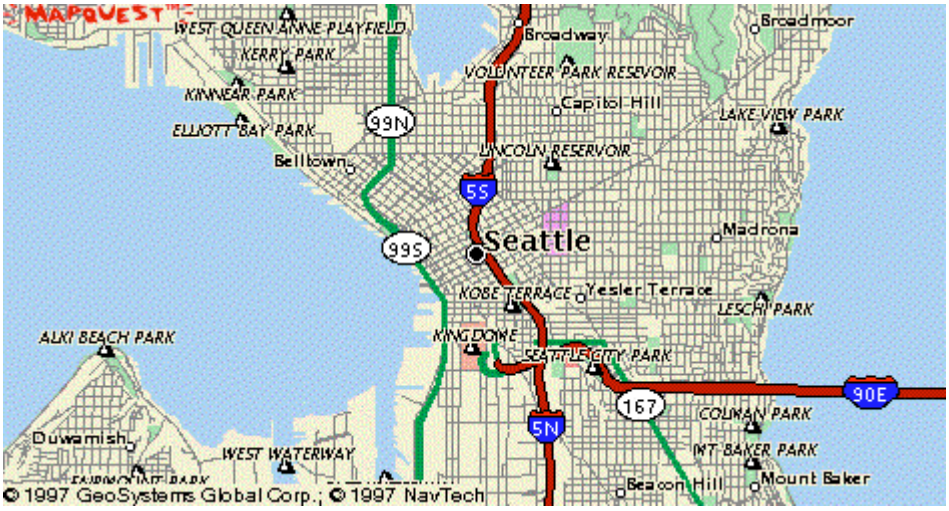
Within the MZ, the socio-economic structures of the population are: 11.2% are considered upper class, 31.7% middle class, 53.9% lower class and the remaining 3.3% marginal existence. In terms of residence 23.5% of the population live in irregular (squatter) settlements.

A major disaster occurred in Guadalajara on April 22, 1992, when the City's sewers exploded, causing the deaths of more than 200 people. Considered by many to be a major milestone for the city it had a great influence on society and political organizing. Citizens were critical of the authorities' handling of the disaster, and organized to improve the city.

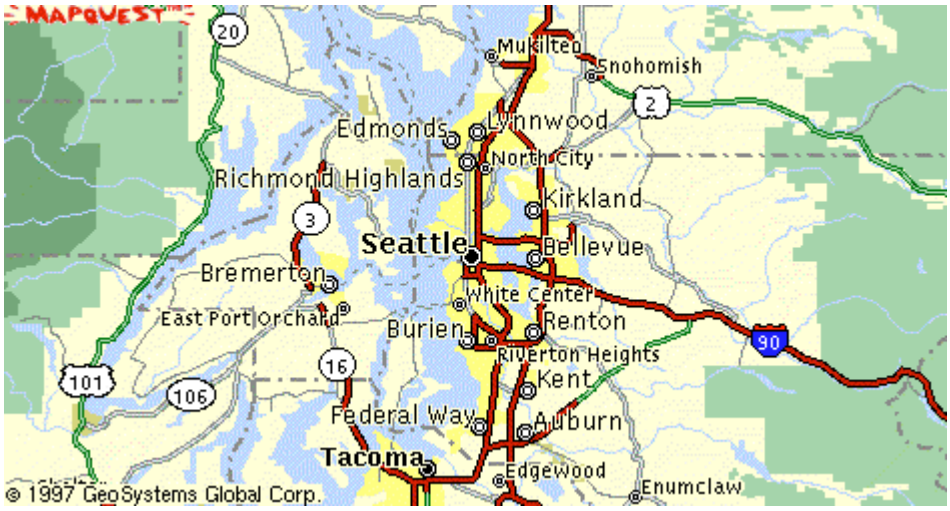
Characteristics of Sustainable Seattle's project

Seattle, Washington, in the northwestern corner of the United States and on the eastern shore of Puget Sound, is a major seaport and a key player in the cultures and economies of the Pacific Rim. Sustainable Seattle produced the "Indicators of Sustainable Community" for the Seattle/King County geographic area. Seattle and King County are shown on **Map 4** and **Map 5**.

Seattle, with its steep hills, lush greenery and sparkling water is known as the Emerald City. The Puget Sound area thrives with diverse marine, wetlands, and forest ecosystems, and of course, salmon. However, the pressures of human development challenge the integrity of these systems and must be tempered in order to preserve them. Puget Sound, bays, lakes, rivers, and snow capped Mount Rainier with its mantle of clouds; surround the city with a beauty that requires careful stewardship for future generations.



Map 4: Seattle



Map 5: Seattle and surroundings

Seattle is home to a variety of prosperous industries - aerospace, computer software, fishing and tourism. The Seattle/King County area is inviting and home to more than 1.5 million people. The area's population is increasing due to both local growth and people moving to the area. The natural boundaries of hills and water produce a city of neighborhoods that feel like small towns, vibrant and varied, each with its own charms.

Although Seattle is known for its rain, the volumes are somewhat exaggerated, about the same as Boston. The "liquid sunshine" is usually passing showers or a gentle mist, a most basic element of life in the "Emerald City."

The Pike Place Market downtown is the soul of Seattle, the oldest continually operating farmers' market in the United States, a civic resource saved from the wrecking ball of "progress" by public vote in 1971. Salmon fly through the air as fish vendors provide for both locals and tourists. There are vegetables, flower displays, handcrafts and countless eateries - wafting smells from around the world.- Hillside vistas offer views of ferries and freighters passing on the Sound below.

Close to the market is the commercial heart of Seattle, a lively downtown district of department stores, renovated historic theaters, hotels of every size, multiplex cinemas, espresso stands, restaurants and specialty shops offering a variety of shopping experiences. Westlake Center's spacious exterior balconies overlook Westlake Park, the city's unofficial gathering place, where the paving tiles display a Northwest Indian design.

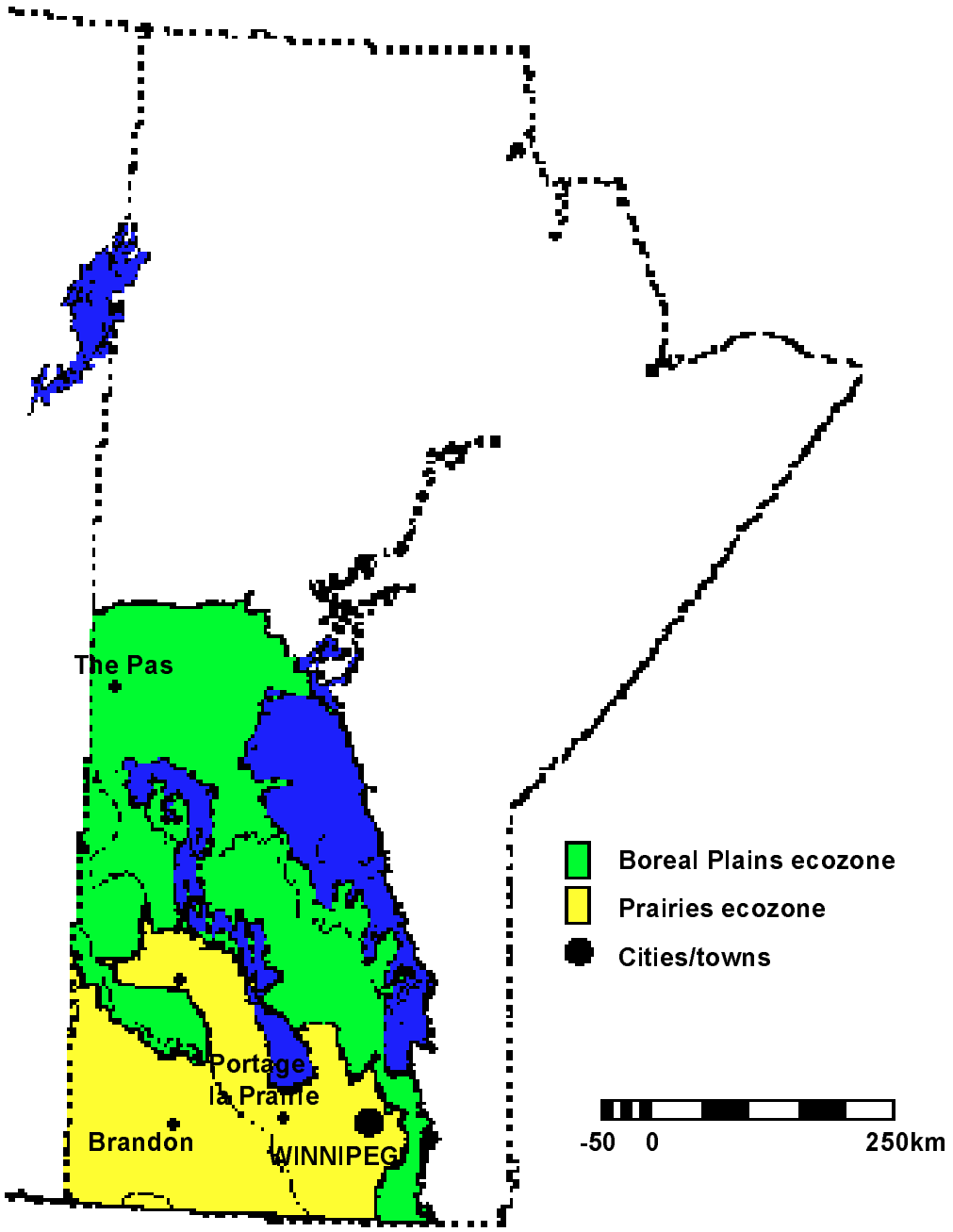
Seattle's foundation is her people from many nations and cultures who make Seattle their home and contribute their wonderful diversity.

Characteristics of IISD's project

IISD's project was carried out in a rural area located in the southern part of the City of Winnipeg, in the Province of Manitoba, Canada, which is denominated as the Manitoba Prairie Ecozone. The Manitoba Prairie Ecozone is shown on **Map 6**.

Patches of green and gold fields, quilted together by straight roads, drainage ditches and meandering rivers, comprise the familiar aerial view of the Manitoba Prairies. The region is an important part of the "bread basket" of Canada and the world. Behind the tranquil and romantic image lies a history of major change affecting both land and people.

This is the area of the province where settlement has had the most impact, transforming a predominantly mixed and tallgrass native prairie into an agricultural landscape in just over a century.



Source: State of the Environment Directorate; Environment Canada

Map 6: Manitoba's Prairie Ecozone

Ecozones are large areas of land with similar geographic features such as soil, land forms, vegetation, wild animal life and climate. The Prairie Ecozone is unique in that the original prairie ecosystem has virtually vanished. The prairie ecosystem today is one dramatically created by, influenced by, and dependent on agricultural development.

Canada's Prairie Ecozone comprises the northern extension of open grassland in the Great Plains of North America. It arcs from the western edge of Alberta to the eastern edge of Manitoba and extends south to the United States border, to the states of Montana, the Dakotas and Minnesota.

Within Manitoba, the Prairie Ecozone covers 74,000 square kilometers or 12 % of the province, making it one of the smaller oh the provinces six ecozones. Located in the southwestern corner of the province , it extends from the Saskatchewan border to the Red River Valley. Its northern and eastern boundaries adjoin the coniferous forests of the Boreal Plains ecozone.

The Prairie ecozone is predominated by plains and some foothills covered by tall and mixed grassland and aspen parkland. The organically rich, fertile soil overlays moraine and lake bottom materials provided by glacial Lake Agassiz. Cold winters, warm summers and moderate to minimal precipitation characterize the prairie climate.

The Prairie Ecozone in Manitoba encompasses most of the province's rich farmlands and a varied industrial and manufacturing base of economic activity.

As of the 1991 census, 944,552 people live in Manitoba's Prairie ecozone, including the 616,790 people who live in Winnipeg. If the city's population is excluded, approximately 27% of Manitoba's total population of 1,1 million people live within the ecozone.

IV. THE PROCESS

The three communities participating in this project are located in regions that are different in many ways. There are differences not only in terms of climate, vegetation, economic activities and traditions, but also in terms of what people value and how they express their values. There are also differences in terms of institutions, and institutional capacities to monitor socio-economic and environmental conditions. These, and other differences are the main reason why an existing indicator set from other jurisdictions can not be simply adopted: the communities needed to create measurement systems and indicators of their own.

In the case of all three initiatives establishing a measurement system required a stepwise, iterative process. In general, the process was expected to lead to quantitative, measurable indicators starting from a qualitative statement on sustainable development. While most people would accept that sustainable development is a worthwhile and agreeable objective for their community, there is far less agreement on what this exactly means for people and, consequently, what its measures are. In order to obtain a picture representative of the whole community, the process must help identify and then pool priority issues for stakeholders, including individual citizens and organizations. It also needs to ensure that the results are not only representative of stakeholder concerns, but also that the indicators and the accompanying analyses are defensible from an expert point of view. This has implications on data gathering and interpretation, but also on making sure that no essential dimension of sustainable development is left out of the analysis.

Creating a sustainable development measurement and reporting system influences decision-making in two ways. One is the impact that indicators and accompanying analyses have on actual decisions. If the information is verifiable, well-timed, clearly presented and well-marketed, it can be expected to have an impact on decision-making. At the same time, stakeholders participating in setting up a measurement system also gain insights about key issues, interlinkages between ecological and socio-economic processes and conditions, and so on. Through dialogue leading to a better understanding of key issues and their interlinkages, communities increase their capacity to recognize, anticipate and better respond to problems. Given this, measurement enhances to the community's adaptive capacity that is at the heart of sustainable development.

Pro Habitat's Process

Guadalajara's indicator project is the only one that has been initiated from outside the area through an external grant. Pro Habitat was selected as a partner based on its history as an advocate of community development issues for over 24 years. Through its recognition and network in the community Pro Habitat was well positioned to carry out the work on indicators. IISD and S2 provided help by introducing the Seattle and Manitoban experience to Pro Habitat representatives and assisting in the planning of Pro Habitat's work.

The first task of the immediate project team at Pro Habitat has been the identification of the project's geographic base. After considering other options, the area, including the municipalities of Guadalajara and Zapopan, and adjoining areas of Tonala and Tlaquepaque were selected. This was followed by two meetings. The meeting resulted in the establishment of a core group that was to coordinate, and in fact undertake, most of the work on the indicators. In addition, a list was put together with the names of about 30 key individuals, who were to help with issue and indicator

selection. Based on its long-standing familiarity with local conditions, the core group generated an issue and indicator-framework with four categories. They also identified an initial set of priority issues in a second meeting. The following four categories were included (1) urban development; (2) economy; (3) environment; and, (4) social area. A time-table was put together for data collection and indicator development. The core group was divided into four subgroups to focus at the four issue categories above.

An initial set of issues was identified by the four subgroups, followed by the recruitment of volunteers to help with data collection. Their task also included conducting public surveys about priority issues from the issue list selected by the core group. Data was collected primarily from governmental and academic sources, and involved detailed interviews with leading local experts on specific indicators. Based on the available data, the indicator set was again revised to exclude indicators where data was inadequate.

Once the subgroups finished their work, they reported to the entire core group and the indicator set was finalized. The final report was compiled by core group leaders with the help of volunteers, who took responsibility for particular indicators. Using its good relationship with the local media, Pro Habitat put particular emphasis on ensuring that the report received publicity, and also reached top civil servants. Guadalajara's final report makes specific proposals for action in areas, where indicators show the community is falling behind.

At this point there is no certainty whether follow-up indicator reports will be prepared, and with what frequency, once external project funding comes to an end. Given that Pro Habitat will continue to exist, and the increasing level of interest in indicators in the state government, it is likely that reporting will continue in one form or another.

Sustainable Seattle's Process

In the Fall of 1990, a group of more than 70 people from the Seattle area representing community, business, non-profit, and other organizations held a one day conference to discuss a range of city problems, solutions, and how measurement of progress in the context of sustainability might be tracked. The meeting inspired the establishment of an Indicator Task Team and the organization that became known as Sustainable Seattle (S2) since 1991. The vision of defining sustainability for Seattle through specific measures helped galvanize the process and provided the overall framework for the group. For Seattle this vision meant passing on a healthy, vital and fulfilling community to future generations. S2 soon decided to launch a sustainability indicators project - a project to measure the Seattle area's progress toward sustainability in Seattle and King County.

Following an initial attempt to create a list of indicators, the Task Team recognized the need for broader public input, and decided to organize a Civic Panel with stakeholders from all walks of life in the city. In the first step, the Indicator Task Team presented an draft set of indicators to gather initial comments from participants of the Civic Panel. In addition to the first Civic Panel meeting, participants were also invited to provide written comments on the draft list of indicators. Based on the comments received, the Task Team divided the Civic Panel into ten Topic Groups. After agreeing on indicator selection criteria, the Topic Groups selected indicators around their broad issue areas, including: resource consumption, education, economy, transportation, natural environment, health, social environment, culture and recreation, population, and community participation. The last Civic Panel meeting was used to review and prioritize the 99 indicators

selected by the Topic Groups. Panelists also worked in small groups to identify the main causal chains between the indicators. Based on the results of prioritization the Task Team, expanded with a number of Civic Panel members, pared down the original indicator list to the 40 indicators that finally made it to the final report.

Data collection for these 40 indicators was coordinated by the Task Team. Data came from various sources in the community, including data systems maintained by government offices, but in many cases from citizen based monitoring groups. Data and the accompanying analysis was compiled by the working group into Seattle's indicator report. The report received coverage in the local media, and later in the national and international press.

IISD's Process

The indicator reporting process for Manitoba's Prairie Ecozone was initiated by Manitoba Environment and the Provincial Government's Sustainable Development Coordination Unit. Manitoba Environment is required by law to periodically report on the state of the Prairie's environment. The planned Sustainable Development Act envisions periodic sustainable development reports as a next phase of SOE reporting. Manitoba's Prairie Ecozone was selected as the geographic base of the indicators order to harmonize the provincial SOE report with environmental reporting. It was also decided that the report will go beyond environmental issues and also deal with social and economic matters and their interactions.

IISD was commissioned to design and coordinate the process, in close collaboration with the other two initiating government organizations. IISD's first task was to design a participatory measurement process with a time line. The process built on input from two consultative groups. The first was a Focus Group of stakeholders from the Prairie Ecozone, a representative sample of local citizens and organizations. Their primary role was to help identify and review key sustainability issues and indicators. The other group was a Technical Advisory Committee of government departmental experts, whose mandate was to help review indicators, facilitate data collection, and contribute to the analysis of key issues within their expertise.

Prior to the Focus Group meeting to select and prioritize the key issues, IISD designed an issue and indicator framework. The role of the framework was to set the broad context for the issue selection process, and to ensure participants do not limit their attention to e.g. economic or environmental matters alone. Two facilitated issue selection sessions were held that resulted in a long list of issues. Issue identification followed an iterative process based on a nominal group method[1]. Participants individually brainstormed key issues, listed and clarified them in plenary, and finally ranked them according to their priority. The resulting list was consolidated by the project team, and subsequently verified with Focus Group members. Indicators were identified by the core team on the basis of the issues and implicit selection criteria including availability of data, policy relevance, validity, cost, and communicability. Indicator selection was again an iterative process that involved returning to the issues for further clarification and refinement as necessary.

Data collection was carried out by IISD's team, with significant help from a large number of governmental and non-governmental experts. In the process some indicators and even issues had to

[1] Delbecq, André L. et al., *Group techniques for program planning*. Scott, Foresman and Co., Glenview, Ill. 1975

be further clarified. Indicator interpretation focused on the determination if any trends were discernible on the basis of the information and the potential implications for sustainable development. Because of data limitations no statistical methods were used to perform trend or regression analyses. Indicators for the Prairie Ecozone were compiled into a pilot chapter on sustainable development in Manitoba's 1997 State of the Environment report. The report was released by Manitoba Environment in May, 1997. An update will be prepared by 1999, expanding the sustainable development framework to the Province's urban ecozones, using a consultative process similar to the one used for the 1997 report.

Process Analysis Framework

Although the process to identify and report indicators had important differences in the three cases, it is possible to outline some broad process steps that they all went through. These steps also provide an outline for a measurement process, template and a framework for analysing and comparing the approaches used by the initiatives. The main steps in this process template are shown in **Figure 1**.

The template outlines an ongoing cycle of measurement, interpretation of indicators and corrective policy action. Monitoring and reporting in statistical departments of local government is usually a continuous routine task. However, the information is rarely compiled and published in an easily accessible format complete with the analysis of issues that go beyond a single domain, let it be economics, environment or social affairs. All these *together* are important for measurement in the context of sustainable development. The frequency of the cycle may vary, but in our three cases it is in the 2-3 year range. Many environmental and socio-economic variables change slowly, and reporting with a higher frequency may not be able to demonstrate meaningful changes in trends. Running the measurement process is also a time and resource intensive undertaking, and more frequent reporting may increase costs and the willingness of unpaid volunteers to participate.

Following the format of the general process outline, the methodologies of the three projects can be put side-by-side in the process diagram (**Figure 1**).

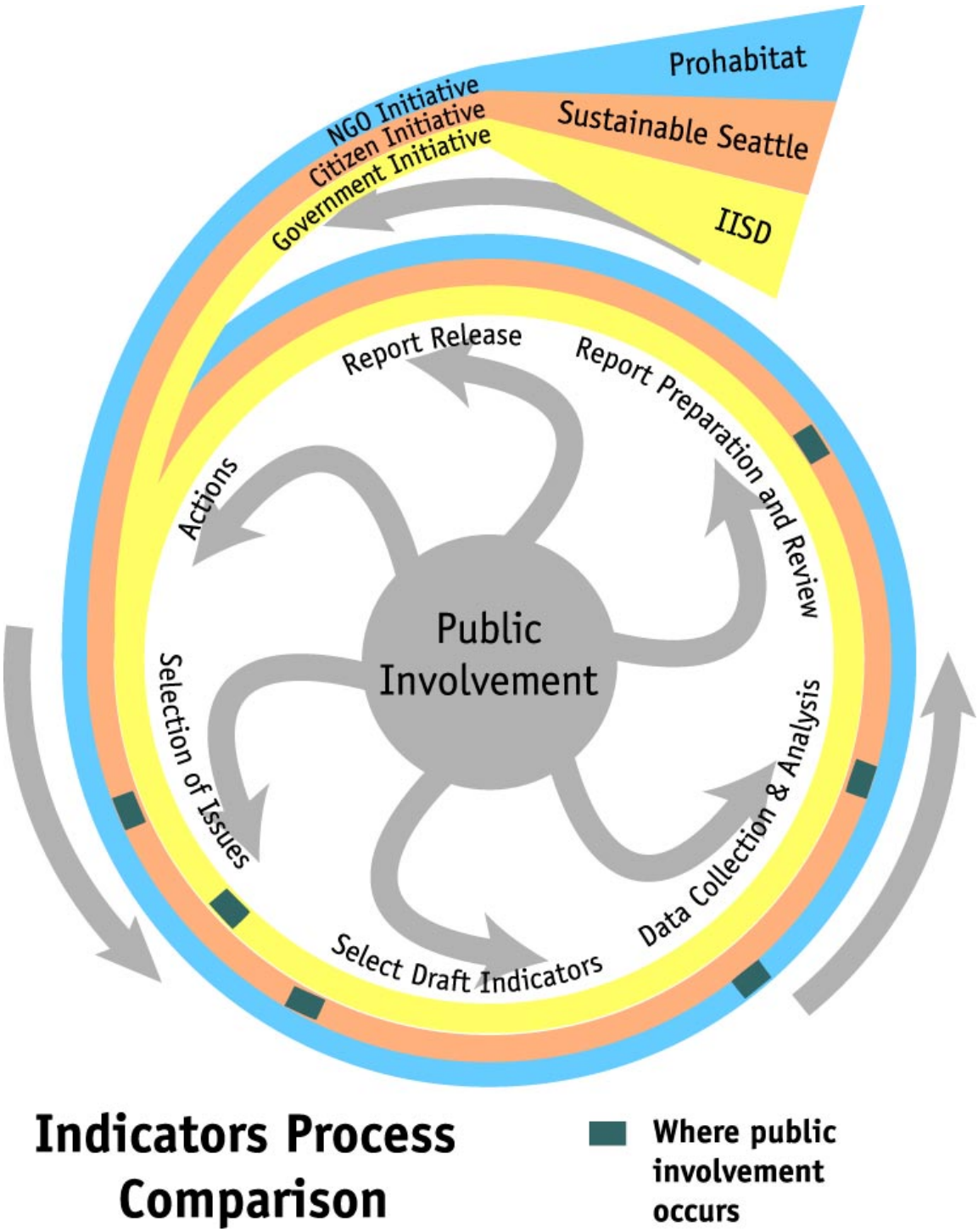


Figure 1: General measurement process outline.

Project specific steps are also summarized in **Table 1**. At almost every stage the project groups chose somewhat different approaches. The phasing of these steps was, perhaps in most cases planned but in many cases changes had to be made as project teams made progress and encountered unexpected challenges. The next section of this chapter will look at process steps one by one and compare the approach used by the three initiatives.

Table 1: Process summaries.

PROCESS TEMPLATE	PRO HABITAT	SUSTAINABLE SEATTLE[2]	IISD
1. Core group initiation	• Selection of existing group for cooperation • Determine geographic area • Determine time frame • Gather core group	• Emergence of need for indicators • Formation of S2 • Formation of Task Team	• Project initiation by government agency and expert group
2. Selection of key issues	• Select main issues • Design time-table	• Clarification of purpose • Clarification of values and vision • Review of existing models	• Process design • Indicator framework design • Issue selection (Focus Group input)
3. Selection of indicators	• Pre-selection of indicators	• Selection of draft indicators by Task Team • Review of indicators by Topic Groups and Seattle Civic Panel • Prioritization of indicators	• Indicator selection (TAC input)
4. Data collection and analysis	• Recruitment of volunteers (feedback to time-table design) • Data gathering • Meeting with experts • Comparison of	• Research • Regular update and follow-up	• Data collection (TAC input) • Data analysis

[2] S2's process included public involvement at every step.

	results • Final selection of indicators		
5. Report preparation and review	• Final report preparation	• Report preparation	• Report preparation (Focus Group input)
6. Report release and communication of results	• Communication of results (media, government, public)	• Report release	• Report release
7. Actions	• Action proposal to government	• Problem areas for action highlighted in report	
8. Updates	• Planned	• In progress	• In progress

Evaluation

1. Core group initiation

Who initiates and leads a measurement exercise is a critical issue. An important commonality across the initiatives was a core group that already had or developed the capability to run and manage the measurement exercise, from start to end. How this core group was started, the background of its members and its technical capacities were rather different. The starting point in Seattle was based on local, grass-roots action, inspired by the events at a workshop on measuring community well-being, and initial support from a local government agency. In the case of Manitoba the provincial government is required by law to report on the state of the environment, and emerging new legislation, the draft Sustainable Development Act, envisioned the requirement for broader sustainable development reports. The government decided to engage IISD, an NGO conveniently located in the city and with expertise in the field of measurement, to design and coordinate the exercise. In Guadalajara Pro Habitat was approached by IISD to initiate the measurement process. Pro Habitat was selected because of its track record in community activism and conservation.

In all three cases there was already some level of understanding for sustainable development when the idea of measurement and indicator development emerged. It took different forms, but it was probably essential for the idea of the measurement project to catch on. The advantage of a government initiative - the case of Manitoba - is that it opens up channels for the institutionalization of the measurement exercise. However, at the same time it may also constrain the process by channeling its output to fit at least some formal bureaucratic expectations. Although this was not the case in Manitoba, it may be a factor in other jurisdictions. A measurement process managed by a non-governmental group may have a more independent voice, but at a potential cost that it has less access to data and resources in public agencies. On the other hand, both S2's and Pro Habitat's case shows that if the measurement process are well publicized from an early stage, government tends to listen.

One of the first tasks of the core groups was process planning. Although the three organizations put different emphasis on this task, the important message seems to be that visualizing the entire measurement process from start to end is an essential step. In addition to

methodological steps, this should extend to the assessment of costs, human resource needs (paid or unpaid), relationship to media and officials, and the identification of potential allies and supporters.

Besides the core team, all three initiatives involved some sort of stakeholder participation in different phases. In Manitoba's case the stakeholder group was identified early in the process, soon after the need for Focus Groups was identified. Technical Advisory Committee members were also chosen early, a more or less formal requirement of a process that is going on with government involvement.

2. Selection of key issues

Sustainable development is a broad, holistic concept, and it is difficult to select indicators without an intermediate step to first clarify sustainability issues in broad categories. These categories define the framework for issue and indicator selection, and link the general vision of sustainability to its tangible components. The issue and indicator frameworks for the three initiatives are shown in **Table 2**. The frameworks are slightly different, but all of them are based on a whole system perspective. Although an adequate framework alone did not guarantee that the issues and indicators selected were appropriate, it helped prevent major omissions.

In the case of Pro Habitat, indicators were selected directly by the project leaders and a small number of participants from the core group, without a formalized intermediate step of issue selection.

Table 2: Summary of sustainable development indicator frameworks for the three initiatives.

INITIATIVE	FRAMEWORK CATEGORIES
Guadalajara (Pro Habitat)	• urban development • economy • environment • social area
Seattle (S2)	• environment • population and resources • economy • youth and education • health and community
Manitoba's Prairie Ecozone (IISD)	• natural resources • human made capital • community assets • human life

IISD chose a structured issue identification process in a Focus Group setting that involved issue selection and prioritization by participants. In a small group setting issue selection, clarification and prioritization may take one day. If the number of participants is larger (e.g. over 20), as it was the case in Manitoba's project, smaller breakout groups would be necessary. This means that issue lists from breakout groups need to be combined by the

project team and prioritization may require an extra meeting with the whole group working in plenary.

S2's issue selection process was less structured, involved more iterative steps, and the issue list developed over a longer period of time. Issue selection was facilitated by asking broad questions about "where the community was" in the present, "where it was going" and "where it wanted to be" in the longer term future. The final set of categories evolved from the list of indicators chosen.

3. Selection of indicators

The final list of indicators depends on who is selecting them, in what process and based on what knowledge and criteria. There are probably as many indicator criteria lists as indicator sets, thus the criteria used by these three initiatives were also partially different. S2 and Pro Habitat identified explicit criteria, in the case of Manitoba the criteria were implicit, but in retrospect they can be clearly identified.

S2's criteria suggested that indicator should be (1) bellwether tests of sustainability; (2) accepted by the community; (3) attractive to local media; (4) statistically measurable; and (5) logically and scientifically defensible. These criteria would map quite well for Manitoba's implicit list, with added emphasis on policy relevance and feasibility. In addition, in Manitoba the cost of information was an important factor as some of the data had to be purchased from Statistics Canada.

Pro Habitat identified three essential criteria, including (1) relevance, (2) relationship with public policies and (3) potential for capturing the public's attention and creating debate.

As mentioned above, in Pro Habitat's case the core team pre-selected an initial set of indicators that were subsequently presented to stakeholders to gather feedback. Probably because of the experience of the project team with local matters, this process seemed to work well, although the relevance of the selected indicators could be assessed only over time, as decision-makers and the public develop experience with them. Pro Habitat also tried to assess the relevance of the selected indicators for the broader public, and conducted a survey in which a random sample of citizens was asked to rate the selected indicators according to their importance. Members of the core team also held individual consultations with a number of experts in academic and government organizations to receive feedback on the list. The indicator list was finalized based on the inputs received.

S2 chose to involve stakeholders in indicator selection (following the selection of issues), while in Manitoba indicator selection was the task of the core project team, with input from the Technical Advisory Committee. Stakeholders were consulted about the adequacy of the indicators once a draft set was identified.

4. Data collection and analysis

Data collection is usually the next step after the indicator set is finalized, although data availability is one of the important indicator selection criteria and usually influences the composition of the indicator set. Pro Habitat specifically identified two stages of indicator selection, one before and another after the data collection exercise. Although the revision of the indicator set was not identified as a distinct step in Manitoba's process, the fact is that the indicator set was revised during the data collection exercise. IISD's policy has been not simply to exclude indicators from the set for which data was not available, but to point out data gaps where it was thought to be a serious problem (e.g. monitoring water use for irrigation).

For Manitoba's report data was collected for a five year time span from 1990 onward. In hindsight, this strategy probably lead to too short data sets that in the analytic phase hindered the identification of trends over time. While sometimes a five year interval might be sufficient, in many cases, especially in the environmental domain, meaningful trends are detectable only over a much longer time scale.

Because of the use of an ecozone and not a jurisdictional unit as a basis for reporting, IISD needed to find ways to isolate spatially referenced data for this section of the province. In some cases it was possible, e.g. by selecting census divisions that fell mostly in the ecozone. However, not all data was collected in spatial units (e.g. GDP), and for that no ecozone values could be found.

Data analysis issues for the three initiatives are reviewed in detail in section V.3. of this report. One important procedural issue to point out here is the need for cross-cutting analysis. The added value of sustainable development indicators is that the indicator set brings together measures that normally do not appear linked in sectoral analyses. Among the three initiatives only Pro Habitat attempted to use statistical methods to draw linkages. While such analysis may pinpoint correlations between different variables, the results should be used with caution. In a multivariate environment simple correlations do not necessarily mean causality, although, causality is exactly what policy-makers are interested in.

5. Report preparation and review

Report preparation in all three cases was the task of the core project team. In all three cases the report went through a review process that involved sending drafts of particular sections or the whole report to reviewers. The review process may be used to raise the profile of the project and communicate the indicators' message directly to decision-makers. However, consultations in the three projects usually remained on the level of technical experts.

The structure of the reports follows the structure of the indicator frameworks. All reports contain some description of the process that lead to the indicators, a basic discussion on what sustainable development means in general and for the city or region in particular. The discussion of indicators includes figures and graphs and focused explanations to help the reader understand the message of the indicator. The reports chose to use templates to structure the discussion on indicators. Although the templates are slightly different, they follow a similar pattern (**Table 3**).

Table 3: Templates for discussing indicators.

IISD	S2	Pro Habitat

• explanation of issue • description of trend • implications for sustainable development	• description • definition • interpretation • evaluation • linkages	• definition • description • evaluation • sources • actions • linkages

In addition to graphs and the explanation of indicators, IISD's report contains a number of box stories. These box stories serve to highlight and describe in detail an important and interesting issue with relevance to the indicator set discussed. They also describe in detail the complexity and cross-cutting linkages of a sustainability issue, usually on the basis of a real life story or example.

6. Report release and communication of results

Communicating the message of indicators determines to a large extent the success or failure of the measurement exercise. In all three cases, the audience of the indicators was defined very broadly and included key decision-makers in the community, as well as the general public. All three projects had a communication strategy that tried to reach this broad audience, both through the electronic and print media.

Both S2 and Pro Habitat, developed good connections with the local media, and the indicators received good coverage. Pro Habitat has been especially skilled in managing media relations. This relationship has evolved over time prior to this project, and it was carefully cultivated to keep media attention alive. The lesson from these exercises is that media attention does not simply happen, it needs to be planned and managed.

Manitoba's case was slightly different, given that the indicator report came out as part of the government's regular SOE report, and, as such, some level of media attention was basically guaranteed.

7. Actions

The purpose of indicator reporting is to make decision-making more responsive and adoptive to emerging challenges. While this influence can not be guaranteed, it can be facilitated through credible reporting, defensible conclusions and realistic recommendations. In order to facilitate actions, the indicators should be linked to current policies that drive the variables measured by the particular indicator. All three initiatives set out to explore linkages in some detail, however, they do not go as far as identifying links between indicators and particular policies, the leverage points for action.

8. Regular updates

Reporting on sustainable development is a cyclical process. Both the Province of Manitoba and Seattle are planning or have completed more than one cycle, while Pro Habitat completed only the first reporting period. The Province of Manitoba is the most advanced in making

reporting mandatory through its Sustainable Development Act that requires periodic assessment based on indicators.

Recommendations

In order to define the specific meaning of sustainable development according to the needs and conditions of communities, it is necessary to go through an iterative indicator selection process. As shown here, the process moves from a general framework for sustainable development towards key issues and finally measurable indicators. Depending on the nature of the initiative, communities may choose somewhat different strategies to organize the process. In these three cases a framework with eight consecutive steps was found suitable to analyze the projects. These steps can be considered as stages of a progressive learning process for the whole community.

Measurement processes need to be repeated from time to time. When starting a measurement exercise, communities should already think about the requirements of running the process over and over again with some regularity in the future. This would extend the time-horizon of the measurement exercise, and it would also help focus on key capacities necessary to ensure that assessment becomes a routine part of community life .

Success, however, depends not only on identifying issues and measures, but on communicating them to the audience. In addition to reporting the indicators, it is also necessary to provide a concise analysis of what they mean, what are their implications for policy, and what are the main uncertainties and questions that remain unanswered by the measures. Communicating the message of sustainable development indicators needs an information marketing plan: from newspapers through radio and television to the internet, there are many opportunities to reach people. As the case of Pro Habitat shows, communication with the public through the channels of the mass media can become part of the measurement process at every stage.

V. LESSONS LEARNED

V.1. PUBLIC INVOLVEMENT

In all three areas public involvement was key to development of indicators that represented community values. There are many facets to public participation that depend on local culture and politics as well as economic and social conditions. Among the three projects reported here there were several components common to each yet, different in the approaches that proved effective. The following categories describe those areas but are not intended to be all-encompassing. It is important to keep in mind that each project started form distinctly different origins. The IISD is a government funded organization. Prohabitat is an existing, well-established environmental NGO. S2 began as a spontaneous group of citizens that evolved with the indicators project into an NGO.

Stakeholders and Participants Selection

Identifying the interested people, groups, and organizations - stakeholders - in any public process is one of the first steps to be taken. With the subject of sustainability it is easy to say that everyone is a stakeholder and, while this is true in a sense, the candidates can be narrowed by observing the nature of public debate and activism in the local area under consideration. The goal is to identify and engage the groups and individuals that have the interest and resources to fully engage in the indicators development process, and that also collectively represent, as much as possible, the full range of economic, social, and cultural diversity.

The IISD focus group was selected based on environmental and economic sector activities, and major social interest groups and organizations. This group expanded as more groups became aware of the process and goals. Participants were invited based on their ability to bring experience in key areas to the dialog and knowledge of related issues. The participants understood that they would be describing the prototype indicators and community issues as a framework from which the IISD would develop indicators with data.

S2 has two categories of participants: the overall indicator development team and a Civic Panel. The development team was somewhat self-selected by people interested in Sustainability. However, the Civic Panel participants were selected with criteria very similar to IISD. However, Civic Panel participants were selected to be directly involved in review, refinement, and in some cases, redesign of the final indicators. The difference is small but significant. The panel participants were chosen from government, institutions, NGOs, business, and neighborhoods.

Prohabitat, by nature of their 24 year history, had a ready group of people to contact for involvement in the indicator project. However, these ties were specific to various areas important to sustainability. These contacts were used for points of reference and as resources. About 30 active people were selected from this group to participate in indicator development meetings.

Public Trust and Representation of Public Interests

It is important to continually nurture public trust and be careful of how public interests are represented. Public trust can be volatile with respect to business, NGO, and government activities. Sustainability, being a broadly applied concept, can be a idea around which trust between all sectors can be rebuilt or strengthened. In building public trust it is important to be forthright and open about the nature of the indicators project. It is equally important to continually be aware of and open to public interests not previously voiced. When public interests are represented be sure of the validity of the ideas and sources of those ideas. Including many different groups in the indicators process is the best way to cover most issues.

Comparing the three projects there are quite different levels of public trust. In Winnipeg the IISD is funded by the government. The group is respected and well-regarded by all sectors and have developed a good working relationship with local citizens. Thus they were in a good position to convene a civic-based indicators development process. There is significantly less trust between government, citizens, and businesses in Seattle. Thus a citizen's group such as S2 served (and continues to do so) a non-partisan role in its ability to convene diverse interests and engage them in creative dialog about sustainability. Pro Habitat is established as a well-respected and highly trusted NGO, by citizens, businesses, and government. Thus they were already well positioned to take on development of sustainability indicators.

Volunteer Issues

The S2 and ProHabitat projects made much use of volunteers. The level of volunteer involvement depends on a number of circumstances

Local interest in environmental protection
People with enough time to volunteer
The economic health of the locality
Cultural values and perceptions
Understanding and valuing sustainability concepts

As volunteers come into the organization it is important to be clear about the work at hand, the tasks needed to be done, and the time needed. Much of the work requires professional skills and expertise. Yet often additional training is needed in order to provide volunteers with the concepts of sustainability and the goals of the indicator development process. Care should be taken to match as much as possible the volunteer's interests and skills with the tasks to be assigned.

Volunteers were plentiful in Seattle primarily because of the high level of environmental awareness and concern combined with a strong economy. Hundreds of people covering all age groups volunteered for the Seattle sustainability indicators project. However, in Guadalajara the scenario was significantly different. The economy is growing but there is not yet an abundance of well-paying jobs to the point of producing a large population with volunteer time. Thus fewer volunteers were available to Prohabitat. Thus key community activists were engaged because of their knowledge and available time.

Public Involvement Processes

IISD used a focus group approach to guide the initial selection of indicators. The process for developing the indicators was planned out with the focus group providing initial guidance. IISD held focus group meetings to identify important issues related to sustainability and also to develop a preliminary list of indicators. The core group at IISD then proceeded to research data for the indicators and develop analyses along the guidelines of the focus groups. Focus groups helped finalize the selected indicators and provided advice on data collection.

S2 used a workshop method to refine and develop sustainability indicators. The original group of about 50 volunteers developed a large list of indicators. These reflected community values with some inclusion of practical aspects of data measurement and analysis. The next step was engaging community leaders broadly representative of and active in Seattle. This group was called the Civic Panel, and engaged in reviewing, refining, and validating the set of sustainability indicators. The group engaged in four plenary meetings with homework before each and sub-task meetings in between. The original set of indicators was thoroughly examined. New indicators were proposed, and at the end of the process the Civic Panel prioritized the indicators for the core group to finalize.

Polling and Surveying

Public involvement for Prohabitat took the form of an issues survey to the general public. Prohabitat surveyed the public to determine the issues of importance relative to sustainability. The results of the poll gave Prohabitat general guidance on major issues in six major categories: Environmental Problems, Urban Development Problems, Economic Problems, Social Problems, Women's Problems, Significant Entertainment. Three or four general themes emerged under each category as the areas important to the public.

S2 used a survey to create three subjective indicators. In this case it was decided that some public feed back was important as part of the indicators. There was no data available for the indicators chosen so a survey was authorized. The three indicators are, Perceived Quality of Life, Neighborliness, and Gardening Activity. The first two included a variety of questions designed to find out about peoples perceptions and how much personal interaction takes place. The gardening indicator is intended to show connection to environmental knowledge.

Development of the surveys was undertaken in a manner to provide a way to draw conclusions about the entire population. In the case of S2 the questions were revised several times in order to eliminate misinterpretations and provide a consistent response structure. Demographic data was collected also for use in later analysis of the survey results.

Expert Group Function

Integrating expert knowledge into the indicator development process can be accomplished in a number of ways. Overall, experts should be informed that the process is intended to combine public values with technical data. Expert groups can be

- Advisory to the public dialogue process
- A resource for data and analytical techniques

Peer reviewers for the final report

It is important to decide early in the project what roles experts will take in the indicator development process. The IISD is an expert group that put together an indicator development process that included the public and other expert groups. S2 is a mixture of professional people working in areas strongly linked to environmental, social, and economic work. Prohabitat is an NGO representing public interest in the environment and possessing well-established links to expert groups.

Expert groups can be called upon to provide a preliminary list of indicators or at least some commonly held measures in their area of expertise. The advantage here is that the public can see what is available. However, the discussions may be limited because of public perception that the experts already addressed topics in the most appropriate way.

Another approach is to have the experts be part of the discussions and thus advise process by participating in it. This approach can foster very open public dialogue. However, care must be taken to make sure the experts do not limit discussions by dominating with too much technical information or inadvertently intimidating lay-participants with expertise. An advantage to experts in dialogue with the public can be the broadening of expert perception.

Towards the end of an indicators development project expert groups can be very effective as peer reviewers of the end product. They can review their specific areas of expertise and also provide insight as well as review of links to other subject areas. Using experts in a peer review process helps ensure that sound logic and defensible analyses are used. This gives the report credibility and makes sure that the concepts expressed make sense. The value of the use of experts as peer reviewers cannot be over-stated.

Media Relations

News media should be involved in the project early on. Although, in the early stages it will not be for publicity so much as it will be for advice on how to approach the public with sustainability indicators. The subject of sustainability is not generally considered by the media to be very interesting to the public on a continual basis. However, if they are involved in the development of indicators or kept informed of the process, then there is much more potential for success in getting good media coverage.

V.2. CAPACITY SUPPORT

For a community to initiate an indicators process and maintain it over time, certain key capacities and elements of support must exist. We define capacities and support to include community interest and initiative, leadership, political and institutional support, financial resources, technical capability, and the ability to sustain indicators over time. We shall explore capacities and supports in the context of those that were common to all three indicators processes, and those that varied from one project to another.

Our hope is that, through examination of the support that existed in the three projects, we can begin to understand what basic foundational support is necessary for indicators projects in North America. The variety of support evident in the three projects studied suggests that indicators projects can succeed with a range of support mechanisms.

Community, Political and Institutional Support

A shared and fundamental support of community indicators efforts in all three communities is the concern for the well-being of future generations and the earth's ecosystem. Communication of these concerns to the general populations, and resulting actions on the behalf of sustainability in all three communities are goals of the indicators efforts. The political and institutional support provided to the indicators projects in Guadalajara, Seattle and Manitoba was quite varied due to the rich variety of history, culture, and economy.

Guadalajara. Pro Habitat was founded in 1973 to halt the region's deterioration and promote the natural, cultural, artistic, and historic heritage of the region. Since its creation, Pro Habitat has initiated and promoted environmental education activities through schools, citizens' groups, and the mass media. Pro Habitat's work providing citizen education, increased environmental awareness, and greater appreciation of artistic and historic heritage has provided critical support for effective sustainability indicators work.

In Guadalajara the reputation and experience of Pro Habitat leaders has been key to the political and institutional support they've developed for the Guadalajara indicators project. Pro Habitat has differentiated itself and gained support by bringing constructive proposals to the government rather than choosing an antagonistic view. The governor of Jalisco is supportive of their indicators work. Some government offices provide not only the data for the indicators, but personnel to assist with research.

Pro Habitat has also earned the support of key academic groups including the Center for the Strategic Studies of the University of Guadalajara and the Western Technological Institute for Superior Studies. Pro Habitat was able to gain the cooperation of the media including the newspaper daily Ocho Columnas. Pro Habitat's work was well covered during the project.

The political changes that occurred in Mexico during the summer of 1997, and in particular in Guadalajara, somewhat hampered Pro Habitat's data collection efforts. Unfortunately, as happened in both Jalisco and Guadalajara, officials of outgoing administrations left with much of the office data and information. This clearly creates difficulties in gathering and maintaining consistent data over time.

Additional difficulties are created when department heads run for a post in the Senate, Legislature, or Mayoralty; resign or take leaves from their positions; and are replaced by interim officials. These new people often don't know of the work of Pro Habitat, are unwilling to support the work, and are generally less accountable since their tenure is limited.

Seattle. The people of the Pacific Northwest US have long enjoyed and appreciated the local natural environment, its forests, streams, and abundant wildlife. However, as a result of the

pressures of population and development, it's evident we're reaching the carrying capacity of many of our key natural systems.

What legacy are we leaving future generations?" In November of 1990, this question drew 70 citizens of Seattle to the "S2 Forum" to discuss the environmental, economic, and social problems affecting Seattle's long-term well-being; propose definitions of sustainability; and wonder how to measure progress toward that goal.1* This meeting gave birth to the continuing civic effort of S2 (S2) on issues of sustainability and indicators.

Although S2's 1993 and 1995 indicators efforts were all volunteer, critical support by several organizations and businesses was provided from the outset. Metrocenter, a local organization working on issues of community, youth, education, and the environment; provided an administrative home, an office, and part-time staffing. A variety of small businesses, foundations, and consultants — planners, facilitators, researchers — provided a range of in-kind resources to S2's projects. Key people in several offices of City government also provided expertise and guidance.

Manitoba. The Winnipeg indicators project clearly had the most direct political support as it was initiated by the Manitoban government. In Manitoba, indicators of sustainable development for the Prairie Ecozone are included in the "State of the Environment Report for Manitoba, 1997." In this project the foundational support, concern for the future and the environment, was manifested through the citizens' elected representatives — the government. This action by the government resulted from a series of international and Canadian initiatives.

In 1987, the World Commission on Environment and Development focused global attention on sustainable development. In Canada a National Task Force on Environment and Economy was established, encouraging industry and government to integrate environmental and economic decision making. In 1988 Manitoba Round Table on Environment and Economy was founded, incorporating the principles of sustainable development into public and private sector planning.

In 1990 the Manitoba government made a commitment to sustainable development. The Sustainable Development Act for Manitoba is being drafted and will require regular sustainable development reporting. In 1994 the Manitoba government released its Sustainable Development Strategy combining indicators with a number of related provincial initiatives: the Environmentally Sensitive Initiatives Committee, the Component Strategy on Demonstration Projects, and the Component Strategy on Education.

Such governmental initiative and support has many benefits including funding, potential long-term support, and the influence of other sectors of society, particularly the business community. The potential down side is the sometimes cumbersome and slow progress of bureaucracies.

The concepts of sustainable development are being integrated into the highest levels of national and provincial government. We look forward to following how well public and private sector planning and activities are guided by sustainability indicators.

Financial Resources

The clear reality of even modest efforts to create sustainability indicators is that financial resources are quite necessary.

Pro Habitat. Given Pro Habitat's effective community, environmental education, and historic preservation work for almost 25 years, its leaders were invited by IISD to participate in this tri-lateral sustainability indicators project. The NAFEC funding for the project also supported Pro Habitat's sustainability indicators work. Pro Habitat's funding for its administrative overhead and core work in the community is provided in large part by one of its leaders, Rene Solinis.

In Pro Habitat's experience, funding issues concerning the indicator work have been significant. People who might otherwise be able to help on the indicators project generally have little time to do volunteer work because of personal economics. People are forced to spend most of their time securing the means to sustain themselves and their families. Therefore most of the work on the indicators was done by a small group of people who could afford the volunteer time.

The timing of receiving financial support from IISD was somewhat a factor in the progress of the project. Over the summer, indicator analysis was somewhat slowed by late financial support from IISD. Although it is early to project the future of sustainability indicators in Guadalajara, financial support will likely be one of the key issues.

S2. Since its founding in early 1991 S2 has been primarily a volunteer driven organization. They were fortunate to have an administrative home, an office and part-time staff at Metrocenter, a local organization within the YMCA working on issues of community, youth, education, and the environment. From 1991 through 1997, S2 was financed with several small grants from foundations and local business, and sales of publications, primarily the two iterations of their "Indicators of Sustainable Community" reports. Some grant money was spent on surveys to gather data for the indicators. Seattle's indicator projects were carried out with this low-overhead administrative base and an extensive volunteer effort. In late 1997, S2 was making a transition from Metrocenter to greater autonomy with their own office and 501 (c) (3) non-profit status.

The benefits of this low-budget indicators campaign were that a prodigious amount of work was accomplished for little expense. Had the Seattleites started by looking for grant money, they might still have been in the fundraising stage.

The downside of strictly volunteer efforts is that it's sometimes difficult to make deadlines. Seattle's 1995 indicators slipped almost a year from the first intended publication date.

IISD. IISD's indicator work for the Prairie Ecozone was mandated and funded by the government of Manitoba. Manitoba's financial support of sustainability indicators is one part of the provincial commitment to sustainable development, a commitment born in an international context. Near-term funding for sustainability indicator work in Manitoba seems assured, and longer-term funding likely if the indicator tools continue to be well crafted and integrated into decision making. As is

often a challenge in bureaucracies, care must be taken to keep the process from too complex or cumbersome.

Technical Support

The technical quality of sustainability indicators is critical to their usefulness and success. Technical aspects of indicators must be considered within the overall context of indicators projects. In all three of the projects, the technical issues followed the critical first steps of a sustainability indicators process — inspiration and initiative to begin; determining the geographic area and time frame; clarification of purposes, values and visions; and reviewing existing models. Technical issues become relevant when setting criteria for indicators, when selecting and composing indicators, in gathering data, in presenting and publicizing indicators, and in formulating actions and solutions to increase sustainability. As these issues are analyzed in detail in the following section (Data and Analysis), here only the logistics of technical support is addressed

Pro Habitat had technical support for the indicators project from the Pro Habitat leadership, and key academic groups including the Center for the Strategic Studies of the University of Guadalajara and the Western Technological Institute for Superior Studies. Although the initial responses from the University and Institute were very positive, only a handful of students were ultimately involved in the project. Two journalists were very helpful providing research for the indicators. Sources for the data that proved useful were the National Institute of Statistics, Geography, and information (INEGI); local archives; and libraries. Some government offices not only provided data, but personnel who assisted with the research.

With the exception of the Secretariat of Health (Secretaria de Salud), the Secretariat of Education, the IJAS, the universities, and the media archives, most organizations have not organized their information or they lack complete archives. In some cases, they lack trained personnel or political experience. This is the first time that an opposition party has defeated the official party not only at state level but also in the four municipalities in which Pro Habitat works. In many cases new officials do not understand the indicators project.

S2. In Seattle, the result of a series of meetings of the Civic Panel, was a group of 99 sustainability indicators. Since most agreed that this number of indicators was to large to be manageable, the Panel agreed to let a technical review group winnow the set to a lesser number. The result was 40 indicators.

The all-volunteer task team was composed of groups corresponding to the five sections of the indicators set - Environment (natural and built, Population and Resources, Economy, Health and Community, Youth and Education. The coordinator-led groups were composed of people each of whom was committed to the completion of one or more of the indicators. Team members either researched and wrote the indicators themselves, or called on others to do the work. Fortunately, the volunteers had good initiative and resourcefulness for this difficult work. It is important to note that the volunteers were in fact working in a professional capacity, donating their expertise in addition to their time.

It soon became apparent, however, that because of limited data availability, it was more realistic to first publish a group of twenty indicators, with the balance to follow at a later date. Volunteers made use of whatever data resources were available — city, state, and federal agencies; libraries;

and universities. As the task teams progressed, data availability, or lack thereof, shaped an evolution of the indicators. Team members worked with the best available data to come as close as possible to the original intentions of the Civic Panel. "Homelessness," for example, evolved into "Housing Affordability," which experts felt was a more reliable source of long-term data and a better indicator of the conditions that breed homelessness. "'Wild Salmon' was narrowed down to the salmon runs in two specific streams, reflective of the Puget Sound system as a whole. Similar technical adjustments were made to virtually every indicator, but the values, vision, and recommendations of the Civic Panel remained the guiding beacon for each of those decisions."[3]

Whether or not to set sustainability thresholds or benchmarks was another technical issue raised in Seattle. The decision was a quick no given the obvious difficulties in setting levels for something as squishy as sustainability.

IISD. As the Institute's Measurement and Indicators for Sustainable Development Program has had the in-house expertise to develop and apply indicator frameworks and indicator sets, most of the technical support was needed in identifying the most appropriate indicators for the Prairie Ecozone and find the best sources for data. The multi-stakeholder, public participatory approach (the Focus Groups) helped in the former task, while a special Technical Advisory Committee (TAC) assisted in the latter.

The TAC was created by the provincial government as an inter-departmental body to help prepare the biannual State of the Environment Report in Manitoba. This committee consists of the representatives of basically all government departments and agencies. The TAC member is also responsible for coordinating the participation of the respective department. IISD's team members interviewed every TAC member and other representatives of the departments to find the best available data as well as clarify the indicators. They also used the expertise of the TAC members to revise the indicators.

IISD's team received further help from several departments of the University of Manitoba, particularly from those dealing with natural resources, agriculture and ecological economic issues. Several NGOs that collect data on specific issues, such as gender equity, family violence, neighborhood issues, were also interviewed and their data, if available, were used. Both the Focus Group members and members of the Environment Sub-Committee of the Manitoba Round Table on the Environment and the Economy helped identify potential sources of relevant data.

Sustaining Indicators

For sustainability indicators to help us realize our ultimate sustainability goals, they must be in place over time and be a key element in the most critical decision-making of government and industry. Although only time will tell how well these indicators efforts are sustained, we note a number of relevant factors.

Institutionalization. For sustainability indicators to be long lived, it is probably best that they be included in long-term planning and decision-making processes — usually the realm of government.

[3] AtKisson, Alan, *Developing indicators for sustainable community : Lesson from Sustainable Seattle*. Seattle, 1996, p. 4.

An integral component of the Canadian and Manitoban commitment to sustainable development, IISD's indicators have an excellent start. "Manitoba's commitment to sustainable development is based on a vision of economic growth that is environmentally sustainable"[4] In 1994 the Manitoba government released its Sustainable Development Strategy. The indicators are a part of this Strategy that also includes the "Component Strategy on the Public Sector," the "Environmentally Sensitive Initiatives Committee," the "Component Strategy on Demonstration Projects, and the "Component Strategy on Education."[5]

For several years, the Seattle team has been discussing how best to assure many future iterations of the S2 indicators. How many times S2 can call on its energetic volunteers is a reasonable question. As S2 makes the transition to a more independent non-profit organization, foundation and private sector support for future indicators updates are being considered and will likely be pursued. Yet Seattle has a strong foundation of civic activism and environmental stewardship, and volunteers for sustainability work are there when asked.

An interesting development in Seattle has been the completion of two other related indicator sets since S2's first set, published in 1993. King County, within which Seattle is located, completed the King County benchmarks in late 1996 — indicators of King County's progress toward growth management policy goals. And in 1997, the City of Seattle completed indicators to guide the City in design and planning responsibilities. Regardless of S2's future indicator iterations, this valuable feedback and tracking tool is finding increased use in critical areas of local planning and decision making. S2 continues to work with both the city and the county on their indicator sets.

In Guadalajara, Pro Habitat is the first group to convene a sustainability indicators project. For these indicators to have a future it is probably necessary that at least one of several things take place. The indicators will be seen to have value if they are well publicized by the media and there is a good public response. The indicators will have a better chance of future iterations if the city or state government see their value and adopt or fund them for future iterations. Pro Habitat may be able to keep them alive if it is able to secure additional funding for future work.

A benefit of the indicators project being completed by Pro Habitat, a well-established organization with a 24-year history, is that they are likely to be around for awhile and will integrate sustainability and indicator concepts into much of their related environmental, community and education work.

Indicators, action, improvement. A key to the success of indicators projects will be the extent to which the public links indicators with positive change. Pro Habitat has good experience in this key area of identifying problems; rallying community support; and coordinating the necessary political, institutional, and community legwork to get the job done. Breathing life into indicators by making them relevant to the community is critical if they are to be useful and long-lived.

[4] State of the Environment Report for Manitoba 1997, p. 9.
[5] See State of the Environment Report for Manitoba 1997, pp. 8-10.

V.3. DATA AND ANALYSIS

The whole process of doing performance measurement for sustainable development indicators assumes we are looking at a broad landscape of data where there will naturally be inconsistencies, lack of data, mismatching of data, data not allowing meaningful disaggregation (for example, state or provincial data that cannot be disaggregated to King County or the Prairie Ecozone). This is true with most new things. All the ducks will not be in a row. If they were, there would not be much work to do. Only after this type of work is done for quite a while, will some of the data anomalies begin to be resolved. One of the first steps is to note where the problems are.

This section discusses data collection and data analysis which is the most technical part of the report. The aim here is to address issues that are problematic in undertaking indicator and measurement work and related to a fundamental yet often neglected area of sustainable development projects. The critical nature of this section in part is due to the fact that these types of projects, even if they are implemented by an expert team, are not in the phase yet to be verified by rigorous statistical/econometric methods. At the same time, the need for such a verification and the necessary conditions for that is usually ignored in a report of this kind. The participants of this project are convinced that to expose rather than bury problematic issues may help address and resolve them.

Data and analysis are critical to empirical research, although they are only methodological tools. Data are factual information, organized for analysis. Analysis is a rigorous examination of the elements or structure of the data; in short, a tool by which results are generated from the data. The analytical procedures must be appropriate to the nature and type of data collected, and must take into consideration the available means and the needs and interests of the potential users. With this interpretation of data and analysis in mind, we can examine the relevant processes of all three projects.

Pro Habitat's Report

The Pro Habitat report was an initiative based on international cooperation. The time frame for the study covered the period 1990 - 1997. However, where there were adequate historic data available the study preceded 1990. There was contact with different groups to help with the project including support from some government offices which provided access to data as well as a personal assistant for analyzing the data. Four different working groups were formed representing each of the four areas of sustainability addressed. Each group had a leader and was given flexibility in the collection and analysis of data. Pro Habitat worked under severe time limitation due to the deadlines of the project (specified by the grant), having less than nine months to complete the first report on sustainability for the Metro Zone of Guadalajara (MZG).

During the first phase of the project the working groups experienced an enormous challenge in terms of the availability of information and statistical data. Data requirements were identified before the final selection of indicators. The list of issues were screened and aggregation proceeded

where possible. Each of the four groups selected indicators if it was feasible to define them, and if there were enough data for analysis. Data were available for almost all the indicators selected at the final stage of the study. Public polling was conducted in four municipalities to gauge the opinions of people on the streets about quality of life in the MZG.

The lack of historic data is explained by incomplete archives of the information held by the institutions responsible for data collection.

The interconnectedness of the zone of Guadalajara and Zapopan and their surrounding urban areas of Tlaquepaque and Tonalá, made it difficult to disaggregate information and data that were pertinent to the MZG. To resolve this problem, the team was flexible in the levels and the scope of the data gathered in order to find adequate substitutes.

There was no major data problem identified with the environmental indicators used in the study. This was mainly due to the availability of a data set resulting from continuous monitoring of most of the environmental indicators that were used. For example, there were adequate and reliable data for water quality because it is regularly monitored by the Water Quality Control Department.

Data Analysis

Both trend analysis and basic statistical analysis were done on most of the indicators. Correlation analysis was performed on all of the indicators and their respective components. The primary objective of the correlation analysis was to measure and determine the strength of the correlation between any two indicators or components of relevance. This helps draw linkages between individual indicators. This also helps determine how other indicators or components influence a particular indicator. For example, the study found that water quality was correlated with public health: a decrease in water quality helped the outbreak of a cholera epidemic.

All data collected were analyzed in their totality and all the data that were inconsistent, incomplete or unreliable were discarded. Existing indices were used where available and relevant to the interpretation of some of the indicators. For example, the Metropolitan Index of Air Quality was used to describe and analyze the Air Quality indicator. Historic data were used to analyze some of the indicators to determine if they were adequate and reliable. Predictions were made for some of the indicators. A public opinion survey was used to strengthen the results and consistency of their findings.

S2's Report

S2's indicator work was community-based, focusing on Seattle and surrounding King County. S2's "Indicators of Sustainable Community" reports focus on trends in key areas determining sustainability. Data for most issues are from the 1970 to 1994 period.

Data were provided by a wide range of public and private agencies and organizations. Additionally, S2 collected some data through new studies. The geographic scale of specific indicators depended on context and accessibility of data; in other words many indicators could not have been used if the entire collection were restricted to one geographic area. This geographic variety, however, makes aggregation and comparison to other regions of the country difficult. The indicators task teams assembled an initial set of 99 indicators. The Civic Panel refined this set to the final set of 40 indicators.

Data were acquired from a range of sources; from readily accessible public information, to new data synthesized from existing research, to public opinion surveys and other more subjective information. Definition and classifications of data also varied among jurisdictions. There was a lack of historical data for some of the indicators. Data were limited for some of the indicators due to several factors, including their relative newness and the narrow definition used to describe these indicators. For example, the effort to collect data on pedestrian-friendly streets is only recent.

Multiple-data sources were used in obtaining adequate data for some of the indicators, however this approach also had problems. For example, employment concentration data was from the period 1980-1992, but data for the period 1981-1994 were from 4 different sources that were not directly comparable. For indicators having no other data available, surveys and opinion polls were used.

Technical issues, specifically lack of data, necessitated dropping certain intended indicators. However, in certain cases, even where there was clearly no reliable data, the team felt that the indicator was important and the lack of data was an indicator itself that little attention was focused on a given issue. For example, there was virtually no data tracking the number of youth involved in community service or the number of hours devoted to arts instruction in the schools. The Civic Panel felt that these issues are critical in improving societal health and should be raised in the context of sustainability indicators, first, to raise important issues, and second, to catalyze a process by which agencies might begin to track these critical issues.

Data Analysis

Data analysis was directed by S2 with expert recommendations from people supplying the data. Trend analysis and basic statistical analysis were done wherever necessary. Because of the wide variance in the time frame of the indicators, there was no attempt made to evaluate all of the indicators over a consistent time period. In some cases indicators were analyzed based on one year of data or a survey collected at one point in time. Trend was inferred from those indicators with adequate and reliable historic data and whenever possible comparisons were made. Indicators with no historic or reliable data were in some cases not included in the analysis at all. A specific example is agriculture in the King County, where data gathered prior to 1982 were not included due to unreliable estimates between 1974 and 1981 and non-comparable formats from the years prior to 1974.

In situations where no data were available to adequately measure an indicator, but because it was of importance to the Seattle Civic Panel members, the interpretation and evaluation of the indicator was based on informal surveys.[6]

The presentation of each indicator included a discussion of linkages to other indicators. Linkages were inferred and identified for most of the indicators, although specific statistical tools used to assess correlation were not detailed (for example, the number of visits to emergency rooms was linked to levels of poverty).

[6] This is discussed under V.2 Capacity and Support, “Technical Support”

The Seattle team addressed several other technical issues. Should they aggregate the indicators into a "sustainability index" for uses such as the quick sound bite on the evening news — or maybe create such indexes for the three to five subsections of the indicators set. The group decided not to do this because of the difficulty of assigning the indicators relative weights. Such aggregation would also hide the systemic complexity and intertwined linkages the team saw as critical to illuminate through the project. Of course, a sound bite on the news is better than no coverage. Some people involved in Seattle's continuing indicators efforts advocate adding aggregation where it can be useful.

IISD's Report

IISD's Report was a provincial government initiative, and the study area was restricted to the Prairie Ecozone. The Institute lacked the flexibility and control over the boundary of the project. This resulted in a major methodological difficulty. The report tried to make the best use of the limited resources, especially applying a consistent conceptual framework to cluster and aggregate the indicators and analyze the trends. Real life examples (stories presented in boxes beside the indicator analysis) highlighted issues the indicators represented. An innovative aggregation method, the Barometer of Sustainability index was used for overall performance assessment.

Another merit of the project was the public participatory process. Stakeholders were chosen to start the process of selecting the appropriate issues and respective indicators. A Technical Advisory Committee provided input to data collection and analysis. Data for the report originated from a wide variety of agencies and organizations. Most of these sources have been provincial and federal government statistical departments. A mix of several data sources were used to evaluate several of the indicators and their components. The baseline of data for the report was at the beginning of 1990 to 1996.

Difficulties arouse for two main reasons: a) There was a lack of historic data for most of the major indicators for the Prairie Ecozone. In many cases data were not collected on an ecozone level; most of them was available only on a provincial basis. This created a disaggregation[7] problem, with the result that appropriate data was lacking on several issues that concern prairie residents. For example, health and most economic data (like the GDP) were collected only on a provincial basis. In cases where reliable data were not available, individual data sets were used to assist in establishing a trend over the five-year period. Although some disaggregation was done using the population data, this was quite expensive and time consuming.
b) Important issues could not be measured by the suggested indicators either because available data were poor representations of them or data were unavailable. In view of this, the selected indicators were restructured to suit the data or proxy indicators[8] used in some instances.

Data Analysis

Trend analysis and the Barometer of Sustainability Index were the major analytical tools used to process the data. The Barometer was used to assess the overall progress of the Prairie Ecozone toward sustainable development. The results provided information about the status of opportunities

[7] Disaggregation problem refers to a case in which composite data (e.g. population data for a state) have to be broken down to the constituent parts (e.g. for a district or a county)
[8] A proxy indicator is a substitute used when the originally selected indicator is not applicable

for sustainable development. For example, the results indicated the need to resolve problems in the areas of soil erosion, water quality, poverty, waste management and energy use. Major statistical analysis, however, was very limited due to the short data time period available.

Numerical trends were determined whenever possible. However, this was not possible for some indicators because of the complexity of issues and scarcity of relevant data (e.g. in the case of biological diversity).

Because of the poor nature of data, some of the analysis done were inconclusive. For example, the expenditure data on environmental protection are inconclusive because increased spending does not mean improved environmental protection. In addition, because of a lack of capability, no statistical testing was done to verify findings or results.

Evaluations

Data Sources: Primary and secondary data sources were used in all three initiatives, ranging from governmental agencies and organizations to municipalities, private organizations, libraries and in some cases survey questionnaire. There was a mix of several different data sources used in analyzing some of the indicators. Combining these different sources into one report created some problems due to a lack of consistency in the definition and classification of available sets (for example, soil erosion is measured as number of hectares affected by erosion or volume of soil eroded per hectare per year).

Data availability: All three projects had to face with a lack of historic data for some or most of the indicators. Some possess a wealth of information while others are deficient. In many instances, available data sets were not as recent or complete as hoped for.

Many of the major data problems experienced in IISD's work are not the same as in the S2 and Pro Habitat projects. This is due to the fact that the latter projects have an urban focus and data are usually collected and monitored at that level, while the former has an ecozone focus, and not much data collection has been done at that level. The above suggests that further work studying the methods of data collection is necessary and would improve sustainable development reporting. It also reveals the reality of the data world we must work in and the need to develop feasible data collection procedures before a pilot project or study is attempted, if the pilot study is specifically concerned with the effectiveness of measuring sustainable development performance itself.

Data Collection Methodologies: Like other projects, ours too depended on existing data, of which we did not have direct control. Some of these existing data may have been collected based on criteria not appropriate for the indicator study in question. The lack of control over the data collection often creates special problems for the researchers in pinning down the exact meaning of the data, so the conclusions drawn might be less reliable, adequate, or consistent than they hoped for. These problems tend to exist in almost all research work since it is difficult and in some cases unreasonable not to depend on existing data set (it is clearly not feasible with historic data and not realistic with current data collection efforts).

For the long term process it will be important and necessary to collect data specifically related to sustainable development in order to address the most important issues as defined by the communities.

Varying time period: IISD's report analyzed most of its indicators within the time period specified for the study. S2 and Pro Habitat used different time periods for most of the indicators mainly due to differences in available data. Although data covering longer time series would have been preferred to determine possible trends, because of their dynamic nature, these were not available in most cases. If we want to make comparison between the present and the past, in order to foresee trends in the future, we will need consistent data for many years, if not decades.

Disaggregation Problem: All three projects had to cope with poor fits between the area for which the data were collected, and the area of project focus. In IISD's case, some data were available for the entire province, but not transferable to the Prairie Ecozone portion of Manitoba. Pro Habitat had some problem due to the interconnection of Guadalajara and its surrounding areas. However, where there was a poor fit between available data and the area of project focus, they tended to avoid the use of the data or used them in their original context.

An important conclusion of the above points is that the need for appropriate data collection procedures should be addressed at the very local or micro level rather than within political boundaries. Thus separate data monitoring or collection procedures should be needed for the rural and urban regions. This could resolve some of the disaggregation problems and also be useful in comparing achievements of the rural and urban areas to determine if their sustainable development goals are accomplished. While such an outcome would be nice and maybe possible in certain cases, yet we need to work within the constraints of larger data collection efforts such as national census.

Use of Proxy: In the S2 and IISD projects when there were no data available to create indicators of importance to the communities, a proxy statistic was selected. For example, presenting a reliable numerical trend for biological diversity is not possible because of the complexity of the issue and the scarcity of relevant data. Consequently, an indirect measure of population trends of some species sensitive to environmental stress has been selected as a proxy measure. It is particularly important to look for good proxies that are very close to the actual or true observations/indicators, otherwise the use of a proxy may lead to a systematic distortion of the statistical and analytical results since the original indicator was not used in the analysis.

Trend and Statistical Analysis: Trend analysis was one of the major analytical tools used in the three projects. In situations where data were unavailable or available just for a specific year, no trend could be have been determined. It was therefore difficult or impossible to evaluate whether the indicator was moving toward sustainability or not. In the future, all teams might apply standard statistical methods (such as regression analysis) to provide additional proofs of the empirical significance of the results.

Recommendations

Given the need for data quality and reliability, the following are recommendations for future work:

- Improve the graphic presentation of data;
- Organize information from all contacts or sources;

- Modify existing data collection procedure if possible to suit the data needed to address sustainable development problems and undertake new data collection initiatives, applying innovative techniques and technologies (though it might be the most expensive activity);
- Co-ordinate local data collection agencies and organizations in terms of timeliness, data format, quality and responsiveness to changing needs;
- Make the assessment process ongoing and secure resources for continuation.

V.4. COMMUNICATIONS AND IMPACT

Impact of technology on data accessibility

The dramatic and rapid advances in technology, particularly computers and information technology have revolutionized the potential for sustainability indicators projects. information for accessing information useful for projects such as indicators for sustainability has revolutionized the amount and diversity of information available. In the 3 country combination, both Canada and U.S. were able to reap significant benefit from this technology. However, in the case of Mexico, only a small amount of useful information could be accessed through data base technology, because many of the government agencies do not have the information systematized.

In these days is more and more easy to get all kind of information through technology, that is, with the computer networks is easy to get through the data bases, which some years ago, it was unthinkable.

The extremely rapid development of technology for accessing information useful for projects such as indicators for sustainability has revolutionized the amount and diversity of information available. In the 3 country combination, both Canada and U.S. were able to reap significant benefit from this technology. However, in the case of Mexico, only a small amount of useful information could be accessed through data base technology, because many of the government agencies do not have the information systematized.

It is recommended that the Final Report of the three participants is given broad accessibility through electronic means in all 3 countries.

Report Audience

It is recommended besides, that not only the Final Report, but also the backup project work be published and made available to local communities with appropriate media coverage. In addition, it is recommended to have the project available to libraries, whether or not the community has been involved directly in the project.

Presenting Results

For that, various forms of media communications can be utilized, including press conferences, interviews on TV and radio, and special bulletins. In addition, researchers and technical people in related fields should be briefed in order to promote dialogue and future developments.

Follow-up periodic progress reports can also be presented to authorities, and released to the media to keep the public informed and asses the progress on implementation and corresponding results of recommendations.

Impact of Indicator Project on community

That is important, since in that way it can be measure the indicators project impact on community. In this way the local community can become involved in revisions or new participative programs for their own quality of life in their respective communities and a true sustainable development.

Media Relations

Cultivation of Media support was particularly strong in the Guadalajara Project. It is felt that this positive communication with the local citizens, through the media, gives the project credibility and importance, and keeps local communities informed about the progress of the project, as well as encouraging participation as it must be the concern of all that are forming the community. The Media if it is interested, is a powerful ally in linking the community with the work of researchers, project workers, and local authorities.

The Media is an informal education medium through which consciousness of emerging new aspects of indicators for the quality of life can be promoted.

The opportunities for the potential of the media, can be realized not only as a medium of information, but also a forum for proposing new ideas, orientation and focus which will lead to changes in conduct and mind set for local citizens. Any opportunity must be profited, that is why close relationships with sensitive reporters and media are important and can prove to be indispensable in the transformation to a sustainable mentality.

Common Language

Language used in the communicating of the project should be accessible to all, it is necessary not to use a high technical and unnatural jargon. A clear and colloquial language is very important in order that citizens feel themselves as a part of the project, the results and the solutions. Otherwise, the project can be perceived as another government imposed project, where local views are not taken in account, and hence encourages non participation. That does not mean that the report, article o interview, must be superficial, very deep things can be said using a simple language and using the common sense.

Time series vs. categories or short term vs. long term

It is important for recommendations to be carefully prioritized, based on time scale of implementation potential. Local citizens want some things to happen quickly to give the project credibility and encouragement for public support. Therefore the recommendations should contain potential actions which are both short and medium term in their implementation process.

VI. CONCLUSION: RECOMMENDATIONS FOR NEW BEGINNINGS

In the last couple of years an increasing number of communities, local authorities as well as national governments have become interested in assessing progress toward sustainable development and started to develop their own measurement tools and indicator sets. Though these initiatives often start with a quick survey of other existing approaches, very little systematic effort has been taken to date to evaluate experiences and learn the lessons they offer.

Our project, "*Communities for Environmentally Sustainable Development*", intended to accomplish exactly that goal. It was a unique, first of its kind cooperation among three different groups in three countries to share experiences in their work to facilitate and measure sustainable development in their communities. The project offered many important lessons for all the participants. Sustainable development is perceived as an ongoing process that requires continuous efforts to maintain it as well as to assess progress toward it. The lessons we have learned and the conclusions we have drawn from these efforts serve as recommendations for new beginnings and renewed efforts for all involved in similar efforts, both new and continuing projects.

There are numerous ways to assess progress toward sustainable development. The United Nations Commission on Sustainable Development, for example, asked a group of international experts to develop a set of indicators to measure progress toward sustainability. The result, a comprehensive list of 134 indicators, has been recommended to nations for testing. Countries can select the most suitable, "personalized" set from the indicator list, and use methodology sheets developed by expert groups for guidance through the process of developing sustainability indicators

The approach taken in this collaborative project has been clearly different. The experiences of two rather distinct initiatives and methods in Canada and the United States were carefully studied before launching a third project in Guadalajara, a significantly different social and cultural setting. All partners agreed that applying a Northern model to Mexico was bound for technical and political failure. Increasingly, the emphasis has been for the Mexican partner to direct and control its own development and the process for assessing the sustainability of such development.

At the same time, the project experiences have resulted in a great deal of learning by all partners, especially in the area of societal base which is still bound by cultural values of great importance for sustainability. The grassroots level is seemingly the place where the force will come from to influence governments, attitudes and positive business practices. Local cultures, beliefs and values of the people are taken into account in implementing the project. Perceptions of reality shape behavior and influence action more statistical figures and hard facts. These have been the important lessons for the project partners during the year of cooperation.
In evaluating this project from a Northern perspective, it is important to consider cultural differences and variations in the criteria for determining useful indicators. The quality behind the numbers is equally important, and the criteria used to evaluate issues might vary. It means that even if there are many similarities in the processes and results, some of them might be quite

superficial. These issues have been considered in the project evaluation and particularly as we have formulated recommendations.

The stages of assessment completed through this project will be very useful as a part of an ongoing, continuous review process. The data collection was a very valuable part of the Mexican work, completed under severe time limitation and with limited human and financial resources. It will be used, without doubt, for other projects. The experiences gained through organized process planning, group work and community participation, may be of significant help to other groups and communities launching similar programs.

Some of the lessons learned regarding the cultural, social and political aspects of effective and successful projects are best summarized in the Executive Summary of the Pro Habitat Report "*Communities for Sustainable Development*" (see Attachment). These elements are specifically relevant to the implementation of sustainable development indicators projects in Mexico by grassroots groups. The recommendations refer to the selection of groups, adequate training of the leaders, insightful political timing of implementation, and careful consideration of resources necessary for project implementation.

1. Groups should have experience conducting work related to sustainable development or at least some familiarity working within the community. Groups must be known and respected by the community, and should have good connections with influential groups, including the media, government and institutions of higher education.
2. If such a group does not exist, it should be created to launch an assessment project. Group leaders and members must receive some training in group management, research methodology, and sustainable development in general.
3. The political situation in which a project is initiated will strongly influence its implementation. During election periods, for example, government agencies that might provide data and information, will be immersed in the electoral process and there will be little time for supporting indicator projects. Changes in government administration or political instability will also cause disruptions in the sources of data, institutionalized data storage, or the willingness to support projects outside of government. In cases where these conditions exist it is preferable to wait before implementing the project.
4. Project implementation must take consideration of the limited resources of project workers and participants in countries like Mexico. Volunteer community work has a different meaning and even volunteers must be paid because the time invested in the project is a lost opportunity to earn a living. In most cases, the smallest expense (like office supplies) can be significant for the budgets of many groups. Where possible, it is best to avoid the use of intermediaries in the provision of support. Bureaucracy and speculation by government agencies impede the support and completion of work.
5. In projects based on international cooperation, the knowledge of the country, people, culture and any local idiosyncrasies is imperative for the person(s) responsible for linking the various organizations together to perform their tasks successfully. The way that people look at their problems varies from town to town and culture to culture.

Other lessons are more closely related to technical issues, particularly to the availability and reliability of data. In following the vision of sustainable development, there are issues related to the status quo and self fulfilling prophecies that must be reckoned with. New ideas and priorities will often require data that are not yet available. The data that we *do* have may have too much influence on the complexities, linkages and interrelationships, and on matters of the heart and soul that

should benefit from fresh thinking. For example, society takes actions that have real human impacts, based on many economic and employment statistics that lack social components.

Existing tools, including statistical methods and physical monitoring capabilities, have been developed over the decades, long before the concept of sustainable development was developed. Issues of paramount importance from this perspective, cannot be measured without data. For this reason, data collection is a valuable part of the Mexican work that has been completed under severe time limitation and with limited human and financial resources. It will be used, without doubt, for other projects. It also demonstrates an obvious need for continuation of the project. The Metro Zone Guadalajara indicator report is only the very first stage of the work. S2 is working on its third report; IISD will take part in a continued effort of the provincial government in regular reporting; and Pro Habitat will also need further opportunities to expand its work.

The need for continuity to transform the assessment process into an ongoing activity raises additional observations. Some communities can generate their own resources to manage measurement projects. They might rely on civil society, grass-roots resources or government budgets (or both). Others, however, may need external support; this underlines the importance of international collaboration on the one hand, and awareness raising on the other. Pro Habitat's experience demonstrates that media cooperation from the beginning is important. The media should be consulted and provided information regularly. They may also have an important role to play in generating the resources necessary to sustain the measurement efforts.

A further lesson is that communities must be aware of the impediments confronting sustainable development performance evaluations. These include, an absence of issues to mobilize public interest, a lack of participation from deprived groups of society due to economic costs and a reluctance to cooperate with government agencies, and problems created by the translation of technical terms. A critical understanding of the task ahead will enable community groups to plan more effective projects in the future.

We - people, communities, and entire cultures are in a constant and cyclical process of observing, doing, experiencing, receiving feedback - wanted or not, adjusting, and doing again. The challenge and the primary focus of sustainability indicators initiatives is to create tools and processes enabling us to first create ideas of where we might like to someday arrive - what kind of societies we would like to live in - and secondly, create effective cause-and-effect feedback loops - with the help of indicators - to guide us to those visions.

We will zig and zag, but if we have a clear view of where we *wish* to go, we may get there. Effective indicators of sustainable development can smooth out the zig-zags, can reduce the knee-jerks and whip saw responses to events around us - and may advance us well beyond crisis management. If we can see the coming train wreck and have time to do something about it, we may act. And if we can see a society of beauty, art, community, health, fulfillment, caring, music and spirit, we may work to get there. We have liked our leg of the trip - Guadalajara, Seattle and Winnipeg. Here is to the rest of the journey.