PEOPLE AND WATER: A RESOURCE BOOK FOR APPLYING COMMUNITY-BASED WATERSHED MANAGEMENT TO INFORMAL SETTLEMENTS

by

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The already rapid pace of urbanization in developing countries is exacerbated in informal settlements. These unplanned areas typically have twice the growth rates of the city region and account for the majority of organic pollutants within Third World Cities. Conditions in and around these areas are deteriorating and alarmingly unhealthy: Many observers cite these areas as the most polluted and disease ridden habitats on the planet. Planners and urban managers are struggling with finding new ways to cope with these unregulated areas, as traditional urban management approaches have failed. One of the most recent arrivals is community-based watershed management (CBWM). Unfortunately, there is little guidance from the developmental field on how CBWM can be applied; the information that is available is inconsistent as there is wide disagreement in practice for the scope and nature of its activities.

This thesis provides decision-makers, urban managers, planners and international agencies with ideas and resources for applying CBWM strategies to the urban environment and informal settlements. Integrating information from participatory development, integrated watershed management, and urban environmental management, this thesis has taken the form of a Resource Book to better illustrate a process, and associated principles, methods, and tools for CBWM. Beginning with an overview of the challenges and opportunities for CBWM, this document continues by developing a municipal planning framework that identifies the main concepts and potential activities for CBWM and organizes them in a logical format. This framework is supplemented with a menu (or toolbox) of specific strategies available to carryout CBWM according to the institutional, social, and environmental systems. The final section of this document concludes with three appendices which provide users with additional resources and reference points to more specific information.

This Resource Book is based on meta-research: drawing from the documented experiences of other researchers and collating the information into a useful and comprehensive format. While it attempts to reach as wide an audience as possible, its current format is perhaps most appropriately targeted at the professional level. It is, therefore, considered a first step (or one component) towards a community-level resource book that is more applicable to all stakeholders.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>iv</td>
</tr>
<tr>
<td>Preface</td>
<td>viii</td>
</tr>
<tr>
<td>Conceptual Drawing of Urban CBWM for Informal Settlements</td>
<td>xi</td>
</tr>
<tr>
<td>1.0 Urban Environmental Management and CBWM</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td></td>
</tr>
<tr>
<td>1.2 Challenges of Urban Environmental Management</td>
<td></td>
</tr>
<tr>
<td>1.3 The Way Forward: CBWM</td>
<td></td>
</tr>
<tr>
<td>1.4 A Conceptual Model For This Resource Book: CBWM Applied to Informal Settlements</td>
<td></td>
</tr>
<tr>
<td>1.5 Key References</td>
<td></td>
</tr>
<tr>
<td>2.0 A Municipal Planning Framework for CBWM</td>
<td>36</td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td></td>
</tr>
<tr>
<td>2.2 Developing a Planning Framework</td>
<td></td>
</tr>
<tr>
<td>2.3 A Planning Framework for CBWM</td>
<td></td>
</tr>
<tr>
<td>2.4 Key References</td>
<td></td>
</tr>
<tr>
<td>3.0 Urban CBWM Strategies</td>
<td>66</td>
</tr>
<tr>
<td>3.1 Planning and Administration Strategies</td>
<td></td>
</tr>
<tr>
<td>3.2 Community-Based Strategies</td>
<td></td>
</tr>
<tr>
<td>3.3 Environmental Strategies</td>
<td></td>
</tr>
<tr>
<td>3.4 Key References</td>
<td></td>
</tr>
<tr>
<td>4.0 A Yardstick for CBWM: An Evaluation Framework</td>
<td>119</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td></td>
</tr>
<tr>
<td>4.2 Overcoming Challenges of Evaluation: Participatory Evaluation</td>
<td></td>
</tr>
<tr>
<td>4.3 A Method for Developing a CBWM Evaluation Framework</td>
<td></td>
</tr>
<tr>
<td>4.4 An Illustrative Evaluation Framework for CBWM</td>
<td></td>
</tr>
<tr>
<td>4.5 Key References</td>
<td></td>
</tr>
<tr>
<td>5.0 Summary and Conclusion</td>
<td>154</td>
</tr>
<tr>
<td>5.1 Introduction</td>
<td></td>
</tr>
<tr>
<td>5.2 The Appropriateness of CBWM as an Urban Management Tool for Informal Settlements</td>
<td></td>
</tr>
<tr>
<td>5.3 Limitations of the Research and Lessons Learnt</td>
<td></td>
</tr>
<tr>
<td>5.4 Future Steps</td>
<td></td>
</tr>
<tr>
<td>Appendices</td>
<td></td>
</tr>
<tr>
<td>A. Annotated Bibliography</td>
<td>165</td>
</tr>
<tr>
<td>B. Annotated Internet Websites</td>
<td>207</td>
</tr>
<tr>
<td>C. Case Studies Illustrating Community-Based and Environmental Strategies</td>
<td>219</td>
</tr>
</tbody>
</table>

Applying Community-Based Watershed Management Strategies to Informal Settlements
List of Figures

Figures

Figure 1.1 Conceptual Drawing of Urban CBWM for Informal Settlements ................. 30
Figure 2.1 Schematic Showing the Management Process Stages for CBWM ................. 39
Figure 2.2 Recommended Management Areas for the Policy Planning Stage .......... 43
Figure 2.3 Recommended Management Areas for the Designing CBWM Stage .......... 49
Figure 4.1 Schematic Showing the Management Process Stages for CBWM .......... 127

Tables

Table 1.1 Fundamental Aspects of CBWM ................................................................. 26
Table 2.1 Management Activities for Policy Planning ........................................... 44
Table 2.2 Management Activities for Designing CBWM ........................................ 52
Table 2.3 Management Activities for Implementing CBWM .................................... 58
Table 3.1 Regulatory and Economic Instruments .................................................... 100
Table 4.1 Fundamental Concepts of CBWM Applied to an Analytical Framework .... 125
Table 4.2 Indicator Framework for the Policy Planning Stage ............................... 133
Table 4.3 Indicator Framework for the Designing CBWM Stage ............................ 137
Table 4.4 Indicator Framework for the Implementing CBWM Stage ....................... 142
Table 4.5 Indicator Framework for the O&M Stage .............................................. 146
Table 4.6 Indicator Framework for the Monitoring and Evaluation Stage ............... 151
Table 5.1 Fundamental Principles of CBWM ......................................................... 156

Boxes

Box 1.1 Economic Benefits of Community-Based Development Projects ............... 15
Box 3.1 Appropriate Technologies: PROFAVELA in São Paulo, Brazil ............... 72

Applying Community-Based Watershed Management Strategies to Informal Settlements
<table>
<thead>
<tr>
<th>Box Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box 3.2</td>
<td>Decentralized Management: A Potential Hierarchy of Responsibilities for Water Management within Communities</td>
<td>73</td>
</tr>
<tr>
<td>Box 3.3</td>
<td>A Typology of Public-Private Partnerships</td>
<td>76</td>
</tr>
<tr>
<td>Box 3.4</td>
<td>Community Managed Water and Sanitation Projects: Port au Prince, Haiti</td>
<td>78</td>
</tr>
<tr>
<td>Box 3.5</td>
<td>Joint Inter-Governmental Work: A National Water Policy in Sri Lanka</td>
<td>83</td>
</tr>
<tr>
<td>Box 3.6</td>
<td>A Water Strategy: Brazil's National Water Resources Management Act</td>
<td>88</td>
</tr>
<tr>
<td>Box 3.7</td>
<td>More Sustainable Training: UNCHS Community Participation Training</td>
<td>94</td>
</tr>
<tr>
<td>Box 3.8</td>
<td>Governance Structure: Brazil's National Water Resources Management Act</td>
<td>96</td>
</tr>
<tr>
<td>Box 3.9</td>
<td>Additional Benefits of Community Participation: Indonesia's Kampung Improvement Project (KIP)</td>
<td>103</td>
</tr>
<tr>
<td>Box 3.10</td>
<td>Government Funds for Participatory Watershed Development: The Experience from India</td>
<td>105</td>
</tr>
<tr>
<td>Box 3.11</td>
<td>Pollution Prevention Program: BC Ministry of Environment</td>
<td>109</td>
</tr>
<tr>
<td>Box 3.12</td>
<td>Building Constituencies: Municipal Government in Peru</td>
<td>114</td>
</tr>
<tr>
<td>Box C.1</td>
<td>UNICEF's Urban Basic Services (UBS) Programme in Guatemala City</td>
<td>221</td>
</tr>
<tr>
<td>Box C.2</td>
<td>An NGO's Experience: IDRC's Natural Resources CBWM Project in Nam Ngum, Laos</td>
<td>222</td>
</tr>
<tr>
<td>Box C.3</td>
<td>Women as Community Managers: Guayaquil, Ecuador</td>
<td>222</td>
</tr>
<tr>
<td>Box C.4</td>
<td>A Word about Gender Analysis</td>
<td>223</td>
</tr>
<tr>
<td>Box C.5</td>
<td>The Empowerment Approach to Social Intermediation for CBWM</td>
<td>224</td>
</tr>
<tr>
<td>Box C.6</td>
<td>A Menu of Methods for Participatory Rural Appraisal (PRA)</td>
<td>225</td>
</tr>
<tr>
<td>Box C.7</td>
<td>PRA and CBWM: Potential Key Areas to Focus on</td>
<td>226</td>
</tr>
<tr>
<td>Box C.8</td>
<td>Participatory Techniques Used to Determine Demand: A Case Study</td>
<td>227</td>
</tr>
<tr>
<td>Box C.9</td>
<td>Workshop-Based Methods Used by the World Bank</td>
<td>227</td>
</tr>
</tbody>
</table>
List of Figures

Box C.10 Community-Based Methods Used by the World Bank ................................. 228
Box C.11 Stakeholder Consultations Used by the World Bank ........................................ 228
Box C.12 Commentary on the Prerequisites Considered for Community Mobilization.... 229
Box C.13 Pilot Projects: The Experience from the Orangi Pilot Project (OPP), Pakistan.. 229
Box C.14 An Illustrative Governance Structure for CBWM ........................................... 230
Box C.15 A Revolving Fund: A Case Study in Rufisque, Senegal ................................. 231
Box C.16 Illustration of How A Community Revolving Fund Could Operate .......... 231
Box C.17 Alternative Community Financing Option: Local Exchange Transfer ...... 232
   System (LETS)
Box C.18 Community-Based Urban Environmental Management in Rufisque, Senegal.. 232
Box C.19 Some Key Points to Keep in Mind for Performing a Community ....... 233
   Watershed Assessment
Box C.20 Scaling Up Successful Participatory Watershed Development Projects: ...... 234
   Case Studies from India
Box C.21 A Word About Geographic Information Systems (GIS) ................................. 235
Box C.22 Planning for Precarious or Vulnerable Residential Areas ......................... 236
Box C.23 Water and Sanitation Technologies: "Beosite" ® Production Facilities ............. 236
Box C.24 Water Pumping Technologies ........................................................................ 237
Box C.25 Ecological Sanitation ...................................................................................... 237
Box C.26 Eco-San Vegetable Growing in Mexico City .................................................... 238
Box C.27 Strategic Sanitation Approach (SSA) ............................................................... 238
Box C.28 Innovations in Sewerage Systems: Brazil's 'Condominial' Sewerage System... 239
Box C.29 Community Based Waste Disposal: A Case Study in Bangalore, India ....... 240
Box C.30 Community-Based Solid Waste Management: Rufisque Senegal, Africa ...... 240
Box C.31 Measures to Encourage More Sustainable Resource Use ............................. 241

Applying Community-Based Watershed Management Strategies to Informal Settlements
| Box C.32 | Co-Management of Forests: Gujarat, India | 241 |
| Box C.33 | Common Pool Resource (CPR) Management Groups | 242 |
| Box C.34 | Common Pool Resource Management Groups: Criteria for Assessing Robustness | 243 |
| Box C.35 | Community-Based Protection of Forests: Watershed Planning in Pohnpei, Micronesia | 244 |
This Resource Book was stimulated by two realizations relating to community-based watershed management (CBWM) projects in developing countries: first, that there is little in the developmental literature on how CBWM can be applied to an urban environment; and second, the information that is available is inconsistent and confusing. Reading through the CBWM literature reveals numerous competing and contradictory definitions as to what, and how, CBWM could be carried out.

The purpose for this document therefore is to help clarify some of the confusion surrounding CBWM through the development of an easy to use and comprehensive Resource Book for urban managers, planners, and support agencies. This includes defining and establishing CBWM as a planning theory for urban environmental management in informal settlements—describing the principles, methods, techniques, and tools which could be used for CBWM.

While this Resource Book was originally targeted towards all stakeholders in a CBWM planning process, the resulting format falls short of this goal. Since this Resource Book relies entirely on information from the developmental literature, it lacks field experience as a resource guide during the planning and management process. This weakness is expected to be greatest at the community level, where the structure and content of this document may not be the most appropriate as a community-level resource. This Resource Book is therefore considered a starting point for future work; it is envisioned that a number of different formats would better serve stakeholder needs.

It must be noted that this Resource Book is not intended to develop a universal method for undertaking CBWM. If there is any silver bullet for dealing with and mitigating the impacts from informal settlements it is flexibility and innovation: these two criteria continuously emerge from the case studies as key ingredients for success. It is further recognized that any first step must analyze and understand the resources and experiences that each community has before tailoring any strategies. It is imperative to understand how a community functions: the leadership, skills, resources, and coping mechanisms that are already in place. This is the starting point to enhance and build upon systems that already work. Therefore, this Resource Book is designed as a guide and as a catalyst for ideas; creating a foundation of tools and techniques that can assist in moulding specific strategies appropriate to each community's strengths and weaknesses.

The format and structure for the Resource Book was based on a review and analysis of planning-related documents and handbooks (produced for decisionmakers, planners and managers) which described participatory techniques for urban, or land and natural resource management. The resulting categorization into sections was therefore based on both the identified practical components needed for a handbook format, and the normative components used to describe a planning theory: process, principles, and tools.

The final structure of the Resource Book was broken down into five main sections.

- **Section 1.0** provides an overview of urban environmental management in developing countries, and develops a potential definition for CBWM;
Section 2.0 describes a planning framework identifying the main activities, key principles, and a recommended process for carrying out CBWM;

Section 3.0 uses the Planning and Administrative Strategies subsection—one of three identified strategy subsections—to illustrate a range of available strategies that may be applicable for CBWM;

Section 4.0 illustrates an evaluation framework for assessing CBWM initiatives; and

Section 5.0 provides the author’s concluding remarks about the creation and limitations of this Resource Book.

The last three appendices provide additional resources related to CBWM: an annotated bibliography; an annotated Internet website listing; and a selection of illustrative case studies, which highlight potential community-based and environmental strategies.

The characterization and division of topics, included within each section, is based on synthesizing and identifying the emerging trends from the developmental literature. This classification is by no means perfect. Many of the topic areas are 'fuzzy' with some strategies or techniques potentially fitting into one or more of the topic areas; other topic areas include strategies that are key components throughout the management cycle; and other highlighted strategies are inextricably linked to other topic areas and practices. Therefore, the adopted framework has led to a certain amount of repetition at times, and an over or under-emphasis of some topic areas and strategies.

It needs to be emphasized that this document is not intended to be read from start to finish, it is designed as a Resource Book. Consequently, it serves as a reference source which collates, condenses, and organizes information from over 300 case studies into a dense format with numerous lists and tables (this is especially evident in Sections 2 and 4). Given this utilitarian approach, the content and frameworks within each of the four main sections have a certain degree of overlap and repetition. This redundancy has been deliberate to facilitate use and minimize cross-referencing with other sections of the document. Therefore, users may be able to search directly for specific material without necessarily familiarizing themselves with related, or earlier, sections.

Another point which needs to be highlighted is how referencing is done. Typically, only key sources are referenced at the end of each section. This limited referencing technique is chosen for two reasons. First, it acknowledges that many of the principals and techniques discussed in this document are widespread and commonplace in the developmental literature for community-based strategies and development. Therefore, highlighting any one document or author seems inappropriate in many cases, particularly because an accurate reference requires lengthy multiple sources and these sources would have to repeat themselves throughout the general discussion areas (specifically in Section 1.3, and Sections 2 & 4). Second, it is also felt that listing a source(s) for every bulleted activity or practice takes away from the clarity and readability of the material (this was particularly true for Sections 1.3 and 2). Therefore, to avoid repetition of the references and improve readability only key documents are cited. However, all the sources...
which influenced and contributed to the general principals, techniques, and ideas generated throughout the Resource Book are included in the Annotated Bibliography in Appendix A.

The developmental literature reviewed for the Resource Book included both empirical and theoretical research related to participatory development, urban environmental management, community-based watershed management, integrated watershed management, water resources management, adaptive management, and demand-responsive approaches for rural water and sanitation projects.
Applying Community-Based Watershed Management Strategies to Informal Settlements

- Participatory Development
- Integrated Watershed Management

Urban Watershed (Problemshed) Boundary

Magnified Considerations for Informal Settlement:
- Rapid Urbanization
- Poor basic infrastructure services
- Poor social services
- Uncontrolled land use
- Excessive poverty
- Illegal dumping
- Non-conforming construction

- Relationships
- Agreements
- Coping Mechanisms

CBWM of Informal Settlements

Formal Sector

- Legislation
- Policies
- Agreements
- Regulation
- Guidelines
- By-Laws
  - Community Plans
  - Standards & Codes

Considerations from Adjacent Watersheds
Section 1.0 Urban Environmental Management and CBWM

Contents:

1.0 Urban Environmental Management and CBWM

1.1 Introduction

1.2 Challenges of Urban Environmental Management

1.3 The Way Forward: Community-Based Watershed Management

1.3.1 Community-Based Watershed Management (CBWM)

1.3.2 Participatory Development

1.3.3 Integrated Watershed Management

1.3.4 Combining Participatory Development and Integrated Watershed Management

1.4 A Conceptual Model For This Resource Book: CBWM Applied to Informal Settlements

1.5 Key References
1.0 Urban Environmental Management and CBWM

This section provides readers with an overview of the challenges of urban environmental management in developing countries, discusses the opportunities to address these challenges using the components of community-based watershed management (CBWM), and finally proposes a definition for CBWM applied to informal settlements.

1.1 Introduction

As consumption and waste continue to rise with the rapid pace of urbanization and changing lifestyles in developing countries, policymakers, urban managers, planners and international development agencies are challenged with finding new ways to meet the escalating demands and address the increasingly unhealthy conditions within the urban environment. Within this urban mosaic, informal settlements often fall between the cracks of service provision and regulation, frequently leading to deleterious conditions for all the residents of the greater urban area. The anachronistic policies currently used to govern these uncontrolled areas are slowly giving way to community-driven models that promote a devolution of decision-making along with more integrated regional planning approaches.

Over the past two decades, there has been a progression of new and creative approaches for dealing with, and minimizing the effects from, these informal settlements. Some of these new approaches have developed by trial and error, others are spin-offs from new theoretical foundations, while still others are manifestations or conglomerations cultivated from earlier practices. These new policies and programmes have had to rely on shrinking public financial resources and limited institutional capacities for support. One of the most recent arrivals on this evolutionary path is community-based watershed management (CBWM)—it builds on and incorporates many of the successful aspects from these past experiences.

The appearance of CBWM on the international development scene is a relatively new phenomenon as an environmental management approach. Initially having its origins as a land resource planning tool for rural areas, the successes of CBWM strategies have found new applications: most recently as an urban management tool. From a developed country perspective, urban CBWM generally appears to be focused on the restoration and enhancement of habitat areas for wildlife. This generally contrasts with the broader application of CBWM in developing countries, where it is seen as a technique to begin to address the deteriorating environmental conditions of all inhabitants—people, plants and animals. Applied this way, CBWM offers a more holistic planning tool. A method whereby communities are empowered as stewards of their environments within the functional workings of a watershed; and thus better balancing the needs of the residents with the carrying capacity of the eco-system.

By definition, CBWM is all about people and water. It is a method of community management that combines the principles and practices of participatory development and integrated watershed management. The promotion of the watershed as the physical planning unit serves as an effective and efficient coordinating framework between competing sectors and political...
jurisdictions and serves to better include science into the decision-making process. Applied to informal settlements, CBWM is a tool to integrate human activities beyond basic infrastructure requirements of water and sanitation. It is seen as a way to begin to address the underlying concerns of each community: dovetailing goals of health, income, tenancy, shelter, poverty, transportation, pollution, education, food security, and empowerment into comprehensive community plans. These plans and the CBWM process serve as a link between the formal and informal sectors of the urban environment, creating a mechanism for regularizing these uncontrolled areas.

The regularization of informal settlement land use areas is perceived as a crucial step in ameliorating some of the deteriorating environmental and social conditions within the urban watershed. CBWM is, therefore, seen as a vehicle to achieve the following fundamental development goals:

- Improving the quality of life for all watershed residents, especially those within informal settlements;
- Rehabilitating and enhancing degraded informal settlement land use areas; and
- Preserving environmentally sensitive areas, or protected areas, from resource extraction and unmanaged growth.

Before continuing any further it is necessary to define what is meant by informal settlements. It is recognized that there are shades of informality when discussing informal settlement areas, and the relationship of these areas to the legal and regulated formal sector is fluid and ever-changing. Accordingly, this document uses two defining characteristics to identify informal settlements—tenureship and level of basic services. The following definition is therefore promoted for informal settlements.

*Informal settlements are residential areas in urban, or peri-urban, regions where the residents have no effective access to legal tenured land of their own and hence squat on vacant land, either private or public; and where basic social and infrastructure services are below the minimum levels required for healthy living.*

This definition includes landowners renting space under quasi-legal arrangements that are not valid or recognized under law. In addition, it is important to recognize that informal settlements are often characterized by land that is frequently located on marginal or environmentally precarious areas; and by residents who are generally in the lowest income groups. Informal settlements are not to be confused with slum areas, which refer to the physical or social conditions of residential areas and are generally considered as a degraded state where satisfactory normal life is impossible (Srinivas 1998).
1.2 Challenges of Urban Environmental Management

Huge growth rates, rapid urbanization, limited resources, and weaknesses in urban governance are some of the principal challenges that plague and frustrate urban environmental management in developing countries. The complex and inter-related dynamics between these variables can be illustrated by considering social and environmental challenges separately from the institutional and financial challenges. Institutional challenges refer to the weaknesses of government agencies and public utilities carrying out urban planning and management.

Social and Environmental Challenges

Today almost half of the world's population is urban. While the developed world still accounts for the majority of this metropolitan figure, the developing world is experiencing fantastic growth rates and massive urbanization. 18 out of the 23 mega-cities that have populations near or over 10 million inhabitants are in developing countries (Wright 1998). It is anticipated that by 2050 the global population will double to over 10 billion people; 95% of this population growth will be in developing countries, increasing from 4 billion to over 8.6 billion; and 85% of this growth will be in urban areas (quoted in Rijsberman 1998).

The proportion of 'urban poor' who lack access to basic amenities is estimated to be between 30% and 60% in many Third World cities (and in some cases this figure is as high as 79%1). It is further estimated that well over 1 billion residents currently live in informal settlements (UNEP 1992), which accounts for approximately 40 to 60 percent of the population of many cities in developing countries. The growth rates within these informal areas are estimated to be 2 to 3 times higher than the formal areas of the city (Perlman 1993), and can be as high as four times the rate of the country's growth rate (UNDP and UNCHS (Habitat) 1993). If these growth rates continue, nearly 1 out of every 3 people in the world will be living in an informal settlement by 2025.

These informal settlements are characterized by systemic problems beyond their rapid growth and proliferation, including: inadequate access to basic services and shelter, increasing poverty and social alienation, poor urban infrastructure, and a deteriorating living environment (Cheema 1993). These areas have been quoted as being the "the worst polluted and disease ridden habitats of the world" (Esrey 1998). The consequent living conditions are distinguished by "overcrowdedness, filth and squalor" which threaten the health of the entire urban area (Black 1994). With few policies and regulations, these eroding informal landscapes are likely to be the most important environmental and social health challenges in the 21st century.

Two of the most basic services—which are typically absent in informal settlements—need to be highlighted: access to safe water and sewerage. These basic services are recognized to be among the most serious problems facing the developing world today (UNDP and World Bank 1999). Even though these services are considered moral pillars of the 20th century and have been

1 In Addis Ababa ((Donohue 1982) quoted in (Black 1994)).
recognized and endorsed in international law by almost every country in the world\textsuperscript{2}, the majority of informal residents lack access to them. It has been conservatively estimated that 510 million urban residents lack access to safe water, and approximately 850 million are without access to sanitation (Rogers 1997). The lack of these services in informal settlements has huge ramifications.

**Water**

Informal settlements are affected by both the quality and quantity of available water. Reliable estimates for the degree and impact of diseases attributed solely to inadequate water are not available. However, it is recognized that inadequate water—quality and quantity—is a major contributor to the health burden of developing countries.

Diarrhoea is the leading cause of illness and death among children under five years old in developing countries, where an estimated 4 million deaths occur each year. The leading cause of acute diarrhoea is dehydration caused from contaminated water and poor sanitation (WHO 1999). Inadequate water also has significant economic implications, it is considered one of the leading causes of productive years lost to morbidity and mortality in the developing world (World Bank 1993). According to Pearce and Warford's book, *A World Without End: Economics, Environment and Development*, "in 1979 an estimated 360 billion - 400 billion working days were lost in Africa, Asia, and Latin America because of water-related diseases that kept individuals from work."\textsuperscript{3} (Pearce and Warford 1993).

Globally, over 80 countries (comprising 40% of the world's population) suffer from water shortages at some time during the year (UNDP 1996), and 1.5 billion people lack access to safe water (Wolfensohn 1999). In the next 25 years there will be an additional 2.6 billion people added to the global urban population (Rijsberman 1998), and there will be over 66 mega-cities with populations of over 10 million residents (Wolfensohn 1999). These urban conglomerates will exert tremendous pressures for additional water resources. The additional 2.6 billion urban residents are estimated to need an additional 1365 billion m\textsuperscript{3} annually of water to meet their minimum water requirements (MWR) for urban life and food production. This figure represents approximately 30\% of the total global water extraction, and amounts to almost 16 times the flow of the Nile River to quench the additional annual demand (Rijsberman 1998).

This additional demand will lead to increasing competition and conflict with other sectors—irrigation, aquaculture, industry, navigation, hydropower generation, and the maintenance of ecosystems—over the remaining available water resources.

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\textsuperscript{2} Documents which define them include the UN Declaration of Human Rights or the Geneva Conventions (Oxfam 1995).

\textsuperscript{3} "At $0.50 a day, these continents lost some $180 billion - 200 billion that year. Their GNP was around $370 billion, so output was below productive potential by perhaps 35 percent \([200 / (200 + 370)]\)" (Pearce and Warford 1993).

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
For developing countries, it is anticipated that additional water will be reallocated from agricultural sources to urban areas, leading to greater food insecurity and a greater necessity for integrated water resources management (Black 1998).

A key aspect of water provision that further undermines the stability of informal settlements is cost. The urban poor suffer disproportionately when water supply is unreliable, since middle and upper class households can afford private facilities or purchase additional services. The urban poor, however, often have few options and must rely on paying private vendors upwards of 10 to 1000 times the official tariff rates (World Bank 1996). Approximately 20 to 30% of all Third World urban dwellers are thought to purchase their water from these private vendors (Cairncross 1990). This skewed spending on water takes away from household finances for other basic needs, including: food, shelter, healthcare, and sanitation.

Sanitation

3.0 billion people in the world lack access to sanitation facilities. For the poorest 1 billion in the world, inadequate sanitation is the main cause for death rates (from infectious disease and maternal and perinatal conditions) that are 7 times higher than the next poorest 1 billion people (WHO 1998). In developing countries, 90% of the sewage is discharged directly into waterways without any treatment; in Latin America this figure is 98% (Esrey 1998).

According to Esrey, the lack of sanitation services is one of the main causes responsible for high disease rates, malnutrition and death in Third World cities (Esrey 1998). It is also recognized that sewage from informal settlements accounts for the majority of organic pollutants within Third World cities, contaminating rivers, lakes, and coastal areas (Wright 1998).

There are many reasons why sanitation services have been ignored and not provided to informal areas. The institutional reasons will be discussed in the following section. For communities, there are generally two main reasons cited for why sanitation is not adopted—cost and education. Conventional sanitation costs approximately US $25-35 per household per month to provide, which is equivalent to the total monthly income of many households. There is also a general lack of education linking the benefits of proper sanitation to health. Without this link, few communities will see the need for proper facilities (Whittington 1997).

Other basic infrastructure services are typically absent, or under-serviced, in informal settlements: lack of solid waste collection, power, drainage, access roads, and public transportation are all recognized to further destabilize these communities. Accordingly, the lack of these services (and their interconnections) leads to serious health risks and a general degradation of the living environment. For example, inadequate solid waste collection and disposal is a major factor in the spreading of gastrointestinal and parasitic diseases; for informal settlements, conventional collection of waste is made even more difficult with an absence of roadways or pathways for service vehicles (Pfammatter 1996).

Applying Community-Based Watershed Management Strategies to Informal Settlements
Absence of informal settlement households having access to the city power network also has destabilizing and detrimental environmental effects. A lack of electricity results in residents resorting to wood and fossil fuels for their cooking, lighting, and heating needs. There are currently 2 billion people in the world without access to power and who must undertake these practices causing serious health and breathing problems, especially among women and children (Wolfensohn 1999). The additional need for wood leads to illegal forestry and threatens outlying protected and environmentally sensitive areas. The net result is a deteriorating ecosystem where water quality diminishes with a corresponding increase in disease, and where flooding becomes more prevalent.

Informal settlements are also often situated on marginal areas, which are more vulnerable to natural disasters. These areas are not only more precarious in a 'physical sense', but also in an 'institutional sense' as medical services are generally harder to access, if present at all. Correspondingly, informal settlements have higher disease infection rates and infant mortality rates: sometimes four, or more, times higher than the greater city region (Hardoy 1992). There are also other common social infrastructure services which are noticeably absent, including schools, marketplaces, and recreational areas.

It is clear, the additional challenges that informal settlements pose to urban planning are formidable. And these challenges will only increase with the anticipated proliferation of these areas and put additional pressures on existing governance systems.

**Institutional and Financial Challenges**

On top of the normal urban management tasks, municipal planners and managers in many developing countries must contend with a barrage of critical environmental issues: overloaded water sources and networks, improper waste disposal, contaminated streams and waterways, exploited and depleting aquifers, suffocating air pollution, and all their corresponding health and social effects. All of this is set against a backdrop of shrinking institutional resources, explosive urbanization and demand for services, increasing competition and conflict with neighbouring regions, increasing unit costs for delivery of infrastructure services, inappropriate policies and pricing mechanisms and a long list of management deficiencies carried out by overstaffed government agencies. A daunting task.

Perhaps the greatest challenge of all is securing adequate funding to deliver and maintain adequate basic services. Municipal governments have traditionally relied on central government funding, but these sources have dried up significantly with low agricultural revenue, increasing debt, the onset of recession, and the demands for flood or drought relief. It has been estimated that an additional US$ 106.5 billion is needed per year for conventional water and sanitation services to keep pace with urbanization rates. This implies a four-fold increase in what developing countries are currently spending (Rogers 1997). There is also minimal support from multi-lateral agencies who typically spend approximately US$ 1 billion per year on these services (Rogers 1997), and this figure is decreasing (Wolfensohn 1999).
Municipalities simply do not have the funds to meet escalating demands, let alone pay for ongoing operating and maintenance costs. According to a World Bank study of 120 projects, only 4 countries in the developing world were found with water authorities performing well (World Bank 1992). Poor operations and maintenance also lead to huge inefficiencies: in some countries, upwards of 50% of the fresh water is lost in the distribution system (Rogers 1997). A vicious cycle has therefore evolved where service provision is so bad that no one pays, and income generated is so low that services cannot be improved. In developing countries consumers only pay 35% of the recurrent costs for water and sanitation delivery, compared to 100% in developed countries (World Bank 1992).

There is now widespread recognition by multi-lateral agencies and the international water and sanitation community, that centralized systems based on a 'Western' model are inappropriate for the dynamic and expanding urbanization process currently underway in developing countries. Surprisingly, 80% of the investment in the water and sanitation sector is still allocated to these high cost systems (Black 1994). Furthermore, every time a water system has to be augmented with a new source, the unit costs typically double (World Bank 1992).

It is no wonder cities can barely maintain existing services let alone address those already unserviced, especially those residents living in burgeoning informal areas. While conventional approaches have been able to supply adequate water supplies to those properties with household connections, there are frequently no water—or sewage or drainage—services supplied to informal settlements.

There are additional dynamics at play which affect and impede service delivery to these areas.

**Perceptions**

It is recognized that informal settlements have been deliberately neglected and under-serviced. They are typically left out of the urban planning picture since the inhabitants are occupying land illegally and are therefore denied basic services. It has been assumed that if they are ignored they will leave (otherwise, if services are supplied, more people will be attracted); history has proven this incorrect. Too poor to pay for conventional housing, the residents from these areas have been left with few options. This 'blind eye' policy has consequently failed and in many instances perpetuated—or, worse, led to—deteriorating conditions and uncontrolled growth whereby informal settlements now represent the majority of urban residents in many developing countries.

There is a growing realization by policymakers that urbanization is unstoppable, and perhaps it is not the evil that it is so frequently made out to be. The urbanization trend has fuelled the growth and progress of developing countries where Third World cities now account for 60% of the output value.

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4 Operations and maintenance expenses are typically the first items to be cut during financial hard times (OED 1994).

5 It has been estimated that an additional US$ 123 billion could be collected from users not paying for delivered services in the Developing World (Schüebeler 1996: 15).

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
and 80% of the growth in these countries (Harris 1992). Within this urban engine, informal settlement residents are, and will continue to be, catalysts supplying labour and small-scale enterprises to the urban economy. There is a symbiotic relationship between the formal and informal communities where "the work of the humblest and most poorly paid worker in the urban shantytowns is linked to the productivity and marketing of large corporations" (Sassen-Koob 1987). The challenge therefore for urban planners is to look for new ways to manage urban landscapes that recognize and integrate this co-dependence.

Social Characteristics

To begin to address and include informal settlements into the urban planning arena there must be consideration given to the unique characteristics which are associated with these social landscapes. These defining features are prevalent throughout the urban environment, but are generally more pronounced in informal settlements and therefore merit special attention. Urban managers and planners trying to craft more appropriate management approaches must contend with these parameters and challenges, taking into account these additional factors, including:

- Communities have high social stratification;
- Communities have uneven and disjointed settlement patterns and growth, and each informal settlement cluster is unique;
- Reciprocal relations, agreements, or commitments with residents are hampered, and frequently threatened, by their constant search for wage work to meet basic life necessities;
- Residents lack institutional knowledge and skills for assessing this information;
- Residents typically require start-up financing; and additionally
- Construction within these areas is typically non-conforming and frequently located on marginal or precarious lands.

Institutional Capacities

The weak institutional capacities of government agencies to deliver appropriate services and carry out urban planning and management are cited as one of the major shortfalls of urban environmental management ((Black 1998; Carney 1998; Khan 1996; Kironde 1997; Rogers 1997; Schübeler 1996; Wright 1998)). Local authorities are neither empowered nor have the means for effective management. According to the World Bank, this is the starting point where the 'scales of governance' must better balance central government regulation with incentives for local accountability (Dillinger 1995).

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6 Informal settlements account for the majority of new housing in Third World cities. Moreover it is estimated that 50% of the labour force in Third World cities is engaged in the informal sector (Hardoy 1986).
At the national or state level, inappropriate economic policies and pricing encourage consumers (and companies) to squander and misuse subsidized water, waste disposal and fuels. There is a need for more effective regulation to enforce planning and environmental legislation. Moreover, there is a need for overarching policies that direct competing sectors and agencies, as well as promote a devolution of control, decision-making and financing to local authorities. These policies should specifically address issues of tenancy and land and resource management planning in informal settlement land use areas.

At the municipal level, there is a need to coordinate and collaborate with overlapping and competing planning units on an inter- and intra-regional basis. There must be a clear organizational framework that defines roles and responsibilities while integrating participation from outside interests. Urban governance is further handicapped with corruption, limited political support, resistance of bureaucrats and staff to change, poor quality of city councillors, competition between rivalling sections of the city (inner and outer), rigid planning models and other technical and administrative limitations.

At the planning and management level, local government and public agency staff frequently lack the skills and resources to effectively manage and plan, especially when integrating community or private sector participation. They are also thwarted with time-bound management requirements and—most importantly of all—a regulation, revenue, and reward system that is still predominantly controlled by central government guidelines that ignore local city conditions and citizen accountability (Dillinger 1995).

There are two realizations that can be distilled from the long list of challenges facing urban environmental management and, in particular, planning and managing for informal settlements. First, investments in the physical infrastructure have been made at the expense of investments in the social infrastructure, leading to a detrimental affect on overall management performance (Carney 1998). In many cases, failure to address informal settlement issues has greatly perpetuated and increased deteriorating conditions. Second, without addressing these social and environmental health concerns, the whole urban landscape will be threatened with continued and escalating health and economic crises\(^7\) —this is a certainty.

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\(^7\) This point is illustrated by the 1991 cholera epidemic that occurred in Peru. Within just 3 months it was estimated that over US$ 1 billion was lost in tourism and trade, three times the amount that the country spent on water and sanitation during the preceding decade (Wright 1998). This example shows only the tip of the economic iceberg between poor environmental management and its associated health and economic impacts.

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Section 1.3  The Way Forward: Community-Based Watershed Management

"If governments cannot meet all the needs of the poor and if the poor are in fact meeting most of their own needs, the conventional development equation has to be turned upside down. The question is not how people can participate in programmes organized by governments and NGOs, but rather how these agencies can support the people's efforts to meet their own needs."

--William Cousins (1991)

There is now a consensus in the international community—both Northern and Southern governments, developmental agencies, and NGOs—on how to overcome the challenges of urban environmental management in developing countries and integrate informal settlements into the urban planning milieu. This consensus highlights a number of approaches for improving the quality of life for all residents and specifically mitigating the impacts from uncontrolled and unregulated land use. These new approaches begin by recognizing the human potential within informal settlements to manage and become stewards of their environments. Images of parasitic castaways stranded on the shores of urban poverty are being replaced by images of pioneering entrepreneurs who forge their destinies through their skills and resources. Residents from these informal areas are being seen as consumers (rather than recipients) capable of paying for services, and citizens qualified to govern and protect their communities.

These widely touted approaches are the culmination of years of experiences from international, national and grass-roots organizations. The general trends and characteristics from these approaches can be summarized as follows:

- A promotion of participatory development in the planning and management process, which typically includes the following characteristics:
  - A devolution of control and decision-making from central bureaucracies to the most appropriate level, therefore enabling communities to manage their environments;
  - A re-focus on the roles of local authorities: shifting from delivering services to fostering capacities within communities to gain access to services;
  - A concentration on facilitating the use of stakeholders' knowledge, energies and resources, especially residents and the private sector; and
  - An integration of women into the community management cycle, recognizing their indispensable role as primary health care givers and the environmental managers in the household.

- A call for demand-responsive approaches where residents express their needs through their ability to pay for services;

- An integrated approach that unites social, economic, environmental, and institutional considerations from different planning sectors and different political jurisdictions;
A promotion of sustainable development where communities are empowered with the necessary skills to sustain and improve service delivery in an environmentally safe manner; and

A flexible process that adapts to each community's needs and site-specific conditions.

Additionally, for the environmental management of water and sanitation services, there is a unanimous call for:

- An integrated water resources management approach, where the watershed is the logical planning unit within which to link and collaborate activities;
- A requirement that water must be treated as both a social and economic commodity; and
- A promotion of appropriate technologies that are simple, cheap, sturdy, and easy to maintain.

While many organizations and governments have incorporated and built many aspects of these accepted characteristics into their operations, the vast majority of policies, programs, and projects have only scratched the surface for implementing them. Unfortunately, it would appear that words have been easier than action and the operationalization of these characteristics has been slow in coming. It has been recognized that the main hurdle to their application has been a lack of models, techniques and tools for implementing them at the community level.

Community-based watershed management provides such a framework; it is seen as one such method that incorporates the above characteristics and provides enabling strategies for turning rhetoric into reality.

1.3.1 Community-Based Watershed Management (CBWM)

In the search for a definition for CBWM a vast body of literature was reviewed. It became apparent that CBWM initiatives had different meanings and different interpretations, depending on where they were being applied, what they were being applied to, and who was applying them. Generally speaking, from a developed country perspective, urban CBWM projects were focused on the restoration and enhancement of habitat areas. In a rural setting, however, CBWM was used as a vehicle to partially include residents into the land and natural resource management decision-making process. In rural areas in developing countries, CBWM has been increasingly used as a decentralization technique to devolve more control in the management of—primarily forestry and water—resources. In Third World cities, CBWM is just beginning to be used as a method for environmental management, which integrates its influence beyond basic

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8 The Global Water Partnership is a network of international partners—that formed after the 1992 Rio Conference—represented by different governments, multi-lateral agencies, support organizations, and other professionals involved in the water sector. Their purpose is to look for and promote integrated water resources management (IWRM) programs acting as both a clearinghouse of information and a think tank for the global water sector. They have recognized the need for workable models and tools for IWRM that provide a framework for planners to work with communities in selecting and implementing systems that residents can sustain (Rijsberman 1998).

Applying Community-Based Watershed Management Strategies to Informal Settlements
environmental and infrastructure requirements to highlight socio-economic and institutional considerations. Unfortunately, even within this rather focused setting, CBWM approaches have been interpreted in a wide variety of ways.

Therefore the difficulty in synthesizing a definition for CBWM that could eventually be used for informal settlements was frustrated by the following observed inconsistencies witnessed in the application of CBWM initiatives, including: the scope and nature of CBWM activities, the degree and type of involvement by the stakeholders, the amount of control and decision-making that were delegated to CBWM processes, the level of influence by international agencies and other support agencies, and the underlying mandates or purposes prescribed for the CBWM initiative. Given this difference of opinion on how CBWM was interpreted and applied, this document returns to the basic components of CBWM in search of a clearer definition and application for it.

Community-based watershed management is all about people and water. It is seen as a type of community management that combines the principles and practices of participatory development and integrated watershed management. The combination of the two is what makes CBWM distinct from other management strategies.

By definition, CBWM embodies both the process and the boundaries for environmental management. The process identifies participatory development as the vehicle for carrying out CBWM, and the boundary defines the watershed as the planning and management framework. Consequently, a marriage is made where the process and boundaries are inseparable. The participatory process is carried out with stakeholders defined within geographically delineated areas. Similarly, the watershed boundaries are a product of collective decision-making using both physical and—as put forward in this document—social parameters. The integration of both biophysical and socio-economic parameters to delineate the watershed area may be misleading for some: Therefore, replacing watershed with problemshed will alleviate confusion in those instances where the socio-economic boundary extends the planning area beyond the physical limits of the watershed.

Applying Community-Based Watershed Management Strategies to Informal Settlements

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\[9\] A watershed boundary defined by a social parameter may refer to how a community views itself. A community therefore may interpret their neighbourhood as extending beyond the physical boundaries of the watershed. Accordingly, to effectively manage this area the watershed boundary should be adjusted to include this perception. (This is discussed in more detail in Section 3.0).

\[10\] There are three scenarios envisioned for defining the planning and management boundaries in CBWM.

- Scenario 1 The first scenario is the most common, where the community and its land use patterns fall entirely within the confines of a defined watershed. In this case, the watershed is the planning boundary.

- Scenario 2 In this case the community, or its land use areas, fall outside the physical limits of the watershed. Therefore, the problemshed should incorporate both the watershed boundary and the additional parts of adjacent watershed lands that the community directly influences or impacts. In this case, the problemshed is the planning boundary and comprises both physical and socio-economic boundaries.

- Scenario 3 By far the most uncommon, this case deals with a community, or its land use areas, that stretch entirely beyond the watershed boundary. Therefore, the problemshed should incorporate the adjacent watersheds’ lands that are directly influenced or impacted upon by the community. In this case, the problemshed is the planning boundary and is entirely defined by socio-economic boundaries.
Both these defining features of CBWM have their own—and complementary—fundamental concepts. These will be discussed more in the following section to gain a better understanding of what CBWM is and how it may be applied to informal settlements.

1.3.2 Participatory Development

"From time immemorial, societies have organized themselves to take care of collective and individual needs. ... [N]ever before in the history of humankind has there been such a massive experiment at inducing change through the infusion of external ideas, management, funds and technology, all controlled from places far distant from the site of development."


"Community-based partnerships enhance land and natural resource management by drawing expertise and input from a wide range of individuals and groups who live in and intimately know the resource base and the local economy. Getting more people involved in a project increases the likelihood that it will be maintained over the long term, ... [and lead to more] creative and desirable projects."


Participatory development, or community-based development, is all about reversing conventional top-down approaches of planning and management: whereby policymakers (and planners) are involved in a dialogue to engage and enfranchise the people they represent with more control and decision-making over their affairs. It is about individuals and groups of people working collectively to solve problems and assume responsibility for their own development. A reversion to where decision-makers devolve control and facilitate an enabling environment to encourage community participation and accountability is therefore needed.

Under the right conditions, participatory approaches are known to lead to better decisions and management practices as local knowledge is tapped, and as a more diverse group of stakeholders are engaged to tailor more innovative strategies to suit their mutually-defined needs and goals. This community partnership fosters a sense of ownership and buy-in from participants leading to more support and involvement. This support increases cost recovery for services and leads to more sustainable delivery, as services are better maintained and more responsive to users. The quality of services is higher and more appropriate since participants are active earlier on in project design, and throughout the construction or implementation period. This involvement also has the advantage of tapping the skilled and unskilled labour pool that exists within communities. Additionally, the problem-solving process which ensues empowers stakeholders through capacity building, partnerships and collaboration. These formal and informal relationships strengthen understanding between participants, and build legacies.

Community-based development also strengthens the local economy and provides more employment opportunities leading to income generation for lower income groups. The process begins by small businesses taking advantage of niches created as government agencies re-focus their efforts away from funding large projects and towards creating an enabling environment. As
more money is decentralized to a greater number of small businesses, a greater amount of money is recirculated in the local economy (Cotton 1998).

To realize these benefits, however, participatory approaches need to be fully supported and adopted; this is rarely the case. Besides government agencies or staff sometimes lacking the necessary skills and training to implement community-based strategies, or feeling threatened by them, there are other reasons why they have not been fully embraced.

One of the largest hurdles required for this participatory process to take place is the selling and subsequent adoption of community-based strategies to policymakers, planners and managers. This sales job is particularly difficult because of the persistent myths that are associated with them—costs, time, and supervision. These myths need to be dispelled at the onset.

**MYTH #1: Community-Based Programs are More Expensive**

According to the World Bank's experience, community-based projects result in greater efficiency and cost effectiveness (See Box 1.1). At the start of a program costs may be higher during capacity building at the local level, but these costs are "more than offset by subsequent gains" (World Bank 1996). These subsequent gains, however, are conditional on a supportive institutional setting.

In an evaluation of the performance of social funds, when communities managed the implementation of projects, costs were reduced by between 30 and 50%. Further savings were observed when communities were actively involved in the contracting of services since there was an improvement in transparency and how quickly the contracts were awarded (Sara 1998).

In a study carried out for the Department For International Development of the British Government, 390 micro-contracts were analyzed for infrastructure projects in urban low-income communities in India, Pakistan, and Sri Lanka. A total of 151 community-based contracts were compared to 231 conventionally contracted projects; on average the community-based projects were cheaper. Moreover, completed costs for community-based contracts were an additional 11% cheaper than the initial tendered price (due in large part to negotiating down prices during construction), this was not the case for the conventional contracts (Cotton et al. 1998).

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**Box 1.1 Economic Benefits of Community-Based Development Projects**

- Pakistan's Orangi Pilot Project is but one example which is representative of cost effectiveness. An NGO worked together with community groups to provide sewage facilities to approximately one million poor people in Karachi; costs were one-eighth of conventional city sanitation costs (Khan 1992).

- For the PROSENEAR project in Brazil, urban managers and planners were able to supply sanitation services for as low as $50 per capita, well below the maximum target of $120 per capita (Watson and Jagannathan 1995). This was achieved through creative community problem solving and partnerships.

- In Cote d’Ivoire, maintenance costs were reduced by two-thirds when community water groups took over the maintenance of 13,500 water points in a national water supply program (World Bank 1996).
MYTH #2: Community-Based Programs Take More Time

Similar to costs, the World Bank has found that there is increasing evidence that participatory approaches are quicker to implement. Savings are realized from improved efficiency when community support is sooner in coming, and from more coordination and collaboration between stakeholders and government agencies, in many cases avoiding duplication and overlap. The Bank's experiences show that there is a typical timeline progression on initiatives: a slow build-up period during which communities are mobilized and organizational development takes place, followed by a speedy disbursement period when projects are implemented (World Bank 1996). Therefore, the overall duration from project initiation to project operation is still considered less for community-based projects.

MYTH #3: Community-Based Programs Require More Government Supervision

It is recognized that in the early stages of planning and implementation of community-based approaches, government agencies have to invest more time in developing skills, providing technical support, and negotiating with the communities. Cotton, Sohail and Tayler, however, found that after these initial stages there was very little difference in supervision time between community-based and conventional approaches during the construction of infrastructure works in Sri Lanka (Cotton et al. 1998). Presumably after construction, the required supervision on the part of government agencies would be considerably less using community-based approaches, since the communities are normally responsible for (and already familiar with) the ongoing operations and maintenance of the systems.

In addition, once these institutional linkages and community governance systems have been established they can be built upon and used by other government agencies—and used by the communities themselves to expand and improve services—greatly reducing the effort required to mobilize and develop organizational structures. So although there may be an initial disproportionate outlay of supervision time for community-based development in the formative stages of a project, the subsequent gains are considered to more than offset this investment.

It needs to be stressed that any comparison between participatory and conventional approaches must not only consider the time and costs to implement or construct a service, but how well and to what degree those services are used, maintained, expanded, or upgraded (ideally over the lifecycle of a project). For a more meaningful analysis, therefore, two additional parameters should be considered in conjunction with costs and time—quality and service coverage. The relationship between these parameters is incestuous and separation is difficult without consideration of the others. Unfortunately, quality is a hard parameter to measure and will be dependent on the goals of service provision. If the goal for quality is to have fewer disruptions and more continuous service operation, then community-based approaches are known to have higher quality11 (Barker et al. 1991; Black 1998; Narayan 1995; World Bank 1996). If quality

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11 For example, in Cote d'Ivoire, after community water groups took over the operations and maintenance of 13,500 water points, breakdown rates were reduced from 50 percent to 11 percent with a consequent increase in operation time and performance (World Bank 1996).
refers to the quality of construction work, then community-based approaches are perceived to have higher quality (Cotton et al. 1998).

Service coverage is equally difficult to compare between approaches since a control group would ideally be required. However, international experience in the provisioning of water and sanitation services has demonstrated that if communities play an active role in the planning, designing and implementation of services, then they will be more likely to be financed, used fully, and looked after properly (Narayan 1993).

**Level of Participation**

A distinction needs to be made for the level and type of participation that is available for community involvement. In short, there is a spectrum of participation in both conventional and participatory approaches; and the line between them can be very blurry at times.

Dawson identifies a typology of community participation types in local government decision-making, which are instructive to identify [quoted in (Dawson 1992)]:

- **Participation through delegation** where participation is elicited through voting;
- **Subordinated participation** where a municipality forms local organizations as a support mechanism to support plans and programs that have already been created;
- **Collaborative participation** where participation in municipal programs are offered to existing organizations to gain support and achieve consensus; and
- **Democratic participation** where community organizations are incorporated into the decision-making process.

This Resource Book defines participatory development to incorporate both democratic participation and a new category referred to as empowered participation: whereby communities have control and decision-making mechanisms for their self-management, and participate as one stakeholder in a multi-stakeholder process with local authorities. Participation in this case is not seen as a step in the community management cycle, it is a process—both a means and an end.

**Characteristics of Participatory Development**

For this document, the principal characteristics associated with participatory development are defined as those approaches that have been widely regarded as the way forward in addressing the urban environmental management challenges that plague many developing countries (described at the beginning of this section). These approaches can be summarized into the following principles that should be used to guide participatory development and CBWM:

- A devolution of control and decision-making to the most appropriate levels (e.g. decentralization and unbundling of services);
Transition local government's role from an implementer to a facilitator of services (creating an enabling environment);
- Adopt collective decision-making;
- Promote women as active participants in the community management cycle;
- Focus on community empowerment;
- Concentrate on incorporating local knowledge;
- Focus on partnerships and collaboration among stakeholders;
- Increase the role of the private sector;
- Adopt an integrated approach;
- Emphasize sustainable development;
- Take a flexible and adaptive approach; and
- Advocate demand-responsive approaches.

A key aspect that is now closely tied to participatory development for the provisioning of basic services is demand-responsive approaches (DRA). Initially defined during the 1992 International Conference on Water and the Environment in Dublin, DRA was an approach that called for water to be treated as an economic as well as a social good that should be managed at the lowest possible level of governance. The successes from DRA, and other earlier self-help models, have led to a widespread acceptance and promotion of their principles for other service sectors. The World Bank believes that DRA is more sustainable than supply dominated approaches since they lead to more innovative and creative solutions, and have led to proper financial arrangements (UNDP and World Bank 1998). The adoption of DRA principles is now commonplace in the provisioning of almost any basic infrastructure initiative.

DRA is a strategy that devolves a certain amount of control and decision-making to both the household-level where consumer demand guides investment decisions, and the community level where local committees manage and operate those services. The main components typically associated with DRA include: community initiation; community supplied with adequate information to make informed decisions on service options; community contributes to investment costs; government plays a facilitative role to create an enabling environment that encourages wider participation into the service delivery sector; community owns resulting facilities; community pays for all operating and maintenance costs; and there is a focus on community empowerment throughout the process.

It should be noted that DRA is neither an economic theory nor a specific strategy for delivering services; rather it is more a bundled group of vague concepts which help customize interventions. The UNDP-World Bank Water and Sanitation Programme carried out a global study in 1996-7 to determine the effects of DRA in action. They concluded that DRA approaches significantly increased the likelihood of system sustainability; that training of household members and local committees played a critical role; that willingness to pay for a service dramatically drops when communities have no control over how their contributions are spent (Black 1998).

Applying Community-Based Watershed Management Strategies to Informal Settlements
according to a market model of a consumer's willingness to pay. Accordingly, DRA-related initiatives have had a wide spectrum of interpretations for their operationalization, and a corresponding amount of criticism. Critics have pointed out the difficulty in defining what is meant by demand: opinions range from demand as an expression of willingness to pay (WTP) to demand as an expectation of right. It has also been criticised for not serving the interests of the poorest of the poor, who may be willing to pay for a service but may not have the ability to pay\textsuperscript{13}. 

One of the most serious potential flaws of DRA is a lack of integrated planning for the service being delivered. In the case of water, it assumes that if a household is willing to pay more then it is able to get a larger share of the resource without regards to its sustainability. This becomes increasingly important as the demands for water and other resources escalate in burgeoning urban areas. Critics have therefore called for the need for more holistic and integrated planning when adopting DRA concepts in service provisioning.

It is evident that there are many challenges to DRAs. However, many of these pitfalls are mitigated by using DRA as a method that augments participatory development practices and by dovetailing it into an integrated planning approach. DRA is, therefore, seen as a complementary set of principles for the development of urban environmental management. The following list summarizes the basic principles which should guide a demand-responsive approach:

- Focus on community management using local committees to deliver services;
- Focus on household demand to govern the upgrading process, this is typically measured through a household's willingness or ability to pay for services;
- Focus on effective communication flows and information dissemination procedures;
- Focus on a clear procedural framework and an enabling environment (defining the roles and responsibilities between participants);
- Focus on community capacity-building;
- Focus on appropriate technologies and providing a range of service options;
- Focus on innovation and flexibility throughout the management cycle; and
- Focus on water as both an economic as well as social good (for the provisioning of water and sewerage services, this is discussed in Section 3.2.2).

\textsuperscript{13} There have been a host of other criticisms from the developmental community commenting that DRA undermines basic social services as human rights and makes them contingent on WTP. Others see DRA as an opportunity for government agencies to skirt their responsibilities to provide basic services to all their citizens. And others point out that if the poor are able to pay for a service then this will rob their expenses for other necessities of life (DRA is discussed in more detail in Section 3.2.2).
1.3.3 Integrated Watershed Management

"People working together to protect public health and the environment
-- community by community,
watershed by watershed."

--Carol M. Browner, USEPA (1996)

Integrated watershed management (IWM) is an ecosystem management approach where the watershed is considered the logical planning unit. Accordingly, it is a more holistic approach for environmental management that considers the functioning of both natural and human systems as the basis for planning and management. IWM has been generally defined as:

the process of planning and implementing water and other natural resources management strategies in watersheds with an emphasis on integrating the biophysical, socio-economic and institutional aspects of natural resources management (Dorcey 1991: emphasis added).

Applied to the urban environment, the definition for IWM needs to be expanded to better represent the issues and considerations impacting the urban landscape. Environmental management is used as an umbrella category, to broaden the definition of IWM, by aggregating land & natural resources management and urban environmental management together. Therefore, by replacing natural resources management with environmental management in the above definition, both the 'built' and 'social' environments can be better highlighted and incorporated in IWM for Third World cities (as discussed in Section 1.2 Challenges of Environmental Management).

Why Integrated Watershed Management?

The promotion of the watershed as the physical planning unit serves as an effective and efficient coordinating framework between competing sectors and political jurisdictions; and serves to better integrate science into the decision-making process. Additionally, a watershed approach internalizes externalities and incorporates them into the planning process, better addressing some of the subtle and chronic problems that affect environmental degradation. The adoption of an integrated approach to management better deals with the uncertainty and complexity of natural and social systems and the available science to interpret them. Also the health of the watershed is better balanced with needed management strategies to achieve the desired outcomes.

For the protection and restoration of the local environment, the watershed is considered the most appropriate geographic planning unit [Schueler 1995; Zandbergen 1998; Schreier 1997; USEPA 1997]. The hydrological cycle serves as a functional starting point to understand the connections and processes between land and resources, and public health sectors; and better integrates upland activities with the cumulative impacts downstream. Accordingly, water is the planning link: linking the upstream with the downstream; linking groundwater with surface water; linking water

14 A watershed is generally defined as a topographically bounded catchment area of land from which all the water drains to the same location, either a stream, lake, wetland, or ocean.
quality with quantity; linking water with land-based resources and human activities; and linking water with economic development and cultural integrity (Boehmer 1997). The physical landscape, therefore, serves as a logical boundary and framework for interdisciplinary work that facilitates easier data collection, modelling, analysis, and planning and management activities.

IWM is also known to save time and money. Governance efficiency improves with collaborative and integrated approaches that reduce duplication of efforts and conflicting actions (especially for streamlining activities for monitoring, issuing permits and reporting) (Schreier 1997; Zandbergen 1998). Better communication and improved coordination between stakeholders lead to an increase in support and commitment with correspondingly fewer conflicts. Consequently, IWM is associated with improving the likelihood of sustaining long-term environmental improvements [USEPA 1997].

**Characteristics of Integrated Watershed Management**

To provide a clearer interpretation of what is meant by IWM, the defining features have been categorized according to process, principles and methods. These characteristics of IWM have emerged from the literature as key components, and are recognized and called for by organizations and academics involved with integrated watershed management.

The process of integrated watershed management contains the following basic sequential activities:

1. Performing a watershed assessment;
2. Prioritizing and targeting objectives;
3. Developing management strategies;
4. Creating a watershed management plan;
5. Implementing plan; and

These activities are discussed in greater detail in Section 2.0 A Management Planning Framework for CBWM.

The defining characteristics that are generally advocated for IWM, and derive from an ecosystem management approach, can be summarized into the following principles.

- Recognize water as a finite and vulnerable resource;
- Use a watershed approach (which delineates the planning and management boundary);
- Promote participatory planning and management that includes all stakeholders in a collective decision-making process;
- Emphasize strategic planning to optimize limited resources;

* Applying Community-Based Watershed Management Strategies to Informal Settlements*
Use a multi-sectoral approach to integrate all natural and human considerations and lead to more sustainable environmental management;

- Balance social, economic, and environmental values;

- Focus on innovative institutional structures that enable collaboration and partnerships;

- Concentrate on shared learning and capacity building for participants; and

- Emphasize flexibility and adaptability to cope with uncertainty and complexity.

Furthermore, in a developing country context the following two principles are considered critical.

- Promote water as both an economic and social good; and

- Emphasize the central role of women and their inclusion in the management process.\(^{15}\)

These principles will be expanded and commented upon in the following sections of this Resource Book (especially Section 3.0 Urban CBWM Strategies).

The tools, techniques and methods that make up the strategies\(^{16}\) for IWM include a wide spectrum of options; in this document, they are not limited solely to water-related issues. Recognizing the integrated nature of environmental and human systems, the strategies discussed for IWM include all areas which are linked to the underlying causes of environmental and social degradation in the watershed periphery. This, therefore, leads to strategies to mitigate and address socio-economic, environmental, and institutional concerns. The resulting strategies can be broadly subdivided according to the following subject areas of planning and administration, community-based, or environmental.

Planning and administrative strategies may range from decentralization policies to tradable water rights to geographical information systems and technical model simulators. Similarly community-based strategies may range from community mapping to interactive theatre performances. And finally, environmental strategies may range from composting toilets to community bike cooperatives. The point to stress is that the possibilities are endless, and will depend on the skills and resources of the stakeholders involved in every IWM process. These strategies are elaborated on and form the basis of Section 3.0 Urban CBWM Strategies of this document.

There is one strategy, however, which is promoted as an essential component for IWM that merits further comment. Adaptive management is a systemic approach to management that is considered complementary to IWM, and a necessary tool for better coping with the complex and

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\(^{15}\) Women's participation in the earliest stages of planning is considered crucial to increase the likelihood of successful outcomes. They are the principal water haulers and environmental managers in the household, responsible for hygiene and sanitation. Women have proved to be the most receptive and capable of managing natural resources (Black 1998; Datta 1998; Whittington 1997; Wright 1998).

\(^{16}\) The word strategy is used as an umbrella term to refer to any method, approach, technique, or tool, that may be used for CBWM in this document.

Applying Community-Based Watershed Management Strategies to Informal Settlements
uncertain nature of watersheds. When dealing with an urban watershed, the complexity and corresponding uncertainty of management practices increases with additional stakeholders and impacts. This is further complicated when focusing on informal settlements that are unregulated. Any management strategies must therefore deal with the normal uncertainties associated with science and impact assessments, as well as the compounded unknowns involved with the dynamic and uncontrolled nature of informal communities. Hence, adaptive management is seen as a valuable management tool to try and mitigate this uncertainty.

Adaptive management, also referred to as learning-by-doing, is a process which systematically learns, corrects, and adjusts itself. It explicitly deals with the uncertainty of science and nature—and potentially other factors, like the capricious nature of informal settlements—by institutionalizing a mechanism for structured learning that is built into ongoing monitoring. The main elements of adaptive management involve conducting focused management experiments, the explicit analytical treatment of uncertainty, and the development of ongoing monitoring and feedback systems (Holling 1978; Walters 1986). The main principles of adaptive management are considered to be: continuous and deliberate learning, field science and formal experimentation (experimental management), a systems approach, and the integration of management and research (Ohlson 1999).

The application of adaptive management into IWM will be discussed more in the following sections.

**Additional Considerations for IWM**

Typically, IWM has been used and geared towards land and natural resources management in rural areas. While many of the challenges that face environmental management are common to both rural and urban settings, there are certain considerations and effects which are magnified in the urban environment and further complicate management. Any IWM plan will need to include and highlight these additional factors. Some of the common factors which are synonymous with the urban environment include the following:

- A greater diversity and number of stakeholders, which can overwhelm participatory processes;
- A planning scale that is typically much smaller and with a far greater number of competing jurisdictions;
- A large amount of impervious surface areas, leading to an increase of peak flows;
- A drainage network which has been drastically altered, and further confuses management boundaries;

17 Rather than focusing on specific parameters, a systems approach highlights the relatedness of outcomes to management practices. For community-based approaches, outcomes at the community level will be related to initial stakeholder objectives and needs as well as the implemented management strategies (Dayal and van Wilk-Silijbesma 1999). For more information on systems approaches see (Checkland 1981).
A reduction or elimination of natural buffer areas like streams, wetlands and riparian areas that normally serve as filtering layers for pollutants; and

- A greater number of chemical and biological pollutants which interact with the water and land.

Additionally, informal settlements are special areas within the urban tapestry that add to the characteristics needing consideration for IWM. These considerations have a wide variety of impacts and relative significance for IWM, and will depend on the specific features in each community and urban region. Having said this, however, there are characteristics which are perceived to be significant and associated more with informal settlements than the surrounding areas of the city, including:

- Rapid urbanization;
- Poor basic infrastructure services;
- Poor social services;
- Uncontrolled land use;
- Excessive poverty;
- Illegal dumping; and
- Non-conforming construction.

These characteristics accordingly must be dovetailed into IWM plans to properly emphasize the social, economic, environmental, and institutional constraints and considerations facing informal settlements and their remediation.

**Pitfalls of Watershed Management Plans**

Given the potential benefits of adopting a watershed management approach, it is surprising to learn why so few have been successfully implemented in the urban environment. It is therefore beneficial to review in what way these plans have failed and apply these lessons to CBWM initiatives.

In developed countries there is a growing body of experience that highlights the difficulties and pitfalls of implementing urban watershed management plans. It appears that there is a huge difference between watershed planning and implementation. Therefore, a distinction needs to be made highlighting the difference between watershed assessment and watershed management plans. A watershed assessment is a study to determine the problems and issues facing a watershed and to recommend a series of management practices to remedy them. A watershed management plan, however, is a framework or process that leads to the implementation of interventions that protect the watershed.

A study carried out by the Center for Watershed Protection concluded that there were nine main reasons why urban watershed management plans were never realized (Schueler 1995).
1. *Plan was conducted at too great a scale (>50 sq. miles).* This led to a generic plan that could not isolate stream quality or development parameters. Furthermore, the interrelationships between parameters were found to be too complex: too many impacts, and too many stakeholders.

2. *Plan was a one time study, rather than a long-term process and continuous management commitment.* Local authorities were criticized for not fully committing resources and authority to a long-term watershed management plan.

3. *Plan skirted real issues about land use change in the watershed.* Plans failed to accurately measure how current and future land uses would be impacted by watershed plans.

4. *Budget for watershed plan was poor or unrealistic.* Plans were hampered by an unrealistic scope of work given the available resources.

5. *Plan focused on the tools of watershed analysis rather than their outcomes.* Planners and consultants were overly focused on watershed assessment tools like geographic information systems and modelling programs. Therefore, more emphasis was placed on demonstrating the value of these tools rather than the management outcomes.

6. *Document was too long or complex.* Many watershed plans were simply too complex and long for anyone to have the time or skills to use. Accordingly, any recommendations were mired in voluminous amounts of data and obfuscated language.

7. *Plan failed to critically assess adequacy of existing local programs.* Few plans adequately addressed the institutional process required for implementation; particular attention was lacking with regards to evaluating the capabilities of local governments and their existing programs.

8. *Plan recommendations were too general.* Vague watershed recommendations were made without proper regard to site specific conditions and how these recommendations could be implemented.

9. *Plan had no regulatory meaning.* No one was required to use the plan as a routine land development process.

For CBWM, these pitfalls will be addressed by adopting community-based strategies that include multi-stakeholder processes that promote collaboration and coordination. In addition, the process of CBWM will pay particular attention to both the methods of implementing plans and the institutional arrangements needed to create a supportive environment (see Section 2.0). Other challenges of implementing watershed management plans will be mitigated by strategies that call for (a) small-scale community watershed assessments and strategic management plans, (b) community-driven innovative financial mechanisms, (c) integrating the use of local knowledge and appropriate technologies, (d) dovetailing plans into ongoing local environmental management programs, and (e) policy reform that supports CBWM. This management process and strategies will be discussed in more detail in Sections 2.0 and 3.0.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Combining participatory development and integrated watershed management is a natural marriage. Many of the concepts and fundamental principles are similar and/or complementary to one another (See Table 1.1 Fundamental Aspects of CBWM). The amalgamation of these two components therefore represents an integrated whole in terms of a management approach: defining the principles, the process, and the methods available for CBWM. The principles are a cumulative product from both participatory development and integrated watershed management. The process is governed by both processive and substantive components. Generally speaking, processive components are primarily determined by the community-based approaches of participatory development, whereas the substantive aspects of the process are largely steered by those components identified (or needed) for a watershed management approach. The methods to be utilized for CBWM are a synthesis of the available strategies communicated from the participatory development and integrated watershed management literature, and as determined and expressed by the communities involved.

### Table 1.1 Fundamental Aspects of CBWM

<table>
<thead>
<tr>
<th>Participatory Development</th>
<th>Integrated Watershed Management (IWM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devolution of control to the most appropriate level</td>
<td>Integrated and holistic approach</td>
</tr>
<tr>
<td>An enabling environment</td>
<td>Watershed as the functional planning unit</td>
</tr>
<tr>
<td>Collaborative decision-making</td>
<td>Strategic planning</td>
</tr>
<tr>
<td>Community empowerment</td>
<td>Balancing social, economic and environmental values</td>
</tr>
<tr>
<td>Local knowledge</td>
<td>Appropriate technologies</td>
</tr>
<tr>
<td>Sustainable development</td>
<td>Innovative institutional structures</td>
</tr>
<tr>
<td>Low-cost and appropriate methods</td>
<td>Adaptive management</td>
</tr>
<tr>
<td>Demand-responsive approaches</td>
<td></td>
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</tbody>
</table>

Common Aspects for Both Participatory Development and IWM:
- Women play a central role in the development process
- Multi-stakeholder processes
- Participatory planning and management
- Capacity building of stakeholders
- Partnerships and collaboration
- Effective communication
- Flexible approach

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Accordingly, the merger of participatory development with integrated watershed management forms an interwoven and symbiotic relationship where both components benefit from the other’s strengths and fundamental features. Participatory development is strengthened and focused by using the watershed as the management framework and by better linking human activities with environmental processes. Similarly, integrated watershed management benefits from an increased concentration on the socio-economic and institutional parameters identified through participatory approaches and by providing a mechanism to translate watershed management plans down to the household level for implementation.

The union between participatory development and IWM to form CBWM fulfills the widely touted approaches called for by the international community (discussed in Section 1.3) to meet the challenges of urban environmental management in developing countries. Furthermore, the adoption and implementation of CBWM is seen to have additional benefits. It is seen as an ecosystem management approach which places a heavy emphasis on people. At the institutional level, it invests heavily in the social infrastructure needed for governance. This accordingly builds capacities and strengthens linkages between stakeholders, leading to greater understanding, cooperation, and partnerships. Moreover, CBWM saves time and money for cash-strapped government agencies.

At the community level, CBWM promotes a value system that is articulated by the communities and stakeholders, integrating their social, economic, and environmental concerns. The process of development focuses on self-determination to improve the quality of life for the watershed residents. Local knowledge, skills, and resources are tapped in a collaborative problem-solving process to develop more innovative strategies which are more appropriate for local conditions. In the end, partnerships are strengthened with improved communication, accountability, and understanding.

And in the development of CBWM plans, the linkages between social and natural systems are more tightly woven together to promote sustainable development and incorporate uncertainty and science into the decision-making process. This will lead to better decisions and mitigative strategies as externalities and cumulative impacts are better addressed.
1.4 A Conceptual Model For This Resource Book: CBWM Applied to Informal Settlements

This Resource Book is primarily concerned with applying CBWM strategies to informal settlements within the urban landscape of developing countries. As defined above, CBWM is an integrated approach that embodies the key components identified from past experiences for the remediation of the urban environment and informal settlement land use areas. Informal settlements are singled out within the confines of the watershed because:

- They are currently uncontrolled and responsible for the majority of organic pollutants in Third World cities;
- They are the population growth poles within urban centres responsible for absorbing the majority of new residents;
- Their expanding nature infringes and pours upon adjacent areas in search of the basic necessities of life and therefore impacts any growth management strategies or protection measures required for environmentally sensitive areas; and
- They are also some of the worst polluted and disease ridden habitats in the world.

Perhaps, most importantly of all, the problems facing these precarious areas are increasing and as conditions deteriorate these issues will threaten the health of the entire watershed even more. The impetus therefore for new tools and techniques to meet these challenges is critical.

The promotion of CBWM builds on many of the past successful endeavours carried out by other participatory urban management frameworks. However, CBWM is seen as going one step further by strengthening the understanding between human activities and environmental processes. By better integrating science and uncertainty into the decision-making process a clearer awareness is possible to identify the underlying inter-related causes of problems, and to determine the effectiveness of proposed management interventions. Also, by using the natural landscape as a planning unit, a stronger connection can be made between informal settlement land use impacts on the downstream (and the surrounding) environment; similarly, the effects of upstream (and surrounding area) activities and impacts can be more easily identified to see how they impact informal settlements (and the surrounding area); and correspondingly mitigation strategies can be more effectively and efficiently implemented.

Therefore, CBWM applied to informal settlements is a tool to integrate human activities beyond basic infrastructure requirements of water and sanitation, which are often the focus of informal management programs. It is seen as a way to begin to address the underlying concerns of each community: integrating goals of health, income, tenancy, shelter, poverty, pollution, education, food security, and empowerment into comprehensive community plans. These plans and the CBWM process serve as a link between the formal and informal sectors of the urban environment, creating a mechanism for regularizing these uncontrolled areas.

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18 UNICEF's urban basic services program; OXFAM's TDR program; UNDP-World Bank's VLOM, PROWESS, and UES programs; rural water and sanitation DRA projects; rural watershed management projects; and integrated water resource management initiatives.
This *regularization* process builds and strengthens the symbiotic relationship between the formal and informal sectors. Dovetailing the informal management and coping mechanisms already being used in informal settlements with the regulatory mechanisms that are present in the formal sector. This process is considered as a necessary step in the amelioration process for improved sustainability and a healthier watershed environment.

The figure below summarizes the main components of how this Resource Book conceptually applies CBWM to filter and focus on informal settlement issues within the urban network of management (see *Figure 1.1 Conceptual Drawing of Urban CBWM for Informal Settlements*). The remainder of this document will concentrate on providing a process, the principles, and the strategies (methods, techniques and tools) for implementing and using CBWM. All these components of CBWM are connected and intertwined in a hierarchal relationship. The principles serve as a guide to largely influence both the development process and the potential methods chosen; the methods define the framework in the selection of the more specific techniques and tools; and the techniques and tools are the enabling vehicles to carryout the CBWM development process.
Figure 1.1 Conceptual Drawing of Urban CBWM for Informal Settlements

**Urban Watershed (Problemshed) Boundary**

- Participatory Development
- Integrated Watershed Management
- CBWM

**Magnified Considerations for Informal Settlement:**
- Rapid Urbanization
- Poor basic infrastructure services
- Poor social services
- Uncontrolled land use
- Excessive poverty
- Illegal dumping
- Non-conforming construction

- **Informal Sector**
  - Relationships
  - Agreements
  - Coping Mechanisms

- **Formal Sector**
  - Legislation
  - Policies
  - Agreements
  - Regulation
  - Guidelines
  - By-Laws
  - Community Plans
  - Standards & Codes

Applying Community-Based Watershed Management Strategies to Informal Settlements
1.5 Key References


Applying Community-Based Watershed Management Strategies to Informal Settlements


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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Applying Community-Based Watershed Management Strategies to Informal Settlements


Section 2.0  A Municipal Planning Framework for CBWM

Contents

2.0    A Municipal Planning Framework for CBWM

2.1    Introduction

2.2    Developing a Planning Framework

2.3    A Planning Framework for CBWM

2.3.1  Policy Planning Stage

2.3.2  Designing CBWM Stage

2.3.3  Implementing CBWM Stage

2.3.4  Operating & Maintaining Stage

2.3.5  Monitoring & Evaluation Stage

2.4    Key References
2.0 A Municipal Planning Framework for CBWM

This section develops a municipal planning framework that identifies, organizes and corrals the main ideas and activities associated with CBWM. It brings together and merges the concepts from participatory development and integrated watershed management into a logical framework for understanding, assessing, and managing initiatives. The resulting framework serves two principal purposes: to illustrate the scope of management activities, and to provide an organizational structure that can be used as a planning tool (it has also been designed to dovetail into the evaluation framework developed in Section 4.0). Ideally, the framework is intended to serve as a checklist, or guide, to assist users in developing and carrying out CBWM initiatives.

2.1 Introduction

The framework has been deliberately targeted towards the municipal planning level. Therefore, the management practices and considerations cited are geared for use by urban managers and planners whose jurisdictions and control do not extend beyond their municipal or city boundaries. Accordingly, many of the policy level management tasks place an emphasis on coordination and cooperation between other levels of government and with adjacent municipalities.

This focus on municipal or city level governance is in line with the two main tenets commonly advocated for participatory development (and CBWM): decentralization and demand responsive approaches (DRAs). Before either of these tenets can be institutionalized, however, an enabling environment must be created; the literature suggests that this process is most appropriately implemented at the municipal planning level.

Decentralization Control and decision-making should be devolved—as much as possible—to the community level, and to the lowest level of government. For environmental management and the basic provisioning of services the facilitating government agency should accordingly be at the municipal level. This recognizes and respects the reality that municipalities are typically charged with the regulation of all land uses within their boundaries.

DRAs The experience with DRAs suggest that the closer the link between the consumer and service provider, the more responsive, representative, and sustainable, the service will be. Therefore, placing attention on the municipal level acknowledges that it would be the most representative and accountable executing agency for households and communities. Of course every community has its own corresponding socio-political jurisdictions and site specific context which must be taken into account.

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1 Only specific reference material has been included, the majority of the reference material which has influenced this section is provided in the bibliography contained in Section 5.0.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
This concentration on municipal planning does not limit the framework to this level or planning perspective. On the contrary, a conceptual framework developed from a community's perspective—or from a NGO's, regional or national government's viewpoint—could still contain exactly the same management activities and organizational structure. However, there may be different emphases placed on activities, with correspondingly different strategies and institutional arrangements to implement them.

### 2.2 Developing a Planning Framework

For urban community-based watershed management, a planning framework needs to consider all the different planning stages and their associated management practices. Accordingly, a CBWM conceptual framework consists of a broad range of topics dealing with issues of participatory development, integrated watershed management, provisioning of basic social services, growth management, and other urban social and environmental programs. The organization of a framework into logical components can take many different forms; the framework developed below therefore represents one possible slice for conceptualizing the different aspects involved in managing informal settlements.

To facilitate ease of use, and simplicity, the framework was categorized according to two principal dimensions: *management process* and *management activities*. Where *management process* refers to the typical sequential stages involved in the management planning cycle—planning, designing, implementing, and operating and maintaining initiatives. Nested within each of these stages is a series of *management activities* where each activity includes a task, a method, and an institutional arrangement (these items will be discussed in more detail in the following sections).

The planning framework has also included a brief set of key principles that serve to guide the management planning activities considered for CBWM. These principles repeatedly emerged from the developmental literature, and were identified as critical elements for successful endeavours involving the management of community-based initiatives or integrated watershed projects. An expanded set of principles that are not necessarily critical, but are recommended for CBWM initiatives can be found in *Section 3.0 Urban CBWM Strategies* (where there is a specific set of principles associated with each potential management strategy).

#### Management Process

This dimension of the framework consists of the principal management stages associated with any planning cycle. However for a CBWM framework, certain modifications have been made to better reflect the political reality of managing informal settlements. To begin with a distinction must be made between the planning process for developing government policies, and the participatory planning process for designing and managing CBWM initiatives. While these two planning processes share numerous aspects—and are inextricably linked—a separation provides an institutional segregation that is beneficial.
First, this division allows for a clearer assessment and organization of government policy activities to create an enabling environment for CBWM. Second, it recognizes that low-income communities are rarely involved meaningfully in the development of policy formulation in developing countries. This is unlikely to change since government agencies, at all levels, are reticent to forfeit their decision-making power to processes that share control and are therefore more unpredictable (Narayan 1993). Third, the isolation of policy planning also recognizes that it is not necessarily a prerequisite for CBWM. In developing countries, CBWM projects are frequently successfully carried out independently of government support; this is similar for many environmental and infrastructure self-help projects in informal settlements in Third World cities.

Therefore, the management process consists of the following stages: policy planning, designing CBWM, implementing CBWM, and operating and maintaining CBWM. In addition, monitoring and evaluation is considered a non-sequential stage that is intrinsically connected to every stage in the management process. It is considered a distinct stage to emphasize the importance of evaluation in the management process (even though it is a fundamental component of each stage), and to illustrate the particular management activities associated with it (this is discussed in greater detail in Section 4.0).

A key aspect of CBWM (described in Section 1.0) is its adoption of an adaptive management approach, also referred to as learning-by-doing. As mentioned earlier, it is a process which systematically learns, corrects, and adjusts itself. It explicitly deals with the uncertainty of science and nature, and the capricious nature of informal settlements, by institutionalizing a mechanism for structured learning that is built into ongoing monitoring. By nature, therefore, CBWM adopts a learning-by-doing approach that continually evaluates itself and iterates this information into all the stages of the management process. For this reason the management process stages have been represented schematically as a closed loop (see Figure 2.1). This 'process wheel' therefore symbolizes the feedback and continual iteration of new knowledge to inform management practices: from macro-policies to micro-pilot projects.

Figure 2.1 Schematic Showing the Management Process Stages for CBWM

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Applying Community-Based Watershed Management Strategies to Informal Settlements
This cyclic representation also has the added benefit of not distinguishing a prescribed starting point for the management of CBWM initiatives. The chosen framework therefore serves to dampen priorities typically assumed with the stages of the management process, and places an equal emphasis on all the stages. At a conceptual level, at least, it is recognized that there should be a hierarchal relationship between the stages, starting with a favourable policy-planning environment. However, this is rarely the case with informal settlements. It is far more common for defacto community initiatives to lead to dejure government policies. A circular framework therefore is far more representative of the managing environment and incorporates the additional planning challenges of policy playing catch-up to existing conditions.

It needs to be stressed that there is no one-size-fits-all model for the development process. Each situation will evolve according to its specific characteristics. Therefore, any stage of the management process may lead the development cycle or be nested with other stages where multiple activities are taking place at once. So while management activities may be involved at the community level with implementing projects, there may also be efforts directed at creating a more favourable policy climate. In practice, therefore, the management stages are webbed together.

Management Activities

This dimension of the planning framework subdivides each management activity into a series of four elements:

1. Management Area
   Provides a topic area categorizing the management tasks.

2. Management Tasks
   Defines and outlines the management practices to be undertaken or considered.

3. Potential CBWM Strategies
   Illustrates potential CBWM strategies—methods, techniques and tools—used, or considered appropriate, for implementing the management tasks.

4. Institutional Arrangements
   Illustrates a series of potential institutional arrangements to carry out the management tasks (both within and between institutions).

This division of management activities into a system of elements addresses a couple of key points considered weaknesses in typical watershed management planning: implementing plans, and politics. According to Hufschmidt—in his development of a conceptual framework for watershed management—planners focus on “things to be done”, rather than on “ways of getting things done” (Hufschmidt 1986). This has also been the case with projects adopting adaptive management for coastal ecosystems: plans have rarely evolved past the planning stage into implementation (Walters 1997). Breaking down management activities into tasks and potential strategies attempts to overcome this shortfall by placing an equal emphasis on both “what needs to be done” and “how can it be done”. Watershed management has also failed at times by not considering the political setting; typically, governing political structures are not adequately integrated into, or able to support, new management plans (Hufschmidt 1986). By identifying
in institutional arrangements as components within the activities of management, a greater emphasis is placed on the roles of political institutions and how they may fit into the management structure.

Another advantage of considering management activities as a system of elements is that it is conducive to analyzing and regrouping management practices according to either task, method, or arrangement. It is, therefore, quite a simple task to breakout all the CBWM methods from the different stages in the management planning cycle. This provides a specific analytical slice that can assist in monitoring and evaluating management practices.

2.3 A Planning Framework for CBWM

This section develops a planning framework that can be used as a management planning tool: describing specific management activities associated with each stage in the management process; and outlining a potential organizational structure, or order, to carryout these activities.

The management activities included represent either a) integral components identified for a community-based watershed management strategy or plan, or b) they represent management practices that are recommended for consideration in the planning cycle but may not necessarily be required, depending on the site specific context. These management activities were selected because they either met the theoretical components needed for CBWM (briefly discussed in Section 1.0) or emerged repeatedly from the empirical case studies reviewed\(^2\) as key ingredients for success. Indicators of success were an activity's ability to assist a project with meeting its initial objectives, promoting acceptance and adoption by local authorities and communities, proving its flexibility with use to other locations, and offering more cost effective options.

The suggested CBWM methods and institutional arrangements described in the framework provide illustrative examples of how management practices can be carried out and institutionalized. It is recognized that many of the methods and arrangements presented are not new to developmental projects in developing countries, and definitely not specific to CBWM. Many of the methods were borrowed from participatory approaches used in other fields and were modified, when necessary, for a CBWM context.

The management activities within each stage of the management process would ideally follow a sequential logical order. Even though this may not happen in practise, the promotion of a hierarchal structure is considered important to assist stakeholders, whether they use it or not, to optimize a planning process. Therefore this document promotes and recommends the application of a seven-step model developed by Peter Boothroyd. While based on the classic components of rational planning models, it is particularly well suited for application to CBWM initiatives since it was developed as a participatory planning tool that focuses on the "dynamics of collective deliberation within communities" (Boothroyd 1991). It can be used as a generic sequence of

\(^2\) These case studies were from the developmental literature relating to integrated watershed management, urban environmental management, and participatory development projects (for a complete listing of case studies see bibliography in Section 5.0).

Applying Community-Based Watershed Management Strategies to Informal Settlements
steps for each stage in the management process, and in most cases for each management activity. The main steps in the model are:

1. Define your planning task;
2. Plan your goals;
3. Appraise the relevant facts;
4. Generate many action possibilities;
5. Package the possibilities;
6. Assess the pros & cons of each option; and
7. Decide on an option to adopt (Boothroyd 1991)

The application of these steps to a CBWM approach is not perfect. There are times when certain steps may be out of sequence for certain planning tasks. For example, sometimes it is difficult to plan your goals without the relevant facts or knowledge that highlight a specific problem, which is typically the case in informal settlements. Few communities identify the need for toilets until they have received, or are knowledgeable about, hygiene issues. Therefore, defining a planning task or setting goals may follow the collection of data at times. There are also weaknesses in attempting to define an activity neatly into one of the model steps. Some management activities may span or include a number of the model steps, and therefore arranging the other management activities in a sequential order becomes problematic. The key point to stress is that any model needs to be flexible. Strict adherence can confine and hinder processes at times; there must be fluidity to jump between steps to suit the users' needs. Therefore, the developed framework has attempted to use the model as best possible in laying out the sequence of management activities, and at other times it has deviated from it.

Flexibility is also crucial when considering each unique informal settlement. Each informal settlement may contain a series of distinct settlement areas, or clusters. Therefore, a management strategy must recognize these clusters, and be flexible enough to adapt to their site-specific conditions. For a CBWM strategy or plan, a framework should identify the key management practices, provide over-arching principles that support community-based initiatives, and create an enabling policy environment for each settlement cluster. Accordingly for any given land-use area, there may be a series of informal settlement clusters with their own specific goals, methods and arrangements. The following planning framework has attempted to integrate this required flexibility.
2.3.1 Policy Planning Stage

This stage of the management process is predominantly concerned with planning and management—at the municipal level—to create an enabling environment supportive of CBWM initiatives. The principal output for this stage is the development of a municipal-level CBWM Policy Strategy that defines the roles of government agencies, and provides a mechanism for how communities will be mobilized and empowered to manage themselves. A summary of the recommended management areas are displayed in Figure 2.2.

Figure 2.2 Recommended Management Areas for the Policy Planning Stage

Applying Community-Based Watershed Management Strategies to Informal Settlements
Two distinctions which influenced the development of this policy planning stage need to be commented on up front.

1. A distinction needs to be made to distinguish the shades of policy reform. Existing policies may or may not guide management interventions in informal settlements. New policy formulation may be something that happens incrementally; or it can be blurred and integrated into the activities of other management stages; or lastly, it can be done as a distinct step to promote the right conditions for CBWM, as it is illustrated here.

2. Another distinction needs to address the spectrum of options for the type and timing of community involvement in policy formulation. There are two points to consider. First, one of the principal conclusions from participatory development projects is that the earlier participation is solicited, the more likely there will be community ownership and buy-in—two key elements for success (Narayan 1993). The second point recognizes the political reality in developing countries, discussed previously, that government agencies are unlikely to share decision-making given the perceived unpredictability of public processes. Therefore bureaucrats must balance the tradeoffs between the benefits of early community participation and the management of uncertainty. The policy planning framework developed below has placed particular emphasis on activities that manage uncertainty; while still illustrating potential CBWM methods that promote early stakeholder involvement.

The following table provides a summary of the management activities identified for the policy planning stage. One management activity that may seem out of place is the development of a typology for informal settlement land use areas. This activity was included early on for a number of reasons: to assist in defining potential stakeholders who may be focused outside the delineated watershed boundary but who are essential to the upgrading process; to harmonize a consistent typology for informal settlements between municipalities; to begin the collaboration and coordination between planning units on a relatively straightforward activity; and finally, to highlight specific considerations that influence the next management activity of developing a municipal policy strategy.

<table>
<thead>
<tr>
<th>Table 2.1. Management Activities for Policy Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Principles for Guiding CBWM Management Activities</td>
</tr>
<tr>
<td>Process-Related</td>
</tr>
<tr>
<td>- Coordination, collaboration, and harmonization between government agencies</td>
</tr>
<tr>
<td>- Collective decision-making</td>
</tr>
<tr>
<td>- Clear management responsibilities and a common vision</td>
</tr>
<tr>
<td>- Learning-by-doing approach</td>
</tr>
<tr>
<td>Policy-Related</td>
</tr>
<tr>
<td>- Policies should promote decentralization, privatization and deregulation</td>
</tr>
<tr>
<td>- Policies should promote demand responsive approaches</td>
</tr>
<tr>
<td>- Policies should focus on gender issues, promoting the role of women</td>
</tr>
<tr>
<td>- Policies should integrate sustainable environmental, economic, and social goals</td>
</tr>
</tbody>
</table>

Applying Community-Based Watershed Management Strategies to Informal Settlements
<table>
<thead>
<tr>
<th>Management Area</th>
<th>Management Tasks</th>
<th>Potential CBWM Strategies (see Section 3)</th>
<th>Institutional Arrangements</th>
</tr>
</thead>
</table>
| Municipal Pre-Planning | Define the need and purpose for specifically developing a policy strategy that addresses the issues in informal settlements, including:  
  - Outline the political and policy context  
  - Provide a rationale  
  - Identify preliminary goals  
  - Identify which municipal agencies have a stake in the process  
  - Identify a lead agency, if possible. | • Development of a task group/committee  
  • Consultation with communities  
  • Citizen's advisory committee  
  • Citizen panels or juries | • Informal arrangements  
  • Organizational changes  
  • Formal arrangements (e.g. bylaw and policy changes, or alterations to community plans)  
  • Education on informal settlements and CBWM |
|                      | Delineate watershed boundary, and identify all water bodies.                      | • GIS  
  • Community mapping  
  • Zoning and land-use maps  
  (Using physical and social parameters) | • Informal arrangements  
  • Internal work order with the planning or engineering department  
  • Subcontract to outside consultant |
| Coordination and Collaboration  
  (Outside and Inside the Municipality) | Develop a strategy for joint work with other planning units involved with, or providing services to, informal settlements including:  
  - Intra-municipal depts.  
  - Service providers  
  - Public utilities  
  - Adjacent municipalities  
  - Other levels of government, the private sector, and NGOs  
This coordination includes joint goal setting, the streamlining of data collection and other activities | • National Water Coordinating Board  
  • Watershed Planning Councils  
  • Watershed Working Groups  
  • Multisectoral processes  
  • Information sharing and integration of databases  
  • Technology transfer  
  • Technical committees | • Organizational changes  
  • Informal arrangements  
  • Intermunicipal agreements (MOUs)  
  • Contracts  
  • Monetize joint work functions  
  • Education on CBWM concepts |
|                      | Develop a typology for informal settlement land-use areas. For example:  
  1. Residential & commercial areas  
  2. Resource appropriation areas  
  3. Environmentally sensitive areas (riparian, wetlands, drinking watershed)  
  4. Hazardous or precarious areas (flood plain, hillside, industrial, refuse dumps)  
  5. Other areas impacted by informal settlements | • Resource utilization assessment  
  • Ownership analysis  
  • Impact assessments  
  • Basic services evaluation  
  • Current zoning and land-use  
  • Consultation with residents and users’ | • Informal arrangements  
  • Internal work order with the planning or engineering department  
  • Subcontract to outside consultant |
<table>
<thead>
<tr>
<th>Municipal Planning Policy for CBWM</th>
<th>Develop a municipal-level CBWM Policy Strategy, including for example:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Choose guiding principles</td>
</tr>
<tr>
<td></td>
<td>• Define a common vision</td>
</tr>
<tr>
<td></td>
<td>• Identify goals</td>
</tr>
<tr>
<td></td>
<td>• Define management and planning responsibilities and objectives</td>
</tr>
<tr>
<td></td>
<td>(including, for example, an adoption of adaptive management and</td>
</tr>
<tr>
<td></td>
<td>strategic planning)</td>
</tr>
<tr>
<td></td>
<td>• Identify regulatory and economic instruments which will facilitate</td>
</tr>
<tr>
<td></td>
<td>CBWM</td>
</tr>
<tr>
<td></td>
<td>• Identify potentially needed institutional reforms to better carryout</td>
</tr>
<tr>
<td></td>
<td>CBWM</td>
</tr>
<tr>
<td></td>
<td>• Develop an institutional monitoring mechanism</td>
</tr>
<tr>
<td></td>
<td>• Define legitimacy of community groups (legal or not)</td>
</tr>
<tr>
<td></td>
<td>• Task group</td>
</tr>
<tr>
<td></td>
<td>• Interdepartmental sub-committees</td>
</tr>
<tr>
<td></td>
<td>• Intra-municipal roundtable process (government agencies, service</td>
</tr>
<tr>
<td></td>
<td>providers, and international agencies)</td>
</tr>
<tr>
<td></td>
<td>• Community advisory committee</td>
</tr>
<tr>
<td></td>
<td>• Multistakeholder process</td>
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<tr>
<td></td>
<td>• Informal arrangements</td>
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<tr>
<td></td>
<td>• Formal policy and procedures</td>
</tr>
<tr>
<td></td>
<td>• Intermunicipal agreements (e.g. MOUs)</td>
</tr>
<tr>
<td></td>
<td>• Regulation and by-laws</td>
</tr>
<tr>
<td></td>
<td>• Planning and administrative changes</td>
</tr>
<tr>
<td></td>
<td>• Organizational changes</td>
</tr>
<tr>
<td></td>
<td>• Educational programs</td>
</tr>
<tr>
<td></td>
<td>• Subcontract to outside parties (e.g. consultant or working group)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Municipal Planning Process</th>
<th>Develop a planning process for enabling the CBWM Policy Strategy, this may include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Identify participants</td>
</tr>
<tr>
<td></td>
<td>• Define necessary work committees</td>
</tr>
<tr>
<td></td>
<td>• Define codes of conduct, and a procedural framework</td>
</tr>
<tr>
<td></td>
<td>• Clarify tasks and responsibilities, integrating management issues to avoid</td>
</tr>
<tr>
<td></td>
<td>overlap and fragmentation</td>
</tr>
<tr>
<td></td>
<td>• Develop timeframes</td>
</tr>
<tr>
<td></td>
<td>• Define the decision-making process</td>
</tr>
<tr>
<td></td>
<td>• Develop a conflict resolution process for all stages of the planning cycle</td>
</tr>
<tr>
<td></td>
<td>• Develop a financial strategy for the policy process</td>
</tr>
<tr>
<td></td>
<td>• Develop an information-sharing/communication protocol</td>
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<td></td>
<td>• Develop a strategy for mitigating the likelihood of corruption</td>
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<tr>
<td></td>
<td>• Task group</td>
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<tr>
<td></td>
<td>• Interdepartmental sub-committees</td>
</tr>
<tr>
<td></td>
<td>• Intra-municipal roundtable process (government agencies, service providers,</td>
</tr>
<tr>
<td></td>
<td>and international agencies)</td>
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<tr>
<td></td>
<td>• Community advisory committee</td>
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<tr>
<td></td>
<td>• Multistakeholder process</td>
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<td></td>
<td>• Planning and administrative changes</td>
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<td></td>
<td>• Informal arrangements</td>
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<tr>
<td></td>
<td>• Formal policy and procedures</td>
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<tr>
<td></td>
<td>• Intermunicipal agreements (MOUs)</td>
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<tr>
<td></td>
<td>• Regulation and by-laws</td>
</tr>
<tr>
<td></td>
<td>• Information and education</td>
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<tr>
<td></td>
<td>• Subcontract to outside parties</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Human Resource Development</th>
<th>Identify and define new jobs, or management functions, needed for implementing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>the CBWM Policy Strategy including:</td>
</tr>
<tr>
<td></td>
<td>• Provide an adequate incentive program for managers to adopt new policies and</td>
</tr>
<tr>
<td></td>
<td>procedures</td>
</tr>
<tr>
<td></td>
<td>• Provide necessary skills and training for process and programs</td>
</tr>
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<td></td>
<td>• Develop advocacy literature and operational guidelines</td>
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<tr>
<td></td>
<td>• Develop forums to share experiences</td>
</tr>
<tr>
<td></td>
<td>• Task group</td>
</tr>
<tr>
<td></td>
<td>• Interdepartmental sub-committees</td>
</tr>
<tr>
<td></td>
<td>• Intra-municipal roundtable process (government agencies, service providers,</td>
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<tr>
<td></td>
<td>NGOs, etc.)</td>
</tr>
<tr>
<td></td>
<td>• Community advisory committee</td>
</tr>
<tr>
<td></td>
<td>• Multistakeholder process</td>
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<tr>
<td></td>
<td>• Informal arrangements</td>
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<td></td>
<td>• Financial incentives</td>
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<td></td>
<td>• Formal policy and procedures</td>
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<tr>
<td></td>
<td>• Regulation and by-laws</td>
</tr>
<tr>
<td></td>
<td>• Planning and administrative changes</td>
</tr>
</tbody>
</table>
### Policy & Legislative Reform

Identify and lobby for reform measures needed for CBWM planning processes to begin. This will likely involve policy reforms at the local, regional and national levels. Two aspects should be considered:

1. Harmonizing competing and contradictory legislation and policies
2. Creating new policies and legislation where there are gaps which need to be filled to better support CBWM. These new policies would address policy issues related to decentralization, deregulation, privatization, and may also include specific reforms for:
   - Land Tenure and/or Informal Settlement Policy
   - Community Watershed Management or Water Resources Policy
   - Gender Policy
   - Decentralized Financial Policy

### Financing

Develop a financial strategy to mobilize necessary funding for CBWM initiatives. This strategy should identify funding sources locally, regionally, nationally, and internationally.

A financial strategy should mirror the need of a decentralization of financial authority, if there has been a decentralization in responsibilities.

Potential CBWM funding sources may include an emphasis on:
- Locally—user fees; micro-credit schemes; water stamps; etc.
- Regionally—property taxes; land banking; land consolidation; land sharing; credit foundations; social funds; private lenders; municipal credit funds; etc.
- Nationally—inter-government transfers; loan financing system; cross-subsidies for watershed protection; taxes; water pricing; pollution prevention schemes; etc.
- Internationally—low interest loans; grants; co-financing options; etc.

### Applying Community-Based Watershed Management Strategies to Informal Settlements

- Task group
- Interdepartmental sub-committees
- Intra-municipal roundtable process
- Community committees
- Community advisory boards
- Multistakeholder process
- Informal arrangements (e.g. MOUs)
- Formal agreements (e.g. working contracts, monetized agreements)
- Statutes
- Governance policies
- Regulatory or economic instruments
- Planning, administrative, and organizational changes
- Subcontract to outside parties (e.g. consultant or working groups)
### Political Support

Develop a strategy to build political support for CBWM both internally (city or municipal departments, agencies and councils) and externally (other levels of government, municipalities, and the public). A strategy may involve:

- linking monitoring and evaluation to better inform policy reform;
- defining a plan for public participation;
- mitigating procedures to limit the influence of party politics;
- cultivating reformers within resisting agencies;
- instituting accountability mechanisms;
- promoting research to highlight the benefits of CBWM;
- etc.

Potential methods may involve a greater reliance on one or more of the following components:

- Networking
- Collaborative research
- Public participation techniques
- Marketing
- Advertising
- Information dissemination

<table>
<thead>
<tr>
<th>Potential methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking</td>
</tr>
<tr>
<td>Collaborative research</td>
</tr>
<tr>
<td>Public participation techniques</td>
</tr>
<tr>
<td>Marketing</td>
</tr>
<tr>
<td>Advertising</td>
</tr>
<tr>
<td>Information dissemination</td>
</tr>
</tbody>
</table>

### Community Selection

Develop a strategy for engaging and choosing communities eligible for support, including an information plan to disseminate the applicable programs and policies to the public; and clearly defined selection procedures

- Task group
- Community advisory groups
- Planning committees
- Multistakeholder process

Same as above

### Monitoring and Evaluation

Institutionalize a monitoring and evaluation strategy to assess ongoing activities and performance throughout the management process

- Task group
- Community advisory groups
- Planning committees
- Multistakeholder process

Same as above
2.3.2 Designing CBWM

This stage of the multi-stakeholder planning and supporting a plan of action. It then develops programs, which is considered under the Implementing CBWM Stage. There are three main management areas considered for this stage in the management process: Community Management, Community Watershed Assessment, and Strategic Management Plan. Community Management is considered as both a goal and a process necessary for CBWM; accordingly, it is intrinsically connected to—and encompasses—the other management areas for this stage (see Figure 2.3). Community Watershed Assessments and Strategic Management Plans have been specifically created for dealing with informal settlements in urban watersheds.

Figure 2.3 Recommended Management Areas for the Designing CBWM Stage

Applying Community-Based Watershed Management Strategies to Informal Settlements
Community Management

Community management refers to activities which facilitate the devolution of control and decision-making and empower communities to manage themselves. There are two constituent parts for this management area: capacity building of the stakeholders, and developing a community-based process.

One of the fundamental first activities that the literature identifies for this area is the implementation of an environmental and health education program to raise the awareness of stakeholders. This awareness raising leads to a stronger understanding of the connections between actions and impacts, especially related to environmental practices and health issues. Once established, an education program may evolve and serve as a procedural catalyst to begin the capacity building process. This process includes training, organizational development, and creating mechanisms that improve the delivery of more sustainable services.

Community Watershed Assessment

The Community Watershed Assessment is a new concept which has been specifically crafted for assessing individual communities. It differs from a typical watershed assessment by paying closer attention to the integration of biophysical, socio-economic, and institutional issues that affect each community. It is a mechanism that feeds the scientific research collected and analyzed into the Strategic Management Plan and the community management cycle. It also differs from a watershed assessment by having its level of inquiry defined by the informal settlement land use areas, rather than the entire watershed. Negative impacts or problem areas identified during the assessment are then traced back to their source, within the watershed boundary. It is anticipated that the Community Watershed Assessment could be a component piece of a larger watershed assessment for the region. However, it would be customized to—and highlight the watershed issues facing—each specific community.

The purpose of the Community Watershed Assessment is to assess the health of the natural, the social, and the built environment. The main functions identified for the assessment are:

- To define the role of assessment and how it fits into the management planning process;
- To define informal settlement land use boundaries;
- To develop a set of indicators;
- To collate existing information and prioritize new information to be collected;
- To analyze the data, define the problem areas, and summarize it in an understandable and useable format; and
- To develop a series of recommended guidelines and management practices to mitigate problem areas.

---

3 Zandbergen defines a watershed assessment as "the systemic collection, analysis and integration of information on the biophysical elements of a watershed, using scientific methods, in support of watershed management" (Zandbergen 1998).
The Community Watershed Assessment's (CWA) management activities have been accordingly categorized into three component parts: biophysical, socio-economic, and institutional. This division into components is helpful for planning and managing CBWM initiatives. It provides a logical division which assists with information collection, understanding the legal and regulatory contexts, integrating science, understanding the connections between land-use and impacts, evaluating and monitoring, developing common goals, planning according to the hydrologic cycle, and in developing mitigative strategies.

It is noted that while this breakdown into three components provides an analytical device for a clearer identification of the issues and needs, the development of an integrated plan for CBWM must consider all these components together.

The identified management activities for the CWA, illustrated in Table 2.2, are quite extensive and potentially far too complicated and time consuming for any group to undertake. The activities chosen are provided as a guide for groups to use, alter, and to design an assessment that better fits with their needs and resources.

**Strategic Management Plan**

The Strategic Management Plan is an action plan developed through a participatory process for each community. It defines 'what to do' and 'how to do it'. It is also the substantive output from the Designing CBWM stage, and follows from the Community Watershed Assessment. The generic components of the strategic plan follow the seven step model discussed previously and include the following:

- To clarify the role and function of the strategic plan;
- To define a clear set of prioritized goals (integrating environmental, economic, social, and institutional concerns);
- To summarize the assets and liabilities of each community;
- To develop strategies/plans to actualize the prioritized goals (incorporate the appropriate CWAs identified guidelines and management practices);
- To integrate and package the plans and strategies across different sectors;
- To assess, agree, and coordinate action plans (including pilot projects); and
- To develop a timeframe and procedural framework (including outlining the roles and responsibilities for the stakeholders).

The management activities mentioned below involving community management, CWAs, and Strategic Management Plans can occur more or less simultaneously. The development of a participatory process can evolve at the same time as specific management activities are being carried out. Therefore, a hierarchal sequence to the activities is not necessarily warranted, except that the CWA should precede the strategic plan.
Assuming that a typology for informal settlement land use areas has already been developed during the Policy Planning stage, the management activities for the Designing CBWM stage have been simplified by only focusing on **residential land use areas**. Accordingly, management activities may have to be added or tailored for other land use areas. For example, a resource appropriation land use area (e.g. timber or fish resources) may include management activities for developing a common property resource management regime\(^4\). Therefore, while the management areas are consistent for all the land use areas, the **management activities identified in Table 2.2 may have to be augmented depending on the land use being considered.**

### Table 2.2 Management Activities for Designing CBWM

<table>
<thead>
<tr>
<th>Key Principles for Guiding CBWM Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process-Related:</strong></td>
</tr>
<tr>
<td>• Devolution of decision-making and control to the community level</td>
</tr>
<tr>
<td>• Focus on community empowerment and involvement during all <em>management activities</em></td>
</tr>
<tr>
<td>• Focus on encouraging and promoting women's participation</td>
</tr>
<tr>
<td>• Improving process sustainability(^5)</td>
</tr>
<tr>
<td><strong>Management and Planning-Related:</strong></td>
</tr>
<tr>
<td>• Integration of local knowledge</td>
</tr>
<tr>
<td>• Holistic integrated watershed approach that also integrates multiple goals</td>
</tr>
<tr>
<td>• Promotion of partnerships and collaboration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management Area</th>
<th>Management Tasks</th>
<th>Potential CBWM Strategies (see Sec. 3)</th>
<th>Institutional Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community Management</strong></td>
<td><strong>Education</strong></td>
<td>Develop an environmental and health education programme</td>
<td>These management tasks can be implemented through stakeholder groups facilitated by NGOs, CBOs, or government agencies using:</td>
</tr>
<tr>
<td></td>
<td><strong>Management Structure</strong></td>
<td></td>
<td>• Participatory research</td>
</tr>
<tr>
<td></td>
<td><strong>General Administration</strong></td>
<td></td>
<td>• Participatory action research (PAR)</td>
</tr>
<tr>
<td></td>
<td><strong>Management Area</strong></td>
<td></td>
<td>• Feminist participatory action research</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• ZOPP workshops</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• institutional organizational changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Planning and administrative changes</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Informal arrangements</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Intermunicipal or service provider agreements</td>
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<td></td>
<td></td>
<td></td>
<td>• Formal policy and procedures</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Regulation/by-laws</td>
</tr>
</tbody>
</table>

\(^4\) Discussed in more detail in Section 3.0.

\(^5\) At the simplest level, process sustainability is defined as a program's or process's ability to continue to work over time while improving the welfare of the participants. This implies that communities and stakeholders have the necessary skills and training to maintain activities at the same time as securing stable financing.
### Community Management (Cont'd)

<table>
<thead>
<tr>
<th>Skills and Training</th>
<th>Develop a training programme for community capacity building—both hard and soft skills—including organizational development, negotiation, facilitation, mediation, technical skills, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnerships and Collaboration</td>
<td>Develop a strategy to encourage and facilitate partnerships, participation, and collaboration between and within stakeholder groups</td>
</tr>
<tr>
<td>Structured Learning</td>
<td>Develop procedures to institutionalize a 'learning by doing philosophy'</td>
</tr>
<tr>
<td>Process Sustainability of Programs and Services</td>
<td>Develop mechanisms that make stakeholders more self-reliant, including areas for resources (stable financing, training and skills) and political support (skills related to networking, lobbying, and the use of the media to advertise success stories, or advocate issues)</td>
</tr>
</tbody>
</table>

### Biophysical Component of the Community Watershed Assessment

<table>
<thead>
<tr>
<th>Environmental Assessments</th>
<th>Assess or perform the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Biophysical conditions: including physical, chemical, and biological evaluations for the water (including groundwater), land (including soil surveys), and air resources (including depositional characteristics)</td>
<td></td>
</tr>
<tr>
<td>2. Identify location, magnitude and complexity of land-use impacts and their cumulative nature. This assessment may locate all waterbodies within a community—or watershed—and highlight the visible signs of point and NPS pollution; locate aquifers and recharge zones; and indicate the critical areas of concern, including: seasonal flood areas, erosion and landslide areas, drainage network patterns and problems, etc.</td>
<td></td>
</tr>
<tr>
<td>3. Aquatic and terrestrial habitat inventory and assessment, including wildlife and marine animal (e.g. fish) populations and health</td>
<td></td>
</tr>
<tr>
<td>4. Resource utilization analysis</td>
<td></td>
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<tr>
<td>5. Land-use capability analysis</td>
<td></td>
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<tr>
<td>6. Water balance assessment</td>
<td></td>
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<tr>
<td>7. Pollution loading assessment</td>
<td></td>
</tr>
<tr>
<td>8. Environmental risk assessment, including identification of natural hazardous areas like:</td>
<td></td>
</tr>
</tbody>
</table>
  - Flood prone areas |
  - Land slide areas |
  - Fire prone areas, etc. |
| Stakeholder group using: |
  - Archival records |
  - Case studies |
  - Modelling exercises |
  - Rapid assessment techniques |
  - Environmental impact assessment |
  - Cumulative effects assessment |
  - Ecological risk assessment |
  - Participatory action research: transect walks, modelling, seasonal calendars, daily time analysis, group interviews, timelines and trend analysis, VENN diagrams, linkage diagrams, matrix scoring, etc. |
  - Time sequence of change analysis |
  - Critical facilities maps or multiple hazard maps, GIS |
  - Natural hazard assessments/vulnerability assessments |
| Cont’d from above: |
  - Community Contracts |
  - Subcontract to outside parties (e.g. NGOs, private consultants, working groups, government agencies) |
  - Education on CBWM concepts |

Applying Community-Based Watershed Management Strategies to Informal Settlements
<table>
<thead>
<tr>
<th>Biophysical Component (Cont'd) of the CWA</th>
<th>Infrastructure Evaluation</th>
<th>Stakeholder group using</th>
<th>Same as above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate basic infrastructure services, for example: Water, sanitation, electricity, solid waste, drainage, roads, paths.</td>
<td></td>
<td>Archival records</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Rapid assessment techniques</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Participatory action research</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Socio-Economic Component of the Community Watershed Assessment</th>
<th>Socio-Economic Assessments</th>
<th>Stakeholder group using</th>
<th>Same as above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform a needs assessment to identify the key issues and problems, including:</td>
<td></td>
<td>Community or social mapping (Adjust land use boundaries according to community's perceptions and uses)</td>
<td></td>
</tr>
<tr>
<td>1. Define community land-use boundaries</td>
<td></td>
<td>Social impact assessments</td>
<td></td>
</tr>
<tr>
<td>2. Collect basic demographic information, for example:</td>
<td></td>
<td>Gender analysis or feminist participatory action research techniques (e.g. gender resource maps)</td>
<td></td>
</tr>
<tr>
<td>• Population distribution, income level, health, housing types, age of settlement, ethnicity, education, etc.</td>
<td></td>
<td>Beneficiary assessments (World Bank 1996)</td>
<td></td>
</tr>
<tr>
<td>3. Gender analysis</td>
<td></td>
<td>Rapid assessment procedures: secondary data, resource inventory, seasonal calendars, daily activity profiles, local histories, VENN diagrams, wealth and status rankings, etc.</td>
<td></td>
</tr>
<tr>
<td>4. Health impact assessments from agriculture, industry, transportation, housing, waste dumps, hydropower, forestry, road construction, drainage, animal husbandry, commercial services, aquaculture, and recreational</td>
<td></td>
<td>Participatory Urban Appraisal: workshops using mapping, line drawings, critical incident, sorting cards, ZOPP, AIC, etc.</td>
<td></td>
</tr>
<tr>
<td>5. Social infrastructure evaluation, for example:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Health centres, schools, transportation, market places,</td>
<td></td>
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<tr>
<td>6. Social capital evaluation, including:</td>
<td></td>
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<tr>
<td>• Organizational development, information networks, leadership, formal sector relationships, etc.</td>
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<tr>
<td>7. Community/environmental risk assessment, including the identification of areas where there are higher risks from:</td>
<td></td>
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<tr>
<td>• Fire, lack or absence of emergency or medical treatment facilities, disease prevalence areas, crime, etc.</td>
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<tr>
<td>8. Income generation analysis for both the informal and formal economies</td>
<td></td>
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<tr>
<td>9. An economic assessment comparing healthcare and other medical costs (of residents within and adjacent to the informal settlement) that are directly related to environmental effects within the community</td>
<td></td>
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<tr>
<td>10. A socio-economic analysis determining residents' willingness or ability to pay for services, especially water and sanitation</td>
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<tr>
<td>11. Assess breadth and range of capacities of the private sector and identify weaknesses that may require strengthening</td>
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</tbody>
</table>

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**Applying Community-Based Watershed Management Strategies to Informal Settlements**
### Institutional Component of the Community Watershed Assessment

1. Define the legal characteristics of the land-use areas, including:
   - Type of tenureship, use, and impacts
2. Review of historical land use changes and issues
3. Assessment of regulatory and legal governance frameworks outlining the roles and responsibilities of the different levels of government, public utilities, and support organizations
4. Basic infrastructure service delivery evaluation: formal and informal mechanisms
5. Identify institutional shortfalls and concerns, including issues dealing with:
   - Corruption, information management, communication, accountability, and representation
6. Assess socio-political and socio-economic relations, including: cooperation & conflict resolution mechanisms; information dissemination and communication; and information on markets of exchange

### Strategic Management Plan

<table>
<thead>
<tr>
<th>Basic Components of a Plan</th>
<th>Stakeholder group using:</th>
<th>Same as above</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Clarify the role and function of the plan</td>
<td>- Rapid assessment procedures: secondary data, resource inventory, daily activity profiles, local histories, chronologies, VENN diagrams, wealth and status rankings</td>
<td></td>
</tr>
<tr>
<td>- Develop a clear set of prioritized goals</td>
<td>- Internal audit</td>
<td></td>
</tr>
<tr>
<td>- Summarize community assets and liabilities</td>
<td>- Institutional mapping</td>
<td></td>
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<tr>
<td>- Develop strategies/plans</td>
<td></td>
<td></td>
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<tr>
<td>- Integrate and package the plans and strategies (including the consideration of a wide range of technical options to better fit in with a demand responsive approach)</td>
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<tr>
<td>- Assess, agree, and coordinate action plans (choose specific pilot projects to implement)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Develop or outline an implementation strategy for 'how' the plan is to be realized: a timeframe, a procedural framework, an outline of the roles and responsibilities of the stakeholders, including strategies to mitigate identified institutional or other contrainsts, etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Community-Based Methods

- Participatory Action Research techniques
- SARAR
- Gender analyses, etc.

- Institutional Organizational changes
- Planning and administrative changes
- Informal arrangements
- Intermunicipal or service provider agreements
- Formal policy and procedures
- Regulation and by-laws
- Community Contracts
- Subcontract to outside parties
- Education on CBWM concepts

---

**Applying Community-Based Watershed Management Strategies to Informal Settlements**
### Strategic Management Plan (Cont'd)

<table>
<thead>
<tr>
<th>Specific Components of a Plan</th>
<th>Same as above</th>
<th>Same as above</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develop a financial strategy to fund CBWM initiatives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop a conflict resolution or pre-emption mechanism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop a community economic development plan: integrate income generating aspects into the plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop a capacity building program that identifies and provides stakeholders with necessary skills and training; including a program to educate and train urban managers and planners to better support the strategic plan (see also Policy Planning Stage)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Develop a growth management plan for informal settlements</td>
<td></td>
<td></td>
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<tr>
<td>• Develop an enforcement mechanism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Integrate ongoing monitoring and evaluation into activities (see Section 4.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Potential Components of a Plan

<table>
<thead>
<tr>
<th>Specific Components of a Plan</th>
<th>Same as above</th>
<th>Same as above</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develop a legal strategy for dealing with property ownership issues</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3.3 Implementing CBWM Stage

This stage of the management process is primarily concerned with taking the policies, programs and projects identified in the Strategic Management Plan and implementing them in on-site programs and services. The main management activities for this stage are therefore dependent on the specific goals and resources already articulated by the stakeholders during the Designing CBWM stage of the management process. For the purposes of illustration, however, this stage has assumed management activities to fall almost entirely within the scope of 'community contracting and management', which encompasses three stages: engineering the identified initiatives in community plans, constructing or implementing the plans, and finally commissioning the plans into active service.

The sequence of management activities closely follows the seven-step model for each project or planning activity identified. Many of the cited activities appear to mirror the activities already described in the Strategic Management Plan, however the activities discussed here are more specific and are concerned with taking the identified priority items in the plan (which are largely process related) and operationalizing them in projects at the community level. Therefore, the Strategic Management Plan serves as a planning framework for the management activities during this stage, where the activities are more concerned with specific service-related strategies and developing the necessary skills required for more effective implementation by the stakeholders at the community level.

Built within this stage of the management process, stakeholder goals like community empowerment, income generation, and capacity building among the participants are further addressed (beyond specific training or skills activities) through their participation and involvement in a participatory planning process. While generally not explicitly taken into account in the designing of programmes and processes, the participation by the stakeholders in a multi-stakeholder process leads to a greater understanding between participants and organizations. This increased understanding is known to improve collaboration, partnerships, and the efficacy of joint planning initiatives. Moreover, it strengthens both government agencies and other support organization's facilitative roles to support CBWM development, strengthening more community control and management.

The term 'community contracting and management' is intended to incorporate the underlying goals for CBWM: community empowerment, demand responsive approaches, collaborative decision-making, and improving the quality of life for watershed residents. Within this management area, the community is considered the principal stakeholder delegated with the
authority to choose, design, procure, construct or implement, supervise and manage the delivery of services that affect them and will meet their needs.

It is beneficial to distinguish between the different forms of service delivery. The delivery of services refers to the provisioning of social services: either 'hard' social services or 'soft' social services. 'Hard' social services refers to those services needing engineered physical plans and result in a change to the built environment (normally infrastructure related). Whereas, 'soft' services is concerned with designing policies or programs which affect the social or political environments (normally health or economic related). Both these types of social service plans require unique skills and knowledge for their development.

Assuming that a typology for informal settlement land use areas has already been developed during the Policy Planning stage, the management activities for the Implementing CBWM stage have been simplified by only focusing on residential land use areas. Accordingly, management activities may have to be added or tailored for other land use areas. For example, a resource appropriation land use areas (e.g. timber or fish resources) may include management activities to develop and implement agreed upon enforcement regulations. Therefore, while the management areas are consistent for all the land use areas, the management activities identified in Table 2.3 may have to be augmented depending on the land use being considered.

| Table 2.3 Management Activities for Implementing CBWM |
| Key Principles for Guiding CBWM Management Activities |

| Process-Related: |
| Community control |
| Collective decision-making |
| Accountability and representation |
| Focus on community empowerment and involvement during all management activities |
| Focus on encouraging and promoting women's participation |

| Design-Related: |
| Low-cost, appropriate technologies |
| Integration of local knowledge and multiple goals into plans |
| Build flexibility into designs to anticipate the changing nature of interests and involvement of users |
| Range of technical options |

Applying Community-Based Watershed Management Strategies to Informal Settlements
<table>
<thead>
<tr>
<th>Management Area</th>
<th>Management Tasks</th>
<th>Potential CBWM Strategies (See Section 3 also)</th>
<th>Institutional Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Mobilization</strong></td>
<td>Develop a specific strategy for mobilizing (solidifying) participation and building support from community residents and stakeholders. Including the promotion of partnerships and collaboration within and outside communities (other communities, CBOs, service providers, micro-entrepreneurs, commercial businesses, NGOs, and government agencies)</td>
<td>Stakeholder group employs community-based methods, this can take numerous forms including: Community consultations • Beneficiary Assessments • Systematic Client Consultations, etc. Workshops • Appreciation Influence Control • ZOPP • TeamUp, etc.</td>
<td>• Institutional organizational changes • Planning and administrative changes • Informal arrangements • Formal policy and procedures • Regulation and by-laws</td>
</tr>
<tr>
<td><strong>Community Contracting and Management</strong></td>
<td>Clarify the role and responsibilities of the stakeholders and in particular the community Organizational &amp; Management Development • Develop a management and procedural structure to carry out planning • Conflict resolution protocol • Enforcement mechanism for non-compliance</td>
<td>Community-Based Methods • Participatory Action Research techniques • SARAR • Gender analyses, etc.</td>
<td>• Institutional Organizational changes • Planning and administrative changes • Informal arrangements • Intermunicipal or service provider agreements • Formal policy and procedures • Regulation and by-laws</td>
</tr>
<tr>
<td>Resources</td>
<td>Identify and secure adequate resources for designing, implementing, and managing services: • Adequate and stable financing • Necessary skills and training</td>
<td>Skills and Training Methods for capacity building can be achieved through workshops, joint partnerships, specific skills and training programs, or other participatory techniques mentioned above. Secure Financial Resources At the community level this may involve one or more of the following: • User fees • Micro credit/borrower groups • &quot;Sweat&quot; equity • Revolving or social funds • Innovative savings and credit systems: ROSCA, ASCRA, SAVA, LETS systems, low interest loans • Cross subsidies • Etc.</td>
<td>• Community Contracts • Subcontract to outside parties (e.g. NGOs, working groups, private consultants, government agencies) • Public-private partnerships</td>
</tr>
</tbody>
</table>

**Applying Community-Based Watershed Management Strategies to Informal Settlements**
<table>
<thead>
<tr>
<th><strong>Community Contracting and Management (Cont'd)</strong></th>
<th><strong>Design Planning</strong></th>
<th><strong>Same as above</strong></th>
<th><strong>Same as above</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Define project and program to undertake</td>
<td></td>
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<tr>
<td></td>
<td>• Identify specific goals for project or program</td>
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<tr>
<td></td>
<td>• Appraise relevant facts</td>
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<td></td>
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<tr>
<td></td>
<td>• Generate potential design concepts</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Integrate and package concepts together</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Identify and enhance income generating and gender aspects of options</td>
<td></td>
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<tr>
<td></td>
<td>• Assess and choose a design package</td>
<td></td>
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<tr>
<td></td>
<td>• Develop plans and specifications for construction or implementation</td>
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</tbody>
</table>

**Note**
Community can take many different roles during the design & implementation:

- Community as client
- Community as contractor
- Community as manager
- Community as co-manager
- Community as stakeholder
- Etc.

<table>
<thead>
<tr>
<th><strong>Construction or Implementation</strong></th>
<th><strong>Same as above</strong></th>
<th><strong>Same as above</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Secure adequate financing</td>
<td></td>
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<tr>
<td>• Tender work</td>
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<td></td>
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<tr>
<td>• Assess tenders</td>
<td></td>
<td></td>
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<tr>
<td>• Award contract or agreement</td>
<td></td>
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<tr>
<td>• Supervision</td>
<td></td>
<td></td>
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<tr>
<td>• Acceptance</td>
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</table>

**Income Generation**
Integrate secondary income generating activities throughout the implementation and construction cycle

**Coordination**
Develop procedures to coordinate activities within and between stakeholders

**Monitoring and Evaluation**
Integrate ongoing monitoring and evaluation into activities (see Section 4.5)
2.3.4 Operating & Maintaining Stage

This stage of the management process is concerned with the operations and maintenance of the implemented programs and projects. In line with demand responsive approaches, it is assumed that these activities are managed, financed, and carried out exclusively by the communities themselves. All the management activities can be considered to fall within the scope of community management, and can be broken down according into either procedural or substantive components.

Procedural activities relate to the capabilities of the participants and the process of the community management system; ensuring that the community has the adequate skills, training, and resources to maintain and improve the services. The management activities (and guiding principles) are similar to those identified in the Designing and Implementing CBWM Stages— included under education, skills & training, organizational development, resources, partnerships and collaboration, structured learning, and income generation—and will not be repeated here.

Substantive activities relate directly to those management activities required to operate and maintain the services provided. The activities are more directly tied into ongoing monitoring and evaluations to make sure that user needs are being met, and that the services are sustained. These activities generally include the following aspects:

1. **Perform Detailed Inventory**
   This includes an inventory of all the assets: human, material, and financial. This also includes a condition assessment to define general and specific data for the maintenance, repair, and rehabilitation of the services.

2. **Define Maintenance Standards**
   This includes quality standards to define the quality of the maintenance service. In addition, it includes quantity standards to define the resources required to implement each task.

3. **Develop an Overall Maintenance Budget**

4. **Develop a Precise Schedule of Activities to Monitor**

---

6 Other activities which parallel the activities for this stage would include many of those mentioned in the Implementing CBWM Stage; specifically those activities which build upon community capacities and their abilities to manage effectively.
There are no specific CBWM strategies provided for this stage, since they will be dependent on what service is being provided and how the community (or subcommittee) decides to set up an O&M system. There are, however, specific tools which are typically associated with O&M activities (e.g. a work-order system, record-keeping techniques, materials management procedures, etc.), but these will not be discussed in this document.

The institutional arrangements can take one of many forms, but if a demand-responsive approach is desired the control and finances required for O&M should reside in the community. If the community does not directly do the O&M, they should be directly involved as managers in sub-contracting out this work to others. This is discussed in greater detail in Section 3 Urban CBWM Strategies.
2.3.5 Monitoring & Evaluation Stage

This stage of the management process is concerned with monitoring and evaluating all stages and activities involved with CBWM initiatives. An evaluation framework has been developed for this stage and is presented in Section 4.0 A Yardstick for CBWM: An Illustrative Evaluation Framework. This section will therefore concentrate on illustrating both a process and the activities required to implement this evaluation framework into every stage of the management process.

Continuing to use the seven-step model as a guide, a participatory process to evaluate either a management stage or an entire project could contain the following generic management tasks:

- Set up a participatory process and define a working group;
- Define the role and scope for monitoring and evaluation (M&E);
- Define the goals and the priority areas for the M&E process and outputs;
- Develop a set of indicators (using existing or newly developed indicators);
- Prioritize and integrate indicators according to priority areas and available resources to collect the information;
- Assess, choose, and adopt an indicator framework;
- Institutionalize a monitoring program;
- Adapt new tools and methods for managing indicator data, including analysis and synthesis\(^7\) of the information; and
- Develop a feedback mechanism.

For CBWM, there are two key concepts, or methods, identified and advocated for use in the monitoring and evaluation stage: participatory evaluation and strategic monitoring.

*Participatory Evaluation* is a collaborative process whereby communities play an active and central role in crafting an evaluation framework, collecting and analyzing data, and planning the follow-up activities. It is based on the premise that if the benefits of community-based

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\(^7\) Synthesis refers to the presentation of the information in an understandable and useable form.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
development are to be realized, then communities and stakeholders must be devolved with the control to carry out shared decision-making. The benefits and characteristics are discussed in greater detail in Section 4.0.

One of the main weaknesses of monitoring and evaluation is trying to collect too much information (Narayan 1993). Strategic monitoring is a method for optimizing the collection and use of information for evaluation. It is characterized by the following:

- Defining priority areas and goals;
- Identifying key variables according to priority areas;
- Integrating variables into other aspects of the management cycle;
- Assessing indicators according to 'pros' (usefulness of information) and 'cons' (time, money and available resources);
- Selecting key indicators; and
- Developing clear guidelines for measuring indicators.

Strategic monitoring therefore balances community resources against the generation of useful information to inform judgement.

The institutional arrangements can take one of many forms, but if a demand-responsive approach is desired the control and finances required for M&E should reside in the community. If the community does not directly do the M&E, they should be directly involved as managers in subcontracting out this work to others. This is discussed in greater detail in Section 3 Urban CBWM Strategies.

To summarize then, the management activities for monitoring and evaluating projects consist of three components: developing a process to carry out participatory evaluation, implementing a strategic monitoring program, analyzing and synthesizing the data into useful information, and institutionalizing a feedback mechanism that informs ongoing management decisions. These three components set the basis for the 'structured learning' process and will inform continuing formal management experiments in an adaptive management approach. This is discussed in greater detail in Section 3.0 Urban CBWM Strategies.
2.4 Key References


Section 3.0 Urban CBWM Strategies

Contents

3.0 Urban CBWM Strategies

3.1 Introduction

3.2 Planning and Administrative Strategies
  3.2.1 Role of the Government
  3.2.2 General Trends in Legislative and Policy Reforms
  3.2.3 Specific Legislative and Policy Reforms
  3.2.4 Monitoring and Enforcement of Policies
  3.2.5 Institutional Strengthening
  3.2.6 Human Resources Development
  3.2.7 Planning and Management
  3.2.8 Community Engagement
  3.2.9 Financing and Cost Recovery
  3.2.10 Technical Assistance
  3.2.11 Building Constituencies for Political Support

3.3 Community-Based Strategies

3.4 Environmental Strategies

3.5 Key References
3.0 Urban CBWM Strategies

This section of the Resource Book presents policymakers, planners, managers, and community groups with strategies—methods, techniques and tools—for facilitating and carrying out community-based watershed management (CBWM)\(^1\). It is intended to complement and elaborate on some of the potential CBWM methods mentioned in Section 2.0 A Municipal Planning Framework for CBWM. Ideally, this section is intended to represent a toolbox; a resource to help users generate ideas and make informed decisions as to which strategy best suits their needs. Rather than attempting to provide a definitive listing of all the available strategies, this section has concentrated on (1) providing a cursory overview of strategy areas, and (2) highlighting some of the more progressive and promising strategies that have emerged from the developmental literature for Planning and Administrative Strategies identified for CBWM.

3.1 Introduction

The format to identify and describe CBWM strategies has been arranged according to three subsections: planning and administrative strategies, community-based strategies, and environmental strategies. Planning and administrative strategies are primarily concerned with governance issues to assist government agencies wanting to support CBWM; these strategies are generally concentrated during the policy planning stage of the management process. Community-based strategies discuss community management methods for designing, implementing and operating CBWM initiatives. Environmental strategies are more technical in nature and focus on specific techniques and appropriate technologies to address environmental issues facing the health of the watershed and its residents.

This section of the Resource Book will use the Planning and Administrative Strategies subsection to illustrate the full range of available strategies for one subsection, and to illustrate how a subsection may be further classified to identify key ingredients for CBWM. For more detailed information on the highlighted strategies, and related ones, the reader is encouraged to refer to the source documents included in the Annotated Bibliographies in Appendix A and B. In addition, a number of case studies—illustrating some of the innovative strategies—have been included for the remaining two strategy subsections in Appendix C: Case Studies Illustrating Community-Based and Environmental Strategies for CBWM.

This classification into three subsections and related categories is by no means perfect. Many of the cited strategies could be used for numerous categories and subsections. At times, the classification understates or de-emphasizes certain attributes of community-based development. For example, the planning and administrative subsection is predominantly concerned with the role of government agencies and correspondingly little emphasis is placed with the role of community groups and support organizations. This is not meant to imply that communities should not play a significant component in the participation and crafting of strategies during the

\(^{1}\text{It needs to be emphasized that there is no one-size-fits-all strategy or model for community development and watershed management. The nature and range of activities that are ultimately chosen will depend on each site specific environment. Therefore, the strategies will not only be representative of the biophysical, socio-economic and institutional conditions affecting each area or community, but also representative of the needs, responsibilities and capabilities of the various stakeholders.}}\n
Applying Community-Based Watershed Management Strategies to Informal Settlements
policy planning stage, the opposite is true. Given these weaknesses of classification, however, the classification was selected to (1) better highlight the institutional, socio-economic, and biophysical factors associated with CBWM; (2) to avoid duplication of strategies and activities between the stages of the management process; (3) to more clearly distinguish the different roles and responsibilities of the stakeholders; and (4) to more easily organize strategies according to their use and functions, from specific on-site strategies to overarching political strategies.

The organization within each subsection heading follows a similar pattern: a description of the category being considered, a discussion of the range of strategies, and—when available—an illustration of how the strategies could be used.

The CBWM strategies included in this section were derived from both empirical and theoretical research. As mentioned previously, there is a real void in the developmental literature on how CBWM can be applied, particularly in the urban environment. Therefore, strategies have been taken from other developmental fields and, where appropriate, applied to a CBWM context. The selection of strategies and illustrative case studies offers examples of novel initiatives which achieved a certain degree of success. Two of the main factors which influenced the selection of strategies were innovation, and flexibility (and replication). Therefore, the principal questions that strategies had to answer were:

Innovation Did the strategies employ non-conventional methods and if so were they more effective at delivering more with less?

Flexibility and Replication Was the strategy, or a characteristic of it, easily adaptable to different settings and therefore frequently replicated to other programs?

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2 Other criteria which influenced the inclusion of strategies and examples (in no particular order):

Quality of Life Did the strategies increase the standard of life of the participants, primarily with regards to primary health care?

Participatory Did the strategies enfranchise communities with a shift in power to enable more self-governance and were partnerships formed?

Equity Did the strategies specifically target inequities associated with gender, age, religion, ethnicity, and income levels.

Gender Did the strategies target or encourage women to play a central role in community decision-making and in the planning and management of initiatives?

Affordability Were the strategies cheaper than conventional methods, cheaper to maintain, and affordable to the poorest residents?

Protect the Environment Did the strategies minimize pollution and conserve water resources?

Acceptability Were the strategies aesthetically inoffensive and consistent with cultural and social values?

Simplicity Did the strategies promote technologies and tools that were robust, easily operated and maintained by local knowledge and expertise, and easily replicated to allow scaling-up?

Sustainability Did the strategies show more sustainable delivery of services in terms of operating and maintenance costs, reliability, and acceptance?

Integrated Approach Did the strategies employ an integrated approach that addressed a range of issues?
3.2 Planning and Administrative Strategies

The planning and administrative strategies discussed here are predominantly concerned with creating an enabling environment that is supportive of CBWM. As well, these strategies have been targeted at the institutional level of government agencies and public utilities during the policy planning stage of development and during the ongoing operations of CBWM initiatives. This subsection, therefore, looks at the roles and responsibilities of these institutions and outlines strategies that strengthen them: making them more effective and responsive to both watershed management and community-based approaches.

3.2.1 Role of the Government

Defining the role of government agencies\(^3\) when it comes to the governance of informal settlements is a contentious issue; there is a spectrum of opinion on the subject. On the one side, state, regional and local governments have (or been delegated with) the power to regulate land use and provide basic services to their citizens and therefore many believe that it is the government's duty and responsibility to invest in and manage these areas like any other area under their authority. The problem and reality with this viewpoint, however, is that these institutions have proven themselves incapable (through a lack of resources, abilities, or political will) of meeting the challenges from these areas and, in many cases, providing even the most basic services. On the other side of the opinion spectrum, there are those who have pointed to the failure, incompetence, and corruption of government agencies and the recognition that these informal settlements are currently coping without outside support. And, therefore, government institutions should concentrate on finding mechanisms to support these grass-roots efforts. The problem and reality with this viewpoint, however, is that it can too often lead to government agencies absolving themselves from any responsibility for the social and environmental ills that affect and/or derive from informal settlements and relieve them of their fiduciary duties.

It is clear that in this debate there is no right answer as to what a government's role should be other than falling somewhere between the two extremes of full responsibility and no responsibility\(^4\). It is also clear that in many developing countries government agencies are failing to meet the needs of their urban population and a restructuring in the way these institutions operate is critical before conditions worsen.

As discussed in Section 1.0, one of the main tenets called for by the international community, and supported in the reviewed case studies, is the promotion of community-based management as the basis for the urban environmental upgrading process. However, before the benefits from

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\(^3\) This Resource Book uses the term government—or government agencies—rather generically to refer to the different government actors and institutions—at all levels of government—involved with managing land and natural resources and providing social services to urban residents. Where possible, a distinction will be attempted to differentiate between national, provincial or state, and regional or local institutions.

\(^4\) The "no responsibility" viewpoint does not advocate that the government's responsibility should not fundamentally address issues of equity; access and distribution to natural resources; threats to the environment; and poverty reduction. This viewpoint just recognizes that when it comes to informal settlements, government agencies efforts would be better spent on facilitating and building upon others work rather than trying to do it themselves.
community-based development can be realized there is a need for restructuring the roles and responsibilities of government agencies. A restructuring that encourages a devolution of control to enable community management, allowing government agencies to refocus their resources to support this process. This is not an abdication for government agencies to reduce their financial and/or professional resources away from informal settlements. On the contrary, it is a call for government agencies to use their limited resources more wisely by building upon mechanisms that are already working and in place. This re-shifting of the role of government agencies turns the conventional development process upside down: rather than government agencies organizing, managing, and delivering programs for the residents of informal settlements, these agencies must find ways to support residents in meeting their own needs. Therefore, the role of the government moves away from being an implementer of programs to one of being a facilitator and partner of programs. This new role leads to government agencies working collaboratively with NGOs, the private sector, and people's organizations and to better take advantage of the skills and resources of each stakeholder.

If this transition is well planned and executed, it has a number of beneficial implications. Beyond the benefits already discussed for community-based development (see Section 1.3.2 Participatory Development), this public sector reformation can create incentives for new suppliers, providing more opportunities for the private sector and a greater sharing of the benefits from economic growth. Also since government resources are focused on a narrower range of activities, it follows, that costs will be reduced as performance improves under the right conditions (Carney 1998).

As simple as this transition to community-based management sounds, there are few road maps to guide government agencies along this path and many speed bumps which attempt to undermine the process. The remainder of this subsection will highlight some of the observed pitfalls in the governance of the public sector while illustrating strategies and principles that have been used to overcome them. These strategies have been arranged according to government responsibilities that need to be considered in the transformation towards creating an enabling environment for community-based development and watershed management.

3.2.2 General Trends in Legislative and Policy Reforms

In the bureaucratic transition towards community-based management, there are typically three processes which need to occur simultaneously: reforming the legislation and policies governing the planning and management of government agencies; reforming the internal structure and organization of how government agencies operate; and reforming the incentive system for how government employees are rewarded and encouraged to participate and develop the needed skills for community-based development. The administrative reforms, in many cases, are needed to institutionalize changes to ensure the effective implementation of new legislation and policies (these will be discussed in greater detail in the following sections, specifically under institutional strengthening and human resources development). The rest of this subsection will address the legislation and policy strategies needed to better support CBWM.

Applying Community-Based Watershed Management Strategies to Informal Settlements
In general, the basis of reform is to improve governance, making government agencies more capable of achieving their goals in an efficient, equitable, and accountable manner. In developing countries this reformation seems both fashionable and prolific: at last count all but 12 out of 75 developing, or transitional, countries with populations greater than 5 million were embarked on a reform process (Dillinger 1995). This process, which is frequently motivated by foreign aid and debt repayment, is paralleled by three general trends: a scaling down, or downsizing, of public agencies; a decentralization of decision-making to the most appropriate level; and a concentration on involving the private sector. The research from the developmental literature indicates the trends which are most often used for urban environmental management of informal settlements are decentralization, privatization, and deregulation. In addition, demand-oriented service delivery is now inseparable from any urban governance reform process.

These identified trends of deregulation, decentralization, privatization, and demand-side management serve as guiding principles in the formulation of new policies and legislation for community-based development. If not directly forming the basis of new policies, these principles will need to be integrated into policies and legislation as mechanisms to support and enable the transition to CBWM. To better illustrate how these mechanisms could be operationalized for CBWM, it is instructive to describe them in more detail.

**Deregulation**

Deregulation is a generic term implying a loosening of a government's (or agency's) rules, regulations, by-laws, building or planning codes, etc., allowing for a greater variety of designs that will still adequately meet the desired performance standards. From a policy perspective, therefore, strategies should be encouraged to support technologies and designs that may not meet code, but would function adequately providing an acceptably safe and low cost alternative.

The research indicates that it is important for communities to have an active role in this deregulation process since, in many instances, they will become the contractors, purchasers, regulators, maintainers, and upgraders of the resulting systems. Moreover, earlier involvement from communities allows a shared learning process to take place, where technical experts can be educated on the site specific environmental, social, and cultural issues needing consideration before any solution is prescribed; and community residents can be educated on the benefits of alternative technologies, mitigating the frequent perception that these technologies are inferior. Furthermore, the integration of local knowledge and skills into the problem solving process leads to more innovative and appropriate technologies. The dialogue that is created between community residents, planners and engineers is also known to quicken the time needed for support and adoption of new technologies and has direct ramifications for demand-side service delivery. It seems that individuals are much more willing to pay for services that they have had an active hand in designing.

For CBWM, the following general deregulation strategies were identified and considered appropriate (more specific alternative technologies are illustrated in *Section 3.4 Environmental Strategies*).

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5 Generally a down-sizing of public agencies is called for with the management of natural resources of state institutions. It is most often emphasized by international lenders who call for a reduction in the absolute numbers of public sector staff (Carney 1998).

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Promote an unbundling of services

Unbundling of services refers to the splitting of projects into smaller-scale and lower cost options that can be incrementally upgraded at a pace that is consistent with the financial and managerial capacity of the community (adapted from Wright 1998). Therefore, for water provision in an informal community a project may begin with a single communal standpipe that may eventually grow into a network of pipes to each household and connect to the city's water supply grid. The benefit for communities is that it reduces the scale, complexity, technology, and cost of beginning the upgrading process; and it also facilitates management by the communities themselves.

An alternative form of unbundling is called vertical disintegration which allows for the breaking up of monopolies into smaller pieces according to functions. For example, a water supply utility could be broken down according to water collection, storage, delivery, maintenance, collection of fees, etc.

Encourage a widening of technological options and a loosening of conventional standards

A key tenet of deregulation involves the transition away from conventional standards and towards cheaper alternative technologies. Strict codes and standards have proven themselves prohibitory for low-income groups to begin to participate in the upgrading process. Evidence supports the benefit for regulatory agencies who loosen their standards and encourage innovative, alternative technologies within informal settlements. These technologies should be robust, simple, and amenable to user maintenance. In addition, they must be low cost, be easily upgradeable, and must have a flexible enough design to adapt to a multitude of physical constraints and conditions (see Box 3.1).

New technologies should be based on demand-side supply

According to the growing experiences with demand-responsive approaches in the provisioning of rural water and sanitation in developing countries, there should be a host of technological options which consumers are presented with to better meet their demands. Therefore, conventional standards and associated costs should be offered with alternative technologies and their associated costs. In the final decision, the consumer is informed as to the merits and disadvantages of all the options before making a final decision based on their willingness, or ability, to pay. Ideally, if a non-standard technology is chosen in the short-term it should be upgradeable in the future.

Box 3.1
Appropriate Technologies: PROFAVELA in São Paulo, Brazil

In the late 1970s community groups living in informal settlements were lobbying the water and sewage authority for services in São Paulo. This eventually led to a community-centred project called PROFAVELA—a pilot project whose aim was to improve services to the favelas (squatter communities). The backbone of this new delivery system entailed appropriate technologies using a new, low-cost technology consisting of small bore high density PVC piping for the water distribution network.

The community groups played a crucial function in this alternative delivery system: including surveying, planning, negotiating right of ways, supervising construction, and the important role of acting as mediator between service provider and individual service users. After project completion, these neighbourhood groups remained active and focused on other community issues including sanitation, health services, schooling and erosion dangers. After the successes of the pilot project were shown, the water and sanitation agency gradually adopted this new approach which promoted alternative technical standards and procedures.

By 1985, three years after PROFAVELA formed, there were more than 70,000 favela water connections.

Source: Watson quoted in (Schübeler 1996)
Decentralization

"Decentralization is a process, a shift in the locus of power from the centre towards the periphery...The centre [however] still sets broad policy guidelines and goals and is responsible for coordination between decentralized units in addition to supplying certain key goods and services (Carney 1998)."

The underlying premise of decentralization is that physical proximity leads to better decisions. If decision-makers are more closely connected to the issues and concerns of an area, it follows that decisions will be more sensitive and appropriate to those residents' needs. Moreover, as decision making is deconcentrated from central government authority, there should be more accountability and transparency as the people making decisions are closer to their constituents and more accessible to the impactees of any policy changes. Accordingly, there is a direct correlation between level of decision-making and readiness to accept and embrace policy changes. Therefore, the decentralization of responsibility is credited with facilitating more demand-responsive and participatory approaches (Schübel 1996).

Not surprisingly, decentralization can take many different forms at all levels of the governance system: (1) from the central government deconcentrating power to their local administrative offices, or (2) from the government delegating new powers to parastatals, or (3) from government agencies devolving power to more local authorities, and finally (4) from governments transferring power to private entities (Rondinelli 1990).

For CBWM, the shift in the locus of power refers to decentralizing structures to promote and allow more community involvement and control. A shift from macro-management to micro-management of initiatives where decision-making is devolved to the most appropriate level: from state to province, from the province to municipality, from municipalities and service agencies down to neighbourhood levels, and in some cases from neighbourhoods down to household levels (see Box 3.2 for an example of what a devolved decision-making hierarchy of responsibilities may look like using water resources management).

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**Box 3.2**

Decentralized Management: A Potential Hierarchy of Responsibilities for Water Management within Communities

When dealing with issues of water resource management, Briscoe proposes a hierarchy of responsibilities and involvements based on geographical and jurisdictional boundaries. For example, an applied urban CBWM system for an informal settlement may have the following hierarchy:

- **Regional or provincial governments** (or river basin authorities): would focus on managing pollution externalities
- **Municipal agencies**: would administer and manage the macro-services involved in the watershed (e.g. primary and secondary infrastructure pipelines, treatment plants, etc.)
- **Community groups**: would administer and manage the micro-services within their neighbourhoods (e.g. secondary infrastructure pipelines)
- **Households**: would administer and manage services within their properties (e.g. tertiary infrastructure pipelines)

Source: (Briscoe 1996)

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6 The number of government agencies and departments involved in this transition may well involve public sectors beyond water and environmental management to include: public works departments, health departments, municipal affairs departments, national and urban housing departments, community and business development councils, etc.

Applying Community-Based Watershed Management Strategies to Informal Settlements
Whatever the decentralization strategies adopted, they will be reliant on the institutional capacity of government agencies to be able to increase responsibility and authority to local bodies and develop their capacities. The developmental literature identifies two general aspects which are critical in the decentralization process for local authorities to successfully assume new responsibilities.

Clearly defined roles, responsibilities, and mandate

It seems that many of the problems associated with the current trend of decentralization arise from the failure of the public sector to match the pace of political change with the needed regulatory and organizational reforms. Therefore, central governments who are prompted to undergo structural reforms have been bogged-down with implementing new regulatory relationships between themselves and local governments (Dillinger 1995: 7). From the beginning, the roles, responsibilities, and relationship between each government agency and/or organization involved in the decentralization transition must be clearly defined. There must also be a clearly stated mandate to guide any organization which has been delegated, or devolved, new responsibilities.

Decentralization of Decision-Making Must be Followed by a Decentralization of Financial Authority

In most countries, governments have been quicker to decentralize functional responsibilities than to devolve control of funds, leaving lower levels of government in a more difficult predicament (Carney 1998; Dillinger 1995; Dillinger 1994; Schübeler 1996). It is not sufficient to reform policies and legislation which promote decentralization without providing the financial means to allow delegated agencies a means to operate. It is too often the case that local governments or organizations have been delegated with responsibilities without the necessary financial mechanisms to manage or implement new initiatives; without the appropriate finances any decentralized scheme will be condemned before it begins. This does not mean that central government agencies have to fully fund or support organizations which will be delegated with more control, but there must be a mechanism for them to cover operational costs and become financially autonomous (e.g. through the use of property taxes, surcharges, levies, user fees, pollution charges, etc., see Section 3.2.9 Financing & Cost Recovery).

Returning to the decentralized management example in Box 3.2, the financial tools which may be employed to implement this system of governance may include more market-like instruments. For example, at the household level their may be a reliance on user fees, at the municipal level there may be a focus on the private sector in the provisioning of services, and at the regional level there may be a focus on abstraction and pollution charges.

More specific strategies to encourage and carryout the decentralizing of responsibility are discussed in the following sections. One of the most important of these decentralization strategies is privatization.
Privatization (Public-Private Partnerships)

"Privatization can be broadly defined as the process of change which involves the private sector taking responsibility for activities which were formerly controlled exclusively by the public sector. This may include the transfer of ownership of productive assets from the public sector to the private sector or may simply imply that 'space' is created in which the private sector can operate." (Carney 1998)

Privatization is now almost synonymous with public sector reform because it is seen as the most cost effective, efficient, and demand-oriented way of delivering some services. The argument is made that services are delivered in a more cost effective manner since fewer staff and resources are required. Services are delivered more efficiently since corporations are removed from political interferences and can therefore react more quickly to market conditions. And, services have a better demand orientation because performance is directly linked to customer satisfaction; the more responsive a service is, the greater potential there is to broaden service coverage and thus generate more revenues.

There are other advantages for encouraging private sector involvement. In some cases, it can relieve the need for large public capital investment programs: government agencies can provide an environment of incentives encouraging commercial enterprises to invest and reclaim their expenditures through user fees. There are numerous examples demonstrating the greater efficiency of these infrastructure partnerships, especially in the maintenance and collection of fees. In Dar es Salaam, Tanzania, a privatized garbage collection agency was able to collect twice as much solid waste with fewer vehicles, and under half the workforce as compared to the city (Kironde 1997).

Critics of privatization schemes point out that involving the private sector sets a dangerous precedent because of their for-profit orientation. Therefore, there is concern that left unregulated, companies will delivery the lowest quality service for the highest possible price, often ignoring lower income groups. However, this viewpoint should be tempered with the realization that the government and related public utilities (and sometimes NGOs) have performed so poorly in some cases that questions arise whether they should even be directly involved with service delivery. In these instances, they should focus solely on policy setting, regulation, social mobilization and capacity building. It seems obvious that there is a greater role for the private sector to play and that their participation will depend on the relative strengths and resources of both sectors.

It must be stressed that promoting more privatization initiatives is not a call for a shirking of all government agency responsibilities. The onus for equity, quality and a fair price for services, must still reside within government departments. Privatization, therefore, is an admission that certain services can be greatly improved through public-private partnerships. Many governments are starting to realize that demand-orientation, competition, and accountability can be more easily achieved by involving commercial enterprises rather than attempting to do them internally. Moreover, there is increasing evidence to suggest that when competitive conditions are

7 Other potential benefits of private sector participation include (Franceys 1997):
- they have a better source of capital because they can be trusted to pay it back;
- they have better managers because they can afford to pay more (and not be restricted by pay scales like government agencies are);
- they are better motivators of staff because they can hire and fire freely and provide performance incentives;
- they have better management through limited objectives; and
- they are continually forced to improve and adapt or they will lose out to competitors.

Applying Community-Based Watershed Management Strategies to Informal Settlements
introduced that private industries have a tendency to transform an entire service system (Schübeler 1996).

The relationship between public-private partnerships can take many different forms, involving a number of different stakeholders (see Box 3.3).

### Box 3.3
**A Typology of Public-Private Partnerships**

One type of system that identifies a spectrum of agreements between public and private partners is referred to as the "French model" and consists of the following potential partnerships:

- **Community contractors** - refers to residents coming together to form a CBO which then carries out a particular task or contract.
- **Mini-contractors** - refers to small scale contractors or individual artisans.
- **NGO partners/contractors** - refers to private voluntary NGOs which can act as a contractor.
- **Suppliers** - are a crucial element of the privatization process and refers to any organization supplying materials and parts.
- **Contracting-out, service contracts** - refers to contracting-out for aspects of the operation or management of the constructed services (billing, metering, operating, maintaining, enforcing, etc.).
- **Management contracts** - is similar to service contracts only at a larger scale. Therefore, responsibility generally includes managing the operations and maintenance of existing assets.
- **Lease** - refers to the taking over of operations and management; in addition to collecting tariffs from which the lessor makes a profit and covers expenses. The government or community would remain the owner of any fixed assets.
- **Concessions** - similar to a lease, but also includes new investments to upgrade a system when it is required.
- **Build operate and transfer (BOT)** - similar to a concession only it generally refers to a whole new segment of a system. In addition, the tariff that they will be allowed to pay should cover their financing and construction risks.
- **Divestiture** - refers to the selling of (a) the assets of a system or service; (b) the rights to operate and maintain them; (c) the ability to charge tariffs or sell shares for those services. This sale can either be through a private company, a selling of shares, or a buy-out to the existing management.
- **Multimode** - is a hybrid option that refers to any public private agreement involving a combination of the approaches described above.

Source: (Franceys 1997)

It is evident that there are a multitude of scenarios or programs which may be considered as a privatization scheme; each with a potentially unique role and responsibility for community residents and other stakeholders. The emphasis for CBWM initiatives involving informal settlements (and community development in general) is to create an environment that stimulates opportunities for the private sector and which encourages as much participation by community members as their ability and desire allow. The research highlights that the most common privatization schemes involving low-income communities are the smaller scale initiatives, which are able to focus on the household level. Therefore, an emphasis on community contracts, micro-enterprises, local artisan suppliers, NGO partnerships, and service contracts, is desired for communities applying CBWM. Other public-private partnerships are better geared for larger scales typically involving an entire municipality or metropolitan area; and these agreements consistently under service low-income areas because they are seen as a poor revenue generator, this is especially true for squatter communities.
Given a concentration on smaller scale privatization schemes, a key aspect to private-public partnerships is their relationship to their clients, or with CBWM, the community. This relationship can interestingly take many different forms depending on the service, conditions and resources within a community. For example, a community may serve in one or more of the following roles:

- The community as client;
- The community as both entrepreneur and client;
- The community as manager;
- The community as contractor;
- The community as joint manager (with government or an NGO);
- The community as one stakeholder in the selection and ongoing operation of the service;
- The community as recipient of services, etc.

It seems intuitive that the more direct control communities have over the management and financing of private service delivery, the more likely those services will be responsive and accountable to their needs (see Box 3.4 for an example of a community managed development project). This leads to the first strategy for better harnessing the capacities of the private sector for community development of informal settlements.

Facilitate as much community control over public-private agreements as possible

If a privatization scheme has private entrepreneurs entering contracts with government agencies, another layer of bureaucracy is created which may be more susceptible to political interference. In addition, there will be fewer incentives for contractors to answer to community demands. If however communities enter contracts directly or are given financial and/or administrative control over work, contractors will be encouraged to develop stronger ties and be more responsive. Therefore, communities should be devolved with as much control as their interests, resources, and skills will allow for any community-based privatization scheme.

The remainder of this section will highlight other general privatization strategies that have been used and called for in the provisioning of services at the community level (more specific measures can be found in Section 3.2.3 Specific Legislative and Policy Reforms).

Assess the capacity of the private sector

One of the first steps in the move towards involving and facilitating more private sector participation is assessing exactly what their capacities are and their availability: therefore, determining their ability to meet additional or greater participation. There is no point going down a road towards privatization only to find out at the ninth hour that there is not sufficient capacity to handle the new policies or shift in management arrangements. If it is determined that capacities of the private sector are inadequate, there will likely be a need to provide incentives to build up the sector. These incentives may extend beyond skills and training programs to include financial motivation to encourage entrepreneurs to get involved.

Governments must commit to process

Equally important to an enabling environment and potential subsidies, is the perception for how stable and committed government agencies are to new
privatization policies. Therefore, a government's commitment to new strategies is directly related to how willing the private sector will be to get involved. Companies will not be willing to risk investments if attractive profit projections are based on weak or uncertain conditions; particularly when potential subsidies may be easily cancelled (Carney 1998: 67).

**Box 3.4**

**Community Managed Water and Sanitation Project: Port au Prince, Haiti**

Over the past few years political instability, repression and embargoes have led to a huge rural-urban migration in the city of Port au Prince, Haiti: the population went from 1 million in 1990 to approximately 1.6 million in 1998. Many of these new residents swelled the already crowded informal settlements; the environmental conditions within these areas were appalling. This health condition is worsened with a city that is completely without any sanitary sewer system. This project was carried out in one informal settlement of 200,000 residents with no safe water or solid waste collection and only 30-40% of the residents had access to a latrine.

USAID and a Haitian NGO (CDS) established an autonomous community-managed service district (basically an NGO) that was responsible for the supply of potable water and sanitary services. CDS signed a 3 year contract with the municipal water authority to manage the water supply system and provide sanitation services. The methodology used for the project placed significant responsibility for managing water and sanitation with the communities, creating a sense of ownership and protecting against illegal connections. Organizational structure is broken into zonal committees, each zone oversees a number of communities, each community has a fountain committee that enters a concessionary agreement with the NGO.

**Key principles:**

1. NGO will have autonomy over key aspects of its operation
2. NGO will be run with substantial community involvement
3. NGO will involve private sector and NGOs as much as possible
4. NGO will be entirely self-financing

**Highlights:**

The hierarchal organizational structure—from the NGO down through community-led zonal committees, down to the neighbourhood-level fountain committees—greatly facilitated community buy-in and responsibility. The structure was an effective tool for mobilizing community support, with built-in mechanisms for self-control, income generation and self-policing.

**Conclusions:**

After 6 months the NGO was covering administrative, operation and maintenance costs with the retail sale of water; scaling up of operations was anticipated to cover expenses for the start-up of the solid waste system.

**Source:**

(McGahey 1998)

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**Generate demand and interest in the private sector**

There is a misconception by policymakers that if they create a favourable policy climate for privatization that businesses will necessarily answer and meet the opportunity. This failure to advertise and market policy changes and conditions is often cited as a principal failure of privatization initiatives. It is ironic that the principal tool employed by the private sector for success, is often ignored by government agencies when they are trying to generate interest and encourage private sector participation (Rijsberman 1998).

**Governments need to adequately regulate the private sector**

It is clear that as government agencies attempt to make "space" for more private sector participation they must also adequately regulate and provide safeguards against profiteering. Otherwise, contractors may be tempted to 'asset strip' where maintenance is not carried out and reinvestment in assets is required after the contract ends. Alternatively, contractors may be motivated to force tariffs too high and too early without proper controls. Therefore, government agencies...
Governments need to concentrate on smaller businesses. In general, public-private partnerships which focus on smaller businesses generate higher economic benefits for a given area (Franceys 1997). This is particularly true in the provisioning of basic services to low-income areas, where a concentration on micro-entrepreneurs and local artisans will likely lead to more local currency being recycled into other income generating opportunities for that community.

Demand-side management and demand-responsive approaches. Demand-side management is now ubiquitous through the developmental literature relating to the delivery of basic services to low income communities. It is a mechanism that is called for in most upgrading initiatives and is normally built into every policy reform, especially privatization strategies. The main premise of demand-side management is that demand leads supply, rather than the conventional approach of supply governing demand. Demand-side management is seen as a more effective and less wasteful approach, matching consumers' needs with service supply. Accordingly, both the quality and quantity of services can be more easily gauged and provided for according to a person's requirements, and presumably their willingness to pay for a service. Therefore, commercial principles motivate service providers' actions.

Demand-responsive approaches (DRAs) are one such demand-side management strategy which is becoming widely used in the delivery of basic water and sanitation services. Generally associated with supplying rural water and sanitation services to poor communities in the developing world, DRAs are continuing to be touted for community development projects in the urban environment. DRA approaches are considered—by the World Bank—to be more sustainable than supply dominated approaches; more flexible and innovative; and more financially secure, since water is considered an economic good rather than a free commodity (Katz 1999).

DRAs are a market-driven framework where communities play a more active role in the community development process—they take initiative, collect money, make contributions, choose the levels of service; and inherit the constructed works. The process begins by a community expressing a demand for improved water and sanitation services and their willingness to pay (WTP) for a minimum of project costs and pay fully for operating and maintenance costs. The local government subsidizes the remaining portion, sometimes with the aid of external funding agencies. The government plays a facilitative role to create a more favourable climate, encouraging wider participation, and typically NGOs and CBOs act as support agencies by disseminating information, and providing consulting and other training services.

The two concepts most commonly associated with DRAs are that a community's preference is based on their WTP for a service, and that each...
community is offered a menu of service options to choose from. There are also four general rules which form the basis of DRAs: (1) not every community is eligible for services; (2) decisions are made on the affordability of options; (3) cost sharing among community members and stakeholders must be spelled out; and (4) there is an emphasis on sustainability in terms of who manages and maintains the resulting works.

As mentioned in Section 1.3.2 Participatory Development, DRA is not without its criticisms. Nevertheless, even with its weaknesses, DRA represents a shift that almost all practitioners and international aid agencies see as a positive step towards more sustainable delivery of services to low-income communities. Recent experience, however, identifies a number of strategies that would strengthen the DRA upgrading process for water and sanitation projects, including:

- Women must be central in the decision-making and development process;
- An integrated approach is needed beyond water management;
- Institutional rules need to be explicit and should create incentives for each organization or stakeholder;
- Communities must play a central role throughout the process including: selection of contractors, making contracts, conflict resolution, acceptance of completed works, etc.;
- All those who provide services to the community should be made accountable to the community;
- The community organization charged with managing the service must be legally recognized;
- Clear and full communication is important to outline levels of service; investment and recurrent costs; service delivery and management options and their complexities; availability of spares; technical assistance; etc.; and
- The poorest members of the community must have the ability to pay by informal means (e.g. alternative credit schemes, or sweat equity where labour is used rather than money).

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8 Some of the typical criticisms that have been used against DRAs include:

- That it is not an approach, but rather a series of vague concepts which have been appropriated from established community-based practices;
- Some critics argue it further marginalizes the poorest of the poor, who may be willing to pay but not able to and therefore are left out of the developmental process;
- The basis of DRA is in the determination of demand, most academics and practitioners however cannot agree on a definition for it so its operationalization becomes problematic (economists see demand as WTP, engineers see demand as amount of water needed, social scientists see demand as a basic human need which must be met);
- Demand is not static: there will be a change in demand over the life of project which is potentially of more significance to the design than estimating initial demand;
- DRA assumes that demand is already present, which is seldom the case (few communities ask for toilets, they first must be informed as to the link between health and hygiene);
- One of the harshest criticisms is that DRA does not support sustainable or integrated development because it assumes that if a household is willing to pay more for a higher level of service then they will be able to get a larger share of a resource without consideration of that resource's sustainability; and
- The promotion of DRA strategies presupposes that water and sanitation services are not fundamental human rights which should be supplied to all citizens, they are conditional on an individual's ability to pay. Supporters of DRAs counter that although water and sanitation should be basic rights that does not necessarily mean that they should be free.

Applying Community-Based Watershed Management Strategies to Informal Settlements
3.2.3 Specific Legislative and Policy Reforms

This sub-section is concerned with illustrating specific legislative and policy changes that may be directly applicable to the governance of informal settlements and watershed areas. These potential changes or strategies serve as a reference point to facilitate and guide the reformation process: creating an enabling environment that provides the freedom and incentives for people to more actively participate in the environmental management of their communities.

It is recognized that there is no shortage of existing legislation and/or policies which exist or could be enhanced to better support and enable a community-based watershed management approach. For example,

- At the national level, policy and legislative reforms could deal with everything from constitutional issues recognizing tenurial rights, or address changes to environmental laws (EIAs, SIAs, endangered species, etc.) or resource laws (related to water, forestry, agriculture, fish, etc.), or social laws (poverty alleviation programs, indigenous rights, etc.) or delegate more jurisdictions to regional bodies, or develop new intergovernmental agreements, or revising municipal affairs legislation, etc.

- At the provincial or regional level, this could entail changing environmental management policies and legislation (industrial wastes, pesticides, surface water, etc.) or municipal acts, resource management acts, acts which affect industries (mining, oil & natural gas, etc.) new approaches for departments or crown companies, etc.

- At the municipal or city level this may entail new land use zoning, by-laws, financial allocations, growth management strategies, new participatory approaches, official community plans, etc.

The options are unlimited. Each reform strategy or intervention will first have to carry out an assessment to determine what policies or legislation may be appropriate, or may be strategically applied, to support CBWM initiatives. Experience shows, however, that it is far easier to amend and change existing legislation or policies rather than trying to start from fresh. Therefore, an emphasis should be placed on harmonizing competing and contradictory legislation and policies to begin the CBWM reform process.

An alternative to amending or re-interpreting existing legislation and policies is to create new ones. The remainder of this subsection will provide examples of legislative and policy reforms which other cities have employed or ones deemed directly applicable for achieving the principles associated with CBWM. Obviously, any legislation or policy changes will be dependent on each specific physical, social, economic, and institutional context. However, it is hoped that a listing of potential reform measures will serve policymakers to better craft their own strategies.

Basically any new legislative reform that is targeted towards supporting community-based development should address the following issues (Narayan 1995: 31):

- redefining the role of government agencies as facilitators and regulators;
- civil service reform;
- new funding mechanisms;
new systems of accountability for performance;
- legal status of community groups;
- simplification of legal registration requirements for individual, group or community ownership; and
- use and tenure rights over assets.

While seldom the case, these legislative components can greatly facilitate community-based initiatives by clarifying the roles of the different stakeholders; recognizing the roles, rights, and responsibilities of each stakeholder; providing flexibility in how projects are implemented; and institutionalizing better communication and accountability networks into the design and management processes. These items can greatly improve the potential for success in community-based development.

One of the critical components of legislative and policy reform which is ubiquitous throughout the development literature is the need for clarity in defining responsibilities and roles between government agencies. According to Dillinger in his reviews of the World Bank’s decentralization experience:

> clarity in the division of functional responsibilities between levels of government is an essential condition of any reform... A clear linkage between a particular unit of the government and a specific service is crucial if constituents are to hold that unit of government accountable for providing that service well (Dillinger 1995: 4).

Therefore, one of the main goals of any policy or legislative reform should be on clearly defining and articulating the roles and responsibilities of the different government agencies and the stakeholders. Furthermore it is imperative to encapsulate a clear vision and direction to be followed, which can be used as a guide by the participating organizations. This includes having clear instructions setting guidelines and rules from the state level down through parastatals.

For CBWM, four legislative or policy reform areas have been identified. These areas are considered key to addressing many of the pitfalls which have derailed integrated watershed management and community-based development projects in the past. These potential reform measures are therefore considered important for creating a more supportive environment for CBWM. These policy reform areas are:

- Land Tenure and/or Informal Settlement Policy;
- Community Watershed Management or Water Resources Policy;
- Gender policy; and
- Decentralized Financial Policy.
Land Tenure and/or Informal Settlement Policy

There are basically four schools-of-thought for contending with land tenure issues and informal settlements in Third World cities. The first school-of-thought is the 'do nothing' approach and everyone agrees that this is unacceptable and will only perpetuate worsening conditions. The second school-of-thought is relatively outdated now, it involved draconian measures to forcefully remove residents from their homes and neighbourhoods. Governments soon realized, however, that they could not simply bulldoze the problem away and almost without exception these actions proved counter-productive (Molnar 1990). With few options, squatter's had little choice between obeying the law and surviving.

The third and fourth schools-of-thought relate to either de jure recognition of squatter's rights, which attempt to directly formalize squatter's access or right to land; or de facto recognition of squatter's rights, which focus on management—rather than ownership—issues and allow the regularization process to begin. These last two schools-of-thought will be discussed in more detail below.

De Jure Recognition of Squatter's Rights

Lack of secure tenure has a profound affect on the poor's ability to acquire safe land for housing. Without secure tenure, residents have little incentive to invest in improvements when they could be evicted at any moment. Even if there is a willingness, informal residents are challenged with gaining access to formal credit systems to help finance the upgrading process.9

Therefore, defining property rights can be an incredibly effective environmental management strategy. The outcome can mean clarifying water rights to promote water conservation, allocating emission rights to control pollution, and providing secure tenure to encourage investment in housing and services. It also has the added benefits of improving land development; regularizing construction and improving quality; and allowing residents to gain access to formal credit and help pay upfront costs for improvements. Securing tenureship is known to improve environmental conditions in and around informal settlements through improved water and sanitation services, better drainage and solid waste management (Bartone 1994: 60).

The act of defining property rights however is a political process and is therefore dependent on how supportive the political climate is to address these issues. Trade-offs will have to be made between the type and use of tenure rights granted, the need to address deteriorating environment conditions, and the likely changes in political support that may take place. An information and education campaign could parallel the land tenure rights process to mitigate misinformation and highlight the benefits of secure land tenure for informal settlements.

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9 Poor titling and land registration systems make it even difficult for landowners: since they frequently cannot use their properties as collateral and thus cannot borrow money needed for infrastructure or housing upgrades (Bernstein 1996: 3).

Applying Community-Based Watershed Management Strategies to Informal Settlements
If the political will is there to undergo land tenure reform, research shows that safeguards must be in place to protect residents from opportunists who will want to profit from new policies. The World Bank's experience indicates that there are often unanticipated negative impacts associated with land tenure changes. Therefore, precaution should attempt to predict and mitigate negative impacts, especially when dealing with informal or customary rights to access different kinds of land. At the same time, care must be taken to understand the existing tenureship relationships and better capitalize on opportunities (Molnar 1990).

Tenurial rights governing access and use of land can be addressed at any of five distinct levels:
1) customary or traditional rights;
2) administrative orders regarding use of land;
3) court rulings regarding existing legislation;
4) state and national legislation regarding the rights over land; and
5) constitutional law regarding citizen's rights in land.

The most common for informal settlements is through state and national legislation which directly deal with tenureship arrangements involving state-owned or privately owned lands.

Reforming land tenure policies does not exclusively involve the transfer of titles. For state-owned land tenure agreements there are a variety of forms that can address use and access to land (Boehmer 1997):

- a transferring of title holdings;
- agreements authorizing limited use of government lands (traditional use, or subsistence uses);
- agreements allowing community management of government lands;
- redefining boundaries of government lands;
- recognition of customary land rights;
- provision of secure tenure to occupants of illegal settlements; and
- review of land acquisition, compensation and resettlement schemes.

Similarly for privately owned lands, securing tenureship may involve more than one form of agreement with informal settlements. One of the most contentious issues involved with attempting to secure tenure rights on private properties deals with the matter of compensation. Some methods that have been successfully used or proposed for governments to assist in financing potential compensation claims include the following strategies:

**Land Consolidation** (or land redistribution) where land is pooled together and owners are compensated with either upzoned smaller parcels of land, or parcels of land that have had infrastructure provided or other public...
investments made to them to increase their property values. These compensation measures may include density bonusing, or negotiating more favourable by-law regulations with comprehensive development zoned areas, or land exchanges are purchased by selling development rights for other properties, etc.

**Land Banking** where the government buys and keeps land out of the public market for future uses. Then it uses or trades the land with developers for land elsewhere in the city.

**Land Sharing** where informal settlement communities are allowed to purchase their land for below market rates; in exchange, developers are allowed to commercially develop the remainder of the property (sometimes this may entail 'upzoning' or 'density bonusing' to allow a higher density rating therefore increasing property values).

**Credit Foundations** where non-profit foundations are set up by government agencies to provide low-cost housing, access to property, or to act as an alternative credit source for financing.

Another alternative to full compensation schemes which give clear title to informal settlement residents is to look into granting some form of limited property rights, like leases or certificates or formalizing customary land rights. In this case, residents would have more secure tenure and owners would be compensated on the basis of rent or the loss of development rights.

**De Facto Recognition of Squatter's Rights**

Even when tenureship is addressed it has been known to turn into a litigious time-consuming process that stalemates any progress on a development scheme. Therefore there are those who advocate focusing on management issues rather than ownership ones, this begins a process that can address tenureship issues at a later date. The benefit of this approach is that property owners have already been consulted and/or negotiated with as a part of the upgrading process. Accordingly, many of their concerns may already be resolved without necessarily having to resolve the conflict-laden property ownership issues upfront.

One of the main deterrents, mentioned previously, for communities not wanting to participate and buy into the development process relates to their perceived notion of security. In other words, residents won't invest in their properties unless they feel relatively secure in their either formal or informal tenure. While security can be achieved through formal land titling, service provisioning programs can lead to informal or a de facto form of tenureship. Government-led projects which improve services (and reverses conventional policies of avoiding service delivery to informal settlements) send a positive and reassuring signal to communities who feel threatened by possible eviction. This will likely result in residents being more willing to invest and undertake improvements in
their homes and environment and provide more encouragement for them to actively participate (Schiibeler 1996).

**Community Watershed Management or Water Resources Policy**

A specific watershed policy may have many different aspects to it, potentially on many different levels as well. At the micro-level, policies would be focused at the community level to facilitate local groups in their mobilization and assist in the design, implementation and management of their watershed plans. One of the key aspects to this local level enfranchisement is recognizing the right of communities to not only be involved in this process, but to guide it and become the principal stewards in the upgrading process. For this process to begin, however, the research indicates that there must be a clear legal recognition of community watershed groups and their responsibilities.

At the macro-level, there must be legislation and policies which favour and are consistent with the micro-level policies as well as focusing on larger regional/watershed issues. Therefore, macro policies would link and integrate individual community watershed plans into an overall coordinated plan that would not only consider the social and environmental aspects of each neighbourhood in the watershed area, but also integrate larger socio-environmental issues like flood control and erosion control; water quality maintenance; groundwater recharge; biological productivity and diversity; fish and wildlife habitats; historical and archaeological values; environmental and outdoor education; agricultural productivity; recreational and tourism opportunities, etc.

The macro policy would therefore also serve as a link to coordinate and collaborate activities between adjoining jurisdictions and sectors of the government. This work may take the form of informal or formal agreements—like memorandums of understandings (MOUs)—between agencies and institutions to share information, coordinate actions and research through joint committees or over-arching watershed councils or boards (see Box 3.5 for how inter-governmental work was institutionalized in Sri Lanka). More specifically, joint work may involve some of the following actions:

- Defining roles and responsibilities between competing agencies;
- Developing an over-arching water resources/watershed management plan that specifically deals with watershed issues, especially mitigating the impacts from and within informal settlements;
- Harmonizing conflicting or lacking policies and regulations;
- Defining a process or procedural framework for co-management or planning operations (may include the adoption of an adaptive management approach, monitoring and assessment procedures, etc);
- Setting out MOUs which define coordination and collaboration;

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Establishing an independent conflict resolution panel to negotiate, mediate and if necessary arbitrate disputes between sectors and regions;

- Amalgamating data collection services;
- Sharing and optimizing resources;
- Promoting joint research activities; and
- Enforcing and monitoring progress.

One of the key methods to enable macro-level policies is the establishment of both a National Water Policy and/or a Water Basin/Watershed Board or steering committee. A National Water Policy can be used to both provide a mandate and a process to help guide other related policy and legislative reforms.

**Box 3.5**

**Joint Inter-Governmental Work: A National Water Policy in Sri Lanka**

One method that was used in Sri Lanka to facilitate collaboration between government agencies was to develop an inter-departmental steering committee. The purpose of the committee was to create an integrated water resources management framework and action plan. The committee consisted of eight ministries with water sector responsibilities; and seven chairpersons or directors of government boards with water sector responsibilities. The result of the committee's work consisted of the following:

- Developing a national water policy;
- Establishing a permanent institutional arrangement for water sector coordination;
- Preparing and enacting a national Water Act;
- Amending other water-related legislation;
- Reorganizing and strengthening the management of water sector institutions;
- Establishing the systems needed to provide the data and information needed by decision makers; and
- Carrying out comprehensive planning in selected watersheds.

Source: (Mosley 1996)

A National Water Policy may include a diverse array of factors affecting the governance of water resources including: groundwater, water pricing, managing activities in and around streams, water management planning, water allocation, flood plain management, water quality management, and water conservation. It can address competing and contrasting interests and jurisdictions by providing a regulatory framework that harmonizes water management issues between different levels of government and sectors. It could be used to develop and ratify a process which institutionalizes a multi-sectoral, participatory approach to managing land and water resources and recognize community-based watershed management as a process for upgrading informal settlement land use areas (see Box 3.6 for Brazil's National Water Resources Management Act).

A National Water Policy may also include specific water or participatory development legislation which provide executing agencies with more control and discretion to decentralize governance systems, or provide them with a means to better operate and manage water and land resources. For example, a Water Act may clearly define a framework for utility regulators to...
exercise control, including the standards of service and a framework for setting tariffs and monitoring performance, together with the rights and obligations of the utility. Alternatively, a Water Quality Act may focus on pollution control measures to restore and enhance the physical, chemical and biological integrity of the water. Similarly, a Watershed Act may provide a means to better link upstream effects with downstream cumulative impacts; thereby, better integrating science into the decision-making arena.

For CBWM, a National Water Policy may be a vehicle for institutionalizing and promoting participatory multistakeholder processes and adaptive management into urban environmental management governance systems. And, integrate water resources and land use planning through micro-level policies that better coordinate land development of informal settlements and surrounding areas.

**Box 3.6**

A Water Strategy: Brazil's National Water Resources Management Act

In 1997, the President of Brazil signed the National Water Management Resources Act, which defined both the principles and management process for how water resources would be governed for Brazil. The National Policy was based on the following six principles:

1. Water is a public good;
2. Water is a finite resource and it has an economic value;
3. When scarce, drinking water supply is the uppermost priority;
4. Management must encompass multiple uses;
5. The watershed is the territorial unit for management purposes; and
6. Water management shall be based on a participatory approach involving government, users and citizens.

The last point creates a legal text for a management framework which facilitates a more decentralized management system. A Federal Water Council was created to help harmonize and resolve conflicts between competing levels of government.

The national policy also lays the foundations for a more integrated approach where water and environmental management are considered together and better integrated with land-use policies and practices.

Source: (Porto 1998)

More specific regulatory, environmental, and economic policies are discussed in *Section 3.2.7 Planning and Management*.

**Gender Policy**

The need for a gender policy merits special attention because the active participation of women is such a crucial ingredient for successful community-based endeavours (discussed more in *Appendix C1.2 Gender and Development: Role of Women*). Accordingly, the need for a specific gender policy will ultimately be based on each specific socio-economic, socio-cultural, and socio-political context. An analysis will therefore have to identify any constraints that inhibit
women from participating in the development process—either for socio-cultural, mobility, legal, regulatory or other reasons. Only then can a determination be made as to the merits of either a specific gender policy or an inclusion of gender components into existing policies and legislation.

In some cases there may be a need for special legislation to ensure equal access to participate in a process or to equalize rights which may affect development. For example, on a World Bank project in Honduras it was found that there was a law which forbade women from owning agricultural land, this greatly affected participation by women and therefore had to be rescinded to allow women to hold title (World Bank 1996).

**Decentralized Financial Policy**

As mentioned before, decentralization of decision-making must be followed by a decentralization of financial authority. Therefore, if there is an emphasis on decentralizing authority and decision-making down to the community level, there must also be a means to funnel money to that level. Unfortunately this is rarely the case. While central governments are quick to devolve more responsibilities down to line agencies or local governments, there is a general reticence to adequately fund these initiatives. Accordingly, local revenue sources are typically limited and heavily regulated by the central government; accordingly, there is a need for local governments to be given more financial autonomy over the affairs they have been assigned (Dillinger 1995).

It seems that local governments not only have limited control and discretion over their principal tax base, but also limited authority to collect assessments even when they have the ability to impose additional taxes. This all gets more complicated when much of their municipal operating budget is collected, administered and transferred from the central government. For example in the city of Budapest, 95% of their operating revenues are generated from national income taxes; and in Jakarta, 72% of their budget comes from automobile taxes. Central governments use this control to keep the rates of local taxes very low: in Jakarta the government limits property taxes to 0.1% of the assessed value (Dillinger 1995: 41). This lack of financial control and autonomy restricts the ability of municipalities to effectively take on new decentralized responsibilities and transfer needed resources to the community level.

One of the most common ways to get resources to the local level is through providing for municipal funds, matching grants, and community development funds that decentralize functions and money to existing agencies and local governments (World Bank 1996). Under such arrangements, central governments allocate resources to municipalities or other institutions, which in turn fund many smaller projects. Though they are effective at removing some of the constraints associated with transferring funds to the community level, they are not without their problems.

The main problems with these central government granting systems are that they are arbitrary and inconsistent. Typically, they do not follow any allocation rules and entail bargaining and negotiating which is based more on politics than policies. Therefore, there is a need to reduce the uncertainty of these adhoc transfers.
granting systems and replace them with inter-governmental transfers which are based on clearly defined rules (Dillinger 1995: 51).

Ideally, if a local government or agency has been delegated new responsibilities they will be given the revenue authority to raise funds and perform those duties without having to appeal for direct expenditure from the central government. Therefore, there may be a need to reform how municipalities gain access to financing, especially when it comes to capital investments of new works.

One alternative is to replace the grant financing system with a loan financing one. In other words, the central government becomes more like a bank than a rationer of free goods. This is known to better target finances since it is motivated by a beneficiaries willingness to incur debt, it is also known to help depolitisize the allocation process. However, loan inconsistencies still occur as central governments can still give preferential rates and pay back periods to favoured jurisdictions. Therefore, there are calls for privatizing this role where the private sector mobilizes and finances municipal works. However, in developing countries the private sector has not responded to potential financing opportunities: basically, municipalities are considered too high risk since they lack marketable capital and have weak financial discipline (Dillinger 1995: 59).

Another alternative that combines the commercial incentives of private lenders with the financial backing of the central government is Municipal Credit Institutions (MCIs). They attempt to put an arm's length between the central government and the lending process. There are a large variety of ways for how these institutions are established, operate, and govern the lending process. Recent documented experiences suggest that the effectiveness of MCIs can be increased by (Dillinger 1995: 61):

- Enacting legislation should clearly define the financial role that the institution is intended to perform from other government developmental interests, allowing the MCI to base lending decisions solely on financial criteria and forcing it to be financially accountable;
- Funding for the MCI should be provided in a lump sum, rather than on a project by project basis;
- The composition of any MCI board should reflect a balance between interests—both at the federal and municipal levels;
- There should be internal administrative rules which reduce the potential for political pressure on technical staff;
- Appraisal regulations should clearly define the terms and conditions under which loans will be granted;
- Other government agencies should not operate grant or soft loan programs which may undermine the market for MCI lending; and
- The development of a MCI system should parallel other central government actions to strengthen the ability of municipalities to take out loans. This may entail improving the

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
revenue sources available to municipalities and carry out their functional responsibilities; therefore, greater autonomy over tax rates and expenditure decisions.

Specific financial mechanisms which can be adopted and used by local governments and community groups are discussed in Section 3.2.9 Financing and Cost Recovery and Section 3.3.6 Community Management.

3.2.4 Monitoring and Enforcement of Policies

This section only touches on monitoring and evaluation because there are very few strategies documented in the available developmental literature that extend beyond biophysical components. By earmarking it as a separate category it is hoped that its importance will be highlighted, since it is arguably one of the most important factors needed to inform and improve policy reforms and also an intrinsic part of adaptive management. Implementation of internal or external enforcement procedures to deter non-conformance or provide disincentives to poor performance are rarely applied and seldom documented within the public sector reform process.

While seemingly evident, the culture of monitoring and evaluation is rarely done on development projects in the developing world. Fear of public criticism and political fallout are identified as the two main deterrents to evaluation. Some other common problems with monitoring and evaluation include poor quality and access to information, weak feedback mechanisms into the decision-making process, lack of qualified staff, and high costs associated with carrying out evaluation research (World Bank 1994). Given these challenges it is not entirely surprising that monitoring and evaluation is only at its incipient stages.

The benefit of monitoring and evaluation is learning how to do something better. A process to improve decisions by institutionalizing a mechanism that learns, corrects, and adjusts, engendering a learning culture. Accordingly, better decisions lead to improved performance and a greater potential to achieve goals. For public sector planning and management, evaluation is a necessary yardstick to measure the improvements in the welfare of society: linking political processes to social actions and outcomes.

Many cities in the world are suffering from an information crisis which is seriously undermining their capacity to develop and analyze effective urban policy. They have neither a sustained nor systematic appraisal of urban problems and little appreciation of what their own remedial policies and programs are in fact achieving [(Habitat), 1999 #108]. This underlines the need to strengthen the central monitoring and evaluation capacity inside the public sector, especially for new strategies and technologies which advocate innovative decentralization approaches. The benefits associated with building these capacities include:

1. Informing policy analysis and influencing policy formulation;
2. Improving resource allocation and budgetary processes: how efficiently are government revenues being spent?;
3. Improving investment programs and projects—this provides feedback about management performance and can be instrumental in engendering a performance culture within government agencies; and

4. Examining fundamental missions of executing agencies.

A key aspect of monitoring and evaluation during the implementation and management of CBWM initiatives relates to enforcement. Many practitioners call for having an enforcement protocol to deal with variances or breaches from rules and regulations. Without one, there may be few incentives to follow guidelines and policy objectives. For example, if corruption mitigation procedures are seen as lax, ineffective, or weak, there may be little risk in profiteering by politicians and policymakers. Therefore, internal enforcement procedures could take a number of different forms related to public sector personnel appraisal audits, or client-based report carding, etc. External enforcement could similarly take different forms. For example, the private sector may be required to be registered and receive a license which provides certain privileges. The resultant enforcing mechanism may include a licensing fee and/or penalty fines that would cover all administrative, monitoring and enforcement costs.

In Section 4.0 A Yardstick for CBWM, an analytical framework is discussed and illustrates a potential strategy for assessing initiatives using participatory evaluation. Other enforcement strategies are also highlighted in Section 3.2.7 Planning and Management using both regulatory and economic instruments.

3.2.5 Institutional Strengthening

For CBWM, institutional strengthening refers to the process by which institutions become more responsive and supportive of community-based development (using the watershed as the planning unit). Therefore, the roles of government organizations and public utilities change from being a provider of community services to a key stakeholder, that concentrates on building partnerships, facilitating community development, and channelling limited resources in a more efficient manner to community groups. For this process to occur there is typically a need to restructure administrative procedures in a way that promotes accountability and an increased dialogue with community residents.

There are generally three aspects associated with institutional strengthening in the transition to more community-based approaches (Carney 1998: 89):

1. Institutions need to be given (and then decentralize) more decision-making authority and financial control.

2. Institutions need to enhance their capacity to take on new regulatory functions required for decentralization, privatization, and deregulation strategies.

3. Institutions need to increase coordination and cooperation between departments within the public sector, especially between state level and regional level governments.

Applying Community-Based Watershed Management Strategies to Informal Settlements
Each of these aspects will now be discussed with special attention to highlighting specific strategies that have been used to overcome many of the weaknesses experienced with poor institutional development and failed community-based initiatives.

1. Institutions need to be given (and then decentralize) more decision-making authority and financial control.

Two of the biggest challenges that decentralized institutions with new responsibilities must contend with are external interference from overseeing government agencies and internal constraints imposed by their central auditing or accounting departments.

### Arms-Length Distance Between Institutions and Central Government Agencies

Evidence suggests that the most successful public utilities and local institutions have an 'arms-length' distance from regulating government agencies. For public utilities, this independence allows them to operate according to commercial rules and more easily respond to market conditions. It also mitigates political interference and lessens the likelihood of corruption and nepotism from outside sources. While parent ministries must still ensure appropriate policies and regulations are followed, the executing agencies can more easily focus on meeting economic and social criteria. Managers can also be given more flexibility and independence to set tariffs, select staff, and set competitive salaries. This arms-length distance can be carried out through a number of different approaches including:

- **Corporatization**—which is a market-oriented strategy that converts government agencies into separate commercialized organizations;
- **Explicit contracts**—which specify objectives, roles and regulatory procedures for the services to be delivered, but allows discretion over planning and management;
- **Pricing policies**—which better enforce performance standards through financial mechanisms and ensuring cost recovery;
- **Upgrading the status of agencies doing the work**—thereby providing more control and authority over operations; and
- **A greater reliance on subcontracting services out to the private sector.**

### Include Auditing or Accounting Departments into the Development Process

Public utilities and local governments are frequently forced into following prescribed financial procedures that constrain and hinder innovative strategies needed for community-based approaches. Public servants who attempt to adopt new recording methods or financial mechanisms are easily threatened with liability for non-routine procedures from even "the minutest deviation from arcane rules" (Cotton 1998: 14). It is commonplace for alternative development approaches to be overruled, bogged down and stifled by financial departments who wield much influence and control. Therefore, there are calls to integrate these departments into the participatory planning process and garner leeway in stringent recording procedures and innovative financial strategies. Moreover, these financial departments must be clearly integrated into new administrative and operational procedures.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
2. **Institutions need to enhance their capacity to take on new regulatory functions required for decentralization, privatization, and deregulation strategies.**

Some of the characteristics which are most often associated with building capacities for responsive institutions involved with community-based development include the following (World Bank 1996):

- **Flexibility is critical for responding and adapting to the variable conditions and timelines of community needs, abilities, and interests.** Administrative procedures often restrict the scope of participatory development. Moreover, participatory processes are more unpredictable and usually more time consuming during the initial stages. This is not conducive to local government planning and financing procedures that require schedules, resources and budgets being disbursed on a stringent timeframe (Schübler 1996: 14);

- **A willingness to experiment with innovative approaches and learn.** There is a need to stimulate processes of learning so that institutions correct and adjust practices and procedures. This is particularly important when applying an adaptive management philosophy which requires formal management experiments linking the related of outcomes to management strategies;

- **Accountability to local institutions.** There are a number of mechanisms that can foster more accountability and transparency, these will be discussed in the following sections (everything from community advisory committees, to community members sitting on Boards, to staff receiving report cards from community residents, etc.);

- **A multidisciplinary approach which emphasizes the linkage between the sociological and technical sides of the planning process.** It is too often the case that technical (engineering) departments and social (planning) departments within institutions work independently of one another. In the development process, however, sociological and technical issues are linked together; accordingly, an integrated multisectoral approach will be able to more effectively plan for these connections; and

- **Training which strengthens the capacity of government institutions to carry out participatory approaches (specific training strategies are discussed in Section 3.2.6 Human Resources Development).** A potential mechanism to train public agency staff and develop the needed skills is through NGO training agencies, see Box 3.7.

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**Box 3.7**

**More Sustainable Training: UNCHS Community Participation Training Programme (CPTP) in Bolivia**

After successfully implementing a housing and infrastructure programme that sought to improve the participatory methods and materials within the technical staff of the Ministry of Urban Affairs, there was an identified need to maintain and enhance these learnt skills. This was partly due to the high turnover of government personnel and because of the uncertain outlook and continued acceptance by the Ministry. Looking for a better and more sustainable way to strengthen community participation within national policies and programmes, the CPTP programme transformed itself into a self-supporting, autonomous foundation. The new foundation, called PRO-HABITAT, focused on providing public servants, decision-makers, and community leaders with information, skills and training related to public participation; thereby institutionalizing community participation into national policies and programmes. PRO-HABITAT relied on agreements and funding from government agencies which also ensured the program's orientation towards institutional demands.

Source: (Vance 1993)
3. Institutions need to increase coordination and cooperation between departments within the public sector, especially between state level and regional level governments.

At the simplest level of collaboration between agencies and departments (involved with community development, land and resource use, and urban environmental management) there must be plans to outline procedures for inter-jurisdictional cooperation. These plans should both layout a process and a procedure for coordinating activities and joint work. This collaboration can start within government agencies and their competing sectors, or by including adjacent municipalities within a watershed or river basin boundary, or between different levels of government. The following parameters can be considered as a starting point for this process:

- increasing communication;
- raising awareness and understanding with and between all parties;
- promoting more commitment, or collective will, to reforms;
- sharing resources; and
- collectively building capacities.

One method which has been used to better coordinate and collaborate activities across government agencies and departments is through monetarizing the transactions. The principle is that if a one department is reliant on another for resources (through contracts), then the two will work together in a more cost effective way (Carney 1998: 24).

For CBWM, a necessary component for watershed management is amalgamating data collection procedures, data management, or other information systems (like mapping and GIS). This can greatly improve the flow of information needed for strategic research initiatives and begin the collaborative work cycle.

There are a number of lessons which emerge from field experience when public utilities and government agencies are developing participatory processes.

- Municipalities will sabotage processes if they are not involved. Municipalities have ample control and means to undermine community-based projects (e.g. they are typically involved as a provider of basic services during some point of an upgrading project) and therefore their participation and buy-in to the process is key;
- Institutional reform does not necessarily require the creation of new institutions. It is easier to begin with existing structures. For new water resources or watershed management policies there are examples of new institutions being successful created (see Box 3.8);
- Incentive programs to reward staff for responsiveness and collaboration increase coordination and strengthen relationships between institutions; and
- There is a need for an institutional review, with new policies and legislation, to ensure that institutions are not duplicating their efforts and/or that activities are not conflicting.
Box 3.8
Governance Structure: Brazil's National Water Resources Management Act (NWRMA)

See Box 3.6 for more details about Brazil's national strategy.

The National Water Management System, that was developed out of Brazil's NWRMA, incorporates the following new and existing institutions:

- National Council for Water Resources
- State Councils on Water Resources
- River Basin Committees
- Agencies at different levels of government involved in the management of water resources
- Water Agencies, which are the executive branch of the river basin committees

Source: (Porto 1998)

Other strategies which encourage coordination and joint work between government departments and agencies are discussed in Section 3.2.11 Building Constituencies for Political Support.

3.2.6 Human Resources Development

Since a reform process will entail levels of skills that many government workers do not have, there is a recognition that human resources development is an integral early step towards community-based development (Carney 1998). Experience has also shown that while government agencies need to pay attention to reforming how institutions operate, an equal emphasis is needed on taking into account issues of human nature during the reform process. Therefore, human resources development refers to both the required skills and training that government staff may require as well as creating a participatory environment that addresses employees' fears and encourages collaboration.

For community-based and/or multistakeholder processes there are potentially many reasons why public servants shy away from adopting new reform policies and strategies. Some of the reasons include:

- they fear for their job security;
- they fear an erosion in their authority;
- they are concerned over the competence and financial integrity of partner NGOs and CBOs;
- they are inconvenienced by doing business in a different manner;
- they are concerned over the level of transparency and accountability demanded by them from outside partners; and
- they are skeptical about the appropriateness of new technologies.

Changing the Incentive System of Government Employees

In addition, the general trend inside the public sector is one of perverse incentives. According to some academics and practitioners, the incentive system within government agencies supports behaviour that is typically incompatible with the objectives of decentralized reform. Subsequently, employee performance assessments and reward systems have a tendency to
reinforce conventional behaviour and penalize alternative ones. Therefore, there is a need to implement a system of incentives that rewards staff for responsiveness to partners and better supports community-based initiatives (Carney 1998; World Bank 1996; Wright 1998).

Evidence suggests that when institutions are given more financial autonomy to manage themselves, it is easier to implement a new employee incentive system. This results because the institution will have more freedom to hire and fire staff according to specific performance criteria.

Some governments have implemented a bonusing system where government agency staff receive a bonus if their participatory programs hit certain milestone marks. For example, on a CBWM initiative if a certain health or environmental target is achieved, the executing agency would be recognized and/or honoured in some fashion (World Bank 1996).

"Information flow is the life-blood of management systems...appropriate channels of information and mechanisms of communication are important to the emergence of decentralized participatory environmental management capacities" (Schübeler 1996: 77). Communication and leadership are two other parameters which can motivate greater employee participation. Employees need to be informed as to why reform is taking place, the benefits of it, and how it will affect them and their work. If people's job security is not threatened, they will be more willing to buy into the reform process. This dialogue needs to be followed by strong leadership that clearly outlines new administrative procedures to be adopted.

Experience with India's Integrated Low Cost Sanitation Programme shows that municipal authorities were slow to implement non-conventional practices. But they were very quick to implement them when they were requested from the state government. It is apparent that there is a very important role for higher levels of government to play in encouraging and fasttracking the adoption of procedures and methods that deviate from standard practices (Taylor 2000).

Advocacy

Another aspect which needs to be addressed is the very high turnover rate of public sector employees in many countries. This can create a short institutional memory where developed procedures and practices are continually being eroded and lost with the attrition of staff. Therefore, some projects found it essential to develop advocacy literature and operational guidelines to explain the basic principles of participatory development to new staff (another method is described in Box 3.7).

While the above strategies allay potential internal employee concerns, they do not necessarily address concerns they may have about adopting new participatory approaches to planning and managing. Therefore, the following strategies are examples of a few of the more innovative mechanisms that have encouraged stronger relations between employees and stakeholders.
Multi-Stakeholder Process

This is normally a consensus-based process by which stakeholders are identified and regularly meet to perform specific planning and management tasks. Typically, these processes are delegated decision-making opportunities and varying levels of control to address land and resource planning issues.

Communication Forums

Where public servants from all levels, NGOs, CBOs and research centres, openly debate and make decisions as free from the rules of hierarchy as possible. (Carney 1998: p 79). This serves as a forum where stakeholders and/or practitioners from different areas can learn about other organization's work, coordinate actions, and facilitate new joint work and research activities.

Learning Circles

Similar to forums, but participation usually includes government employees and resource centres who provide information on different methods and techniques for community-based approaches. This can also serve as an opportunity for government workers to meet and share their experiences of which techniques or aspects are working or not.

The reform process may also require specific capacity building skills for government employees to more effectively carryout their new roles under the reform process. These skills have two components: skills related to a community-based process, and skills specific to environmental management. The literature identifies a number of possible needed skills for public sector employees.

For participatory processes there will likely need to be an emphasis on improving stakeholder analysis skills; needs assessment methods; communication skills; consensus-building techniques; facilitation, negotiation, and mediation skills; alternative dispute resolution models; sensitivity training for issues of gender and dealing with low-income residents; skills related to establishing and implementing participatory processes and developing training programs, etc. Other financial skills which may require upgrading include: developing tax structures, setting tariffs, establishing revenue collection procedures, creating incentive programs, and capital budgeting (Bernstein 1996: 46). Many other specific participatory tools are illustrated in Section 3.3.4 Social Intermediation and Section 3.2.8 Community Engagement.

For CBWM there will likely be a need to provide training throughout the entire management cycle. These skills may include fundamentals required for watershed management and focus on community watershed assessments, adaptive management, strategic planning, prioritizing objectives, developing management strategies, participatory evaluation and strategic monitoring (these skills are described in more details in different sections of this Resource Book).
3.2.7 Planning and Management

This section discusses and highlights planning and management strategies that may be used by local municipal governments and planning agencies. It recognizes the reality that municipalities are the principal government agents directly involved with implementing, managing, and delivering services to communities.

This section is loosely structured to illustrate some of the main components needed to support CBWM, lessons which are directly related to CBWM, and instruments that municipalities have at their disposal to carry out and achieve the goals of CBWM initiatives.

Planning and management activities must begin by following policies and ideally an integrated plan which embodies long-term goals and identifies specific action activities. For CBWM, decisions must be made on how community watershed plans will be nested into other planning schemes like neighbourhood, municipal, regional, master, and citywide watershed plans.

Three components that are intrinsic to planning and management activities—and emerge from the fundamental principles of CBWM—are an emphasis on multi-stakeholder processes, adaptive management and strategic planning.

Multi-stakeholder processes allow government agencies to do more with less: by taking advantage of a wider variety of skills, abilities, resources, and interests. By collaborating efforts, multi-stakeholder processes can avoid duplication, streamline other planning and management functions, and reduce conflicts through a more coordinated approach. Partnerships with civic society and the private sector further expand the available resource base and potentially mitigate disputes before they occur, since consensus-based decision making will more easily highlight issues needing to be addressed. There is an added benefit that there will be a larger knowledge base to develop innovative solutions; a knowledge base that is more closely tied to local site conditions.

The incorporation of adaptive management into the planning and management cycle will better cope with the uncertainties of watershed dynamics and informal settlement complexities. Through formal management experiments (carried out through pilot projects), hypotheses can be tested and management strategies can be optimized as science is better integrated into the decision-making process. Key planning and management activities will be associated with defining boundaries; identifying uncertainties; choosing indicators; generating hypotheses; designing pilot projects; monitoring outcomes and feeding back results. Tools that are typically associated with adaptive management include mapping, modelling, and interdisciplinary workshops.

Strategic planning sets out a framework for what activities need to be performed and exactly how those activities are going to be carried out, usually targeting key milestone dates.

Applying Community-Based Watershed Management Strategies to Informal Settlements
Recent experiences with planning and managing watershed initiatives indicate the following lessons which can be used for CBWM plans (Schueler 1995):

- CBWM is not a project, it must be considered a process. Rather than the typical pitfall of treating watershed management plans as a one time study or program, they must be considered as processes to provide more continuity and more easily link outcomes to management interventions. In addition, without a long term management commitment, it is difficult if not impossible to build up trust and commitment from other stakeholders;
- Plans must deal with the salient land use issues in the watershed. How do current and future land uses impact watershed plans;
- Planning and management must have a reasonable budget for the scope of work;
- More emphasis should be placed on management outcomes than the available watershed management tools;
- Plans must be short, concise, and accessible;
- Plans must build on what is there and the work that is currently underway and the existing capabilities of the stakeholders before developing new institutional frameworks; and
- Plans must emphasis how they are to be implemented.

Local municipal governments have a mix of policies and instruments which are potentially available to them for planning and management activities geared to improving environmental management practices. Two of the most commonly used tools are regulatory and economic instruments (see Table 3.1 Regulatory and Economic Instruments).

<table>
<thead>
<tr>
<th>Regulatory Instruments</th>
<th>Economic Instruments</th>
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<tr>
<td>1. Standards</td>
<td>1. Pollution Charges</td>
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<td>• Ambient Environmental Quality Standards</td>
<td>• Effluent and Emission Charges</td>
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<td>• Effluent and Emission Standards</td>
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<td>• Technical Standards (siting, design,</td>
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<td>construction, installation, operation, etc.)</td>
<td>• Administrative Charges</td>
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<td>• Best Management Practices (BMPs)</td>
<td>• Tax Differentiation</td>
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<td>• Product and Process Standards</td>
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<td>2. Permits and Licenses</td>
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<td>3. Land and Water Use Controls</td>
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<td>• Zoning</td>
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<td>• By-Laws</td>
<td>4. Deposit-Refund Systems</td>
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<td>• Growth Management Strategies</td>
<td>5. Enforcement Incentives</td>
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<td>• Subdivision Regulations</td>
<td>• Noncompliance Fees</td>
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<td>• Etc.</td>
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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Typically regulatory instruments involve command-and-control approaches where governments have the maximum authority to control management objectives. However, these approaches have failed to meet increasing demands; they are also difficult to enforce; and finally they are considered economically inefficient. For informal settlements, they are typically inappropriate as residents are illegally occupying land and threats of regulatory actions are useless until issues of tenureship are addressed.

Informal settlements also face inappropriate regulation. Sometimes over-regulation results in artificially inflating land prices out of reach of middle and low-income groups as they are set with low densities, forcing people to illegally squat. At other times, areas are under-regulated with few land use policies, laws and standards which results in development occurring without any controls.

In recent years there has been an emphasis on use of more economic instruments to address environmental management problems (e.g. pollution charges; marketable permits; subsidies; deposit and return systems; and enforcement incentives). These economic tools are thought to be more advantageous since they (Bernstein 1993):

- promote cost effective means;
- stimulate development of pollution control technology and expertise in the private sector;
- provide governments with a source of revenue;
- provide flexibility in pollution control technology; and
- eliminate governments requirement to collect large amounts of data according to each type of industry.

The principle of these types of instruments is either polluter-pays, or users-pay. One of the problems with these economic instruments is that their effects can be unpredictable, since polluters may choose to pay fines rather than curbing their polluting behaviours. Therefore they generally need more complex institutions to administer them. For informal settlements, polluter fees are considered to have limited application because residents simply do not have the means to pay. However, subsidies, grants and user-fees have been used with limited success to promote more environmentally sound practices (discussed in Appendix C1.5 Community Management).

Other mechanisms which can be used by local municipal governments to fulfill planning and management goals with informal settlements may include one of, or a combination of, the following instruments:

- Land acquisition alternatives—including various types of land acquisition approaches, such as voluntary sales, expropriation, easements, land exchanges, and purchase of development rights, exaction, donation and bargain sales as a condition of development rights, and land banking;
- Property rights—involving the provision of secure land tenure to promote investment in housing and infrastructure improvements;

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Government provision of infrastructure—involving the provisioning of appropriate infrastructure to guide development; and

Information and education—including awareness campaigns that expand knowledge of the issues, land conditions, and the environmental implications of various types of development.

More specific planning and management strategies are illustrated in the following sections.

3.2.8 Community Engagement

When local government authorities sponsor programs or projects that require community input and participation they may face a range of responses, which depend on the trust and prior experiences which have been built up.

For community-based development, local managers must be aware that they are requesting more time and labour from community residents who are struggling to meet their livelihood needs. Some community members may rightly question why they must put in additional participatory efforts while other sectors of the population are not required to invest more for those same services. At the same time, it is helpful for community members to understand the pressures that government authorities face: increasing infrastructure service demands with shrinking resources to fulfill them. Therefore, local authorities typically are more focused on providing services to those segments of the population who are able to pay for them.

There is no one-size-fits-all approach for how local government authorities should engage and build closer relations with informal settlements and encourage participation. Each situation will be dependent on existing socio-political relations and it is quite likely that there will be apprehension on both sides. Local authorities may fear increased demands on their time and increased pressure as community groups better mobilize and participate in the development and/or political process. Residents may have distrust and anger directed against these local government workers since they have been so poorly serviced, threatened, or marginalized in the past. In these instances of poor working relations, efforts should be initially focused on fostering a more favourable political climate (Schübeler 1996: 31).

If an open dialogue is created between local authorities and community residents, it follows that there will be an increase in understanding and trust that will—under the right conditions—reinforce participation, mobilize community support, and dispel fears and rumours.

Residents may be motivated to continue to participate (and encourage others to) after they see their own efforts improving their living conditions, and where their efforts are perceived to establish some quasi-form of tenureship that ultimately increases their security and housing values. Accordingly, this motivation may be increased with a local government’s acknowledgement of community residents’ basic right to self-improvement and/or government agencies providing organizational and technical support.
Local government authorities may be encouraged to continue to participate and scale-up their efforts after they experience that community-based development is a cost effective way to improve service delivery to informal settlements and mitigate environmental impacts in and around these areas (see Box 3.9). Furthermore, there may be other incentives for government agencies to engage and promote an open dialogue with communities in the environmental management process: to decrease political pressures, decrease illegal activities (e.g. forest exploitation, illegal dumping, non-conforming construction), stop a degrading physical and social environment, and increase governance control in these unregulated settlements.

Box 3.9

**Additional Benefits of Community Participation: Indonesia's Kampung Improvement Project (KIP)**

Growing out of the 1960s, the KIP has been a very successful residential upgrading project; where low-income informal settlements have been actively involved in the developmental process. The primary goal of the project was to promote equity by improving the living conditions of residents. By the end of 1979 over 3.3 million residents had directly benefited from the project, and 7,500 hectares of land were upgraded, representing over 70% of the area and residents within Kampung areas.

An evaluation of the KIP initiative revealed that public investment of only $160 per household in the project areas resulted in private expenditures in home improvements over double that of non-project areas ($550). It was also found that participating communities with a higher level of participation showed a significantly higher level of maintenance of facilities.

Source: Taylor 1987 and Silas 1987 Cited in (Schüebeler 1996)

A dialogue between community residents and local authorities can be initiated through joint planning exercises like goal setting; sharing and gathering information; defining land use boundaries; workshops; health and hygiene education; and skills and training programs. For CBWM, this process may begin through multistakeholder processes that are involved with community watershed assessments or strategic planning sessions to create community plans. Before a dialogue is created, however, certain conditions may need to be addressed by local authorities.

**Clearly define a plan for public participation**

To begin with, local governments need to define the level and type of public participation they require for the planning process. Moreover, it should clearly provide an overview of the upgrading process. Therefore, the architects of any CBWM process will need to consider, and answer, many of the following questions:

- What is the level and type of stakeholder participation desired for the planning process for a CBWM Policy Strategy?
- How will community participation be used and feed into the policy planning process?
- When should community participation be solicited?
- Which community members will be involved and selected to participate in the process?
- How will participating community members be held accountable to their constituents?

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
How will NGOs, CBOs, the private sector, and the use of local extension workers participate in the community planning process?

What will be the responsibilities of community members and organizations during the process?

What will be the decision making process during the different levels of the planning process?

How will the policy planning process be adequately funded?

How will conflicts be resolved during the planning process?

It should be mentioned that recent experience indicates the earlier and the greater the degree of community participation, the greater the potential benefits. Local authorities should therefore meaningfully involve communities from the earliest stages. Another point to address is the use of intermediary organizations to engage communities—NGOs, or other CBOs, or training local extension workers, or in some cases using the private sector. These support organizations can begin the awareness raising process, disseminating information and advertising incentives for new policies and programs.

Clearly defined selection procedures

The procedure for selecting which communities will be chosen needs to be highlighted. Research indicates that there must be clearly defined procedures for government workers to follow in selecting (or un-selecting) communities and participating organizations. These procedures must allow for a transparent selection process (Turton 1998). Therefore, communities may be required to meet certain criteria before even being considered for programs.

Identify and develop strategies to attempt to mitigate the influence of party politics

Politics cannot be overlooked in the community development process. There is a strong correlation between local party politics and the provisioning of services to communities. Therefore, political allegiances can have a considerable impact on a community’s willingness or a local authority’s willingness to participate in a shared process. Some measures which can partially mitigate these politics include carefully selecting neutral settings to hold meetings; structuring the proceedings in such a way as to deter political platforming or creating a forum to complain about services; carefully selecting participants who are focused on the issues and/or supportive of the process; and finding and fostering key individuals who support the process, but who are associated with opposition parties or unsupportive institutions (Cairncross 1998).

Institute accountability mechanisms

If there are not mechanisms to hold local government authorities accountable, communities may be less inclined to participate since there could be an erosion in trust as services are poorly delivered. When communities are involved in cost sharing arrangements with service providers, accountability mechanisms become even more important. Communities must have some form of appeal mechanism to make governments and service providers more responsible (Black 1998: 64). Some options include a working agreement, a complaints department, or an ombudsperson.
3.2.9 Financing and Cost Recovery

This section provides a brief overview of some of the more progressive financial strategies that are proposed or have been used by government agencies to help fund urban environmental management in general, and CBWM initiatives in particular.

Funding CBWM Initiatives

An obvious place to start looking for more sources of funds would be to collect the 65% of recurrent costs for water supply which are not collected in developing countries (Black 1994). The middle and wealthier classes who can afford to pay are being subsidized since they are the ones who have water connections going into their homes. This money could be used either directly or indirectly to fund the provisioning of services to informal settlements.

Before even attempting to develop financial procedures that require some form of cost recovery from community residents, there needs to be a clearly defined government policy or guidelines articulating what communities' financial obligations—if any—will be\(^\text{10}\). Assuming a focus on demand-oriented mechanisms the following strategies may be used or adapted (see also Box 3.10).

| Box 3.10
| Government Funds for Participatory Watershed Development: The Experience from India |

The Indian government established guidelines for rural watershed development and rehabilitation in 1994. This new initiative made the connection between poverty and degradation and focused on a high degree of participation and local autonomy in the design and implementation of rehabilitation; whereby NGOs play a major role in the upgrading process.

The funding for these microwatershed projects normally starts with the state government allocating approximately Rs4,000 (US$1=Rs43) per hectare over a four year period. These funds help support a Watershed Development Team which is an interdisciplinary team of four individuals who work with and support approximately 10 microwatershed communities. For a typical 500 ha microwatershed Rs 2,000,000 would be spent according to the following breakdown:

- 5% Entry Point Activity
- 5% Community Organization
- 5% Training Program
- 10% Administrative Costs for Implementing Agencies
- 75% Watershed Works

Communities are expected to pay at least 5% for community works and a further 10% toward works on private property (except those who cannot afford it). An amount equivalent to the communities' contributions are drawn from the water budget and deposited into a future account to be used for future projects and maintenance of new facilities.

Source: (Turton and Farrington 1998)

\(^{10}\) One of the main debates that is raised by international NGOs is whether or not low-income communities should have to pay anything for basic services which most countries have an obligation to provide. The argument follows that why should informal community residents, who have no choice but to live in heavily polluted areas, have to pay for the externalities of economic development and growth. Therefore, governments and private industries should be more financially responsible for enhancing and upgrading these areas.

Applying Community-Based Watershed Management Strategies to Informal Settlements
As mentioned in Section 3.2.3, municipal authorities have many economic instruments at their disposal which could be used to fund CBWM. While reforming inter-governmental transfers or providing easier access to capital may be used, such mechanisms are typically problematic to use and make sustained transfers down to the community level difficult. However, these funding mechanisms could be used to create or partially finance a social fund or, perhaps, a community watershed trust fund.

Typically, social funds are set up as autonomous institutions that are transparent and have flexible funding, procurement, and disbursement procedures. Because they are autonomous, they are able to avoid political interference and respond directly to local needs. In some cases, a social fund is an autonomous governmental structure reporting directly to the president or prime minister. In other cases, such as the Agence D'Execution des Travaux d'Infrastructures Publiques (AGETIP) in Senegal, it is a private association contracted by the government. (World Bank 1996)

Social funds can provide funding to local organizations such as community-based groups, NGOs, and local governments in a more flexible, transparent, and rapid manner than line ministries. They are "demand-driven funding mechanisms." They do not identify projects in advance but instead respond to requests generated by local organizations. Typical characteristics that are associated with setting up successful social funds include (World Bank 1996):

- Clear objectives;
- Refuse to fund non-participatory microprojects, and prioritize selection of microprojects according to the intensity of participation;
- Encourage or mandate establishment of microproject management committees;
- Apply participatory data collection methods, such as participatory rural appraisal and beneficiary assessment to monitor subprojects regularly;
- Provide for capacity building of intermediary and community organizations as early as possible;
- Develop a piloting phase in which participatory mechanisms can be tested;
- Design flexible and transparent procurement and disbursement procedures; and
- Deliver what has been promised.

A community watershed fund could act in much the same manner as a social fund: acting like a clearing house for transmitting funds to the community level, supporting intermediaries, and building the capacity of the stakeholders. However, it would be more discriminatory by focusing directly on watershed environmental issues.

Either a social fund, or a watershed fund, or a creation of some form of foundation could be used as a funnel and focal point to direct financing to support CBWM initiatives and serve as a catalyst to encourage funding from different sources. This is not a prerequisite though as many projects continue to receive funding through local authorities. Regardless which institution adopts decentralized local project financing, there are a number of financial mechanisms which may be used to augment or improve funding sources.

Applying Community-Based Watershed Management Strategies to Informal Settlements
User Fees involve charging consumers for the services that are provided to them. They are generally confined to the household level and applied when there will be no major distributional effects, where one portion of society will benefit disproportionately (Dillinger 1995: 51). Benefit taxes are like a collective user charge and are targeted to a localized area which will receive additional services. User charge systems are described in more detail in Appendix C1.5 Community Management.

The general objectives that are advocated when developing user fee or tariff systems include (Yepes 1999):

- Fees should cover all costs;
- Fees should not be discriminatory;
- Fees should send a clear message to consumers: therefore, they should have a sliding scale to dissuade against overuse;
- Collection efficiency is an integral part of the system;
- Subsidies should be explicit and clearly targeted at those who cannot afford to pay; and
- Sound information about consumption patterns should form the basis of the fee system.

As mentioned, a major problem for many low-income communities who may be willing to pay for services, is that they may not have the means to do it. In many instances they lack access to capital which is required to help pay connection costs. In this case, some form of subsidy is normally called for; three possible subsidies are described below (Briscoe 1996: 15):

1. Micro-credit where landless people lack collateral and formal credit, the creation of borrower groups (e.g. the Grameen Bank in Bangladesh) have been increasingly promoted for rural water supply projects (see Section 3.3.6 for more details).

2. Water Stamps are a form of subsidy that is paid directly to residents by the government, without a commercially-oriented utility having to pay some form of social tariff. This has been used effectively in Chile where the poor are targeted with subsidies for water services.

3. Financing Connection Costs—rather than providing subsidies to the poor, some utility companies in India and Pakistan have dramatically increased connection rates to water systems by providing up-front financing for the costs, these costs are then amortized over typically a five year period.

Taxes can be an effective way to charge and target polluters, deter environmentally unfriendly behaviour, and subsidize environmental initiatives within informal settlements. For example, some form of surtax could be added to any of the following taxes:

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_Applying Community-Based Watershed Management Strategies to Informal Settlements_
Increasing taxes, however, is not a politically easy process to undertake and other problems typically arise with monitoring, collecting, managing and enforcing any new tax. Moreover, many cross-subsidy schemes involving water and sanitation projects where poor residents pay less and industrial, commercial, or wealthier classes pay more have proven counterproductive.

In a detailed assessment of who benefits from water and sanitation subsidies in several Latin America countries, it was found that while justified to try and assist the poor, subsidies greatly favoured the top 20% (the 'rich'). Where services are heavily subsidized, service expansion is relatively slow, partly because available resources are used inefficiently (since supply companies are not directly accountable to their customers). In practice it has been the rich, not the poor, who virtually always benefit disproportionately from subsidized water and sanitation services (Briscoe 1996: 15).

Given these weaknesses, there are many examples of how cross-subsidies may be more efficiently applied towards informal settlements or environmental management in general. Many of these cross-subsidies make use of incentives. For example, at the household level, some projects have encouraged residents to invest in toilets and in return they receive a water connection.

When dealing with the industrial sector, many innovative environmental financing approaches have been used (see Box 3.11). In the United States, many local state, and federal agencies have used corporate income tax credits which subsidize the acquisition of recycling equipment. This same approach could be used in the environmental clean-up of industrial zones in Third World cities, where polluters receive tax credits—usually ranging from 3 to 50%—to invest in pollution prevention materials or the modification of processes which reduce or recycle outputs and pollution. Other arrangements include credit for leasing recycling equipment and or tax credit carryovers (Leitmann 1992).

In Tianjin, they have developed a pollution control fund where a non-compliance fee is collected by industries that emit air, waste water, and solid waste pollutants. Eighty percent of these collected fees are then deposited into a fund which is available to the industries in the form of concessional loans and grants to finance pollution control measures (Leitmann 1991).
Box 3.11
Pollution Prevention Program: BC Ministry of Environment

In 1992, the Ministry of the Environment for the Province of BC developed a more flexible regulatory system to encourage more cost effective and less polluting strategies for industries rather than their current "end of pipe" permit system. Their pollution prevention program is a proactive means for avoiding, eliminating, and reducing pollution at the source rather than treating or containing it after it has been created. It induces companies to build regulation into their strategic business plans and develop stronger ties with their community, complements ISO 4000 standards for environmental management, and supports air and watershed management planning. It improves operational efficiency, reduces costs, creates new market opportunities.

It is unique in using a hierarchy for pollution prevention, integrates community and employee ideas into the planning process, and establishes long-term environmental authorizations. The pollution prevention hierarchy functions on three levels during the production process: it looks for alternative inputs or ways to reduce polluting products; it looks for opportunities to eliminate, reduce, or reuse polluting by-products; and it finds ways to treat or contain polluting residuals.

The public is involved through a public advisory committee.

Source: BC Ministry of Environment

- Another method developed in Thailand is designed to reduce monitoring and enforcement costs associated with hazardous waste disposal. Factories must pay their hazardous waste disposal fees for the entire year in advance along with a matching bond or guarantee. The bond is returned to the factory as it delivers wastes to the treatment facility. Another form of regulation is using yearly audits where a company is assessed as to environmental impacts and compliance with applicable standards (Cited in Bartone, 1994: 52).

At the greater watershed level, there have been a number of cross-subsidy schemes which have been used to help to pay for environmental protection. These schemes may be adapted in some form to funnel money directly into CBWM initiatives either through local governments, social funds, communities, or other government agencies.

- In Argentina, a portion of hydroelectric sales has been used to finance institutions entrusted with the conservation of watersheds;
- In Guatemala and Costa Rica, 1 percent of the sales of water generating services are invested in watershed conservation efforts; and
- In Columbia, a portion of property taxes are allocated to watershed management practices (Becerra 1991).
Another method which may have opportunities for funding CBWM initiatives is through water pricing. It involves the reallocation of water resources through treating water as an economic commodity: this generally implies diverting water from agricultural sources to quench the thirst of urban markets. Therefore, water would be charged market value thereby providing incentives for optimizing water irrigation which often wastes a disproportionate amount of the available water resources.

The experience in the 1980s with implementing water pricing and cost recovery mechanisms revealed a number of weaknesses that could be improved. Water pricing is seen as an economic instrument but it has direct socio-political consequences. Water has been typically subsidized for food security reasons, economic development reasons, provisioning of clean drinking water, and increasing the health and income of the poor. Any water pricing scheme must therefore be used with other measures to address these multiple objectives (Biswas 1992).

Obviously, there is no one financial mechanism which will best fit the needs of CBWM initiatives. Most likely, a hybrid variant involving multiple funding sources will be used according to the political, economic, and social climate of each area. More community-based schemes to fund community level projects are discussed in Appendix C1.5 Community Management.

3.2.10 Technical Assistance

One of the main strengths of many government agencies is their strong technical capacity. For CBWM, technical departments may be instrumental as research and development centres, experimenting with new technologies to determine their appropriateness. Given their permanence and institutional memory, they can be critical learning centres to share experiences and replicate appropriate technologies to other areas. They are also fundamental if deregulation policies are going to be effective at loosening stringent building codes, standards, and regulations, which often inhibit CBWM initiatives.

Beyond adopting deregulatory policies, there are a number of ways in which local urban managers and engineers can provide technical assistance that supports CBWM initiatives.

- They can serve as advocates within technical departments to help promote community upgrading projects using alternative technologies.

They can highlight that while these technologies may not be as robust or as effective as conventional technologies, they are an economically efficient means to significantly aid

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11 It is estimated that 91% of total water consumption (in developing countries) is used in agriculture (Franceys 1997).
in the environmental management of uncontrolled areas. In addition, they can review and modify existing standards and practices to be more supportive of innovative technologies.

One strategy that has been used to deal with unsupportive technical departments is through waivers. Projects have developed *de facto* waivers which insulate municipalities and technical departments from liability from perceived inferior technologies. Communities get more cost effective services, local authorities consent and are more supportive (Schüebeler 1996: 12).

- *They can be active in providing specific technical assistance requested by the communities themselves.*

The technical capabilities of urban planners, engineers and managers can fall into any number of categories including: watershed and water resources management, land use planning, environmental management, coastal zone management, natural resource analysis, risk assessment, integrated environmental planning, and land information systems.

- *They can help support and encourage the private sector in developing and marketing appropriate technologies.*

One method which has been used emphasizes those technologies where parts and equipment can be produced locally.

- *They can work together with communities and stakeholder groups to identify innovative technical solutions.*

In participatory processes both attitude and language can have major influences on the efficacy of joint work. Therefore, local authorities may want to think of technical assistance as "developmental collaboration" to more accurately reflect the flow and exchange of ideas both ways (Rijsberman 1998). In addition, research illustrates that technical personnel need to be able to speak a common language which is as free from jargon or elitist overtones as possible.

In the creative process for developing or choosing appropriate technologies, a clear set of criteria need to be agreed upon. These typically include criteria like (Schüebeler 1996: 62):

- low cost;
- demand orientation;
- ability to upgrade;
- adaptation to physical constraints; and
- simplicity and amenability to user maintenance.

Another criteria that must be kept in mind for government technical personnel is standardization. A balance must be struck between appropriateness and standardization. Appropriate technologies and spare parts require a market and if each community uses a
different technology, prices increase and local economic development opportunities are lost (UNCHS 1999).

- They can be active in reviewing and keeping abreast of technologies which may be appropriate.

Local technical personnel should focus on a widening of technological choices and therefore have a menu to serve different socio-economic, physical, cultural, and institutional conditions. This creates opportunities to collaborate and develop closer ties with technical institutions and universities.

As a part of a decentralized strategy, national governments can set up national technical assistance programs. This could take the form of a partnership enterprise with NGOs or other support agencies in the creation of a technical research or training institute for urban managers and other technical staff (and/or other stakeholders). Such an institution is IBAM in Brazil, which serves as an extension support service for municipal administration (Bartone 1994: 51).

3.2.11 Building Constituencies for Political Support

It is prudent to highlight, or not underestimate, the complexity of any political reform. Any reform process will be seen to have winners and losers as changing power structures alter peoples' access to resources. The best intentions in policy reforms can be quashed before they have even been articulated. Policy reform is a political dance; observance of this is the first step towards change. Therefore, to mitigate derailment of new policy directions and/or structural reforms, an integrated strategy should be adopted to build constituencies and increase political support. This integrated strategy may be focused both internally (within the public sector) and externally.

Building Constituencies within Government Agencies

Arguably, one of the main shortfalls of community-based development projects is a lack of success stories. Not because there isn't a plethora of successful projects, but because the success stories are not told. There needs to be a general awareness raising and education that highlights the benefits and affordability of participatory approaches. This is also true for watershed management, where there is limited recognition of the benefits from planning and management according to biophysical boundaries (rather than political ones). Moreover, there is often no consideration given to the advantages of watershed management which better links and addresses the subtle and chronic problems that affect environmental degradation, and stresses the importance of ecosystem services and functions. This results in insufficient priority being given to the management of the watershed as a whole (Rijsberman 1998: 13).

A start in this awareness raising process would be better mechanisms to educate policy makers and provide feedback about ongoing CBWM initiatives. A specific communications plan, or strategy, can institutionalize learning, communicate lessons, and build political support within

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
government agencies (Black 1998: 66). A communications plan may include some of the following characteristics:

| Linking Monitoring and Evaluation into the Political Process | Monitoring and evaluation operations could be better tied into disseminating information about successful components of community initiatives to government agencies and affiliated organizations. |
| Research to Link Health Objectives with Public Spending | There is a need to perform research (like total cost accounting) that highlights the health benefits of community-based development projects, not only within informal settlements but also in surrounding areas. Coordinated research activities can also act as a catalyst and start the collaboration process which seeks to build political support. |
| Encourage Forums and Workshops Where Public Sector Staff Can Share Experiences and Network | Forums and workshops provide an excellent venue for public sector staff to share experiences, learn from others, network across sectors, build alliances, and coordinate activities. These information exchange forums also serve as a positive incentive system for government workers to continue to support community-based strategies. These forums can be focused on technical issues or social ones (involving skills and training development, or simply a presentation of experiences); the idea is to break institutional boundaries and build personal ones. |
| Build Awareness Before Actively Scaling-up Successful Projects | When initiatives have proven themselves, these achievements need to be highlighted through information channels, advertised, and marketed. When people are more familiar with the positive aspects of projects, or are clear on the ingredients of success, there will be a greater potential to actively scale up these efforts. |
| A Staged Level of Participation for Competing or Cautious Government Agencies | Building political support is also a call for increasing coordination and collaboration among competing sectors and levels of government. Beyond a sales job to highlight the benefits of CBWM initiatives, there may be a need for a participation strategy that begins slowly and grows with increasing responsibilities and commitment as agencies work together, build trust, and see the benefits of collaborative participatory work. This staged level of involvement may begin with a ministry's (or department's) willingness to endorse a general plan or process; with few binding agreements. As the process continues, subsequent agreements should build upon the earlier ones with more formal commitments and detailed timelines, reflecting growing trust and consensus among the participants (see Box 3.12 for an example of this) (Schueler 1995). |

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
More strategic approaches which have been used to build constituencies with unsupportive institutions include: using multiple agencies when key agencies interfere and try to disrupt a process; cultivate reformers within larger resistant agencies; in some instances, by-pass an agency by creating a new one; and wherever possible, foster linkages with other levels of government.

**Building Constituencies outside the Public Sector**

Similar to within the public sector, there needs to be a general awareness campaign with the general public. Few formal settlement residents are fully aware how directly an unhealthy environment inside informal settlements affects their health and living standards. This symbiotic connection needs to be highlighted and used for building more public support for CBWM initiatives. This education campaign may also be used to increase understanding of the environmental management issues faced by municipalities; to advertise the success stories and the additional benefits of using community-based development; and to emphasize how CBWM will increase the health of the entire watershed area and better protect potential environmentally sensitive areas.

Once again a communications plan would be useful to set out a course and build political support. Some aspects which may want to be addressed in a plan include:

- Earmarking funds to finance an education campaign;
- Optimizing strategies to effectively use media sources;
- Developing an advertising and/or marketing campaign;
- Researching the inter-relationships between formal sector health and investment and informal sector impacts;
- Encouraging forums to exchange ideas and experiences between stakeholders; and
- Developing networks between government agencies, NGOs, the private sector, and watershed community groups and interested citizen's (see Box 3.12).

**Box 3.12 Building Constituencies: Municipal Government in Peru**

The municipal government adopted a consultation approach to involve major corporations into the decision-making process, which sought to address environmental issues facing the greater community. These early consultations evolved into the 'Permanent Multi-Sectoral Commission on Environment' and a number of community management committees that focused on mitigating industrial wastes. While these organizations initially served as an advisory body, they eventually became more involved: serving as catalysts for small development projects. The committees became an institutional linkage with municipal authorities and eventually were involved in developing partnerships with private companies and NGOs.

Source: (Diaz et al. 1996)

Other strategies are discussed in Appendix C: Case Studies Illustrating Community-Based and Environmental Strategies for CBWM.

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**Applying Community-Based Watershed Management Strategies to Informal Settlements**
3.3 Community-Based Strategies

Community-based strategies are primarily geared towards facilitating and developing the skills and resources needed for community management. Therefore, community-based strategies deal with building a process whereby community residents and other support organizations are empowered to design, implement, manage, and sustain CBWM initiatives. While these strategies are not described in any greater detail for this document, a number of case studies which illustrate innovative community-based strategies have been included in Appendix C: Case Studies Illustrating Community-Based and Environmental Strategies for CBWM.

3.4 Environmental Strategies

Environmental strategies are used to provide a range of specific methods and tools which are available to successfully address urban environmental problems and which could be used for CBWM. These strategies primarily illustrate appropriate technologies (and other methods) that urban managers and community managers may use, or generate ideas from, to mitigate specific environmental issues (for example, problems related to water, sanitation, drainage, solid waste management, etc., within informal settlements). While these strategies are not elaborated on in any greater detail here, a number of case studies which illustrate some innovative environmental strategies have been included in Appendix C: Case Studies Illustrating Community-Based and Environmental Strategies for CBWM.

3.5 Key References


Applying Community-Based Watershed Management Strategies to Informal Settlements


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*Applying Community-Based Watershed Management Strategies to Informal Settlements*


Section 4.0  A Yardstick for CBWM: An Illustrative Evaluation Framework

Contents

4.0  A Yardstick for CBWM: An Illustrative Evaluation Framework

4.1  Introduction: The Basics of Evaluation

4.2  Overcoming Challenges of Evaluation: Participatory Evaluation

4.3  A Method for Developing a CBWM Evaluation Framework

4.4  An Illustrative Evaluation Framework for CBWM
  4.4.1  Discussion for Evaluating the Policy Planning Stage
  4.4.2  Discussion for Evaluating the Designing CBWM Stage
  4.4.3  Discussion for Evaluating the Implementing CBWM Stage
  4.4.4  Discussion for Evaluating the Operating and Maintaining Stage
  4.4.5  Discussion for Evaluating the Monitoring and Evaluation Stage

4.5  Key References
4.0 A Yardstick for CBWM: An Illustrative Evaluation Framework

The purpose of this section is to define and illustrate a method for measuring and evaluating community-based watershed management initiatives in informal settlements. The resulting evaluative framework is intended to form the basis of assessment for the adaptive management planning process described in Section 2.2; and effectively represents the Monitoring and Evaluation stage, which dovetails into the remaining management stages.

Note: This section does not differentiate between evaluation and analysis. Therefore, the terms evaluative or analytic are used interchangeably. This is intended to minimize confusion between social science and applied science disciplines: where there is typically a discrepancy between which term is predictive and which is reflective. For this section both are used to inform judgement by either creating (a) a baseline of information for future reference, or (b) an immediate yardstick that enhances ongoing activities. Evaluation for design purposes is not included here since the Community Watershed Assessment (developed in Section 2.3.2 Designing CBWM Stage) serves this purpose and forms the basis of the Strategic Management Plans.

4.1 Introduction: The Basics of Evaluation

Why Evaluate?

In short, evaluation is all about how to do something better. This is normally carried out by assessing where you are (and sometimes comparing it to where you were), and then deciding if this is the best way to get to where you want to go. Therefore, evaluation is all about optimizing the decision-making process to make the most effective, efficient, and accountable choices. Where effectiveness refers to the ability to meet one's own goals; efficiency refers to the way in which those goals are met, implying both economic and social efficiencies\(^1\); and accountability refers to the institutionalized responsiveness to those affected by decisions (Carney 1998).

Evaluation is, therefore, a process to improve decisions by institutionalizing a mechanism that learns, corrects, and adjusts, engendering a learning culture. Accordingly, better decisions lead to improved performance and a greater potential to achieve one's goals. For public sector planning and management, evaluation is a necessary yardstick to measure the improvements in the welfare of society: linking political processes to social actions and outcomes. Or, put another way, evaluation will highlight the effects and relationships caused by interventions.

An additional benefit of evaluation (which is frequently understated) is that it creates a dialogue among the stakeholders, continuing a communication process that facilitates participation, understanding, and support. For participatory development, evaluation can be a tool to involve users and communities in all aspects of the development process, creating "ownership."

\[^1\] Social efficiency is a measure that reflects the nature in which non-market objectives, and interventions, are carried out by government agencies concerned with mitigating externalities or equity considerations. Therefore, social efficiency can be used as an alternative measure (or a complementary measure with economic efficiency) to reflect a multiplicity of goals—both economic and non-economic (Carney 1998)

Applying Community-Based Watershed Management Strategies to Informal Settlements
accountability, and a willingness by the users to invest time and energy (Narayan 1993). Moreover, evaluation has the opportunity to institutionalize mechanisms that are open and transparent, promoting feedback and accountability.

What is Evaluation?

Unfortunately there is no single universal definition or method for carrying out an evaluation. It can be performed in a top-down manner by expert consultants hired by government agencies, or it can be done in a bottom-up manner with self-evaluation by community residents. It can be done as an isolated and final step to a project, or it can be built into ongoing activities as a part of a monitoring system to alert managers of changes or unexpected problems as they unfold. Evaluation can focus on quantitative measurable data like water quality, or it can analyze qualitative information like capacity building among community residents. Selection of which evaluation approach to take ultimately resides with the objectives of the executing organization.

This document, however, recognizes and promotes evaluation as a process, a tool to maximize the opportunities for success. Otherwise it is like sailing without a compass, you have no idea where you are, and less chance of reaching your target. If by some chance you reach your destination it is doubtful whether you will be able to return home, or provide others with directions to your destination. Evaluation can be a map and a compass that optimizes the available resources at hand to reach an objective, and provide others with a route to follow.

Therefore, the evaluative framework developed here is defined as a process: a process whereby criteria are applied to inform judgement and make better decisions about something being evaluated. Since better decisions are considered an elemental objective of every planning or management activity, it follows that evaluation should be an intrinsic component built into the design of any initiative. Evaluation, therefore, has a role to play during each stage of the management planning process: policy planning, design, implementation, operation and maintenance stages. The greatest challenge for planning and management is to build evaluation mechanisms into their processes to allow for a 'culture of learning' to develop by all concerned parties (Allen 1997).

For government agencies, this learning culture should influence policy and legislation, improve resource allocation, improve investment performance, and build constituent support. For community residents and support organizations, this learning culture will form the basis for assessing their own participation in the planning and management of projects. And for the private sector, this learning culture will provide a framework to analyze customer satisfaction thereby leading to better service and more profits.

Who Evaluates?

As mentioned above there is a wide range of actors who can be involved in an evaluation process: from experts to lay people. For policies or programs which have adopted participatory development principles—that promote partnerships with communities and meaningful involvement throughout the management cycle—an evaluation system needs to be participatory.
with those involved and expected to manage the resulting services. This active participation from all parties is essential for sustainable development: experience indicates that full participation throughout the management cycle increases the chances that facilities "will be financed, used fully and looked after properly" (Narayan 1993). For evaluation, the inclusion and active involvement of all stakeholders will increase the likelihood of early problem identification and corrective action, and decrease the probability of inappropriate designs. In addition, broadening the scope of participants in an evaluation process will lead to more creative and ingenious methods of analysis. Therefore, it is quite plausible to have community residents, government agencies, service providers, and other support organizations, all involved in an evaluation process.

**When to Evaluate?**

The sooner an evaluation begins, the sooner information can be obtained to assess how things are progressing. This applies during every stage of the management planning cycle. Applied at the earliest stages, evaluation can institutionalize a communication process that facilitates building trust and ownership—two essential ingredients required for success in participatory development. Moreover, the sooner evaluation begins, the sooner problems can be highlighted and averted, thereby increasing the possibilities for success.

**How to Evaluate?**

At the simplest level, evaluation is performed by measuring indicators of success against the objectives of an activity. This therefore entails two prerequisites—a clear set of objectives, and well-defined indicators of success. This is the starting point for evaluation: having a clear idea of where you want to go, and how you are going to measure and determine whether or not you have arrived.

For participatory development, the clear set up of objectives is derived from stakeholder goal setting at the earliest stages of the development process. Likewise, indicators of success should be chosen at the same time and mirror these objectives. Indicators are the main tools used in evaluation. They can play a crucial role for both clarifying objectives and informing the decision making process.

[Indicators] are measures or variables that summarize information about a particular subject. They show trends, provide quantitative and qualitative information that can help to prioritize and define targets. The impact and usefulness of indicators increases with their adaptation to the policy context and to stakeholder needs. It is therefore crucial that any indicator for the city be determined through a broad-based partnership approach involving all levels of decision making and all stakeholders which have interests in urban development issues (UNCHS 1999).

According to Allen and his promotion of participatory development for natural resource management, evaluation "will require the development of clear sets of objectives and indicators of success which promote accountability and participation, and which can be monitored and evaluated by the relevant decision makers at all levels" (Allen 1997). Therefore, what makes a
good indicator is its ability to be understood and accepted by all stakeholders—these are the key characteristics.

Other factors to consider when choosing indicators include relevancy, quality, applicability, measurability, importance, representativeness, sensitivity, accuracy, integrativeness, accessibility, cost effectiveness, timeliness, replicability, and scientific soundness, to name a few.

4.2 Overcoming Challenges of Evaluation: Participatory Evaluation

Given the potential benefits of evaluation, one would expect that evaluation would be an intrinsic and well used tool for development in developing countries. Surprisingly, this is not the case. The use of evaluation is only beginning to be institutionalized in most developing countries. According to a report by the Operations Evaluation Department of the World Bank, evaluation in most developing countries is only incipient. Fear of public criticism and political fallout are identified as the two main deterrents to evaluation. Some of the other common problems cited were poor quality and access to information, weak feedback mechanisms into the decision making process, lack of qualified staff, and the high costs associated with carrying out evaluation research (World Bank 1994).

In addition to these institutional hurdles there are other challenges associated with evaluations in community-based initiatives. All these challenges however can be addressed with varying degrees of success by adopting participatory evaluation that incorporates a systems based approach to evaluation. Participatory evaluation is a system which is comparatively inexpensive, does not require extensive training, builds political support, freely disseminates information, and better integrates evaluation into the decision-making process. Narayan defines participatory evaluation as:

A process of collaborative problem-solving through the generation and use of knowledge. It is a process that leads to corrective action by involving all levels of users in shared decisionmaking (Narayan 1993).

Participatory evaluation is the natural corollary to participatory development: if the benefits of community-based development are to be realized with the stakeholders playing an active and meaningful role throughout the management process, then these stakeholders must accordingly be involved in an evaluation process that crafts a framework, collects and analyzes data, and plans the follow-up activities. Evaluation done in this way can lead to earlier problem identification and lead to quicker adoption of corrective measures.

Traditionally, when evaluations have been carried out in developing countries, they have typically been project focused using external evaluators. Their concentration has been on measuring quantifiable project outputs, construction quality, and unit costs. By adopting a participatory approach to evaluation the scope of evaluation can be increased. Not only can the relationship amongst project outputs be measured against the goals, but the process of evaluation can be an empowering tool for building the capacity of participants—a fundamental goal of
participatory development. Therefore, if capacity building is an overall development goal then participatory evaluation is crucial.

Another problem of evaluation typically associated with community-based projects is its inflexibility. Typically, government agencies want a framework that can be applied across programs and projects for ease of comparison and cost effectiveness. On major infrastructure projects this technique works well, however on small community-based initiatives where no two communities are alike it becomes problematic. Local conditions and the assets and liabilities of each community can greatly influence the success or failure of interventions. Moreover, agency evaluators are faced with greater uncertainty as they are dependent on joint decision-making processes which are beyond their control. Participatory evaluation however mitigates these factors. It is incredibly flexible by its very nature: relying on the ingenuity and creativity of the stakeholders to craft a process specific to their needs and conditions. Uncertainty is reduced by the open dialogue and active participation between government agencies and community members. This partnership nurtures a continuous evaluation culture that reduces unknown variables and lessens the imposition of frameworks which are inappropriate (Narayan 1993).

Another aspect to evaluation that must be considered is complexity. Even at the best of times evaluating a policy or project is complex: there are numerous parameters and motivations which are interwoven and have varying affects on the outcomes. When dealing with community development projects the complexity is increased—with additional stakeholders who have their own agendas and objectives—making it difficult to isolate and identify specific parameters to measure and meaningfully analyze. Therefore rather than focusing on specific variables, emphasis should be placed on a systems approach that highlights the relatedness of outcomes at the community level to user demands, the responsiveness of service providers, as well as the over-arching policies that are present (Dayal; Narayan 1993).

4.3 A Method for Developing a CBWM Evaluation Framework

Before starting to develop an evaluation framework, it is worth revisiting the key underlying concepts on which CBWM is based. These concepts must accordingly form the core, or basis, of any evaluative framework.

As mentioned earlier, CBWM embodies two key principles: process and boundaries. Process identifies participatory development as the vehicle for carrying out CBWM, and boundaries are defined by using an integrated watershed approach. Both these defining features of CBWM have their own—and complementary—fundamental concepts. A number of these concepts have particular relevance for crafting an analytical framework, as described in Table 4.1.
### Table 4.1: Fundamental Concepts of CBWM Applied to an Analytical Framework

<table>
<thead>
<tr>
<th>Fundamental Concept</th>
<th>Implications for Developing an Evaluation Process</th>
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</thead>
<tbody>
<tr>
<td><strong>Participatory Development Concepts</strong></td>
<td></td>
</tr>
<tr>
<td>• Devolution of control to the community level throughout the planning and management stages</td>
<td>This implies that communities are actively involved in crafting an analytical framework, including: setting objectives, choosing indicators, monitoring, analyzing, and then adjusting management decisions.</td>
</tr>
<tr>
<td>• Demand responsive approaches</td>
<td>This implies that an evaluation process must be able to adapt and reflect changing demands, expressed by both a willingness to pay and ability to pay.</td>
</tr>
<tr>
<td>• Collaborative decision-making</td>
<td>An evaluation process should promote a decision-making process that is open and representative, reflecting the concerns of all stakeholders and residents.</td>
</tr>
<tr>
<td>• Effective communication</td>
<td>An evaluation process must facilitate communication amongst all stakeholders and, in the process, promote accountability and transparency.</td>
</tr>
<tr>
<td>• Local knowledge</td>
<td>An evaluation process should, wherever possible, use and integrate local knowledge and experience.</td>
</tr>
<tr>
<td>• Partnerships</td>
<td>An evaluation process should aim to foster partnerships between different stakeholder groups, increasing understanding and coordination.</td>
</tr>
<tr>
<td>• Flexible approach</td>
<td>An evaluation process must be able to adapt to local conditions, and reflect the needs of each specific site.</td>
</tr>
<tr>
<td>• Low-cost and appropriate methods</td>
<td>An evaluation process should not require expensive analyses, training, or require resources from outside the community.</td>
</tr>
<tr>
<td>• Community empowerment</td>
<td>An evaluation process should promote and facilitate capacity building for communities to administer their own affairs.</td>
</tr>
<tr>
<td>• Process sustainability</td>
<td>An evaluation process should be self-sustaining and not be dependent on outside resources.</td>
</tr>
<tr>
<td><strong>Integrated Watershed Management Concepts</strong></td>
<td></td>
</tr>
<tr>
<td>• Integrated and holistic approach</td>
<td>An evaluation process should be comprehensive and include all stages of the management planning cycle, considering informal settlements as a piece of a greater whole. Therefore, a multisectoral approach is critical, which takes into account the effects from both upstream and downstream users.</td>
</tr>
<tr>
<td>• Focus on functional relationships to understand the complete system</td>
<td>An evaluation process should incorporate a <em>systems based</em> approach that emphasizes the relatedness between outcomes and user needs, responsiveness of service providers, and the political policies creating an enabling environment.</td>
</tr>
<tr>
<td>• Balancing social, economic and environmental goals</td>
<td>An evaluation process should adopt a multiple accounts approach to evaluation that considers social, environmental, and economic concerns, reflecting user objectives.</td>
</tr>
<tr>
<td>• Gender focus</td>
<td>An evaluation process must incorporate and address issues of gender, recognizing the different roles and responsibilities that women and men have.</td>
</tr>
<tr>
<td>• Hydrological cycle as a starting point</td>
<td>An evaluation process for CBWM should specifically identify water as a key variable: since it is the physical link between upstream and downstream activities. It, therefore, acts as a vehicle for summarizing information about a particular watershed area.</td>
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</tbody>
</table>

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Reviewing the fundamental concepts of CBWM and how these may be applied to an analytical framework may appear like a formidable task. However, closer inspection reveals a relatively simple and straightforward approach which can be used to incorporate all of these concepts. As discussed previously, that evaluation process is called participatory evaluation.

It needs to be stressed that promoting participatory evaluation returns to the fundamental essence of community-based development—community control and decision making. If evaluation and monitoring is performed by external agencies who control the flow of information and analysis, the community will become dependent and potentially excluded from the management process. The devolution of control, therefore, to enfranchise ownership and partnership will ultimately reside in the community playing an active and central role in the evaluation and monitoring of CBWM initiatives. Participatory evaluation facilitates this empowerment process. Additionally, it is a comparatively inexpensive method for evaluation, and it is an effective mechanism which institutionalizes communication and coordination among stakeholders.

The relevancy of perspective needs to be stressed at the onset. CBWM involves many interests and stakeholders; accordingly the evaluation of success or failure of the many aspects of CBWM initiatives will depend on whose perspectives and goals are being considered. For example, a micro-entrepreneur may only view success in terms of profit. Whereas, squatter residents involved in a multi-stakeholder process with government agencies may see success in the process that acknowledges their need for services and thereby validates their informal rights to tenureship. Therefore, success will ultimately depend on whose goals are considered and who is doing the evaluating. The use of participatory evaluation helps to bridge the potential gap in perspectives by including the different viewpoints in an evaluation process which is dependent on democratic and collective decision-making.

In selecting or recommending an evaluation framework (and associated indicator framework) this Resource Book recognizes that the basis for participatory evaluation is self-design. Therefore, the prior selection of any indicators presupposes what each community's goals and priorities are; this is antithetical to any community-based process. Accordingly, the suggested framework developed below is intended as a guide to help shape and provide new dimensions for participants designing their own evaluation framework. Participants are recommended to augment and delete indicators and topic areas to suit their needs. They should prioritize and use only those indicators or criteria that fit with their time and resources (needed for a useful evaluation).

4.4 An Illustrative Evaluation Framework for CBWM

CBWM is all about people and water. Accordingly, at the base level, an evaluation framework could consider these two ingredients as fundamental indicators. Water quality—both drinking water and run-off water—would be representative of both health of the residents and health of the environment. Whereas, the people component would be considered in terms of level of participation from community members. A high degree of participation would, arguably, be indicative of community buy-in and support, and correspondingly reflect an increased...
community capacity. Some consultants suggest that the overall proportion of the total population involved in a project is the most relevant variable to measure success\(^2\).

It is, however, too simplistic to assume that these two variables—water quality and participation—are sufficient to portray an accurate picture of the relationships and interconnections involved in informal settlement upgrading schemes. Their dynamics are too complex to be meaningfully interpreted in such a manner. Moreover, it would be difficult to optimize and improve any initiative that only had two measurements to monitor and upon which to base decisions. A more comprehensive framework is therefore needed.

**Selecting a Framework**

As previously stated, one of the purposes of the evaluative framework is to form the basis of the *Monitoring and Evaluation stage*, described in Section 2.3.5. Moreover, the framework is intended to dovetail into all the management planning stages and serve as a tool for adaptive management (See Figure 4.1).

![Figure 4.1: Schematic Showing the Management Process Stages for CBWM](image)

To integrate a framework into the different planning stages and to facilitate its use, the illustrative evaluation framework has been broken down according to each management stage.

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\(^2\) According to Gaye and Diallo in their assessment of a community-based environmental project in Senegal, the proportion of the overall population involved is the most relevant urban indicator for democracy and impact. They commented on the success of a project that involved one-third of the total population (Gaye and Diallo 1997).
This recognizes and integrates monitoring and evaluation as a continuous process through every stage of planning and management; and formalizes an evaluation process as an application tool for adaptive management. Breaking down an evaluation framework into management planning stages has the added benefit of beginning evaluation regardless of what stage a project is at. As mentioned before, this has particular relevance to informal settlements which have a history of implementation leading policy planning. Additionally, different initiatives or aspects of an upgrading scheme may be at different stages of development, an evaluation framework that is segregated according to management planning stages will allow feedback to be used and cross referenced with other activities simultaneously to enhance decisions.

The format chosen for the illustrative evaluation framework revolves around each specific management planning stage. The structure within each of these stages has included information assumed to be helpful for stakeholder groups who are engineering their own evaluation frameworks. The information summarized and collated comes from the available developmental literature on evaluation of participatory development projects involving environmental or health management. The organization of each evaluation stage includes the following:

* A brief discussion on the main aspects involved with evaluation;
* A summary of potential variables and underlying goals to consider; and
* An illustrative indicator/criteria framework that identifies potential key variables, suggests an information source, and provides references for additional information.

An emphasis was placed on minimizing the number of indicators by using 'proxy' indicators, or key indicators, that were easy to measure and representative of the complex nature of the identified research areas. Suggested collectors of information are almost always assumed to be a community managed working group, which may include representation from local government agencies, service providers, or other intermediaries.

It is recognized that the proposed framework is not perfect. There is duplication of some variables between management stages; this was done deliberately so as to make each management stage a stand alone evaluation. However, at times, some variables do not lend themselves to neatly fitting into one specific management stage, hence there is overlap of some variables and duplication of others. In addition, the framework was made to be broad for two reasons.

1. This was done to encourage involvement and integration of evaluations done by local public agencies, government agencies, and international development agencies who typically have different mandates and procedures. The amalgamation of these evaluations from different levels is considered a necessary component of participatory evaluation (Narayan 1993). It can avoid duplication, increase understanding and coordination, and strengthen the evaluation process with a greater sharing of ideas and goals. However, the amalgamation into the proposed framework has over simplified some aspects of the evaluation process. It has not differentiated between the vast range of NGOs (from international to local, from advocacy-focused to skills-focused), nor has it differentiated between different levels of government. The term "government agencies" therefore represents agencies including...
different public sector organizations and utilities; and government departments at the local, municipal, state or provincial, and national levels.

2. The illustrative indicator frameworks have been deliberately designed to be comprehensive in nature with a large number of criteria and indicators to consider. The range and complexity of variables to monitor and analyze using these frameworks as is, is probably too great for any stakeholder group to contend with. The reason for providing a large number of variables is to provide a broad selection of choices that will hopefully encourage new ideas and innovation in the choice of variables. Stakeholders selecting and prioritizing variables to measure are reminded that trying to collect too much information is one of the largest mistakes in monitoring and evaluation (Narayan 1993).

**Choosing the Right Indicators**

There is no right indicator. What might be representative and work well in one community is no guarantee for success in another community. Moreover, what might be a good indicator today may not be tomorrow as the effectiveness of indicators changes with the dynamic and changing nature of each community. This stresses the importance of treating evaluation as a process. Therefore evaluation—and the appropriateness of indicators—should adapt to mirror the changing needs and demands of the stakeholders in the community. This makes recommending a set of indicators for illustrative purposes slightly problematic. Fortunately there are some key characteristics which can assist in the selection of indicators.

The main emphasis used in the selection of indicators was simplicity so that the evaluation could be readily **understood, accepted and used** by all stakeholders. Attention was also given to indicators that linked the relationships of outcomes to stakeholder demands, responsiveness, and the policy environment. Priority was also given to indicators, or criteria, that disaggregated gender components to highlight the different roles that both men and women play. In this way, initiatives could be more easily assessed to see whether or not project resources and benefits are reaching women.

The indicators displayed in the following frameworks were based on both empirical and theoretical case studies reviewed. The case studies were derived from developmental literature relating to the evaluation of: community-based watershed management, rural water and sanitation management, urban environmental management, participatory land and natural resource management, environmental health management, and adaptive management. As thorough as this list was, there was a noticeable void in the information reviewed. Very few of the chosen indicators were defined and articulated by resident stakeholders. There was therefore a heavy reliance, in the selection of illustrative indicators, on the international agencies reporting on them.

Nevertheless, given the illustrative nature of this section, a series of indicators was recommended for each stage in the management process. These indicators were then arranged into a framework—called an *indicator framework*. Therefore, each management stage has its own *indicator framework* associated with it.

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Structuring an Indicator Framework

An indicator framework can be organized in a multitude of different ways. It makes sense to arrange a framework, however, according to the fundamental goals that a development project is trying to achieve. For CBWM, community empowerment is the principal over-arching goal. Capacity building is the key attribute to determine how much communities have been empowered. Accordingly, the process of involvement is as important as the substantive components of any project to foster community participation, accountability, and representation.

Therefore, as with most participatory development analyses, a framework structure normally has two key elements: an assessment of the process for public participation, and an evaluation of the degree to which the capacities of the stakeholders have been increased. The latter, refers to both a community's capacity to manage their own affairs, and the capacities of the other stakeholders to support this empowerment process—primarily government agencies.

Goals evaluation is the third critical element added to complete the indicator framework. It involves evaluating the goals identified for each stage of the management cycle. These goals are identified by the stakeholder groups in the earliest planning stages. They are actually better defined as working goals, serving as intermediate objectives which tie into the long-term fundamental goals of CBWM. This element of the evaluation attempts to assess stage outcomes as defined by the initial stakeholder-defined goals.

Both the process and capacity elements of evaluation can be further refined to assist with developing and choosing indicators. Borrowing from the work of Duffy et al., in their evaluation of the effectiveness of public participation in consensus-based strategic land use planning in B.C. (Duffy et al. 1998), the following categories will be used to divide and more easily assess the process of participation, and the capacities of the stakeholders.

1. **Process Evaluation Criteria:**
   - **Support for process** refers to the degree of stakeholders' support;
   - **Representation** refers to the representation of stakeholders and the inclusion of their interests into the process;
   - **Resources** refers to the provisioning of adequate resources for stakeholders to be involved in the process, as well as for the adequate resources required for effective process management; and
   - **Process design** refers to the degree to which the process has been effectively structured and designed.

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3 It is assumed that support agencies like NGOs are temporary stop-gap measures which should eventually work themselves out of a job. Therefore, their external capacities are only relevant as much as they can quickly support and build capacities of community members. For the private sector, their capacities will be reflected in consumers' willingness to purchase services. An evaluation of their capacities is not necessarily merited as their performance can be obtained by their fees for services, responsiveness, and wide spread acceptance and use.
2. Capacity Evaluation Criteria:

- **Information** refers to access by stakeholders to applicable and understandable information;

- **Skills and resources** refers to the skills and resources needed for ongoing involvement;

- **Structures** refers to the degree to which informal and formal structures—either relationships or organizational structures—are present to support development; and

- **Attitudes** refers to the attitudes and outlooks of individuals, organizations, and government agencies.

The final element of the indicator framework is the goals evaluation.

3. Goals Evaluation Criteria

The criteria for this element will be dependent on the stage goals defined by the relevant stakeholders.

For the sake of completing an illustrative framework, the stage goals have been assumed by synthesizing and collating the reviewed case study literature to determine potential key components and objectives associated with each management stage. In addition, the long-term fundamental goals of CBWM were used as a setting to better frame and guide the selection of the stage goals; and are presented here:

- **Improve the quality of life for watershed residents**;

- **Mitigate negative impacts from informal settlements**;

- **Improve the provisioning of basic social services**;

- **Increase employment opportunities and reduce poverty**; and

- **Build partnerships and understanding between—and within—the informal and formal communities**.
4.4.1 Illustrative Indicator Framework for the Policy Planning Stage

The evaluation of the policy planning stage is predominantly concerned with planning and administration—by government agencies—to create an enabling environment supportive of CBWM initiatives. Therefore, evaluation of government agencies and their outputs is the primary focus. Accordingly, the three evaluative dimensions for the indicator framework will be mainly concerned with the process of developing policies; the capacity building of the planners, urban managers and other staff involved with service provisioning (and to a lesser extent the community residents); and lastly the evaluation of the goals for the policy planning stage.

Given the underlying concepts and overarching goals for any CBWM initiative, the potential goals to evaluate in the Policy Planning stage can broadly be classified according to: policy reform, human resource development, management and planning, and social mobilization. The following list highlights specific measures, or variables, which may be representative of goals needing consideration when developing an indicator framework.

Policy Reform:

- Degree of decentralization;
- Degree of unbundling of services;
- Specific policy measures: e.g. national water policy, gender policy, informal settlement policy, property rights policy or definition;
- Degree to which ratified legislation reflects and supports policies;
- Development of policy and legislative enforcement mechanisms;
- Degree to which demand responsive approaches have been encouraged and accepted;
- Degree to which the private sector and NGOs have been involved; and
- Degree to which standards and codes have been deregularized to allow appropriate technologies.

Human Resource Development:

- Degree to which staff and service managers have adequate training and resources;
- Degree to which community has received necessary skills to meaningfully participate; and
- Degree to which NGOs and the private sector have received capacity building.

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4 At the onset, the jurisdictions and responsibilities among the different levels of government and between the service providers must be clearly distinguished and defined.

Applying Community-Based Watershed Management Strategies to Informal Settlements
Management and Planning:
- Degree to which management and planning have been integrated on an intra-watershed, multi-sectoral, multi-government level, and sometimes a transboundary (with adjacent regions) basis;
- Degree to which institutions have been strengthened to support community-based and multi-stakeholder processes;
- Degree to which a conflict resolution mechanism has been institutionalized;
- Degree to which participating and executing agencies have necessary funding; and
- Degree to which bureaucrats and urban managers have been made accountable to residents (i.e. degree of responsiveness).

Social Mobilization:
- Degree to which communities and stakeholders have been included and represented in the planning process; and
- Degree to which communities, NGOs, and the private sector are informed as to policies and ongoing governance issues.

The following section will summarize potential variables into an indicator framework.

**Indicator Framework for Policy Planning Stage**

The principal goals for the Policy Planning Stage indicator framework are assumed to be:
- To facilitate devolution of decision-making to the most appropriate level;
- To develop clear policy goals and well-defined tasks and management responsibilities;
- To integrate a representative multi-stakeholder process into the management cycle;
- To build constituent support for the process; and
- To secure adequate finances and resources.

<table>
<thead>
<tr>
<th>Evaluation Type</th>
<th>Variable</th>
<th>Key Indicators/Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Evaluation</td>
<td>Support for process</td>
<td>What community support is there for the process? (% participation) (M/F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What government agencies support the process? (evidenced by establishing clear objectives and allocating sufficient financial and human resources)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What intermediary support is there for the process? (NGO/Pvt)</td>
</tr>
<tr>
<td>Representation</td>
<td>What relevant multi-sectoral agencies are involved?</td>
<td>Are multi-sectoral agencies' interests identified and integrated into policies? (evidenced by each agencies willingness to participate, share in costs/resources and attend meetings on a regular basis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What is the level and degree of involvement of community groups in the process?</td>
</tr>
<tr>
<td>Resources</td>
<td>Are sufficient resources available for the process: funding, training, and information?</td>
<td>Are Process Managers/Coordinators experienced with multi-stakeholder processes? (therefore are processes using skilled convenors, coordinators, administrators, facilitators, negotiators, and mediators)</td>
</tr>
</tbody>
</table>

Applying Community-Based Watershed Management Strategies to Informal Settlements
### Process Design
- Are there clear and defined policy goals?
- Are multi-sectoral agencies (and community members) involved in developing the process?
- Are there well-defined tasks and management responsibilities?
- Is there a developed conflict resolution mechanism?
- Are there explicit decision-making criteria?
- Is there a communication process in place?

### Capacity Evaluation
#### Information
- Is there amalgamation and coordination of data collection among government agencies?
- Is information accessible and usable?

#### Resources and Skills
- What type of management skills—technical and organizational—have been created among government agency staff? (e.g. negotiation, facilitation, administrative, etc.) (M/F)

#### Structures
- What type of informal networks are being used between government agencies and NGOs, private sector, and communities?
- Are there formal agreements between inter-governmental agencies; and between government agencies and NGOs, private sector, and communities?

#### Attitudes
- What is the attitude of participants towards the process? (consensus based, adequate resources, etc.) (M/F)
- What is the attitude of participants regarding the degree to which the process is facilitating a supportive environment to implement CBWM initiatives? (M/F)
- What is the attitude of participants towards other stakeholders? (M/F)

### Goals Evaluation
#### Process
- Did the process meet its own goals?

#### Policy Reform
- What is the degree to which new policies, or new legislation passed, devolves decision-making; as reflected in objectives of local authorities, service providers, and implementation approaches?
- What are the number and type of policies created that directly affect informal settlements? (national/provincial/city) Including:
  - National Water Policy
  - Integrated Water Resources Mgt/Watershed Policy
  - Informal Settlement Tenureship Policy
  - Gender related policies
- Do specially provided and protected budgets exist?
- Number of standards and codes that have been altered?

#### Management Reform
- Number and type of new intergovernmental committees, working groups, or advisory boards formed?
- Number of new institutional development programs? (according to beneficiaries)
- Number of new jobs or positions created as a direct result of process? (M/F)
- Do local groups and local government agencies follow their own rules, regulations, and goals?
- Do local government agencies control their own finances, can they raise additional funds as required? (according to sources of income)
- Are government subsidies made available in a smooth and timely manner?
- Type and number of new registered businesses? (by area, size or type, etc.)
- Are there management incentive or a reward system to encourage adoption of new approaches?

#### Social Mobilization
- What specific strategies have been used to mobilize stakeholders? (by gender)
- Is there constituent support for new policies? (M/F)
- What are the community voter participation rates? (M/F)
- Number of community residents (M/F) requesting assistance and support, segregated according to location and number of residents/community?
4.4.2 Illustrative Indicator Framework for the Designing CBWM Stage

The evaluation of the Designing CBWM stage is concerned with the designing of strategies to meet community needs. It involves an inclusive participatory process involving community residents, responsible government agencies, service providers, technical specialists, and other intermediaries, to understand community and stakeholder concerns, assess the extent and nature of the problems, and craft strategies to mitigate the identified problem areas. The two chief aspects of this stage are the government's facilitative role, and the community empowerment process that allows residents to take responsibility and manage their affairs.

Accordingly, the three evaluative dimensions for the indicator framework will be mainly concerned with a process that is inclusive, participatory and representative of the stakeholders involved; evaluation of capacity building will be concentrated on community participants; and the evaluation of the goals articulated and accepted by the stakeholders.

Given the underlying concepts and overarching goals for any CBWM initiative, the potential goals to evaluate in the Designing CBWM stage can broadly be classified according to: community watershed assessment, social mobilization, strategic management plan, and community management. The following list highlights specific measures, or variables, which may be representative of goals needing consideration when developing an indicator framework.

Community Watershed Assessment:
- Degree to which communities, and other stakeholders, are involved in the formulation of an assessment, information collection process, and analysis of the data;
- Degree to which watershed assessment is able to identify and prioritize problem areas according to informal settlement land-use areas;
- Degree to which collected information is accessible, understood, and used by stakeholders; and
- Degree to which a watershed assessment has the available resources to carry out a meaningful analysis.

Social Mobilization:
- Degree to which communities understand and accept new policies and implementation approaches;
- Degree to which the greater population of the watershed is informed and supportive of new policies;
- Degree and nature of methods used to engage communities support and participation;

Applying Community-Based Watershed Management Strategies to Informal Settlements
Degree to which roles, responsibilities, and relationships, have been articulated and effectively communicated to communities and affected parties (i.e. organizational structure for a governance system);

Degree to which roles, responsibilities, and relationships have been institutionalized and given de jure or de facto jurisdiction;

Degree to which community members are active and involved in ongoing planning operations;

Degree to which NGOs and the private sector are involved in the planning processes; and

Degree to which stakeholders, specifically community residents, have been provided with the necessary skills and training to manage their affairs.

**Strategic Management Plan:**

- Degree to which interests and needs of stakeholders are reflected in the management plan (representing a demand responsive approach);
- Degree and nature of participation from stakeholders;
- Degree to which the plan addresses issues identified in the community watershed assessment;
- Degree to which the plan has built-in and incorporated gender components;
- Degree to which the plan integrates multiple goals into its programmes and projects, including issues of health, poverty, water and sanitation, education, income generation, tenureship, etc.;
- Degree to which a plan addresses issues of conflict, enforcement, growth management, and gentrification;
- Degree to which roles, responsibilities, and relationships, have been clearly defined;
- Degree to which the plan uses appropriate knowledge, resources, and technologies; and
- Degree to which a plan promotes partnerships and collaboration.

**Community Management:**

- Degree to which communities have autonomy and necessary resources to manage their affairs;
- Degree and nature to which women's participation is encouraged, and is representative in all stages of the management process;
- Degree to which community decision-makers are held accountable and are representative of their constituents;
- Degree to which management structure is capable of adapting to changing demands;
- Degree to which a collective decision-making process is used;
- Degree to which non-active residents are informed and supportive of activities;
- Degree to which burdens and benefits are divided among community residents: rights, resources, and wealth—by sex, class, and by socio-economic or socio-political standing;
- Degree to which activities are financially supported by community members and how transparent are the financial operations;
- Degree to which conflicts arise and the nature and success of their remediation; and
- Degree to which communities have formed partnerships and alliances with support and private organizations.
The following section will summarize potential variables into an indicator framework.

**Indicator Framework for the Designing CBWM Stage**

The principal goals for the Designing CBWM Stage indicator framework are assumed to be:

- To develop an integrated management plan that addresses the concerns of the stakeholders;
- To facilitate a participatory process that empowers communities to control and manage their environments;
- To develop a communication process that better informs and educates all stakeholders; and
- To develop a community management system that is accountable, representative, equitable, and accepted by community households.

<table>
<thead>
<tr>
<th>Evaluation Type</th>
<th>Variable</th>
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<td></td>
<td></td>
<td>What government agencies support the process? (evidenced by establishing clear objectives and allocating sufficient financial and human resources)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What intermediary support is there for the process? (NGO/Pvt)</td>
</tr>
<tr>
<td></td>
<td>Representation</td>
<td>Are all interested and affected parties involved in the process?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Are community interests identified and integrated into the design process and the resulting strategic management plan? (evidenced by each household's willingness to support the process—by participation or financial contributions)</td>
</tr>
<tr>
<td></td>
<td>Resources</td>
<td>What administrative resources are available for communities during the design process? (funding, training, information, etc.) (For example, organizational development, leadership, record keeping, collective decision-making, conflict resolution) (M/F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What technical support do community members, and intermediaries, receive to understand the community watershed assessment? (M/F)</td>
</tr>
<tr>
<td>Process Design</td>
<td>Are there clear and accepted terms of reference—for the design stage—outlining roles and responsibilities of the stakeholders; and describing the goals, objectives, and the process for the stage, including the main activities?</td>
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<tr>
<td></td>
<td>Are all stakeholders involved in customizing a process to suit their needs? (M/F)</td>
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<tr>
<td></td>
<td>Is there a procedural framework in place which outlines: codes of conduct, organization, decision-making mechanism, dispute resolution mechanism, feedback mechanisms to revise procedures, logistics for holding meetings, etc.?</td>
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<tr>
<td></td>
<td>Is the process structured to facilitate meaningful participation by all in the decision-making process? (therefore are all participants integrated into all activities in the design process: from information collection to prioritizing the designed CBWM strategies)</td>
<td></td>
</tr>
</tbody>
</table>
### Capacity Evaluation

<table>
<thead>
<tr>
<th>Information</th>
<th>To what degree are community members involved in the collection of relevant social, environmental, and institutional information? (M/F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What access do stakeholders have to useable information? (M/F)</td>
</tr>
<tr>
<td></td>
<td>To what degree are stakeholders involved in the analysis of the collected information? (M/F)</td>
</tr>
<tr>
<td></td>
<td>To what degree have land tenureship issues been addressed, and how familiar are community members with them?</td>
</tr>
</tbody>
</table>

#### Resources and Skills

<table>
<thead>
<tr>
<th>Do community members and NGOs have the time and personal resources to be involved in the process? (M/F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much financing has been raised to undertake the new projects? (internally/externally)</td>
</tr>
<tr>
<td>What is the level of adequate funding, technical skills, and management skills, that government agencies have to support ongoing community-based participation?</td>
</tr>
<tr>
<td>What type of management skills—technical and organizational—have been created among community members? (e.g. negotiation, facilitation, administrative, etc.) (M/F)</td>
</tr>
</tbody>
</table>

#### Structures

<table>
<thead>
<tr>
<th>What is the number of informal networks or alliances that supports community development between a community and other support organizations? (public or private)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What number of knowledge–sharing alliances or networks have been developed between the community and other communities or CBOs?</td>
</tr>
<tr>
<td>Are there formal agreements or partnership arrangements between communities and agencies, commercial businesses, or other support organizations that institutionalize community management?</td>
</tr>
</tbody>
</table>

#### Attitudes

<table>
<thead>
<tr>
<th>What is the attitude of stakeholder toward the process? (M/F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the community management committee’s attitude toward their sense of autonomy? (M/F)</td>
</tr>
<tr>
<td>What are resident’s attitudes towards their management committee? (M/F)</td>
</tr>
<tr>
<td>What are stakeholder’s attitude towards other stakeholders? (M/F)</td>
</tr>
</tbody>
</table>

### Goals Evaluation

#### Institutional Process

<table>
<thead>
<tr>
<th>Did the Designing CBWM stage process meet the goals of the facilitating executing agency? (defined in the Policy Planning stage)</th>
</tr>
</thead>
</table>

#### Community Watershed Assessment

<table>
<thead>
<tr>
<th>Did the assessment have clearly stated goals; define boundary areas; prioritize information to be collected; identify problem areas (internal and external to the land use areas); recommend a series of management activities to mitigate problem areas; develop a set of quantitative indicators for future use according to informal settlement land uses: e.g. imperviousness, riparian forest cover, pollutant loadings, water quality, sediment quality, public health, and aquatic health?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the assessment involve a SIA, as described in Section 2.3.2, and were the community assets and liabilities defined?</td>
</tr>
</tbody>
</table>

#### Social Mobilization

<table>
<thead>
<tr>
<th>What is the percentage of the population who are informed, and percentage of participation active in management operations? (according to gender and socioeconomic income)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the degree of involvement by support agencies? (evidenced by the number of support hours provided to each community to raise awareness, provide skills and training, etc.) (per capita) (M/F)</td>
</tr>
<tr>
<td>What de jure or de facto management controls have been delegated to communities?</td>
</tr>
</tbody>
</table>
| Strategic Management Plan | To what extent does the resulting plan (a) define a clear set of prioritized objectives; (b) integrate environmental, social, and institutional concerns; (c) outline the roles and responsibilities of the stakeholders; (d) incorporate the suggested management strategies identified in the community watershed assessment; (e) develop a timeframe, procedure, and strategy on how to achieve the objectives?  
Are the community’s goals explicitly expressed in the plan?  
Has the procedural framework developed during the Designing CBWM stage been adapted and adopted for the strategic plan?  
What were the range of options considered for technologies chosen? (conventional / alternative technologies: using local or non-local knowledge and skills)  
Does the plan include growth management and gentrification components?  
The number and type of identified specific pilot projects to be implemented, including criteria for ongoing monitoring and evaluation? (adaptive management aspect) |
| Community Management | What is the composition of the management committee according to: status, class, and gender?  
What is the function holding and decision-making by M/F, and socio-econ class? (Is there a guideline or bylaw specifically requiring at least equal representation by women on the management committee, or in the decision-making process)  
Is there a clear definition of the management committee’s mandate, role, rules, and procedures, as known by residents? What management mechanisms are present and used? (e.g. monitoring feedback, disseminating information, collective decision-making, enforcement and appeal process)  
Is there a sustainable financial plan in place to support ongoing management operations; what is the internal and external breakdown? |
4.4.3 Illustrative Indicator Framework for the Implementing CBWM Stage

The evaluation of the Implementing CBWM stage is concerned with assessing how the Strategic Management Plan (created in the Designing CBWM stage) has been operationalized at the community level. Therefore, this stage of the evaluation looks at how community goals and management strategies have been engineered into on-site plans, then constructed or implemented, and then put into active service.

This stage of the evaluation process has been geared primarily for informal settlement residential land-use areas. An evaluation framework for different land-uses would have other goals and accordingly be dependent on other variables to assess.

It is worthwhile to distinguish between the two general types of plans which can be designed for communities: 'hard' social services or 'soft' social services. 'Hard' social services refers to engineering physical plans for the built environment (normally infrastructure related). Whereas, 'soft' services are concerned with designing policies or programs which affect the social or political environments (normally health or economic related). Both these types of social service plans require unique skills and knowledge for their development; likewise, an evaluation should make the distinction between them to better reflect their qualitative and quantitative natures.

Similar to the Designing CBWM stage, the two chief aspects of this stage are the government's facilitative role to support CBWM development, and the empowerment process that further institutionalizes community management and control. Accordingly, the three evaluative dimensions for the indicator framework will be similar to the Designing stage: process evaluation will be focused at the community level and based on its inclusion, accountability, and transparency; evaluation of capacity building will be concentrated on community participants; and the goals evaluation will be specific for how well the strategic management plan is operationalized.

Rather than repeating many of the indicators/criteria variables identified earlier, the indicator framework developed for the Implementing CBWM stage will refer back, where applicable, to the Designing CBWM stage indicator framework.

Given the underlying concepts and overarching goals for any CBWM initiative, the potential goals for evaluation in the Implementing CBWM stage can broadly be classified according to: community contracting and management; social mobilization; delivery of services; and income
generation. The following list highlights specific measures, or variables, which may be representative of goals needing consideration when developing an indicator framework.

Community Contracting and Management:
- Degree to which communities participate in service initiation and activation: designing on-site plans, contract administration, material procurement, construction, quality control and field supervision, and commissioning (i.e. public voice);
- Type of participation that communities undertake: construction services, project management services, administration services, supervision services, etc.;
- Degree to which communities raise the necessary funding to implement and construct programs and projects;
- Degree to which communities have autonomy and necessary resources to manage their affairs;
- Degree and nature to which women's participation is encouraged, and is representative in all stages and decision-making;
- Degree to which community decision-makers are held accountable and are representative to their constituents;
- Degree to which management structure is capable of adapting to changing demands;
- Degree to which conflicts arise, and the nature and success of their remediation; and
- Degree to which communities have formed partnerships and alliances with support and private organizations.

Social Mobilization:
- Degree to which communities understand service options and alternatives;
- Degree to which the greater population of the watershed are informed about operations;
- Degree to which roles, responsibilities, and relationships, have been articulated and effectively communicated to communities and affected parties: i.e. organizational structure for a governance system;
- Degree to which NGOs and the private sector are involved in planning and implementing services; and
- Degree to which community finances and spending are transparent.

Delivery of Services
- Degree to which both 'soft' and 'hard' social services represent the most cost effective solutions;
- Degree to which services are demand-oriented: type and scope of technology options available; type of contributions for services;
- Degree to which services are responsive and accountable to users; and
- Degree to which services are cost effective.

Income Generation:
- Degree to which new employment opportunities are created;
- Degree to which new micro-enterprises are created;
- Degree to which money generated for services stays in the community and gets recycled;
Degree to which burdens and benefits are divided among community residents: rights, resources, and wealth—by sex, class, and by socio-economic or socio-political standing; and

Degree and type of income generating activities (skilled or unskilled labour, formal or informal economy) (M/F).

The following section will summarize potential variables into an indicator framework.

**Indicator Framework for the Implementing CBWM Stage**

The principal stage goals for the Implementing CBWM Stage are assumed to be:

- To effectively and efficiently implement CBWM plans and strategies that:
  a) begin to mitigate environmental problems associated with informal settlement communities;
  b) integrate and improve basic social services—both 'hard' and 'soft'; and
  c) integrate and build local income-generating components into all aspects of service delivery.

- To facilitate a participatory process that empowers communities to control and manage their environments.

<table>
<thead>
<tr>
<th>Table 4.4</th>
<th>Indicator Framework for the Implementing CBWM Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluation Type</td>
<td>Variable</td>
</tr>
<tr>
<td>Process Evaluation</td>
<td>Support for process</td>
</tr>
<tr>
<td></td>
<td>Representation</td>
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<tr>
<td></td>
<td>Resources</td>
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<td></td>
<td>Process Design</td>
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<tr>
<td>Capacity Evaluation</td>
<td>Information</td>
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<tr>
<td></td>
<td>Resources and Skills</td>
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</table>

Applying Community-Based Watershed Management Strategies to Informal Settlements
<table>
<thead>
<tr>
<th><strong>Capacity Evaluation (Cont'd)</strong></th>
<th><strong>Resources and Skills (Cont'd)</strong></th>
<th>What type of community contracting skills have been created, or present, among community members? (e.g. designing on-site plans, contract administration, material procurement, construction related, supervision and quality control, and commissioning) (M/F)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structures</strong></td>
<td></td>
<td><strong>Similar to Indicators and Criteria for Designing CBWM Stage</strong></td>
</tr>
<tr>
<td><strong>Attitudes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goals Evaluation</strong></td>
<td><strong>Institutional Process</strong></td>
<td>Did the Implementing CBWM stage process meet the goals of the facilitating executing agency? (defined in the Policy Planning stage)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What de jure or defacto management control has been delegated to communities for the implementation of services?</td>
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<tr>
<td></td>
<td></td>
<td>Are government subsidies made available in a smooth and timely manner?</td>
</tr>
<tr>
<td></td>
<td><strong>Community Contracting and Management</strong></td>
<td>Were the services constructed or implemented within an acceptable timeframe; and were they within the allocated budget? (M/F) (soft/hard) <em>(Comparison with conventional costs for service provision may be helpful for future replication, or scaling-up, to other sites)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>What proportion of the community's financing for the capital funds were collected before, or during, implementation? (M/F headed households)</td>
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<td>How accessible and transparent were the financial records to community residents? (M/F)</td>
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<td></td>
<td>What was the degree and nature of conflicts, or additional monetary claims, during implementation of services; and to what extent were they remedied and accepted?</td>
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<tr>
<td></td>
<td></td>
<td>Degree to which burdens and benefits are divided among community residents—by sex, class, and by socio-economic or socio-political standing?</td>
</tr>
<tr>
<td><strong>Social Mobilization</strong></td>
<td></td>
<td>What was the level and nature of participation by community residents during the design and/or implementation of services? (M/F)</td>
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<tr>
<td></td>
<td></td>
<td>What is the proportion and nature of the community residents initially earmarked to receive services?</td>
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<td>How often were public meetings held to inform stakeholders, what was the degree of attendance? (M/F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of involvement by support agencies, evidenced by the number of support hours provided to each community to: raise awareness, provide skills and training? (per capita; M/F)</td>
</tr>
<tr>
<td><strong>Delivery of Services</strong></td>
<td></td>
<td>How well do the implemented services reflect the demand-orientation of the users, evidenced by each households willingness to support the process? (either by participation or financial contributions) (M/F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What were the choice of technologies and service levels offered to users? (soft/hard)</td>
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<tr>
<td></td>
<td></td>
<td>What household financial options were provided to households for the capital costs of the services? (money, labour, in-kind donations) (M/F headed households)</td>
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<tr>
<td></td>
<td></td>
<td><strong>What services are provided to the 'poorest of the poor' who do not have the ability to pay for services? (M/F headed households)</strong></td>
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<td></td>
<td></td>
<td>What degree of service provision implemented meets the identified priority items in the Strategic Management Plan?</td>
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</tbody>
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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
### Income Generation

<table>
<thead>
<tr>
<th></th>
<th>Number of person-hours of employment created during the construction, and implementation of services? (M/F) (resident/non-resident; skilled/unskilled)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of new permanent jobs created for community members? (M/F) (skilled/unskilled)</td>
</tr>
<tr>
<td></td>
<td>Number of new micro-enterprises created to provide services to community residents? (resident or non-resident labour; formal or informal economy)</td>
</tr>
</tbody>
</table>
4.4.4 Illustrative Indicator Framework for the Operating and Maintaining Stage

The evaluation of the Operating and Maintaining stage is concerned with assessing how the implemented CBWM initiatives have been effectively operated, sustained, and improved. Therefore, this stage of the evaluation looks at how well communities have managed, financed, and delivered services. Similar to previous stages, two chief principles that are intrinsically linked into the evaluation process are government agencies' facilitative role in supporting CBWM initiatives, and the continuation of the community empowerment process whereby residents manage themselves.

Therefore, the three evaluative dimensions for the indicator framework will be similar to the Designing and Implementing CBWM stages: process evaluation will be focused at the community level and based on its inclusion, accountability, and transparency; evaluation of capacity building will be concentrated on community participants; and the goals evaluation will assess the sustainability of the services implemented.

Given the underlying concepts and overarching goals for any CBWM initiative, the potential goals for evaluation in the Operating and Maintaining stage can broadly be classified according to community management and sustainability. The following list highlights specific measures, or variables, which may be representative of goals needing consideration when developing an indicator framework.

Community Planning and Management:

- Degree to which service users are informed and involved in ongoing management operations;
- Degree to which representation and accountability have been institutionalized into a community management system;
- Degree and nature of service responsiveness, addressing the needs, concerns, and conflicts of the users;
- Degree and role of women's participation in ongoing operations and decision-making;
- Degree to which monitoring and feedback have been integrated into ongoing operations;
- Degree and nature to which support agencies are involved in ongoing operations;
- Degree of capacity and autonomy that the community management system has attained during the management process;
- Degree to which services have increased in terms of number of users, or level of services provided;
- Degree to which communities have a political voice in the development of new policies or ongoing programs;

Applying Community-Based Watershed Management Strategies to Informal Settlements
Degree to which new activities or initiatives are integrated into ongoing operations and services; and
Degree to which local income-generating activities are maintained and enhanced.

Sustainability of Services:
Degree to which community financing covers operation and maintenance costs;
Degree to which user fees are universally applied and paid on time (use of intra-community cross subsidies);
Degree to which cost-sharing arrangements for depreciation, and new capital works, have been accepted;
Degree to which services are suited for their applications;
Degree to which services meet supply goals: quality and quantity; and
Degree to which service operation is reliable.

The following section will summarize potential variables into an indicator framework.

**Indicator Framework for Operating & Maintaining Stage**

The principal stage goals for the O&M Stage are assumed to be:

- To develop an O&M framework that optimizes and maintains service provision in a sustainable, and acceptable manner;
- To facilitate a participatory process that empowers communities and informs judgement for better service provision; and
- To integrate and build local income-generating components into the O&M activities.

<table>
<thead>
<tr>
<th>Table 4.5 Indicator Framework for the O&amp;M Stage</th>
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<tbody>
<tr>
<td><strong>Evaluation Type</strong></td>
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<tr>
<td>Process Evaluation</td>
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<td></td>
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<tr>
<td>Capacity Evaluation</td>
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<tr>
<td>Capacity Evaluation (Cont'd)</td>
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### Structures

### Attitudes

<table>
<thead>
<tr>
<th>Goals Evaluation</th>
<th>Institutional Process</th>
<th>Institutional Process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did the O&amp;M stage process meet the goals of the facilitating executing agency? (defined in the Policy Planning stage)</td>
<td>What defere or defacto management control has been delegated to communities for the O&amp;M of services?</td>
</tr>
</tbody>
</table>

### Community Planning and Management

<table>
<thead>
<tr>
<th>Community Planning and Management</th>
<th>Community Planning and Management</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>What is the level and nature of participation by community residents with ongoing management operations and services delivery? (M/F)</td>
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<td></td>
<td>Who are the non-users of services, and why?</td>
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<td></td>
<td>What is the maintenance level and the timeliness of repairs? (including what is the inventory or availability of spare parts for 'hard' systems operations)</td>
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<tr>
<td></td>
<td>To what extent have new services been created, and existing services upgraded?</td>
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<td></td>
<td>What level of budgeting and accounting for services takes place?</td>
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<td></td>
<td>How accessible and transparent are the financial records to community residents? (M/F)</td>
</tr>
<tr>
<td></td>
<td>What is the degree of service coverage, and the level of service use? (M/F)</td>
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<td></td>
<td>What services are provided to the 'poorest of the poor' who do not have the ability to pay for services? (M/F headed households)</td>
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<td></td>
<td>Degree to which burdens and benefits are divided among community residents—by sex, class, and by socio-economic or socio-political standing?</td>
</tr>
<tr>
<td></td>
<td>Number of paid part time, or full time, jobs directly involved in O&amp;M or service provisioning activities? (M/F, skilled/unskilled, resident/non-resident)</td>
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<tr>
<td></td>
<td>Number of secondary paid jobs created, which support existing services, or provide alternative services? (M/F, skilled/unskilled, resident/non-resident)</td>
</tr>
<tr>
<td></td>
<td>Average per household income? (M/F headed households)</td>
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<tr>
<td></td>
<td>What is the per capita and per household monthly expenditure on all basic social services, and compare mean expenditure to mean household income? (M/F headed households)</td>
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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
<table>
<thead>
<tr>
<th>Goals Evaluation (Cont'd)</th>
<th>Community Planning and Management (Cont'd)</th>
<th>Sustainability of Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the degree and nature of relationships with NGOs, other community groups, local government agencies, private enterprises, and the media?</td>
<td>What is the nature of the conflict resolution process, how often is it used, and how often is mediation achieved? (by M/F, ethnicity, and class)</td>
<td>How well do the implemented services reflect the demand-orientation of the users, evidenced by each household’s willingness to support the process? (either by participation or financial contributions) (M/F)</td>
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<td></td>
<td></td>
<td>What is the financial recovery of investment and/or recurrent costs for community services implemented?</td>
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<td>What are the universality and timeliness of payments? (M/F)</td>
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<td>Are the unit costs of services affordable and reasonable; are they increasing or decreasing?</td>
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<td>How reliable are the services? (e.g. for 'hard' systems, what are the number of facilities in working order)</td>
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<td></td>
<td>What is the quality of the services provided, user satisfaction compared with available alternative services?</td>
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<td></td>
<td>What is the population growth rate, and where is this growth taking place? (M/F headed households; number of people/household)</td>
</tr>
</tbody>
</table>

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
4.4.5 Illustrative Indicator Framework for the Monitoring & Evaluation Stage

The evaluation of the Monitoring & Evaluation stage is unique for a number of reasons. First, it is less a distinct management stage than a process which is integrated throughout the other stages. Second, it may seem like an odd thing to evaluate how well you are evaluating other activities. Third, it must be recognized that the evaluation of project activities is rarely done, and therefore it may seem redundant to spend more precious resources on evaluating the evaluation process (the ultimate decision to evaluate must be made by the stakeholders themselves in their development of an evaluation framework). These peculiarities for evaluating the Monitoring and Evaluation stage may detract from performing an evaluation. However, there are several potential benefits for including an evaluation as a part of an overall evaluation framework.

1. It can be used to develop, or help define, procedures for how evaluation material is collected, collated, analyzed, and re-iterated as useful information to inform ongoing management decisions;

2. It can also be used as an opportunity to evaluate the whole project, not just a specific stage in the management process. Therefore, the long range, meta-goals of CBWM can be assessed as well as the evaluation process; and

3. Finally, it is recognized that the process for monitoring and evaluation is a key aspect of the community management cycle. Accordingly, evaluating the Monitoring and Evaluation stage represents another dimension for assessing community capacity.

These benefits can be grouped according to process, capacity, and goals. Therefore the indicator framework chosen for this section is similar to other management stages in that it is comprised of three evaluative components: process evaluation, capacity evaluation, and goals evaluation. The first two elements consider the process design and the capacity building of the community during the monitoring and evaluation process. The goals evaluation is used as an opportunity to evaluate the overall goals of a CBWM initiative.\footnote{A goals evaluation could also evaluate those activities solely associated with the evaluation process during the Monitoring and Evaluation Stage. However, a goals evaluation limited to the M&E stage was not done during this section. It was felt that an evaluation of the project goals would partially include some of the M&E stage goals and, furthermore, it was recognized that many of the indicators to evaluate during the M&E stage goals would be similar to those used in earlier sections. Therefore, if a M&E stage goals evaluation is desired, refer to Sections 4.4.3 and 4.4.4.}
The activities to evaluate during process and capacity evaluations will be similar to the other stages: process evaluation will be focused at the community level and based on its inclusion, accountability, and transparency; and evaluation of capacity building will be concentrated on community participants. A key aspect to the Monitoring and Evaluation stage is the development and implementation of a Strategic Monitoring Plan (discussed in Section 2.3.5), which may include the quantitative indicators designed in the Community Watershed Assessment carried out during the Designing CBWM stage.

As mentioned, the goals evaluation of the illustrative indicator framework will be used to assess the underlying goals of CBWM projects according to environmental, social, and institutional objectives. Social goals refer to empowering communities to manage themselves (this is represented in both the process and capacity evaluations). Institutional goals refer to devolving control and decision-making down to the most appropriate level, and supporting an enabling environment to nurture and promote CBWM initiatives. And environmental goals refer to the specific goals identified and agreed to by the stakeholders during the Community Watershed Assessment.

The following list highlights specific measures, or variables, which may be representative of goals needing consideration when developing an indicator framework.

Environmental Goals:
- Degree to which identified environmental problems have been mitigated within and outside informal settlement land use areas; and
- Degree to which environmental health has been improved.

Social Goals
- Degree to which the quality of life has been enhanced:
  - Degree to which basic social services—hard and soft—have been improved (assumed health provision, water & sanitation services, and solid waste services);
  - Degree to which income has been generated and kept within the communities; and
  - Degree to which poverty has been reduced.

Institutional Goals
- Degree to which management operations and planning have been devolved to their most appropriate levels

The following section will summarize potential variables into an indicator framework.
### Table 4.6 Indicator Framework for the M&E Stage

<table>
<thead>
<tr>
<th>Evaluation Type</th>
<th>Variable</th>
<th>Key Indicators/Criteria</th>
</tr>
</thead>
</table>
| **Process**     | Support for process | Do community managers acknowledge and support the need for a strategic monitoring process? (has this task been adopted by the management committee, or has it been delegated to others, or has a monitoring and evaluation committee been formed) (Male/Female)  
Do government agencies support the process? (evidenced by establishing clear objectives, allocating sufficient financial and human resources, and by integrating community monitoring into their analysis) |
|                 | Representation | What is the level and nature of participation by community residents with the development of a process, and then the ongoing monitoring and evaluation operations? (by M/F, class, and status)  
To what degree does the composition of the monitoring committee represent the demographics of community residents (by age, M/F, class, status), and represent participation by other stakeholders? |
| **Capacity**    | Resources    | What administrative resources are available for committee members, and residents, during the development of the monitoring and evaluation process—funding, training, and information? (M/F)  
What technical support, if any, do community members receive during the development of the monitoring and evaluation process? (M/F) |
|                 | Process Design | How well defined is the process for: establishing a monitoring & evaluation committee, and developing and implementing a Strategic Monitoring Plan?  
What is the mandate and terms of reference for the monitoring and evaluation committee: does it outline roles and responsibilities, goals, membership, structure, decision-making, financing, training needs, dispute resolution, and logistics?  
What is the procedural framework developed for implementing the Strategic Monitoring Plan: does it include prioritizing information, data collection, collation, evaluation, and feedback procedures?  
How has analyzed information from the Strategic Monitoring Plan been institutionalized back into ongoing management operations? |
| **Information** | Capacity Evaluation | What level of awareness is there among stakeholders, and in particular community residents, as to the results from ongoing monitoring and evaluation? (M/F)  
How accessible is the monitoring and evaluation information for community residents and other stakeholders? (M/F)  
What analytical tools are required to interpret and use the collected information? (i.e. how understandable is the information) |
| **Resources and Skills** | Resources and Skills | Do community members and NGOs have the time and personal resources to be involved in the process? (M/F)  
To what level are residents knowledgeable about higienic practices, and to what extent have these proceures been adopted? (M/F)  
To what extent are residents familiar with the available services, and familiar with the rules and policies about them?  
What level of support—funding, technical skills, and management skills—are provided by government agencies for the monitoring and evaluation of activities?  
What technical support, if any, do committee members need to understand, monitor, and evaluate the indicators in the Strategic Monitoring Plan? (M/F)  
What type of skills have been created with ongoing monitoring and evaluation activities—administrative, organizational, technical, and analytical? (M/F) |
Is there a perception of personal health risk in community? (M/F)
Number of families satisfied with availability and quality of services? (hard/soft services; M/F)

### Goals Evaluation

#### Environmental
To what degree have the Community Watershed Assessment indicators been incorporated into the Strategic Monitoring plan?
To what degree have areas surrounding informal settlements defined policies and guidelines controlling growth management and resource appropriation; and to what extent have community organizations enforced these guidelines?
To what degree has the water quality upstream and downstream of informal settlement land use areas been improved?

#### Social
What is the per capita and per household monthly expenditure on medical services? (medicine, and professional services) (M/F headed households)
Is the immediate vicinity of water points, toilets, and households free of excreta?
What is the under-five child mortality rate? (M/F)
What is the immunization coverage? (M/F)
What is the male to female life expectancy ratio?
What are the school enrolment ratios, and class sizes? (M/F)
What services are provided to the 'poorest of the poor' who do not have the ability to pay for services? (M/F headed households)
Degree to which burdens and benefits are divided among community residents—by sex, class, and by socio-economic or socio-political standing?
What is the percentage of adults who participate in the labour force? (M/F, skilled/unskilled, resident/non-resident)
Average per household income; number below the poverty line; and number below 50% of the poverty line? (M/F headed households)
What proportion of residents have access to potable water; number of trips/day; distance travelled to collect it; and median cost? (M/F)
What is the total quantity of water used, what is the breakdown according to use? (per capita; M/F)
What proportion of residents have access to working toilets or sanitary arrangements? (type of toilet or service, private or communal, number of people/toilet, # of Households connected to sewer line)
What proportion of residents receive regular solid waste collection services? (Amount of waste collected per capita, amount properly disposed of; cost per unit)
What is the percentage of residents who are subject to periodic flooding/or sewage backups?

#### Institutional
Does the Monitoring and Evaluation stage process meet the goals, and suit the needs as defined by the facilitating executing public agency?
What de jure or de facto management control has been delegated to communities for monitoring and evaluation?
How is the Strategic Monitoring Plan's output information used by government agencies?
What is the degree and nature of relationships with NGOs, other community groups, local government agencies, private enterprises, and the media?
What is the percentage of all residences or enterprises which have a legal right to own or use property (M/F headed households)?
What is the government's expenditure on basic social services (per capita)?
4.5 Key References


Section 5.0  Summary and Conclusion

Contents

5.0  Summary and Conclusion
5.1  Introduction
5.2  The Appropriateness of CBWM as an Urban Management Tool for Informal Settlements
5.3  Limitations of the Research and Lessons Learnt
5.4  Future Steps
5.0 Summary and Conclusion

This section provides a brief overview of the research which went into this document and discusses the limitations and lessons learnt (during the preparation of it). It also highlights key conclusions. The section ends by describing future research steps needed to strengthen our understanding of community-based watershed management (CBWM).

5.1 Introduction

Developing a method for the environmental management of informal settlements is an onerous and ambitious undertaking. It is further complicated by the typically capricious nature of informal areas which are unwilling candidates for a quasi-structured approach to planning and management. It is in this context that this document is a preliminary basis for developing a guide for self-governance for residents and stakeholders, providing ideas and information to better address the issues and concerns facing them.

The information contained within this Resource Book was derived by reviewing over three hundred case studies, numerous books and journal articles related to participatory development, integrated watershed management, and from other developmental sectors. The information was then synthesized into a handbook format complete with definitions, commentaries, examples, techniques, tools and additional resources for CBWM. The presentation of the research in a resource book format serves as a bridge towards eventually better linking and connecting CBWM practitioners and community participants to findings from disparate developmental research.

This document was principally motivated by two factors (1) the lack of consistent information related to CBWM and how it may be applied in practice, and (2) the potential appropriateness of using CBWM as an urban environmental management approach for addressing the deteriorating conditions within (and outside) informal settlements.

There were two fundamental components involved with the research for this Resource Book: researching information relevant to CBWM, and researching formats appropriate for a resource book.

Researching CBWM

The preparation for this document highlighted the scarcity of information pertaining to CBWM. Not only is there conflicting literature for how CBWM could be defined, but there is also wide disagreement in practice for the scope and nature of CBWM activities. This incongruity in operationalizing CBWM includes fundamental differences on underlying principles, the degree and type of involvement of stakeholders, the amount of control and decision-making to be delegated to the CBWM process, the level of influence of government and support agencies, etc. Given this difference of opinion on how CBWM should be interpreted and applied, this document returns to the basic components of CBWM in search of a clearer definition, process, and tools which may be used.

Applying Community-Based Watershed Management Strategies to Informal Settlements
The principal research task was to distill the available literature towards creating a CBWM planning regime that could be applied to informal settlements in Third World cities. This specifically entailed:

- Clarifying some of the inconsistency of what and how CBWM was defined and applied;
- Furthering the discussion on CBWM and how it may be interpreted as an independent planning theory—principles, processes and tools;
- Providing a justification and theoretical basis for CBWM;
- Developing a conceptual and analytical framework for CBWM;
- Developing a format for the Resource Book that is appropriate for urban environmental management;
- Identifying and collating the general trends that emerged from the empirical evidence for community-based development projects and watershed management approaches; and
- Highlighting specific strategies and appropriate technologies that had direct application to CBWM.

Two conclusions need to be emphasized.

First, there is a growing body of empirical evidence that supports and validates the effectiveness of the principles and concepts associated with CBWM as an urban environmental approach in the governance of informal settlements (see Table 5.1).

<table>
<thead>
<tr>
<th>Table 5.1</th>
<th>Fundamental Principles of CBWM</th>
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<tbody>
<tr>
<td><strong>Participatory Development</strong></td>
<td><strong>Integrated Watershed Management (IWM)</strong></td>
</tr>
<tr>
<td>Devolution of control to the most appropriate level</td>
<td>Integrated and holistic approach</td>
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<tr>
<td>An enabling environment</td>
<td>Watershed as the functional planning unit</td>
</tr>
<tr>
<td>Collaborative decision-making</td>
<td>Strategic planning</td>
</tr>
<tr>
<td>Community empowerment</td>
<td>Balancing social, economic and environmental values</td>
</tr>
<tr>
<td>Local knowledge</td>
<td>Appropriate technologies</td>
</tr>
<tr>
<td>Sustainable development</td>
<td>Innovative institutional structures</td>
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<tr>
<td>Low-cost and appropriate methods</td>
<td>Adaptive management</td>
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<tr>
<td>Demand-responsive approaches</td>
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</tbody>
</table>

**Common Aspects for Both Participatory Development and IWM:**

- Women play a central role in the development process
- Multi-stakeholder processes
- Participatory planning and management
- Capacity building of stakeholders
- Partnerships and collaboration
- Effective communication
- Flexible approach

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Summary and Conclusion

The second conclusion from the research based on the evidence in the literature reviewed is that most successful strategies for informal settlements rely on the combined principles of participatory development and integrated watershed management. Further, there clearly exists a wide array of CBWM strategies to choose from for customizing a development process to each local context.

It became clear during the research that one of the main pitfalls of many participatory and environmental management theories or techniques was the search for a one-size-fits-all unifying approach. Given the incredible diversity of contexts and situations for each planning area—especially within the dynamic and ever changing nature of informal settlements—it was not surprising that strict adherence to an apparently successful approach frequently failed when it was transplanted and replicated to another area. Learning from this prior experience, this document focused on providing an array of possibilities so that users could choose methods and strategies that were most appropriate to their own situations.

The resulting principles, methods, techniques, and tools applicable for CBWM were therefore intended to illustrate the breadth of options available. The Resource Book steers away from defining specific strategies which must be included for CBWM and concentrates on providing guiding principles, illustrative case studies and a menu of strategies that emerged from the developmental literature as successful components. This open-ended approach may be criticized for not being specific enough at times, but experience has shown that there is no one prescribed way to better manage informal areas; the starting point will be dependent on the residents, the stakeholders, the watershed and the political climate. When a potentially contentious developmental component is mentioned in the Resource Book (for example, the question of when residents should first be included meaningfully into the decision-making process), a commentary typically follows to illustrate the benefits and drawbacks of each option.

Researching a Layout for this Resource Book

A key aspect in the research for this Resource Book has been in the development of its format. The structure and layout were based on a review and analysis of planning-related documents and handbooks (produced for decision-makers, planners, managers, and consultants) which describe participatory techniques for urban, or land and natural resources management. The resulting categorization into sections was therefore based on both the identified practical components needed for a handbook format, and the normative components used to describe a planning theory: the process, principles, and tools.

The resulting organization and layout is by no means perfect. There are problems in trying to categorize subject areas and weaknesses with some components which do not neatly fit into the chosen subject areas. This results in duplication at times or an under-emphasis of certain aspects of watershed management. However, this was considered an acceptable cost for having a more useable resource document.
Another by-product of the chosen format is the amount of information that is included. This document serves as a reference source which collates, condenses, and organizes information into a very dense format with numerous lists, charts, tables and illustrations. It is not intended to be read from start to finish; it is designed as a resource book. Given this utilitarian structure, the content and frameworks within each of the four main sections had an additional degree of overlap and repetition. This redundancy is intended to facilitate use and minimize cross-referencing with other sections of the document. Therefore, an emphasis is placed on providing users with the information they seek without necessarily having them read related information included in earlier sections.

5.2 The Appropriateness of CBWM as an Urban Management Tool for Informal Settlements

So why is there a need for an additional environmental management approach, one that may be appropriate for use in the governance of informal settlements in Third World cities? Hopefully this document answers that question, providing a justification for the need and applicability of CBWM.

CBWM, as defined in this document, builds on the successes of prior community-based development initiatives and is a more holistic urban planning tool. It goes further than other community-based development methods by defining a socio-geographical planning unit (normally the watershed and sometimes the problemshed, see Section 1.3.1). It is a type of community management that combines the principles and practices of participatory development with integrated watershed management. The combination of the two is what makes CBWM distinct from other management strategies.

Participatory Development

Participatory development is all about reversing top-down planning and management approaches, so that local residents are enfranchised with more control and decision-making over their affairs. Residents and stakeholders work collectively to overcome obstacles and design, build and manage development initiatives. Meanwhile, government agencies’ roles shift from implementor to that of being a facilitator of development (primarily concerned with ensuring a favourable policy climate to encourage and allow community participation to happen). The benefits of adopting a community-based process include saving time and money, and increasing the long-term viability of development initiatives as ongoing local support is generally higher than conventional approaches used in development.

Under the right conditions, participatory approaches lead to better decisions and management practices as local knowledge is tapped, and as a more diverse group of stakeholders are engaged in the development process. This community partnership fosters a sense of ownership and buy-in from participants, leading to more support and involvement. This support increases cost recovery for services and leads to more sustainable delivery, as services are better maintained and more responsive to users. The quality of services is higher and more appropriate since

Applying Community-Based Watershed Management Strategies to Informal Settlements
participants are active earlier on in the project design and throughout the construction or implementation period. This involvement also has the advantage of tapping the skilled and unskilled labour pool that exists within communities.

Participatory development also strengthens the local economy and provides more employment opportunities leading to income generation for lower income groups. The process begins by small businesses taking advantage of niches created as government agencies re-focus their efforts away from funding large projects and towards creating an enabling environment. As more money is decentralized to a greater number of small businesses, a greater amount of money is recirculated in the local economy.

Lastly, the problem-solving process which ensues in community-based development empowers stakeholders through capacity building, partnerships and collaboration. Formal and informal relationships are typically strengthened from an increase in understanding among the stakeholders. And, as understanding increases, there is a greater potential for lasting change as legacies are built.

**Integrated watershed management**

Integrated watershed management (IWM) is an ecosystem management approach where the watershed (or sometimes *problemshed*) is considered the logical planning unit. Accordingly, it is a more holistic approach for environmental management that considers the inter-relationship between both natural and human systems as the basis for planning and management.

A watershed approach uses the hydrological cycle as the functional starting point to understand the connections and processes between land and resources, and public health sectors; and better integrate upland activities with the cumulative impacts downstream. Accordingly, water is the planning link: linking the upstream with the downstream; linking groundwater with surface water; linking water quality with quantity; linking water with land-based resources and human activities; and linking water with economic development and cultural integrity. The physical landscape, therefore, serves as a logical boundary and framework for interdisciplinary work that facilitates easier data collection, modelling, analysis, and planning and management activities.

The promotion of the watershed as the physical planning unit serves as an effective and efficient coordinating framework between competing sectors and political jurisdictions and serves to better integrate science into the decision-making process. A watershed approach internalizes externalities by including them into the planning process, better addressing some of the subtle and chronic problems that affect environmental degradation. The adoption of an integrated approach for management better deals with the uncertainty and complexity of natural and social systems and the available science to interpret them.

Other benefits of using IWM include saving time and money. Governance efficiency improves with collaborative and integrated approaches that reduce duplication of efforts and conflicting actions (especially for streamlining activities for monitoring, issuing permits and reporting).
Better communication and improved coordination between stakeholders lead to an increase in support and commitment with correspondingly fewer conflicts. Consequently, IWM is associated with improving the likelihood of sustaining long-term environmental improvements.

**Community-Based Watershed Management**

The marriage of participatory development with integrated watershed management forms an interwoven relationship where both components benefit from the other's strengths and fundamental features. Participatory development is strengthened and focused by using the watershed as the management framework and by better linking human activities with environmental processes. Similarly, integrated watershed management benefits from an increased concentration on the socio-economic and institutional parameters identified through participatory approaches and by providing a mechanism to translate watershed management plans down to the household level for implementation.

This Resource Book joins together both participatory development and integrated watershed management to form a CBWM planning theory which illustrates the principles, the processes and the potential strategies which may be employed to design, construct, maintain, upgrade and evaluate community development projects within the context of a watershed. This approach is not only credited with better integrating science and uncertainty into the planning and management decision-making process, but also providing a means to begin to govern and protect areas within the urban milieu that are currently unregulated by statutory structures. By emphasizing the natural landscape, a stronger connection is made between human activities and environmental processes.

Applied to informal settlements, CBWM is a tool to integrate human activities beyond basic infrastructure requirements of water and sanitation. It is seen as a way to begin to address the underlying concerns of each community: dovetailing goals of health, income, tenancy, shelter, poverty, transportation, pollution, education, food security, empowerment, etc., into comprehensive community plans. These plans and the CBWM process serve as a link between the formal and informal sectors of the urban environment, creating a mechanism for regularizing these uncontrolled areas.

The *regularization* of informal settlement land use areas is perceived as a crucial step in ameliorating some of the deteriorating environmental and social conditions within the urban watershed. It builds and strengthens the symbiotic relationship between the formal and informal sectors, leading to improved sustainability and a healthier watershed environment. It also integrates the informal management and coping mechanisms already being used in informal settlements with the regulatory mechanisms that are present in the formal sector. It is a method whereby communities are more empowered as stewards of their environments within the functional workings of a watershed, better balancing the needs of the residents with the carrying capacity of the ecosystem.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
CBWM fulfills the widely touted approaches called for by the international community (discussed in Section 1.3) to meet the challenges of urban environmental management in developing countries. It is seen as an efficient means to restore and enhance damaged informal land use areas, mitigate future growth area impacts and uncontrolled resource use, and most importantly of all improve the health of the watershed and the quality of life for its residents.

Unlike many other approaches used in urban environmental management, CBWM is an ecosystem management approach which places a heavy emphasis on people. At the institutional level, it invests heavily in the social infrastructure needed for governance. This accordingly builds capacities and strengthens linkages between stakeholders, leading to greater understanding, cooperation, and partnerships. Moreover, CBWM saves time and money for cash-strapped government agencies.

At the community level, CBWM promotes a value system that is articulated by the communities and stakeholders, integrating their social, economic, and environmental concerns. The process of development focuses on self-determination to improve their quality of life. Local knowledge, skills, and resources are tapped in a collaborative problem-solving process to develop more innovative strategies which are more appropriate for local conditions. In the end, partnerships are strengthened with improved communication, accountability, and understanding.

And, in the development of CBWM plans, the linkages between social and natural systems are more tightly woven together to promote sustainable development and incorporate uncertainty and science into the decision-making process. This will lead to better decisions and mitigative strategies as externalities and cumulative impacts are better addressed.

5.3 Limitations of the Research and Lessons Learnt

There were many challenges and lessons learnt during the preparation of this document. Besides some of the difficulties and limitations already mentioned above with researching a suitable resource book format, there were other issues and uncertainties which had to be addressed. These are summarized below and highlight some of the limitations of the research for this Resource Book.

<table>
<thead>
<tr>
<th>CBWM as a composite of earlier experiences and practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBWM borrows heavily from earlier developmental theories and practices, and many of the activities and tools mentioned in this document are not specific to CBWM. Many of the characteristics listed may not even seem relevant for CBWM, but were included because of their potential applicability for informal settlements. If a characteristic met the basic criteria for selection and was considered potentially useful, it was included. This procedure for including more rather than less was motivated by a desire to create a broad foundation of tools and techniques for residents and stakeholders to draw from and better craft strategies according to their needs and resources.</td>
</tr>
</tbody>
</table>
No universal method for carrying out CBWM

It needs to be emphasized that there is no universal method for undertaking CBWM. It is a combination of practices, management techniques and strategies that will be unique to each situation. As mentioned previously, if there are any silver bullets for dealing with and mitigating the impacts from informal settlements they are flexibility and innovation: these two criteria continuously emerge from the case studies as key ingredients for success.

It is further recognized that any first step must analyze and understand the resources and experiences that each community has before tailoring any strategies. It is imperative to understand how a community functions: the leadership, skills, resources, and coping mechanisms that are already in place. This is the starting point to enhance and build upon systems that already work. Therefore, CBWM as portrayed in this Resource Book should be considered a broadly defined management approach that advocates certain core principles, recommends numerous strategies and provides a menu of illustrative characteristics. In the final analysis, the residents and stakeholders must choose a management approach that is in keeping with their goals and resources.

Defining the terms ‘community’ and ‘informality’

The concept of ‘community’ and the boundaries of ‘informality’ are not as neatly delineated as one would like. These terms are typically abstract concepts which have many different interpretations which depend on where and how they are perceived. This document defined informality according to legality and levels of services (see Section 1.1), however even within these relatively focused definitions their identification may be difficult in practice. For example, a community may be composed of legal, quasi-legal, and illegal tenure arrangements with varying levels of services. Alternatively, defining a community may be complicated with the realization that many informal settlements are not easily separable from formal urban areas, often being nestled or clustered within the urban network and crossing municipal boundaries. In these instances, it may be difficult to find a common denominator for defining an informal settlement community beyond the basic criteria of income levels or geography.

To overcome some of these definitional issues, this document began by delineating informal settlements according to a broad context of legality and levels of services and then altered this boundary according to a community’s perception of itself. In other words, where did they consider their community beginning and ending, who comprised their community, and where did their perceptions bound their level of influence. Therefore, in certain circumstances, a watershed area would be redefined as a problemshed area to better take into account a community’s perceptions and better integrate potential social, economic, and/or institutional features into the planning unit. While not perfect, this method of defining an informal settlement community attempted to be as flexible as possible.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
In those instances, where a community extended into a neighbouring municipality, the boundary of the watershed (problemshed) would be flexible enough to corral these pocketed areas into the planning realm. To more effectively manage these areas, CBWM would therefore need to begin by addressing the need for increased coordination and collaboration with adjacent planning authorities. This emphasis on flexibility and collaboration for managing informal settlements was felt to better represent and maintain the integrity of how a community may define itself and the watershed boundary for the purposes of developing a comprehensive approach.

While there were inconsistencies in the way CBWM was defined and portrayed in the developmental literature, there were also difficulties in the way that research was presented for similar CBWM or community-based development projects. Most of these inconsistencies were observed because there was no uniformity in the way projects were measured, analyzed, and reported. This typically led to additional work to try and determine what research methods were used, how certain variables were defined, and sometimes there was a need to double check and locate the original sources quoted in the journals or publications.

Once the inconsistencies in the research were addressed and the general trends emerged from the developmental literature, there were doubts as to what information should be included in the Resource Book and what would be the best way to collate and present the information. In terms of quantity of information, it was found that there was no shortage of information in the fields of participatory development and integrated watershed management, some useful, most not. The resulting synthesis included in this document hopefully balanced quenching the thirst for knowledge without drowning the reader in useless information—it is a fine balance.

In terms of collating the resulting information, it was recognized that there are many ways to cut a cake and this Resource Book only illustrates one potential way. The chosen structure and subject categories attempts to create an understandable layout with a minimum amount of repetition. Inevitably, some features of CBWM in this Resource Book are under-emphasized and others over-emphasized in the chosen format style.

The technical side of watershed management (and watershed assessments) was not concentrated on in this document. While suitable technical watershed management tools and technologies are discussed, it is left up to the participants of a CBWM process to decide which watershed management technologies are most useful for their purposes (for example, information and references for both GIS and community mapping were provided to allow users to choose what worked best for them). The lack of attention on the technical side is for two reasons.
First, it was recognized in watershed management that it is common for the biophysical components and the available watershed assessment technologies to govern the management process. This Resource Book, therefore, focuses more on the socio-economic and institutional aspects of watershed management, which are typically under-represented in community-based watershed management.

And second, the technical components and tools used for watershed management are well advertised, widely discussed and written about in the majority of watershed management documents and books. Therefore, this document touches on the current technologies used for watershed management and then leaves it up to the reader to follow the references for more information from the highlighted (technical) resources.

5.4 Future Steps

While this Resource Book attempts to be as comprehensive as possible, there are obvious weaknesses and additional research areas that would further strengthen understanding of community-based watershed management. Some of the identified future steps that would complement and build onto this Resource Book are discussed below.

There was more information on CBWM that could not be included in this document because of time restrictions. This resulted in both community-based strategies and environmental strategies only receiving cursory attention in Appendix C. This information would be invaluable to any CBWM process and can hopefully be included at a future date.

Currently, this Resource Book is only available in a hardcopy format and is most suitable to professionals. However, a main objective of this work was to make it as accessible as possible. It was hoped that this document would serve as a working document, constantly being added to with the addition of users' experiences and practices. Ideally an appropriately edited version of this work can be put onto the Internet in an interactive format and various internet and other media products can be derived that would be appropriate to the diversity of potential users.

While informal settlements were the focus of this resource book because of their precarious and uncontrolled nature, many of the methods and principles would serve equally well to other areas of the urban landscape. It is felt that many of the benefits mentioned for community-based watershed management could benefit other sectors of the urban landscape. There is the potential to adopt and/or adapt community-based approaches within a watershed context to better address environmental concerns related to industrial areas, land and natural resource use areas within the formal areas of Third World cities. Therefore, there is an opportunity to adjust and modify this Resource Book (or one like it) to better integrate environmental management of the entire watershed (this was briefly mentioned during Community Watershed Assessments in Section 2.3.2).
Appendix A

Annotated Bibliography
This annotated bibliography is included as an additional resource for those interested users looking for more details and commentaries on many of the highlighted strategies included in this document. The cited sources in this bibliography comprise the baseline data and information sources used in the development of this Resource Book. By including an annotated bibliography, it is hoped that users can save time and effort, jump-starting their research inquiries for community-based watershed management and participatory urban environmental management.

The cited references were based primarily on searches on CD ROM databases and Internet Website publications' listings and consisted of all the relevant sources which answered to one, two or combinations of the following keywords: community-based development, participatory development, watershed management; integrated watershed management; water resources management; (urban) environmental management; adaptive management; and demand responsive approaches.

In addition to providing a brief description of the documents and their contents, the annotated bibliography provides a summary statement as to each entry's relevance or application for CBWM purposes. The summary statements did not use any strict criteria in their appraisal; they should be considered more of a commentary by the author. This commentary considered the principles and/or identified components needed for CBWM in making an assessment, with an emphasis on quantity of innovative strategies or ideas which could be flexibly applied to CBWM initiatives and different contexts.

Attempts to organize the cited documents according to the different planning stages, or according to the different strategy sections (identified in Section 3), did not work as each document invariably covered most planning stages and touched on the different levels of planning--from government agencies to community residents. However, the bibliography has been very loosely categorized to assist in locating documents according to the following sections:

A1. Watershed Management Documents
A2. Water Resources Management Documents
A3. Urban Environmental Management Documents
A4. Project Evaluation Documents
A5. Project Financing Documents

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1 The CD ROM search was performed on-line on the article index collection called SilverPlatter (http://silverplatter.library.ubc.ca/cgi-bin/webspirs.cgi) and included the following CD ROM databases:
- AGRICOLA 1992-1997;
- EI COMPENDEX (1997 through December 1998);
- EI COMPENDEX (1999 through 2000);
- GEOBASE 1997/12-1999/12;
- GEOBASE 1980-1989;
- Int'l Pol. Sci. Abs. (1989 through 2000);
- PAIS International 1972-1999/12; and

The Internet Websites that were searched (for articles) are included in Appendix B.

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Applying Community-Based Watershed Management Strategies to Informal Settlements
### A1. Watershed Management Documents

**Ahluwalia, Meenakshi. 1997.**
"Representing Communities: the case of a community-based watershed management project in Rajasthan, India."

This article focuses on a community-based project and how social, institutional, and ecological dynamics affect sustainable development. More specifically, the article explores how people's endowments and entitlements to natural resources influence watershed development interventions. The author uses an *environmental entitlements analysis* for evaluation; it relies much more on the social aspects of community than the physical parameters of the environment. The definition of community-based used by the author seems to focus on the interventions of an NGO, rather than any meaning of community participation in the design and planning processes of the projects.

*Summary:* Provides limited useful information relevant to CBWM strategies other than recognizing the importance of site specific circumstances and the complexity sometimes of articulating a community's interests.

**Arya, Swarn Lata and J. S. Samra. 1995.**
"Participatory Process and Watershed Management: a study of the Shiwalik foothill villages in Northern India."
ISBN: 1018-5291

This article analyzes four community-based watershed development projects in the foothill villages of Shiwaliks. The study reviewed the process of development that occurred and assessed the efficacy of the projects according to the linkages between common property resources, private property resources and community income levels. The article also compares the level of active participation in the communities depending on whether the projects were planned and managed by residents or by bureaucrats.

*Summary:* Provides a rather limited evaluation and insight into watershed management and community participation: therefore, there is little relevant information to aid in designing CBWM strategies.

**Boehmer, Kevin et al. 1997.**
*Guidelines for Integrated Watershed Management Training.*

This training manual consists of a number of modules to introduce Indonesian government planners and universities to the basics of integrated watershed management. It was initially designed for use by five environmental development centres and emphasizes both the technical aspects of watershed management and the importance of community participation through multi-stakeholder processes. The guidelines are formatted to serve three purposes: to provide background information for a training course in IWM; to serve as a resource for funding proposals for IWM-related projects; and to assist in university taught courses. The manual is broken down into three main sections of defining what integrated watershed management is, designing and conducting an integrated watershed assessment, and developing and implementing an integrated watershed management plan.
A1. Watershed Management Documents

Summary: Provides an excellent resource for integrated watershed management with many ideas and strategies relevant for CBWM. However, there is a concentration on the biophysical aspects of watershed management, especially for watershed analysis. There is an extensive bibliography and numerous overhead fact sheets are provided.

Dahl, Christopher and Bill Raynor. 1996.
"Watershed Planning and Management: Pohnpei, Federated States of Micronesia."
ISSN: 1360-7456

This journal article describes the experiences of a community participation programme that evolved from the resource planning and management of watershed areas. Participatory rural appraisals were used as the basis for community involvement, and ultimately lead to Community Action Plans. The paper highlights the hierarchal structure of management that evolved: from community, municipal, and through to state levels. It also identifies some key ingredients for success including: prerequisites for community-level buy in, and the importance of having a flexible approach that recognizes community institutions.  

Summary: Provides an interesting watershed case study with useful information for crafting CBWM strategies. In particular, topics of community defined watershed boundaries, land-use zones and regulations near reserve areas, and community management structures, are all informative for CBWM.

"Towards Sustainable Watershed Development Through People's Participation: lessons from the Lesser Himalaya, Uttar Pradesh, India."

This article describes an externally funded (European Union and the Government of Uttar Pradesh) rural watershed management project in the Doon Valley. The project concentrated on developing community capacity and increasing the natural resource production systems through community participation and an integrated approach. The article provides a thorough background and overview of the project strategy employed. The project methodology employed a revolving fund, an emphasis on women's participation, and community-based planning processes. The article concludes by stating the lessons learned, including: human resource development should precede technical training, and that external implementers should be encouraged to merge their technical skills with local indigenous knowledge.

Summary: Provides a comprehensive and interesting case study that developed a participatory village-level process employing PRA principles. There are many useful ideas and insights that would aid in the design of CBWM strategies.

"Participatory Process in Watershed Management: a case study of Maharashtra."
ISSN: 0004-4555.

This article performs an impact assessment between a government-managed programme and a grass-roots participatory programme. It, therefore, compares the outputs and significant impacts from 'passive' and 'active' beneficiary participation. The paper has an agricultural focus with an emphasis on dry farming.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A1. Watershed Management Documents

practises. The article concludes with the assertion that 'active' participation acts as a better institutional alternative, but that government level support is a necessary catalyst.

Summary: Mostly concerned with policy formulation in agriculture, this article provides little useful information for CBWM strategies.


Watershed Resources Management: an integrated framework with studies from Asia and the Pacific.

This book is a collection of research papers that cover topics of basic economic, biophysical, social, institutional, and policy aspects of watershed management. The book is broken down into two components: the first part discusses the policy aspects of watershed management, the second provides a series of watershed approaches which are illustrated through case studies from Asia and the Pacific. There is an economic emphasis throughout the book to assess interdisciplinary management alternatives in the resolution of resource problems. The authors also highlight that where failures in watershed management practices occurred has been a result of a lack of consideration for the socio-economic aspects of the areas.

Summary: Although the book is somewhat outdated, it does provide a very good overview of the concepts and components needed for an integrated watershed management plan. In particular, Hufschmidt's paper in the second chapter provides an excellent analytical framework for watershed management. Therefore, there is a lot of practical information for the watershed management component of CBWM.


"Scaling Up Participatory Watershed Development in India: lessons from the Indo-German watershed development programme."

This report describes the experiences from a participatory watershed management programme (consisting of 50 NGOs and 74 watersheds) in Maharashtra, India. The initial concept for the programme was to set up a methodology that was easily replicable over a broad area. The report illustrates the field-level collaboration framework developed and some of the problems encountered. The report also describes funding mechanisms used on the projects, and discusses the use of community level financing through a Watershed Organizational Trust. The methodology employed by the programme—while involving community groups through many stages of design—is fairly authoritarian requiring participant communities to accept a variety of preconditions.

Summary: Provides insight into rural community-based micro-watershed programmes; illustrating the evolving concepts of community-based development, and the limited interpretation of community involvement by some international development agencies. There are, however, useful methods and ideas for CBWM strategies.
Appendix A  Annotated Bibliography  Page 169

A1.  Watershed Management Documents

  *Community stewardship: a guide to establishing your own group.*
  Canadian Wildlife Service, Environment Canada, Fisheries and Oceans Canada, Fraser Basin
  Management Program and Forest Renewal BC (Stewardship Series).

A practical guidebook providing local groups the necessary organizational skills required for stewardship
work—from a BC perspective. The main thrust of the guidebook revolves around managing your group,
developing a planning and implementation process, and outlining a 'working with others' strategy.
Summary: Provides a informative guide for local communities interested in habitat restoration and
enhancement in their backyards. There are, however, few recommendations appropriate for
crafting CBWM strategies in informal settlements.

  *Integrated Management Plan for a Suburban Watershed: protecting fisheries resources in the
  Salmon River, Langley, British Columbia.*
  Canadian Technical Report of Fisheries and Aquatic Sciences 2203. Vancouver, BC: Fisheries and
  Oceans Canada.

This report provides an integrated management plan to protect the salmon habitat within a suburban
watershed boundary. The report stresses the challenges of an eco-system management approach and the
importance of natural connectivity corridors to offset the impacts from urban development and
agriculture. The main focal point of the paper deals with technical considerations involved with salmon
habitat. The final sections of the report discuss the application of an integrated watershed management
plan and provides recommendations for implementation.
Summary: Provides an interesting—but context and salmon-focused specific—example of an integrated
urban management plan. However, the report has little application to CBWM strategies in
informal settlements.

  "Building Local Capacity for Stewardship and Sustainability: the role of community-based
  watershed management in Chilliwack, BC"
  ISSN: 0711-6780

This paper describes a case study where community-based watershed assessment (CBWA) was used as a
tool for increasing community stewardship. An evaluation was done on both the CBWA—or Snap
Shot—and the process that was undertaken to achieve it. It was found that the Snap Shot and process:
built on collective community wisdom allowing for connections to be made between health and
sustainable communities; fostered shared responsibility and commitment; and provided a foundation for
future actions.
Summary: Provides a commentary on the experiences of one particular method carried out to promote
stewardship and sustainability. Given the specifics of the case study, there is limited useful
information for CBWM strategies in Third World cities.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A1. Watershed Management Documents


This short article discusses participatory planning in watershed management with an emphasis on forest protection in developing countries. The article develops a framework for planning processes and discusses some policy implications, along with roles and responsibilities of various stakeholders. The article finishes by recommending the establishment of inter-governmental committees to coordinate, facilitate, and help manage the watershed resources with communities.

Summary: Provides a very simplistic review promoting a participatory management approach to forestry protection projects. Little information is particularly relevant for urban CBWM strategies, even with forest reserves.


This paper provides a rationale for why issues of tenureship are an integral part of watershed projects. Additionally, this paper provides a conceptual framework for making decisions about tenureship issues. The paper describes basic land tenure principles, categories of tenure systems found in the Asian uplands (including common property resource management), analytical framework for the relationship between conservation and tenure, and concludes by identifying future studies needed to be undertaken by the World Bank. The paper also looks at state-owned forests and how control of these areas can be transferred to local communities; these mechanisms include cost-sharing models, cooperatives and associations, small-scale enterprises, etc.

Summary: Provides a good overview of some of the main tenureship issues and complexities affecting watershed development. While tenureship issues may or may not be specifically addressed in a CBWM plan, there are many interesting points raised in the article which require consideration.


This document is one in a series of functional papers written for the World Bank's Participation Sourcebook. The report is broken down into three components: issues in community-based development, key features of successful community-based development, and designing community-based development programs. The report dispels the myths that community-based development is more costly and time consuming, by drawing upon numerous case study examples and experiences of the World Bank. The report concludes by providing a framework for crafting effective participatory development initiatives. The appendix highlights a series of World Bank financed projects using community-based strategies.

Summary: Provides an excellent resource for participatory development and is therefore very practical as a guide for designing CBWM strategies.

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Appendix A

Annotated Bibliography

A1. Watershed Management Documents

Office of Water, US Environmental Protection Agency.
"Watershed Approach Framework."
US Environmental Protection Agency Website. Internet. Access Date: May 1999.
http://www.epa.gov/OWOW/watershed/framework.html#6a

This report provides a framework for watershed management. The report provides a rationale for using a watershed approach, as well as describing the key guiding principles and the consequent benefits derived. Within the framework a number of themes are highlighted: partnerships, geographic focus, and sound management practices based on strong science. The remainder of the report is more applicable to the US EPA's efforts to implement a watershed approach, relative to an American context.

Summary: Provides a brief overview of watershed concepts, however it has limited relevance for application to a developing country context.

Romaine, MJ. 1996.
An Emerging Model for Future Watershed Management in BC.

This report provides a rationale for why it is essential for governments to include and foster partnerships with local community groups involved with watershed management projects. It also discusses the resulting benefits from more community involvement.

Summary: Provides an interesting article on community-based involvement in the management of watersheds in BC. While focused on BC, some of the concepts are valid for CBWM strategies in Third World cities.

Schueler, Tom.
"Crafting Better Urban Watershed Protection Plans."
http://www.pipeline.com/~mrrunoff/

This report reviews and analyzes local watershed management plans as a tool to protect urban streams from land development practices. It begins by looking at how and why these plans fail to achieve their mandates, and summarizes the results into nine shortfallings. The remainder of the report develops a 12 point protocol to overcome these problems for a more effective subwatershed management plan. These protocols address issues of scale, management cycle, coordination, monitoring, zoning, and mapping, to name a few.

Summary: Provides a good overview of urban watershed issues and problems from a developed country perspective. There is some useful information which could be used for CBWM in Third World cities.

Shreier, Hans et al. 1997
Integrated Watershed Management
Institute for Resources and Environment, UBC: Vancouver, BC. CD ROM.

This CD ROM provides a comprehensive overview of watershed management definitions, processes and issues. Incorporating an integrated multi-sectoral approach, the CD program is divided into 10 sections
A1. Watershed Management Documents

including biophysical; methods, techniques and tools; governance; management approaches; and numerous other sections. There are also numerous case study examples which illustrate, and provide real-life experiences of, how an integrated water management plan can be designed and implemented. The program also provides links to related websites as well as providing a large bibliography.

Summary: Provides an excellent resource for watershed management concepts and principles. While initially designed for a graduate level course, there is an abundance of relevant information related to developing integrated watershed management plans. However, other than the biophysical factors and the integrated framework, the program is limited in its application to CBWM strategies since it does not adequately address participatory development issues and focuses on a developed country perspective.

"Care, Honduras: Local Management of Community Water Systems."
http://www.lboro.ac.uk/departments/cv/wedc/wedcpubs_online.htm

This conference paper describes a water supply system case study evaluation that Care Honduras carried out in the 1980s. The evaluation sought to determine the fate of the water systems, its impacts, the efficacy of the initial strategy, and the effectiveness of both watershed and community management. The paper concludes by making a series of recommendations on technology, training, environment, gender, and institutions.

Summary: Provides some interesting points to consider for a water supply project and watershed protection project.

"Urban Watersheds: a management challenge."
US Environmental Protection Agency Website. Internet. Access Date: May 1999.
http://www.epa.gov/OW/

This report provides an overview of using watershed management for the protection of urban natural resources. It also includes a listing of watershed management practices to mitigate non-point source pollution, agricultural activities, and forestry activities.

Summary: Provides a simplified summary of urban watershed management issues: appropriate for a citizen's guide to watershed protection. From a developing country perspective, there are limited applications to CBWM strategies.
A1. Watershed Management Documents

Watershed Management: planning for the 21st century.
New York: American Society of Civil Engineers (ASCE).
ISBN: 0-7844-0102-0

This book consists of the proceedings from the 1995 Watershed Management Symposium held in San Antonio, Texas, on August 14-16, 1995. The conference was sponsored by the Watershed Management Committee of the Water Resources Engineering Division of ASCE. There were a range of topics that the conference papers addressed including: urban watersheds, international watershed management, government and industry approaches to management, and new techniques and methodologies. The majority of the papers presented were scientifically based: promoting the integration of research and implementation.

Summary: Provides some good technical background information on watershed management issues, beyond that there is limited material for CBWM.

Urban Watershed Assessment: linking watershed health indicators to management.
University of British Columbia, Vancouver, BC Faculty of Graduate Studies, RMES. Thesis (CD ROM).

This PhD dissertation provides a framework for integrated watershed management as well as providing an urban watershed assessment methodology. Also included in the CD ROM thesis is an application of the framework and assessment tool to the Brunette River Watershed case study. There is an extensive literature review including: ecosystem and watershed management, non-point sources, ecological risk assessments, GIS, and integrated modelling. The framework also identifies seven key watershed indicators: impervious areas, riparian habitat, pollutant loadings, water quality, sediment quality, public health, and fish health.

Summary: Provides an excellent technical overview of urban watershed management issues, and gives a good scientific analytical framework. The framework and assessment tool are not, however, ideally suited for CBWM strategies since the unique issues facing informal communities are not specifically addressed, nor are participatory approaches considered as a part of the watershed management design.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A2. Water Resources Management Documents

Agriculture Canada. 1994.

*Best Management Practises: Water Management.*

Ministry of Agriculture and Food, Ontario.

An agrarian household-level guide for conserving soil and water. The booklet is one in an 8 series set, which provides a series of pragmatic recommendations to make household operations more sustainable. The main concept for the series is to highlight and outline the best practises for water enhancement according to farming activities.

*Summary:* Provides a rather context specific set of guidelines that are not particularly practical for CBWM strategies.


"Sustainable Water Development: a global perspective."

*Water International* Vol 17, pp. 68-80.

A descriptive overview of global water resource development and management practices over the last 20 years, highlighting sustainable water development. It identifies and breaks down current water management trends into: environmentally-sound management of inland waters, water pricing & cost recovery, development of international water bodies, and institutional aspects of water management. There is a heavy emphasis on statistics.

*Summary:* Provides an interesting overview of the global issues that have helped shape water resources management over the past twenty years, however there is limited useful information to assist in developing CBWM strategies.

Bruce, James and Bruce Mitchell. 1995.

*Broadening Perspectives on Water Issues.*


ISSN: 1192-6481.

A synthesis from one national and 8 regional workshops designed to address the major water issues facing Canadians over the coming decades; it suggests what role and responsibility the federal government may play in addressing water resources concerns. Moreover, the report provides a conceptual basis for future federal action.

*Summary:* Provides a limited look into intra-governmental cooperation and partnerships in Canada. There is little relevance for CBWM strategies.


*A Framework for Developing Ecosystem Health Goals, Objectives, and Indicators: tools for ecosystem-based management.*

CCME Documents: Winnipeg, Manitoba.


This document develops an framework—for community groups, government agencies, and other organizations—for ecosystem-based management activities. The framework is divided into four principal activities: assessing the issues, developing ecosystem health goals, developing ecosystem health

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A2. Water Resources Management Documents

indicators, and conducting research and monitoring. The document also discusses the institutional, scientific, and community challenges that must be overcome before an ecosystem management plan can be realized.

Summary: While the framework is weak regarding community participation and a developing country context, it does provide worthwhile information that could be incorporated into watershed management strategies.

Carney, Diana and John Farrington. 1998.
Natural Resource Management and Institutional Change.

This book provides a synthesis of three years (1993-6) of research—conducted by the Overseas Development Institute—focusing on the changing relationship between state and the individual management of natural resources. The book concentrates at the policy level and specifically deals with the potential for state reform—deregulation, decentralization and privatization. It continues by identifying reform challenges and potential approaches to overcome them; numerous case study examples are given. The bibliography provides a comprehensive overview of current literature dealing with state reform and natural resource management.

Summary: Provides an excellent and concise reference for institutional change and policy directions in reforming the state for more effective natural resource management. These proposed changes and directions have direct application to CBWM strategies.

Perspectives on Sustainable Development in Water Management: towards agreement in the Fraser River Basin.
Vancouver, BC: Westwater Research Center, UBC.
ISBN: 0-920146-40-6

This book is a compilation of academic papers intending to provide a conceptual framework for implementing sustainable water resource management principles to the Fraser River Basin. The purpose of the book was to illustrate and share ideas of how sustainable development may be put into practice for water resources management; this was in response to the World Commission on Environment and Development released its report entitled Our Common Future. The papers in the book focused on place, resources, institutions, and future challenges for water resources and conflict resolution. A good deal of the book wrestles with definitions and implications of sustainable development; concluding with a set of emphasis areas for sustainable water resources management.

Summary: Provides an informative set of papers dealing with issues of sustainability and water resources management. There is limited specific information that is directly applicable to CBWM strategies, however there is a set sustainability principles (in Tony Dorcey’s paper, Chapter 22, pp. 577-580) that are appropriate for the institutional governance aspects of CBWM.
A2. Water Resources Management Documents


This paper was one of the demand responsive approach (DRA) case studies presented at the UNDP/WB Water and Sanitation Programme's Conference. The case study describes a rural water and sanitation project that had the following elements: communities self-select their services based on willingness to pay, social mobilization of the communities was facilitated through NGOs, communities control construction funds, and the resulting village committees own the completed works. The paper provides an in-depth assessment of the project components, and concludes with an extensive series of lessons and recommendations.

**Summary:** Provides an excellent overview of the key concepts of a DRA approach and how they were implemented into the provisioning of basic services. In particular, the lessons and recommendations section provides useful information for CBWM strategies.


This report summarizes a global study looking at what is meant by "demand responsiveness"; and to determine its impact on the sustainability of rural water systems. The study found that demand responsive does promote sustainability; the study then provides a series of factors to increase the effectiveness of demand responsiveness, and also provides a list of project implications to consider in the design.

**Summary:** Provides a useful overview of "demand responsiveness" factors and some general rules that would apply to CBWM strategies.


This document provides an overview of what is currently being carried out with the stewardship of streams within BC. It focuses at the community, corporate and legal government levels. It also provides a rationale for a new land ethic, and describes what and how this new ethic is being implemented.

**Summary:** Provides a rather cursory summary of stewardship issues, and has little application to CBWM strategies in developing countries.

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_ Applying Community-Based Watershed Management Strategies to Informal Settlements_
A2. Water Resources Management Documents

Ministry of Environment, Lands and Parks, Province of BC and Department of Fisheries and Oceans, Government of Canada. 1993/4.

*Stream Stewardship: a guide for planners and developers.*
Ministry of Environment, Lands and Parks and Ministry of Municipal Affairs of BC: Vancouver, BC.

A guidebook that develops an institutional framework, at the regional level, for accommodating urban development and protection of wildlife habitat (specifically looking at fish). Designed for government planners and developers, the guidebook develops a matrix outlining stakeholder roles and enabling processes for the effective stewardship of rivers.

**Summary:** Provides a good governance framework for local governments concerned with stream conservation. However, given its focus on regulatory instruments, wildlife protection, and top-down approaches, it is limited in its capacity to provide input for CBWM strategies in Third World settings.


*Stewardship of the Water of BC: A review of BC's water management policy and legislation.*

A series of 10 background reports that reviews—and solicits feedback by stating—the issues and potential proposals for the improvement of proposed changes in water management in BC. Key areas reviewed and identified include groundwater management, water pricing, managing streams, planning, water allocation, floodplain management, water quality management, and conservation. The term 'stewardship' seems to have been appropriated as a new catch phrase for updating provincial governance legislation.

**Summary:** Provides an interesting summary of some of the main water issues needing to be updated for BC's legislation. Some of the ideas raised have marginal value for CBWM strategies.


"Structured learning in Practice: lessons from Sri Lanka on community water supply and sanitation."

This report describes the experiences of a World Bank funded project that applied the principles of a demand-based approach (DRA) to a rural water and supply project in Sri Lanka. The project attempted to develop a conceptual framework for a DRA strategy that incorporated adaptive management—or structured learning—and participatory development. The report consists of a brief project overview, the adaptive project design, and lessons learnt during implementation.

**Summary:** Provides a fair description of the key components of DRA and how it could potentially be operationalized. Beyond the DRA framework, there are a few useful points for engaging community participation that could be used for CBWM strategies.
A2. Water Resources Management Documents

*Canadian Water Management: Visions for Sustainability.*  

This report provides an overview of (a) provincial institutional approaches to water management; (b) the evolution of water management in Canada during the 1990s; and (c) the future implications of provincial policies. The authors identify the ten concepts shaping water management worldwide. In the final analysis there is a promotion towards a more holistic water planning approach that embodies sustainable development.

*Summary:* Provides a good overview of provincial experiences with water policies and guiding principles for a more integrated planning approach. However, the report has little direct information that would be helpful for developing CBWM strategies with informal communities.

Moote, Ann. 1996.  
"Partnership Handbook: a resource and guidebook for local, community-based groups addressing natural resource, land use, or environmental issues."  
Water Resources Research Center Paper.  
University of Arizona Website. Internet. Access Date: April 1999.  
http://ag.arizona.edu/partners/

As the title suggests, this document is a resource book for community groups concerned with natural resource management in their backyards. The handbook provides a conceptual framework for the development and implementation of community-based management. The handbook provides resources according to: what is a partnerships, getting started, success factors, common stumbling blocks, and where to get help. The content of the handbook focuses on providing organizational development skills to new or existing groups, everything from record keeping to conflict resolution skills. The last section of the handbook provides a comprehensive reference library of additional available resources.

*Summary:* Provides a very good starting point and guide to help community groups wanting to manage their local resources. The handbook is targeted at a North American audience and therefore there is only limited useful information for an informal settlement applying CBWM strategies.

Mosley, Paul. 1996.  
ISSN: 0250-8060

This paper describes the development of a strategic framework and action plan for a comprehensive water management plan using a 'participatory process approach.' Both the framework and plan are targeted at the institutional level of government agencies; therefore, there is nominal input from local communities. The framework calls for more inter-institutional collaboration, and stresses the importance of language and the importance of negotiation and communication skills during the meetings and subsequent work. The action plan was a seven-step process beginning at developing a national water policy and finishing with carrying out comprehensive planning.

*Summary:* Provides a rather simplistic account of a scientifically-oriented participatory planning process. Accordingly, there is little information that can be gleaned for CBWM approaches.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A2. Water Resources Management Documents

Ostrom, Elinor. 1996.
"Crossing the Great Divide: coproduction, synergy, and development."
World Development Vol 24 (6), pp. 1073-1087.

This paper considers 2 case studies of coproduction—the process where outsiders' inputs are transformed into goods and services—where citizen inputs are used for the production of urban infrastructure. The first case study reviews the 'condominial system' in the slums of Brazil. There is a heavy emphasis on a number of factors that are considered crucial prerequisites for success, including: active local participation; recognizing social capital outside and within government agencies; and effective coordination between citizens and agencies. The second case study addresses coproduction of primary education in Nigeria. The final section provides an overview of the theoretical basis for coproduction. Summary: Provides a mostly academic and theoretical perspective on coproduction: basically a synonym for community-based partnerships. While difficult to distil the relevant information, there are practical guidelines supportive of CBWM.

Institutional Incentives and Sustainable Development: Infrastructure Policies in Perspective
Boulder, Col.: Westview Press

This book illustrates a mode of comparison between alternate policy reform proposals. Specifically looking at problems of insufficient maintenance of rural infrastructure facilities in developing countries. It further develops a framework for evaluating institutional performance and arrangements; and considers centralized, decentralized and polycentric infrastructure developments. An extensive reference bibliography is provided. Summary: Provides a good overview of how institutions can be more supportive of sustainable development. Mostly focused at the national level, this book has limited application to CBWM strategies.

Crafting Institutions for Self-Governing Irrigation Systems.
San Francisco, Calif.: Institute for Contemporary Studies Press.

This book provides a framework for common pool resource management of natural resources, using irrigation systems as the context for inquiry. The book contains five main parts: the last three deal with crafting institutions, design principles, and implementing these principles for effective irrigation systems. The 8 design principles developed characterize long-enduring, self-organized, robust institutions. These principles include: boundaries, equity, collective choice, monitoring, sanctions, conflict resolution, jurisdictional rights, and nested enterprises. The final chapter looks at the application of the design principles and provides recommendations, based on case study reviews. Summary: Provides useful and practical design principles appropriate for community organizations and individuals in a CBWM strategy.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A2. Water Resources Management Documents

Ostrom, Elinor. 1990. 
_Governing the Commons: the evolution of institutions for collective action._
Cambridge, UK: Cambridge University Press. 

This book serves a threefold purpose of 1) critiquing the foundations of natural resource policy analysis, 2) presenting empirical evidence of successful and unsuccessful efforts to govern the commons, and 3) develop better intellectual tools for understanding the capabilities and limitations of self-governing institutions. The author reviews traditional models of governance and then continues to illustrate the range of alternative options. Ultimately leading to a framework for analysis of models and institutional choices.

Summary: Provides an extensive overview of common-pool resources (CPR) management, including an evaluation framework and theoretical basis. However unless using a CPR regime, much of the information is not directly applicable to CBWM.

Porto, Monica. 1998. 
"The Brazilian Water Law: a new level of participation and decision making." 
ISBN: 0790-0627

This article describes Brazil's new water law—the Brazilian Federal Water Resources System Law—that is currently being implemented as an innovative method to manage its' waters. This new strategy attempts to decentralize decision making down to the most appropriate level using participatory river basin management committees. The article provides an overview of the opportunities and challenges faced to change the way water is governed and describes the experiences of the Piracicaba River Basin Committee, the first project to be established.

Summary: Provides a brief overview of a water resources system, and a cursory evaluation of a multi-stakeholder river basin committee. This type of participatory mechanism is one example of a decentralization enabling policy that may be used for CBWM.

Rijsberman, Frank et al. 1998. 
"Integrated Water Resources Management: needs for services and recommended actions."
http://www.gwp.sida.se/

This discussion paper identifies, evaluates and recommends actions that the Global Water Partnership (an global information and research network) could do to promote and assist in the field of integrated water resources management (IWRM) in developing countries. The paper develops an IWRA conceptual framework and proposes 8 principal elements that need to be addressed. The report also provides an overview of the gaps, or shortfallings, in the ongoing programmes related to IWRM. The paper also discusses in more detail sources of water, water degradation, water uses, and international agencies involved in IWRM.

Summary: While a lot of the report discusses issues specific to the GWP, it does provide a good overview of IWRM issues; with a focus on international involvement. Within the developed IWRM framework, there are many worthwhile areas of interest common to CBWM strategies.
A2. Water Resources Management Documents

*River Basin Planning: theory and planning.*  
Chicesteer, UK: John Wiley and Sons.  

This book comprises a series of academic papers on river basin planning. There is a focus on looking at river basin planning as a major catalyst in the development of Third World countries; with particular attention on the role of dams for either food production or power. The purpose of the book is to provide an overview of the current state of the art in river basin planning, and to assess the interdisciplinary relationships and roles between practitioners in river basin development. The book is categorized into three parts: theory, environmental issues, and socio-economic issues.

*Summary:* Given that the book is close to twenty years old, it still provides useful information into the history, and the concepts of an integrated watershed management strategy. However, the book focuses more on top-down managerial approaches involving specialists, and is hence restricted for CBWM use.

Sara, Jennifer.  
"Giving Communities Choice is Not Enough!"  
http://www.wsp.org/English/index.html

This short article provides a cursory overview of applying demand-responsive approaches (DRA) to rural water and sanitation projects. It identifies some of the key principles of DRA and discusses some of the limiting factors of DRA—identified as limited adoption of DRA by supply agencies. The article continues by defining the ideal DRA model—the market model—complete with stakeholder roles and responsibilities. It concludes by suggesting ways to promote community management over supply agency management.

*Summary:* Provides a simplistic overview of DRA, and has limited useful information for CBWM.

"Rural Poor Choose their Water and Sanitation."  
http://www.wsp.org/English/index.html

This report describes a UNDP-World Bank project that used local bureaucrats to perform participatory research—identifying community needs in 30 rural villages in Lao PDR. The approach adopted involved community dialogues with women and men using a variety of participatory research tools: from mapping to oral histories. The report finishes with a number of lessons learned that would facilitate the transition from a supply-driven system to a more demand driven one.

*Summary:* Provides some interesting insights into performing participatory research, which could be appropriated for CBWM strategies.

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A2. Water Resources Management Documents

*Public Involvement Techniques: a reader of ten years experience at the Institute for Water Resources.*  

A comprehensive collection of papers relating public participation with institutional governance of water resource projects. Deals with public participation issues providing: rationale, principles, institutional implications, definition of who is the public, techniques, and future challenges.  
*Summary:* Provides a comprehensive document that is both somewhat outdated now, and top-down in its approaches. Therefore there is not a lot of relevant information for CBWM strategies.
A3. Urban Environmental Management Documents


This book deals with public participation and urban management. It traces the roots and involvement of participatory development and management, and develops a theoretical framework reviewing the eras of community involvement in urban governance. Three main eras are identified: beginning from *community development theory* of the 19th century, and concluding with our present day era of *negotiated development theory* which is defined by community management models that promote government-community partnerships. A participatory framework for urban management is then developed, which draws from numerous case study experiences. The final section of the book deals with the challenges and opportunities for institutionalizing community participation.

Summary: Provides a comprehensive review of, and framework for, community-based urban management. While not specific for informal settlements or integrated planning, there is useful information for CBWM strategies.


This report is the first in a three part series by the author who served as a manager for EMOS; a successful Chilean municipal sanitation company that was governed by commercial principles and social obligation. The report provides an overview and commentary into water and sanitation issues as public goods and the poor's access to them; with special attention to the relationship and responsibility of local governments and service providers. The report concludes by discussing policy options and the use of tariffs to increase utility service coverage, and the necessity of close linkages between municipalities and utilities.

Summary: Provides some useful real-life accounts into the complexity of issues between providing basic services and informal settlements, from a utility provider's perspective. There is limited information which could be applied to CBWM strategies.


This report is the third in a three part series by the author who served as a manager for EMOS; a successful Chilean municipal sanitation company that was governed by commercial principles and social obligation. The report is a brief commentary on the author's experiences and belief that the poor are more capable of paying for services once costs are reduced through better management, increased efficiency, and the use of a single operating system. The report consists of five key characteristics or principles to

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A3. Urban Environmental Management Documents

consider when developing a water and sanitation policy or programme, and concludes with a number of challenges or tips.

Summary: Provides some basic concepts in the operation of a water and sewer service provider. There are a few practical suggestions which could be incorporated into a CBWM strategy.


This paper was one of the demand responsive approach (DRA) case studies presented at the UNDP/WB Water and Sanitation Programme's Conference. The case study describes Ghana's Community and Water Sanitation Programme that consisted of the following key components: community priorities addressed by their willingness to pay, communication, national policies create an enabling environment, and capacity building of the communities. The paper is organized according to background, project description, and then lessons learnt. Also included in the paper is a strategic framework that describes project activities and responsibilities. The paper concludes by assessing the experiences to date and recommending future actions.

Summary: Provides a good overview of some of the main components of a DRA approach to community managed water and sanitation services. There are DRA concepts that are helpful to designing CBWM strategies.


This article is a commentary into the changing nature of environmental management, and a discussion into the merits of using computers to increase the efficiency of engineers and professionals involved in rural planning. The first half of the article primarily focuses on water and sanitation projects looking at affordability and standard of provision. The last half of the article looks at rural upgrading schemes and the application of new information technologies (and Knowledge Based Systems).

Summary: Provides a rather technically-based discussion into augmenting professionals abilities with rural environmental management. Consequently, there is very little material that supports CBWM initiatives.


This paper is a direct follow-up to the United Nations Conference on the Environment and Development (Rio de Janeiro, 1992), and is one in a series of policy papers for the UNDP/UNCHS/World Bank's Urban Management Programme. This paper develops a framework and a process for setting local priorities and

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. **Urban Environmental Management Documents**

facilitating environmental management strategies and action plans for Third World cities. The main areas emphasized—for developing an city-specific strategic environmental plan—are public support, policy instruments, local institutional capacity, urban service delivery, and local knowledge. The paper concludes by presenting a series of case studies that illustrate the problems involved in developing a strategic environmental management plan.

*Summary:* Provides a very good summary of the key concepts and principles used for an urban environmental management strategy. Many of the recommendations and ideas discussed are appropriate for CBWM strategies.

**Bernstein, Janis D. 1993.**

*Alternative Approaches to Pollution Control and Waste Management: regulatory and economic instruments.*


This paper is one in a series of discussion papers for the UNDP/UNCHS/World Bank's Urban Management Programme. The purpose of the paper is to provide an overview of some of the most common strategies and policy instruments used to deal with pollution control and waste management objectives in both developed and developing countries. The paper provides a discussion on the benefits and costs for choosing either regulatory or economic instruments to achieve the desired environmental outcome.

*Summary:* Provides a comprehensive summary of the regulatory and economic instruments used to control pollution and manage waste. While these instruments are limited in their application to informal settlements, there are informative examples that could be adapted to CBWM strategies.

**Bernstein, Janis D. 1996.**

*Land Use Considerations in Urban Environmental Management.*


ISSN: 1020-0215

This paper is one in a series of discussion papers for the UNDP/UNCHS/World Bank's Urban Management Programme. It focuses on available land management strategies for the balancing of environmental and economic objectives. The paper is broken down into describing the challenges, and then the rationale for a better, more integrated approach to urban land management. Of particular interest is Annex A which provides the mechanisms, or tools, available to urban managers for the regulation of environmentally sensitive lands—regulatory, economic, property rights, land acquisition alternatives, government provisioning of services, and information and education. A comprehensive bibliography is also provided.

*Summary:* Provides a good overview of the environmental issues and factors involved in land-use problems. But most of the land management instruments discussed have limited application to informal settlements and CBWM strategies.
Appendix A  Annotated Bibliography  Page 186

A3. Urban Environmental Management Documents

Black, Maggie. 1998.

*Learning What Works: a 20 year retrospective view on international water and sanitation cooperation.*


This report chronicles the experiences of the UNDP-World Bank Water and Sanitation Program's last 20 years of work. The report has been broken down according to three eras of development that epitomize the program's water and sanitation foci—Appropriate Technology Phase 1978-1988; Hardware to Software Phase 1988-1994; and Promoting the New Agenda Phase 1994-1998. The last phase discusses the growing urban sanitary crisis in Third World cities, and the challenge to move beyond rhetoric towards effective implementation using capacity building and demand-responsive service provisioning. Each era of water and sanitation development contains an overview of the political context, a review of the program's initiatives, and a final concluding section that highlights the lessons learnt. Throughout the report numerous case study examples of successful projects are cited.

*Summary:* Provides an informative overview of the main developmental issues and initiatives in the water and sanitation sector over the past 20 years. There are numerous principles and ideas that are helpful to formulating CBWM strategies.

Black, Maggie. 1994.

"Mega-Slums: the coming sanitary crisis"

*WaterAid Website.* Internet. Access Date: May 1999.


This report examines the impact of urban growth in developing countries on freshwater supplies. The report identifies international development policy biases: ignoring the urban poor and their plight in favour of the rural poor. The report is broken down into 1) the 'Problem' and 2) the 'Response'. The 'Problem' section provides a thorough overview of the global issues. The 'Response' section outlines numerous international responses to the existing and burgeoning urban sanitary crisis. The paper concludes with a series of recommendations geared towards the international level for policy change, promotion of partnerships, sharing of information, new financing arrangements, among others.

*Summary:* Provides a good overview into the international community's involvement in urban sanitary issues over the past 20 years. However, there is limited relevant information that could be used for CBWM strategies.

Cheema, G. Shabbir and Sandra Ward (Eds.). 1993.

*Urban Management: policies and innovations in developing countries.*


ISBN: 0-275-94085-3

This book is a compilation of articles by academics and practitioners involved in urban management issues in the Third World. The book focuses on improving urban management policies as a means to improve and mitigate the deteriorating living conditions within urban centers. The book is broken down into three main parts according to: urbanization process and strategies, urban management issues, and country case studies. The book concentrates more on urbanization issues of housing or information systems rather than environmental management. However, water and sanitation issues are covered in some detail and there is a wealth of information concerning urbanization issues and the challenges that lay ahead.

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*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A3. Urban Environmental Management Documents

**Summary:** Provides a good resource into the issues, trends and challenges of urban management in Third World cities. Yet, the information and innovative policies described are only marginally helpful to designing CBWM strategies.

**Cotton, A. P. et al. 1998.**
"Community Initiatives in Urban Infrastructure."
*Water, Engineering and Development Centre (WEDC) Website.* Internet. Access Date: June 1999.
http://www.lboro.ac.uk/departments/cv/wedc/wedcpubs_online.htm

This document is a manual that investigates the nature of involvement by low-income urban communities in the provision of their infrastructure. Moreover, the manual provides guidelines to craft initiatives—by urban managers, development agency staff, and NGOs—that promote increased community participation in the procurement of neighbourhood services. The manual provides an overview of community partnering, describing the process of procurement and involvement, and then provides lessons learnt from over 30 case studies in South Asia. The final section provides guidelines for community partnering with a series how-to boxes which provide practical implementation tools for practitioners (E.g. selecting a contract type).

**Summary:** An excellent manual and resource that has numerous applications to urban CBWM.

**Cotton, Andrew and Darren Saywell.**
"Strategic Sanitation Approach: A review of literature."
http://www.lboro.ac.uk/departments/cv/wedc/garnet/ssacover.html

This online document summarizes the findings from Department for International Development (UK) funded project (R6875) concerning the development of practical guidelines for the application of the World Bank's Strategic Sanitation Approach (SSA) in Third World cities. The report consists of four sections: a literature review of 56 documents, an overview of the distinctive features of SSA, the implications of operationalizing SSA, and a conclusion.

**Summary:** Provides a comprehensive description and evaluation of the key concepts of SSA; it also highlights the shortfalls and additional considerations for the effective implementation of SSA. The report provides a lot of useful information relevant to developing CBWM strategies.

**Dawson, Elsa. 1992.**
"District Planning with Community Participation in Peru: the work of the institute of local democracy – IPADEL."
ISSN: 0956-2478

This article discusses two projects undertaken by IPADEL in the city of Lima: one which promoted community involvement of low-income groups in the decision-making process for their district's development plan; the second project looked at a community-based water and sanitation system. A key aspect of both projects is the democratization of these low income communities and how these communities need to consolidate their efforts to be more effective at influencing local government policies.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A3. Urban Environmental Management Documents

Summary: Provides limited insight into the two described case studies; therefore there is not a lot of relevant material for CBWM strategies.

Diaz, Doris Balvin et al. 1996.
"Innovative Urban Environmental Management in Llo, Peru."
Environment and Urbanization Vol 8 (1): April, pp. 21-34.
ISSN: 0956-2478

This article describes the experiences of a local city council and how they were successful at developing a strategic plan, addressing environmental problems, overcoming financial shortfalls, and negotiating with a number of competing resource sectors. A product of these processes led to improved housing and living environment for both new and established low-income settlements. The article describes the council's consultation process, the multi-sectoral commission on the environment that was formed, and the establishment of local management committees. The success of the implementation and planning processes were attributed to: stable and reliable leadership, a clear vision, and a decision-making process that included all the stakeholders.

Summary: Provides an interesting case study report with some practical ideas for local management arrangements, involving key stakeholders, that could be used for CBWM strategies.

Better Urban Services: finding the right incentives

This report reviews the World Bank's efforts to improve the efficiency and responsiveness of urban service delivery in developing countries. Moreover, it focuses on the institutional components which are recognized as essential ingredients to ensure sustainability and replicability. Set against a backdrop of proliferating decentralization policies in Third World cities, this report looks more closely at how reforms may mitigate two identified past failures of urban service delivery: perverse incentives that local governments face, and poor inter-governmental relations and collaboration. The book contains an overview of the World Bank's experiences, a framework for analysis, directions for reform, and the implications for urban service lenders and borrowers.

Summary: Provides a good overview of the elements involved with a local government's ability, and potential reforms, to supply better urban services. There is therefore interesting information relating to potential CBWM strategies for both decentralization policies and local government responsibilities and collaboration.

Decentralization and its Implications for Urban Service Delivery.

This paper is one in a series of discussion papers for the UNDP/UNCHS/World Bank's Urban Management Programme. It looks at failures in urban service delivery and reviews efforts to improve efficiency and responsiveness of service providers. It specifically assesses the opportunities that are provided through the spread of decentralization policies; and how these policies may be improved. The report is broken down into two main parts: a framework for analysis, and directions for reform.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. Urban Environmental Management Documents

Summary: Provides an earlier and shorter version of the author's book, "Better Urban Services"; therefore it is a good summary, and has useful information for CBWM.

Doan, Peter L. 1997.  
"Institutionalizing Household Waste Collection: the urban environmental management project in Côte d'Ivoire."  
ISSN: 0197-3975.

This article describes an urban environmental management project where young entrepreneurs were trained to collect household solid waste in small cities. The project was initiated by decentralization strategies, undertaken by the government, to reduce expenses on municipal waste collection. The article provides a thorough overview of the conditions in Côte d'Ivoire, the project components, and the successes and challenges faced during project implementation. The article concludes by recommending more formal institutional linkages between the municipality and the young entrepreneurs.

Summary: Provides an informative case study analysis of a solid waste management project. Many of the ideas and concepts have direct application to CBWM strategies.

"The Political Economy of Urban Poverty and Environmental Management in Asia: access, empowerment and community based alternatives."  
ISSN: 0956-2478

The article deals with the major environmental urban problems facing the urban poor in Asia and searches for innovative alternatives for their address. The paper deals with community-level initiatives and methods by which the poor can be mobilized to manage the environment. The article also discusses both the challenges and opportunities that low-income communities must contend with, based on numerous case studies studied by the author. The article concludes by developing a framework and agenda for future action oriented research into community-based environmental management.

Summary: Provides a general overview of some of the main environmental management problems, and discusses urban poverty issues that need to be addressed. Most of the points raised still require additional research and therefore the article is not particularly beneficial for CBWM strategies.

"UNICEF's urban basic services programme in illegal settlements in Guatemala City."  
ISSN: 0956-2478.

This article describes and reviews the urban basic services (UBS) programme developed by UNICEF between 1984-1993. The programme illustrates a community-based urban management framework that includes all stakeholders and is intersectoral in nature. The programme concentrated on capacity building and a convergence of services with a heavy emphasis on creating opportunities for women and children within the projects. The article demonstrated how a health programme evolved and grew to include other projects involving water, education, nutrition, environmental upgrading, economic development, and recreation and shelter initiatives.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. Urban Environmental Management Documents

Summary: Provides an excellent illustration of an integrated environmental management programme in urban low-income communities. There are many ideas and concepts which could be transplanted into CBWM strategies.

Esrey, Steven et al. 1998. 
Ecological Sanitation
Stockholm: Swedish International Development Institute.
ISBN: 91 586 76 12 0
http://www.gwpforum.org/gwpef/wfmain.nsf/Publications

This book is a manual promoting and providing examples of alternative sanitation planning methods in developing countries. It develops an ecosystem approach to planning sewerage systems whereby human wastes are reused and recycled using dehydrating and composting toilets; it is called ecological sanitation or 'eco-san'. The book documents experiences and practices used in numerous developing countries, and develops a conceptual framework showing how ecosan systems can be implemented. The book is divided into five main sections providing an overview of sanitation planning, and detailing the main components and challenges for an ecosan system. The book can also be downloaded from the Global Water Partnership website.

Summary: Provides an excellent and pragmatic resource for low-cost, appropriate-technology options for sanitation systems in developing countries. There are numerous ideas and practices relevant and useful for crafting CBWM strategies.

"Private Sector Participation in the Water and Sanitation Sector."
http://www.lboro.ac.uk/departments/cv/wedc/wedcpubs_online.htm

This paper provides a conceptual framework for private sector participation (PSP) in the urban and rural water and sanitation sector in developing countries. The paper also serves as a background report on the level and scope of involvement for promoting PSP by the UK's Department for International Development (DFID) agency. The report provides background and case study examples of PSP, and includes a framework of options to incorporate PSP strategies: from BOTs to community contractors. The report concludes with recommendations on how international agencies (and in particular DFID) can assist with promoting and supporting the apparent void in private sector involvement in the provisioning of water and sanitation services.

Summary: Provides an excellent overview of the issues and options for PSP, and includes a very useful framework for choosing the most appropriate PSP option. There are many practical pieces of information that are directly applicable for CBWM strategies.

"Garbage: exploring non-conventional options for Asian cities."
ISSN: 0956-2478

This article describes small-scale, community-based waste management projects from 5 Asian cities. All the case studies reviewed had project components that incorporated both social and economic goals, as
A3. Urban Environmental Management Documents

well as environmental concerns into their designs. In this way, they were seen as a more holistic and cooperative mechanism for dealing with the environmental dilemmas facing them. The article concludes by presenting two additional detailed case studies: street pickers in Calcutta slums, and micro-businesses in Delhi.

Summary: Provides a mostly descriptive account of solid waste management in Asian cities with little analysis or recommendations. Therefore, there is not a lot of information relevant to forming CBWM strategies.

"Community Participation in the Management of Urban Environment in Rufisque (Senegal)."
ISSN: 0956-2478

This article discusses and evaluates 9 case studies dealing with low-income communities for the provisioning of water, sanitation, drainage, and the collection and disposal of solid waste. The case studies reveal the underlying premise that local problems can be solved by local communities working and taking decisions together. The paper provides a detailed overview of the project components, and develops a framework for community-based urban environmental management using an integrated holistic approach with low-tech, cost efficient solutions. The paper finishes by describing the funding mechanisms employed and their usefulness.

Summary: Provides an interesting and comprehensive overview of a community-managed project in low-income areas, and the methods used. While there is considerable involvement from an international NGO that acts as facilitator and manager of the programme, there is a lot of practical information relevant to CBWM.

Halvorson, Sarah Jean et al. 1998.
"Strategies to Involve Women in Water Supply and Sanitation."

This article describes the shortfalls experienced with supplying safe drinking water and improving environmental sanitation in rural villages in Pakistan, and describes the Aga Khan Foundation's new Water and Sanitation Extension Programmes (WASEP). Historically, the main barriers to success in the region involved poor community participation. The WASEP initiatives, however, have focused on actively encouraging and building participatory processes, especially emphasizing gender-responsive strategies to increase women's involvement. The article illustrates three such strategies used: gender-related information gathering techniques, women's committees, and health and hygiene training.

Summary: Provides an interesting article about the issues involved around gender and development, many of the concepts are appropriate for building into CBWM strategies.

"Street Hydrant Project in Chittagong Low-Income Settlement."
ISSN: 0956-2478

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. Urban Environmental Management Documents

This article explores the issues around community participation using participatory tools and methods for water and sanitation provision in Chittagong. The researchers performed a series of Participatory Urban Appraisal (PUA) exercises geared to raise awareness and enable the community to participate in the planning process. The article determined that using PUA techniques assisted and had a positive effect with incorporating gender issues, environmental awareness, level of understanding between low-income residents and "professionals", and empowering communities.

Summary: Provides some examples of participatory research tools, however most of the methods employed have limited application to defining community needs and priorities for CBWM.

Jacobi, Pedro. 1997
"Environmental Problems in Sao Paulo: the challenge for co-responsibility and innovative crisis management."
ISSN: 0966-0879

This article describes and analyzes the main environmental problems that face the city of Sao Paulo, focusing on both the conventional and unconventional management processes undertaken to mitigate the environmental degradation. The article identifies and comments on the city's watershed as one of the most serious threats to public health. The article illustrates the complexities of urban environmental management and then discusses potential solutions using more participatory oriented policies.

Summary: Provides mostly a descriptive overview of the environmental issues facing Sao Paulo. The proposed remedies discussed are regulatory in nature and therefore would have limited application to CBWM strategies.

Khan, Muhammad Aslam. 1996.
"Problems and Prospects of Urban Environmental Management in Pakistan."
ISSN: 0030-9729

This article describes the urbanization trends that have occurred in Pakistan, and then goes on to highlight the environmental challenges and opportunities that lay ahead. It provides an overview of some of the economic policies which have hindered, or had a negative effect, on environmental management (including incentive systems, pricing of resources, institutional constraints, enforcement, and public awareness). The article finishes by presenting a series of policy recommendations that will facilitate a more holistic and sustainable environmental management system.

Summary: Provides a fair summary of typical urban environmental problems and there associated causes. Some of the issues and concepts raised are informative to CBWM strategies.

"Governance of Waste Management in Urban Tanzania: towards a community based approach."
ISSN: 0921-3449

This article provides an overview of the issues involved with solid waste governance systems in Third World cities. The authors argue that proper solid waste management is not caused by a lack of resources,
A3. **Urban Environmental Management Documents**

but rather shortfallings in urban governance. It continues by presenting an alternative governance model using a simplistic 4-step community based approach: elaboration, trial, evaluation and extension phases.

**Summary:** Provides insight into some of the main impediments identified for effective solid waste governance, but the proposed framework is simplistic in nature and sounds more like a participatory research project rather than a governance model.
A3. Urban Environmental Management Documents


This paper focuses on the roles of NGOs in the provisioning of basic services for the urban poor in developing countries. In particular, looking at how NGOs can be more effective at contributing to community-based urban environmental management. It identifies three broad areas of improvement: partnerships with the community, linkage with the government, and coordinating and networking with other NGOs. In a follow-up commentary by Richard Stren (pp.177-178), two additional issues are identified—the importance of local government and recognizing the political context.

Summary: Provides an interesting analysis of how NGOs can play a more effective role in supporting communities in their management of the urban environment. It also highlights the importance and potential for including NGOs into CBWM strategies.


ISSN: 0956-2478

This article focuses on developing a strategic framework for defining and addressing environment related problems of urban development. Much of the research work that went into the article was derived from two years of experiences with the UNDP/World Bank/UNCHS's (Habitat) Urban Management Programme (UMP). The article addresses issues of: pollution from urban wastes, urban transit, resource management, and environmental hazards. The identified challenges of urban management are discussed and a series of management options are provided to mitigate the problem areas.

Summary: Provides a good brief summary of urban environmental problems and potential management interventions for their remediation. These interventions constitute a simplistic framework that CBWM strategies would have to address.


This article summarizes the author's doctoral thesis which provides an inquiry into the state of housing and infrastructure with informal settlements in Kenya, and reviews the inhabitants self-appraisal of their environments. The main focus of the paper evaluates accessibility of water and sanitation services between owners and tenants within informal communities. The article finds that both owners and tenants are willing to pay for better services, potentially through a property betterment tax that would be passed onto to the tenants.

Summary: Provides a simple account and analysis of two case studies. Accordingly, there is little usable information available for CBWM strategies.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. Urban Environmental Management Documents

"Community-Managed Water and Sanitation Utility for the Urban Poor: Haiti."

This report describes the experiences of USAID in their support of a community-managed, autonomous district (basically an NGO), that was responsible for providing and operating water supply and sanitation services for an informal settlement of 200,000 people. The main principles of the project included: NGO autonomy over all aspects of service delivery, substantial community involvement, participation from private and NGO sectors, and sustainable self-financing. It should be noted that when the author refers to self-financing, it only refers to operating costs and no allowance is made for capital costs of the infrastructure, which are funded by international funding sources.

*Summary:* Provides an interesting and informative case study: with a good overview of the concepts and components required for an urban community-managed project, it also provides a governance framework that would be well suited for CBWM strategies.

Ockelford, Jeremy and Bob Reed. 1998
"Guidelines for Planning and Designing RWSS Programmes."

This article begins by recognizing that tools or guidelines are required by professionals—urban managers and planners in developing countries—for creating an integrated approach for domestic water supply, hygiene and water use education, sanitation, and community organization. The article serves as an interim, or work-in-progress, research document and is limited to providing an overview of the guideline sections, rather than any substantive framework that can be used (the authors allude to a completed and more thorough document to be ready by April 1999).

*Summary:* Provides mostly a description about a guideline report that has not been completed yet, therefore there is no valuable information for CBWM strategies.

Pfammatter, Roger and Roland Schertenleib. 1996.
*Non-Governmental Refuse Collection in Low-Income Areas: lessons learned from selected schemes in Asia, Africa and Latin America.*
Department of Water and Sanitation in Developing Countries (SANDEC) Report No. 1/96. Duebendorf, Switzerland: SANDEC at Swiss Federal Institute for Environmental Science and Technology.

This report synthesizes the experiences collected from SANDEC, that focused on looking for alternative schemes to improve solid waste collection in low-income areas. The report starts from the premise that low-income communities must assume waste management responsibilities from municipalities according to their appropriate economic resources. The report highlights the most important lessons learnt to date from a multitude of organizations currently involved with alternative solid waste projects. The report is organized according to: technical and operational aspects, organization and management, and service costs and financing. The appendix provides an overview from 18 solid waste case studies from various developing countries.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A3. Urban Environmental Management Documents

Summary: Provides an excellent assessment of community-based initiatives in urban management. There are many concepts and experiences which are helpful in designing CBWM strategies.


This article provides an overview of sewage-based sanitation alternatives for low-income urban communities; in particular, it describes the advantages and uses of pit latrines and some variations of them. The article serves more as a technical paper—or a how-to manual—for deciding planning, and maintaining the most appropriate sanitation systems. The article draws upon experiences in Asia, Latin America and Africa; and provides an indication of design guidelines, as well as costs, for some of the alternatives considered.

Summary: Provides a good practical resource for assisting with the design, selection, and maintenance of dry or semi-dry pit latrines. This information is relevant and useful for CBWM strategies.


This article describes community-based interventions into solid waste management in the regions of Bangalore and Mysore in India, and reviews their impact with ecological literacy amongst the urban dwellers. The article provides a commentary on some of the essential ingredients and stakeholder responsibilities required to strengthen the interaction between waste pickers and community participation. This community-based focus is seen by the authors as an important catalyst to be used as an environmental education tool that begins the shift of urban lifestyle choices.

Summary: Provides a cursory summary of some key elements for community-based solid waste management projects. The information is related to CBWM strategies, but is rather simplistic.


This paper discusses the provisioning of water and wastewater services in big cities (5 million). The paper provides a general global perspective of the issues, while focusing directly on the optimization of urban water supply. It argues that there are easy technical, economic and financial solutions, however the main hindrance to resolution lies in the inabilities of the institutional frameworks. It concludes, with providing recommendations for city governance including topics of: inter-sectoral planning, private ventures, clarify relationships, water losses, industry impact fees, pollution prevention programs, and community participation.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. Urban Environmental Management Documents

Summary: Provides a good overview of the main urban water infrastructure problems faced by planners in big cities. However, it does not specifically address informal settlements and promotes more top-down governance approaches; therefore, is limited in its application for CBWM strategies.


This book, or resource book, is designed to provide elected officials, municipal workers and concerned citizens with information on how to plan and promote more sustainable communities. The book provides an action plan: moving from theories of sustainable development to creating sustainable communities. The book is organized according to community tools, and planning & administrative tools. These tools include issues concerning water and sewage; solid and hazardous waste reduction and recycling; economic development; growth management; and community development, among others. The book concludes with a section on *Lessons for Policymaking*, which address some of the institutional impediments experienced by policymakers from around the world.

Summary: Provides a useful and informative guide for creating compact, sustainable communities. While not directly applicable to CBWM, there are guiding principles and ideas which are instructive.


This article reviews the manner in which community-based water supply and sanitation projects have been promoted in developing countries, and focuses on one specific project in Myanmar. There is an emphasis on the role of women and how improvement is dependent on their participation; as well as an emphasis for using a revolving fund scheme where communities develop income generating activities. The article concludes by highlighting the role of the government as a facilitator of services with the communities taking responsibility for their needs.

Summary: Provides a very brief summary of a community-based water and sanitation project, but there are a few interesting points raised which can be incorporated for CBWM strategies.


Part of the UNDP/UNCHS/World Bank's Urban Management Programme, this report reviews and summarizes 21 cases of participatory infrastructure development experiences in developing countries. The purpose of the report is to describe the range of participatory strategies available to the urban manager. In particular, what are the opportunities and roles for user-participation in the operation and

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
A3. Urban Environmental Management Documents

management of infrastructure services. Four participation strategies are identified and elaborated on: community-based support strategies, area-based involvement strategies, functionally-based collaboration strategies, and process-based decentralization strategies. The report also includes a lessons learnt section that draws from numerous case studies, and the report provides a framework for an action plan.

Summary: Provides a good resource on the issues and methods involved with demand-oriented urban infrastructure management through partnerships and public participation. There is a lot of practical information and lessons that are relevant to CBWM.

"Government-Community Partnerships in Kampung Improvement Programmes in Surabaya."
ISSN: 0956-2478

This article describes the Kampung Improvement Programme in Surabaya, where the city government worked with low-income communities to identify their needs and priorities. Included within this overview, the author describes the government-community partnerships that emerged during the infrastructure and services improvements. The article concludes by recommending similar partnerships to help facilitate future growth management strategies for peri-urban areas.

Summary: Provides an example of a participatory methodology for linking the public sector and the community, while the community involvement is limited—mostly to consultation—it does offer some useful information for CBWM strategies.

"Addressing Health and Environment Concerns in Sustainable Development with Special Reference to Participatory Planning Initiatives such as Healthy Cities."

A descriptive overview—from an international development perspective—highlighting some key milestones in recent history between the environment and public health fields. The paper calls for the development of more comprehensive and integrated approaches to addressing health and environment issues required for sustainable development. It specifically focuses on the experiences of the WHO's "Healthy Cities" project—as referred to in Agenda 21—and the participatory approaches that were applied to the local level.

Summary: Provides a some interesting information on the "Healthy Cities" programme and the corresponding identified challenges and successes. Very little attention, however, is paid to community-based planning and accordingly there is little information that is transferable to CBWM strategies.

"Urban Sewer Planning in Developing Countries and The Neighborhood Deal: a case study of Semarang, Indonesia."

This report deals with effective sanitation planning in developing countries. It addresses the main challenges and begins to develop a new policy and planning framework for urban sanitation that requires

Applying Community-Based Watershed Management Strategies to Informal Settlements
A3. **Urban Environmental Management Documents**

Active participation from neighbourhoods and households. The new planning framework is basically a methodology for carrying out demand-driven planning—referred to as *The Neighborhood Deal*—and it is discussed in conjunction with a study carried out in Semarang. The report concludes by suggesting 10 areas of focus that need to be addressed for future research work with the case study.

**Summary:** Provides an informative overview into the challenges of urban sanitation planning. From a demand-responsive approach, there may be certain applications for CBWM strategies.

**World Bank. 1996.**

"World Bank Participation Handbook."


This web-based document is an extensive handbook for World Bank staff, and the international developmental community, who need information on participatory development. More specifically, the handbook represents a shift in policy direction for the Bank as they recognize the imperative of including all people—affected by development interventions—in the decision-making process. The handbook is a culmination from over 200 staff members' and consultants' experiences with participatory approaches and activities. The handbook consists of an overview of what participation is and means, practical examples and pointers for participatory planning, participatory methods and tools, and lastly a series of working papers related by theme or sector with participation. The working papers section of the handbook includes topics relevant to CBWM including: 'participation in the water and sanitation sector', 'gender issues in participation', 'participation and intermediary NGOs', 'designing community-based development', etc.

**Summary:** Provides an excellent resource and serves as an anthology of the most recent approaches and tools of participatory development; written by some of the most well known professionals in the field. The handbook is an extremely useful guide for developing CBWM strategies.

**Wright, Albert M. 1998.**

"Sanitation in Large Cities: addressing the challenge."


http://www.gwp.sida.se/cgi-bin/HNref/get/brazil.html

This paper reviews the problems and challenges associated with sanitation delivery systems throughout the world over the past 20 years. It considers the impacts and constraints—according to demand and supply-side management—of improved sanitation. It then provides a way forward to follow, including the following recommendations: creating an awareness of benefits & affordability, unbundling strategies, widening technological options, using demand orientation, making user and beneficiary charges the core of financing, and relying on institutional incentives.

**Summary:** Provides a good overview of sanitation issues in Third World cities, and provides a relevant set of recommendations that could be used for CBWM strategies.

**Yepes, Guillermo. 1999.**

"Do Cross-Subsidies Help the Poor to benefit from Water and Wastewater Services? Lessons from Guayaquil."


http://www.wsp.org/English/index.html

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**Applying Community-Based Watershed Management Strategies to Informal Settlements**
A3. **Urban Environmental Management Documents**

This paper continues the debate on demand responsive approaches (DRA) for assuring sustainable water and sanitation services in developing countries. Rather than focusing on the client's willingness to pay however, this paper looks at a company's willingness to charge and assesses this in terms of sustainability. The paper examines one case study in Ecuador and specifically looks at the effects of subsidies. The final section presents a number of policy recommendations for tariffs and subsidies that mitigate negative impacts.

*Summary:* Provides some insight into the use of tariffs and subsidies for DRA and their consequences, however this article only has limited application for CBWM strategies.
A4. Project Evaluation Documents

"Towards Improving the Role of Evaluation within Natural Resource Management R&D Programmes: the case for 'Learning by Doing'."
_NRM Changelinks Website_. Internet. Access date: June 1999.
http://nrm.massey.ac.nz/changelinks/cjds.html

This paper outlines an evaluation process that can be used to assess community-based natural resource initiatives. The participatory framework developed uses an agricultural case study in New Zealand to illustrate its' benefits. The method used for evaluation incorporates participatory action research and the adoption of the Snyder Evaluation Model; the latter method uses outcome indicators as a feedback approach. The resulting evaluation strategy is more of a process than a one time assessment, and closely mirrors an adaptive management—or 'learning by doing'—approach.

**Summary:** Provides an interesting but somewhat limited analytical framework that is not directly applicable to CBWM initiatives.

Cairncross, Sandy et al. 1998.
The Sustainable Use of Urban Environmental Health Indicators: improving the understanding of the needs of the poor.

This paper explores the feasibility of using indicators as a language between health planners and urban low-income consumers to a) set priorities for environmental health interventions, and b) to assess the progress of projects. The paper is broken down into two main parts: project overview and case studies. The project overview describes the objectives, methods, results and conclusions from the four case studies. It also includes a compiled list of indicators derived from community feedback.

**Summary:** Provides an interesting discussion into health indicators and their identification through a participatory process. Most of the outputs—and indicators—from the case studies are simplistic but informative, and are instructive for preparing a CBWM analytical framework.

Duffy, Dorli et al. 1998.
Forest Renewal of British Columbia. Victoria, BC: FRBC.

This report evaluates the consensus-based LRMP planning processes which were initiated in British Columbia in 1992. The LRMP processes embrace a number of key principles including: consideration of all resource values, public participation, interagency coordination, and the development of a consensus-based decision-making process. The report assesses the role of the public in two LRMP processes; develops criteria to evaluate the effectiveness of LRMPs; and finally provides recommendations to improve public participation and project outcomes. The report develops two evaluation criteria frameworks: one for public participation and shared decision-making (i.e. assessing the process), and the other for assessing community capacity.

**Summary:** Provides an interesting overview of consensus-based public processes as well as developing a very good analytical framework, which could be adapted in some form to evaluate CBWM initiatives.

_Applying Community-Based Watershed Management Strategies to Informal Settlements_
A4. Project Evaluation Documents


This working paper is the second part, or module, of a two volume series comprising the Urban Poverty Sourcebook, produced by the Urban Management Programme. The paper provides a review of urban indicators of poverty that were used, and which emerged, in a series of community-level research studies carried out in four developing countries. The paper also provides a conceptual framework and methods used for rapid assessment of poverty at city, community, and household levels. The poverty assessment tools, included in the paper, consist primarily of a number of survey tables that could be used researchers. Summary: Provides a good overview and framework for assessing urban poverty. However, it is limited in its application for participatory evaluation, with its concentration on measuring externally-identified goals. While limited in its use for assessing CBWM initiatives directly, it does provide a thorough list of potential key indicators for consideration.


This technical paper provides policymakers, managers, and planning and evaluation staff with ideas for participatory processes; including indicators that can be used in the evaluation of projects in the water and sanitation sector. The report represents the lessons learnt by the author, and others, from 15 years of experience working in participatory development. The report provides a background and justification for using participatory evaluation and also provides a criteria framework that is broadly classified according to: measuring sustainability, measuring effective use, measuring replicability, and assessing change. The report also includes a series of insights gained on different case study analyses, and highlights the importance of gender specific analysis as a prerequisite and built-in function of evaluation. Summary: Provides a very good evaluative framework and discussion of the issues for assessing participatory development. The tools and examples mentioned are instructive and helpful for developing a CBWM evaluation framework.


This report assesses the World Bank's experience and performance of their borrowers with the operation and maintenance of urban water supply and sanitation projects. The report includes lessons learnt, types of maintenance, increasing efficiency, and monitoring performance. One of the chief shortfalls cited for poor O & M relates to poor management, and this consequently is a result of low priorities. The report also provides a discussion about private sector development. Summary: Provides more of a commentary on the management issues of loan repayment rather than developing a usable framework for evaluation of projects. Therefore, the report is not particularly appropriate for CBWM assessment.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A4. Project Evaluation Documents


This book provides the papers presented at the 1994 World Bank sponsored conference on evaluation and development, held in Washington, DC, in December 1994. The focus of the conference dealt with development and the methods, instruments, and processes of evaluation. In particular, the conference addressed issues of: the roles and challenges of development evaluation, the conceptual frameworks used for development evaluation, the capacity of evaluation instruments, the consequences of participatory development, and the building of evaluation capacity through changes in structure and processes. The conceptual frameworks discussed cover initiatives ranging from poverty alleviation programs to assessing institutional development to evaluating environmental impacts. The majority of the authors were either World Bank agency analysts or professors from universities.

*Summary:* Provides a good synthesis and interesting discussions on the issues involved with evaluating development. While informative, most of the material is at a conceptual or theoretical level and is therefore difficult to apply to a CBWM evaluation framework.

United Nations Centre for Human Settlements (Habitat).
"The Urban Indicators Programme"
UNCHS (Habitat) Website. Internet. Access Date: June 1999.
http://www.urbanobservatory.org/indicators/

This web-based report and database provides information about UNCHS' Urban Indicators Programme that responds to the need for having better information on urban conditions and trends. The web-based report provides a framework for monitoring the implementation of the *Habitat Agenda* and *Agenda 21* using urban indicators; as well as providing a database of the current state of cities world-wide. The indicator framework developed consists of an abridged list of key indicators as well as a more comprehensive list of indicators. Both lists of indicators are classified according to modules: background, socio-economic, infrastructure, transport, environmental management, local government, and housing.

*Summary:* Provides an very good evaluation framework—and comprehensive set of indicators—for evaluating the conditions of cities. The framework developed is participatory in nature and therefore has application to CBWM, however more emphasis and evaluation would be needed to highlight an integrated approach to water management, and for the specific issues facing informal settlements.
A5.  Project Financing Documents

"Community Financing—Challenges to Community Management."  

This short article describes the experiences in Ghana with the promotion of sustainable water and sanitation projects. These projects displayed a shifting away from the dependency of government financing towards a greater self-reliance by user communities. The article describes a typology of alternative financing schemes complete with option weaknesses and factors to consider in selecting an appropriate scheme. The article concludes with a series of recommendations aimed primarily at outside funding agencies.  
Summary: Provides a quick summary of some funding alternatives and their related 'pros' and 'cons'. While not comprehensive, the article provides some pointers to consider for CBWM strategies.

Arrossi, Silvina et al. 1994.  
Funding Community Initiatives: the role of NGOs and other intermediary institutions in supporting low income groups and their community organizations in improving housing and living conditions in the Third World.  

This book chronicles case studies of NGOs and other intermediary organizations that have provided funding to community-level initiatives related to improving housing conditions or the provisioning of housing infrastructure and services. Lack of access to financing is recognized as one of the major impediments to improving living conditions and therefore the authors have emphasized innovative financial schemes that use credit for housing and infrastructure investment. The book is broken down into two sections: the first discusses the issues, drawing on case studies; and the second section provides an overview of each of the 18 case studies considered. The book concludes by discussing strategies by which NGOs and intermediary institutions may facilitate scaling-up of community initiatives and in the process increase their effectiveness.  
Summary: Provides a good overview of the issues and roles of NGOs and residents in the financing of community infrastructure projects. While the book is simplistic in sections, it does illustrate many ideas that are supportive of CBWM strategies.

"Funding Watershed Management in Latin America: an informal survey of seven countries."  

This short article reviews issues of funding for watershed management efforts in Latin American countries, and looks at ways of improving access to financial resources. It summarizes an informal survey sent out to watershed managers in the selected countries. The article considers four financing scenarios including: national institutions, international aid agencies, international banks, and private enterprises. The author leaves off by stating that there are serious financial shortfallings that the international community needs to address with the development and conservation of watersheds.

Applying Community-Based Watershed Management Strategies to Informal Settlements
A5. Project Financing Documents

Summary: Provides an incomplete assessment of funding options for watershed projects and there is little relevant material for CBWM strategies.

Briscoe, J. 1996.
"Financing Water and Sanitation Services: the old and new challenges."
ISSN: 0735-1917

This report reviews 30 years of experiences with the provisioning of water and sanitation services to developing countries, with a concentration on innovative financial mechanisms. It also breaks down the challenges of service supply into the 'old' and 'new' agendas. The 'old agenda' refers to servicing issues at the household level, while the 'new agenda' builds on this but in a way that promotes environmentally sustainable development. It should be noted that the article has been written from a World Bank perspective and is therefore somewhat limited in its evaluations. However, numerous innovative case studies are discussed and a user-fee framework is proposed. The paper also proposes new directions for future endeavours including: a devolution of decision-making at the river basin authority level, more participation from the private sector and civil society, and an amortization of initial service capital costs.

Summary: Provides a good overview of current funding mechanisms used by international financial institutions. Some of these mechanisms, or combination there of, would be appropriate when developing a CBWM funding framework.

"The revolving Fund: a means of encouraging smallholders to participate in conservation projects in Bolivia."

This brief article describes the experience of the Bolivian government with the implementation of a revolving fund established to promote people's participation in the conservation of their environments. The article provides a description of how the fund works, and the factors which have affected the success of the program.

Summary: Provides a successful example of a funding concept that could be adapted and used for CBWM.

United Nations Centre for Human Settlements (Habitat).
UNCHS (Habitat) Website. Internet. Access Date: May 1999, Section I.
ISBN: 92-1-131209-4
http://157.150.118.3/unchs/english/docs1.htm

The summary recommendations of this report provide a strategy to improve infrastructure management. These recommendations are a first step in developing an operations and maintenance diagnostic assessment procedure. This summary document includes elements that are identified as areas to be addressed, including: planning, programming and budgeting; finance and cost recovery; and the role of governments in improving maintenance.
A5. Project Financing Documents

Summary: Provides a brief and informative summary of some of the key components and issues involved with improving maintenance and operations of infrastructure projects. Many of these recommendations are relevant and should be built into ongoing CBWM strategies.
Appendix B

Annotated Internet Websites
Appendix B

This listing of annotated Internet Websites is included to provide users with a quick reference of some of the most innovative and progressive organizations in the international water sector carrying out research and development work involving informal settlements and/or water resources management. Similar to Appendix A, this section has loosely categorized Websites according to the following:

B1. Water Resources Management-Related Websites
B2. Water Supply and Sanitation-Related Websites
B3. Urban Environmental-Related Websites
B4. Watershed-Related Websites
B5. Other Websites

B1. Water Resources Management-Related Websites

Department For International Development (DFID)'s KAR Website
http://www.hrwallingford.co.uk/projects/dfid-kar-water.html

This website provides information on research and development projects carried out by the water sector of the Knowledge and Research (KAR) programme of DFID in the UK. It is broken down into four categories: water resources, water quality, water supply & sanitation, and water for food. The website provides search capabilities for each DFID project; each project site has an executive summary complete with a bibliography providing additional information sources. There is also a limited listing of links to other water-related British organizations, and the website includes access to a biannual newsletter.

Fraser River Action Plan (FRAP) (website)
http://www.pac.dfo.ca/pac/comp/pages/english/rap.htm **[!!!WEBSITE MOVING!!!]**

FRAP's homepage is administered and funded by both Fisheries and Oceans Canada and Environment Canada, and focuses on habitat (fish), pollution and environmental quality. Moreover, they collaborate with industry, First Nations, and concerned citizens to manage the Fraser Basin. It provides an overview of projects and reports commissioned by FRAP.

Global Water International (website)
http://www.globalwater.org/

Global Water is a non-profit NGO dedicated to the development and implementation of safe water and health-related projects in developing countries (it is located out of California). The organization focuses on (1) drilling new wells to pump clean water, and (2) purifying storage of existing water sources. The website provides an overview of all their projects.

Applying Community-Based Watershed Management Strategies to Informal Settlements
Global Water Partnership (GWP) (website)  
http://www.gwp.sida.se/

Global Water Partnership Forum (website)  
http://www.gwpforum.org/

This website was created in 1996 to translate the Dublin Water & Environment Conference's Statement into practice. The main objective is to build an international network for sustainable water management that promotes discussion, networking, information sharing and priority setting in the water community. The site is maintained by the Stockholm Environmental Institute and is supported by the UNDP. The GWP Forum website provides an extensive list of government and organizational links, and includes links to many online publications. There is also a search function for water development projects, reports and proceedings. The search output, however, is limited with only a listing of the project or document's title and a contact source for further information. The available database is limited in scope and information relating to watersheds.

International Development Research Center (IDRC) (website)  
http://www.idrc.ca/

IDRC is a public corporation created by the Canadian government to help communities in the developing world find solutions to social, economic, environmental problems through research. There is a heavy focus on resource management issues. The website is broken down into categories according to institutions, research programs, and resources. The resources section allows for searches of IDRC reports and of documents in their library. The search findings generally consist of project or document summaries with a corresponding table of contents, full text versions must be ordered through IDRC. There are a number of areas that deal directly with watershed issues, included in the subcategories of environment, biodiversity and natural resources. The IDRC online database also includes an appropriate technologies area. (See IDRC's community-based natural resources watershed project in Laos, website address is given in this bibliography under Watershed-Related Websites).

International Institute for Environment and Development (IIED) (website)  
http://www.iied.org/

IIED is an independent non-profit organization that promotes sustainable patterns of world development through collaborative research, policy studies, consensus building, and public information. Based out of the UK, the organization focuses on improving the management of natural resources to improve the living standards in the South. The website has an excellent bibliography of IIED publications and reports; and also has a search function that provides access to water resources and watershed online reports, which are downloadable (html format).
International Water Resources Association (IWRA) (website)
http://www.iwra.siu.edu/

IWRA is an international education NGO connecting professors, students, and individuals, who are concerned with the sustainable use of water resources around the world. Their focus is to expand the understanding of water resources issues. The website provides an excellent and comprehensive listing of international water organizations. It also includes a newsletter and provides updates on current events within the international water resources community.

Manaaki Whenua Landcare Research Institute (website)
http://www.landcare.cri.nz/about/index.shtml

Landcare Research is an independent New Zealand Crown Research Institute that focuses on management of land resources for conservation and primary production. Attention is given to economic, social and cultural aspects of using land as well as to understanding the ecology of natural and modified environment. The website acts as a clearing house for their reports; there are downloadable reports related to collaborative natural resources management, participatory monitoring and evaluation, multi-stakeholder catchment management, and ecological restoration in an urban environment. Although these reports illustrate the institute's experiences in New Zealand, there is application for a developing country context.

Universities Water Information Network (UWIN) (website)
http://www.uwin.siu.edu/

Universities Council on Water Resources (UCOWR) (website)
http://www.uwin.siu.edu/ucowr/index.html

Both these websites are a product of a network from over 100 universities in the US and world; they are solely concerned with water resources. Based out of Southern Illinois University in Carbondale, members of the network engage in education, research, public services, international activities, information support, and policy development. The website also offers a directory of experts, which is categorized according to specialty area: e.g. there are areas covered from acid deposition through to zoning. Included within the website are listings of other water-related sites, as well as two search engines—from the Water Resources Scientific Information Center and the Water Resources Research Institute. Both search engines are quite technically focused and concentrate on research abstracts rather than providing access to online documents.

Water Environment WEB (website)
http://www.wef.org/

This webpage is the homepage to the Water Environment Federation, an international education and technical NGO that was founded in 1928 through an endowment from the Chemical Foundation in Chicago, Ill. The organization focuses on preserving and enhancing the global water environment, and comprises over 40,000 water experts. The website serves as an information exchange point and also attempts to build alliances. The website includes weekly newsletters, conference information, discussion groups, and includes a search function broken
down according to biosolids, watershed, and industrial areas. There are no online documents available, just bulletins. There are also links to the US EPA, and the Army Corps. of Engineer's watershed resources.

**B2. Water Supply and Sanitation-Related Websites**

**CARE International (website)**

http://www.care.org/

CARE is one of the world's largest international relief and development agencies, it comprises 10 independent country organizations who make-up the confederation. Their focus is on relieving human suffering, providing economic opportunities, building sustained capacity for self-help, and affirming the ties of human beings everywhere. The website developmental information covers CARE's programs, current events, publications, and organizational information. The Health and Population Programme has a Water and Sanitation section that provides an overview of CARE's projects complete with links to related reports. The website also supports a search function that leads to numerous internet water-related and community development reports and articles (html format).

**Global Applied Research Network (GARNET) (website)**

http://www.lboro.ac.uk/departments/cv/wedc/garnet/grntover.html

Supported by the Water, Engineering and Development Centre (WEDC) at Loughborough University in the UK, GARNET was developed as a mechanism for exchanging water and sanitation information between researchers, practitioners, and funders of research. GARNET focuses on low-cost, appropriate technologies for Third World applications. The website is arranged according to networks of information: institutional sector, urban health, gender issues, wastewater management, etc.. Each of these sectors in turn has related information including newsletters, occasional papers and links. There is also a repository of abstracts available that highlight current research in the field, and a link page connecting to other UK and international water and sanitation organizations.

**IRC—International Water & Sanitation for a Healthy Future (website)**

http://www irc.nl/

IRC is an independent non-profit organization supported by the Netherlands's government, UNDP, UNICEF, World Bank, WHO and WSSCC. Their mission statement declares that, "access to water and sanitation are basic human rights", and their focus is on community-based technologies, self-governance, with integrated water resources management planning. Online resources are limited, but there is a large listing of related publications.
UNDP/World Bank Water & Sanitation Programme (website)
   http://www.wsp.org/English/index.html

This website provides an overview of the UNDP/WB's partnership water and sanitation programme; it addresses unsafe drinking water and inadequate sanitation in developing countries. The website is arranged according to 1) focus areas like rural water supply and sanitation, urban environmental management, and participation and gender; 2) what's new—publications; and 3) about the program. There are a large number of down-loadable reports and publications in either text (.txt) or Adobe Acrobat (.pdf) formats. This database can be searched and has useful documents relating to all the programme's initiatives, including community managed, watershed, infrastructure projects in low-income settlements.

Water, Engineering and Development Center (WEDC) (website)
   http://info.lut.ac.uk/departments/cv/wedc/index.html

WEDC is a leading institution in the education, training, research, and consultancy relating to planning provision and management of infrastructure in low and middle-income countries. It is based out of the Loughborough University in the UK. The website is primarily arranged according to conferences, publications, specialist activities, research, education and training, and links. The publications section has an extensive listing of online resources including down-loadable reports, book listings, some manuals, conference details, etc., these documents are available in both a text (.txt files) and Adobe Acrobat format (.pdf files). The specialist activities area deals with topics of groundwater development, institutional development, low-cost sanitation, solid waste management, urban infrastructure, wastewater, water resources and irrigation. The links section also provides a good listing of international agencies working on water and sanitation projects.

Water and Sanitation in Developing Countries (SANDEC) (website)
   http://www.sandec.ch/

SANDEC is the Swiss Federal Institute for Environment, Science and Technology (EAWAG)'s Department of Water & Sanitation in Developing Countries. It concentrates on sustainable development in less developed countries; specifically addressing water, wastewater and solid waste issues. There is also an emphasis on low-cost, appropriate technologies for water and waste projects: for example, technologies such as sand and gravel filtration and solar water disinfection are discussed and highlighted. There is a large listing of project reports and publications that will be mailed free of charge if requested, and a large listing of links to other water-related websites.

Water Supply and Sanitation Collaborative Council (WSSCC) (website)
   http://www.wsscc.org/

The Water Supply and Sanitation Collaborative Council was established in 1990 at the end of the International Drinking Water Supply and Sanitation Decade. WSSCC acts like an international NGO after initially starting from a mandate by the UN General Assembly, but now acting

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**Applying Community-Based Watershed Management Strategies to Informal Settlements**
independently from it. The website is maintained through the IRC International Water and Sanitation Centre in the UK. The website provides a network for water and sanitation professionals to exchange views, experiences and develop effective approaches to sustainable water and waste management in developing countries. The website is organized according to sector or regional working groups and then specific task forces. There are limited online resources available to non-members.

**WSSCC's InterWater (website)**
http://www.wsscc.org/interwater/index.html

This website is also maintained by IRC under the Water Supply and Sanitation Collaborative Council (see above listing), and acts as a resource for information dissemination on water and sanitation issues in developing countries. There is an emphasis on sanitation and technology, which is exhibited through a series of discussion links related to low-cost sewerage, solid waste, urban drainage, and stabilization ponds. The website also includes a listing of links to water programmes and departments in the UN and World Bank.

**WaterAid (website)**
http://www.wateraid.org.uk/

WaterAid is a UK-based charitable development organization working with partner groups to improve sanitation and domestic water supply in developing countries; it currently has projects in 12 countries. The website has a large number of research papers categorized according to women in water, community participation, children and water, and 'why work with partners?'. There are also some downloadable WaterAid reports that focus on sanitation and water in mega-cities.

**B3. Urban Environmental-Related Websites**

**FORUM: Habitat in Developing Countries (website)**
http://obelix.polito.it/forum/
http://obelix.polito.it/forum/links/

This website is an internet resource aimed at providing information to researchers and professionals working for the improvement of the built environment in developing countries, and at facilitating communications among them. The Forum is a project through the Dipartimento Interateneo Territorio and the Library Territorio Ambiente (specialized in planning in developing countries) of the Politecnico di Torino, Italy, in partnership with the School of Specialization "Technology, Architecture and Town in Developing Countries". The website includes project overviews, discussion groups, newsletters and a link page. The link website has a huge listing of information—basically a virtual library—broken down into: know-how, organization links, development information sources, regional country resources, and education and training. Under know-how there are subcategories for housing, infrastructure, environment, urban design, micro-credit, etc., each with their own separate resource pages.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Greater Vancouver Water District (website).
  http://www.gvrd.bc.ca/go/work/water.html

This website provides an overview of the GVRD's watershed management program: with an emphasis on minimizing the effects of slides, soil erosion and wildfires. The site focuses on the biophysical aspects of watershed management and the challenges that these parameters provide. It also describes the GVRD's Water Management Plan, which appears to have a limited emphasis on public involvement and input. There are links to other of the District's programs related to drinking water, conservation, water quality, etc..

Network Association of European Researchers on Urbanization in the South (N-AERUS) (website)
  http://obelix.polito.it/forum/n-aerus/default.htm

This website is a pluri-disciplinary network of researchers and experts working on urban issues in developing countries. Its primary focus is to mobilize and develop European institutional and individual research capabilities on urban issues in the South. The network is broken down into 8 activities, and each activity is principally concerned with the organization's outreach and administration. To access research one must be a member.

North-South Research Institute (website)
  http://www.eca.ac.uk/planning/cehs/ns_gen.htm#database

Based from the Centre for Environment and Human Settlements within the School of Planning and Housing at the College of Art/Heriot-Watt University in Edinburgh, Scotland; the network aims to facilitate interaction between researchers in training and teaching institutes in the field of human settlements, with a focus on developing countries. The network deals with research relating to the environment, planning, housing, architecture, infrastructure, and building technology. There are two search functions that lead to current research abstracts and key researcher links. The search engines are somewhat limited by preselected keywords, and the resulting project summaries are somewhat simplistic. The website also provides an interactive digital conference forum, as well as a small number of links to other sites.

UNCHS (Habitat) (website)
  http://157.150.118.3/home.htm

The United Nations Centre for Human Settlements (Habitat) was established in 1978, two years after the United Nations Conference on Human Settlements, held in Vancouver, Canada. The Centre serves as the lead agency for the human settlements development activities of the United Nations family, as well as for the global exchange of information about human settlements conditions and trends. Habitat's integrated programme focuses on shelter and social services, urban management, environment and infrastructure, and assessment, information and monitoring. The website contains a large resource base of UNCHS reports, press releases, publications and current events. The website also provides downloadable papers and reports.
including a listing of all the reports and abstracts from the Urban Management Programme (UMP). The UMP papers include topics of alternative waste and pollution control schemes, public-private partnerships in infrastructure provisioning, informal governance policies, NGOs and human settlements, gendered habitat, etc..

Urban Environmental Management (website)
http://www.soc.titech.ac.jp/uem/

This website is an output of the Urban Environmental Management Research Initiative (UEMRI), which was formed after the 1997 ISOCARP Congress in Ogaki Japan. The website is a virtual library of information organized according to documents & reports, insights, e-tech, urban environmental technology, links, statistics and more. There are numerous online reports available, including connections to UN departments and documents. The site focuses on information relating to sustainable cities, however there are sections specific to community participation and water resources management: for example, urban communities & participation, urban waste management, etc..

B4. Watershed-Related Websites

Alliance for the Chesapeake Bay (website).
http://www.acb-online.org/overview.htm

A comprehensive website that illustrates the programs and activities of a local community watershed initiative. The Alliance is a non-profit organization—based in Baltimore, USA—which recruits and mobilizes broad public participation in the Bay restoration area. Three programs are highlighted: watershed restoration, information outreach and public policy. A key aspect of the restoration program is building community involvement so that the citizens become the stewards of their own backyards.

California Watershed Information Technical System (website)
http://www.ceres.ca.gov/watershed/plan.html

This website is a good reference point to jump to other websites. It is broken down according to: local community involvement, preparing a watershed plan, and management practises. The website is also directly related to the California Coordinated Resource Management and Planning Handbook, which provides a community participation 15-point framework for resource management.

Center for Watershed Protection (website)
http://www.pipeline.com/~mrrunoff/

The Center for Watershed Protection is an American national organization that acts as a technical resource for local and state governments, watershed organizations, and the general public (based out of Elliot City, MD). The organization focuses on providing objective and scientifically

Applying Community-Based Watershed Management Strategies to Informal Settlements
sound information on effective techniques to protect and restore urban watersheds. This work includes performing research on effective methods for watershed protection and restoration, identification of environmental indicators, innovative erosion control methods, urban manuals, technical outreach, and watershed public education. The website provides numerous online technical resources including access to current projects, ~6 web-based reports on urban watershed issues, publications list, and a web-based link page to other water-related organizations.

Global Rivers Environmental Education Network (GREEN) (website)  
http://www.igc.org/green/

This website is an American-based network linking educators from over 135 countries. The primary objective of the website is to improve education through a global network that promotes watershed sustainability. The site includes many links to watershed area groups (mostly in the US and Canada), and provides educational links that focus on aquatic sciences for teachers.

International Development Research Center (IDRC) (website)  
http://www.idrc.ca/cbnrm/program/namngum/index.htm

This website provides links to all IDRC water-based projects and in particular describes a case study project in Laos. Two areas of particular interest addressed in the case study are community-based natural resource management, and watershed resource conflicts. The case study provides a concise overview of their findings, sources of conflict and recommendations. (Find IDRC's homepage address in above section under Water Resources Management-Related Websites).

Streamkeepers Program (website).  
http://habitat.pac.dfo.ca/pskf/home.htm

The Streamkeepers' program is a non-profit organization jointly run by Department of Fisheries and Oceans Canada and the Fraser River Action Plan. Basically the program fosters and serves as a resource center for communities who are interested in restoring and protecting their local streams. There is a listing of community handbooks and resources available from government and NGOs, as well as a listing of communities who have set-up websites with their CBW programs in BC.

Tijuana River Watershed Project (web site).  
http://typhoon.sdsu.edu/tiwater/homepage/tiwnet.html

This website provides an overview of a transboundary GIS-based watershed management project for the Tijuana River in Mexico. A good bibliography for GIS-based management references is provided.
US Environmental Protection Agency (EPA), Office of Water (website).
http://www.epa.gov/OW/

US EPA's Urban Watershed Management Branch
http://www.epa.gov/ednnrml/projects/main.htm

The EPA's Office of Water website provides the organization's mission, goals, progress, challenges and structural make-up concerning their water policies. The website includes a publications area, education and training area, laws and regulations area, as well as an environmental link page to other water organizations. There is also information that provides a watershed management framework that breaks community-based watershed into: partnerships, geographic forms, and sound management techniques based on strong science and data. Most of the available information on the website is technically based, and specific to the US. The Urban Watershed Management Branch's website provides lots of technical information on modelling, recent research, conferences, and strategies to mitigate NPS pollution. There is a large publications resource base, however most of the watershed documents are outdated (originating from the 1980s). The website also contains a huge link page to other sites, organized according to: hydrology, enforcement, GIS, groundwater, NPS, treatment, wetlands, etc.

Watershed Management Council (website)
http://watershed.org/wmc/

The Watershed Management Council is a non-profit educational organization dedicated to the advancement of the art and science of watershed management, based out of Humboldt State University in California. The website acts as both a repository of information and a forum for exchanging information, research, training, and experiences between researchers and the public. The website provides access to a quarterly newsletter, and also has a searchable database based on 18 categories. The information is focused mainly on the geosciences of watershed management.

B5. Other Websites

Cornell PAR Network (website)
http://www.parnet.org/home.cfm

An excellent database and search engine for current participatory action research books, journals and reports: with an excellent inventory of community-based resource management reports (including water). Allows the user to either order a book or journal, or provides a link to a shareware ftp file copy of the report. Also provides a thorough link page to other PAR related websites.
IID21 Development Ressearch Reporting (website)
http://id21.org/

An excellent website that lists the latest and best UK-based development research. Supported by the UK’s Department for International Development, this site provides research summaries from over 40 research centres, aid and international agencies, including conference papers. The website has a news section, an easy to use search engine, and a large link page to other sites and resources.

Overseas Development Institute (website)
http://www.oneworld.org/odi/index.html

ODI is Britain's leading think-tank on international development and humanitarian issues; their mission is to inspire and inform policy and practice which lead to a reduction or alleviation of poverty and more sustainable livelihoods. Their website includes a publications section which has some online articles (including pdf files); a listing of 5 categorized research and policy programmes (including rural policy and environment); a library for borrowing books and articles (with restrictions); a network and forum section describing what is going on; and a search engine which is slow.
Appendix C

Case Studies Illustrating Community-Based and Environmental Strategies for CBWM
Appendix C serves as a cursory overview to illustrate a few of the progressive and promising Community-Based Strategies and Environmental Strategies applicable to CBWM that emerged from the case studies reviewed for this Resource Book. These strategies complete the last two of the three subsections identified for CBWM strategies (the other subsection is Planning and Administrative Strategies which is discussed in detail in Section 3 Urban CBWM Strategies).

Each one of these two strategy subsections is further categorized to highlight the activities and issues (identified from the developmental literature) needing consideration for successful CBWM initiatives. These strategy categories are illustrated below and will be used to organize the case studies in this appendix. An effort was made to include at least one illustrative case study for each subsection category. The format for this appendix consists of a series of boxes, which summarize key points of selected case studies and illustrate concepts applicable to CBWM.

C1 Community-Based Strategies
C1.1 Role of Other Stakeholders
C1.2 Gender and Development: The Role of Women
C1.3 Social Intermediation
C1.4 Community Selection and Mobilization
C1.5 Community Management
C1.6 Community-Based Design
C1.7 Community Watershed Assessments
C1.8 Community and Sustainability

C2 Environmental Strategies
C2.1 Defining Community Land Use Areas
C2.2 Rehabilitation of Residential Areas
   C2.2.1 Water
   C2.2.2 Sanitation
   C2.2.3 Solid Waste
   C2.2.4 Drainage
   C2.2.4 Other Environmental Considerations
C2.3 Conservation and Protection of Resource Appropriation Areas

C3 References
Appendix C  Case Studies Illustrating Community-Based and Environmental Strategies

C1 Community-Based Strategies

Community-based strategies are primarily geared towards facilitating and developing the skills and resources needed for community management. Therefore, community-based strategies deal with building a process whereby community residents and other support organizations are empowered to design, implement, manage, and sustain CBWM initiatives.

C1.1 Role of the Other Stakeholders

Box C.1
UNICEF's Urban Basic Services (UBS) Programme in Guatemala City

In the early and mid-1980s, UNICEF developed and implemented a number of their Urban Basic Services (UBS) Programmes in developing countries, including one in Guatemala City, Guatemala. The programme focussed on community-driven enabling strategies; what began as a health programme quickly grew into other projects and sectors including economic development, water and sanitation, education and social mobilization, and housing and urban improvement.

UNICEF was instrumental in the creation of a new government committee, called COINAP, comprised of various related informal settlement stakeholders—in inter-governmental ministries and municipalities, community organizations, local universities, NGOs and international agencies. The organizational framework used for the health programme became the foundation for all the following initiatives.

♦ Health Programme. The health programme was innovative in a number of ways: most notably in participation and outreach. It was observed that informal settlements had naturally organized into small micro-zones consisting of approximately 50 families. Each micro-zone elected one community health promoter, who later became known as reproinsas. These volunteer reproinsas were instrumental in the development and monitoring of the health care programme. They received training over an 18 month period and were responsible for: performing a physical survey of their settlements identifying hazards and available resources; meeting with technical teams to discover causes and engineer solutions; collecting medical information of all individuals in their community; developing a work plan of action; educating community members about health issues; vaccinating children and maintaining health records.

♦ Economic Development Programme. After the Health programme was underway it was clear that the volunteer reproinsas could not maintain their involvement with no way of supporting themselves. Therefore, an economic development programme was developed: community pharmacies, grocery stores, and laboratories were opened in the communities and provided the reproinsas with enough income to continue their volunteer work and to support new initiatives in the communities. By the end of 1991, there were 17 income-generating projects in 7 different communities.

♦ Water and Sanitation Programme. As health and sanitation awareness grew in the communities—primarily through the education and outreach of the reproinsas—there was a growing need for water and sanitation projects. A consultant was hired by COINAP to work with community groups and two models were developed for water distribution—based on supply from a tank and a well. Both were administered and managed by community committees who were responsible for the collection and payment of fees. The sanitation aspect of the project revolved around volunteers who received basic environmental sanitation training.

Source: (Espinosa 1994)
Box C.2  
An NGO's Experience: IDRC's Natural Resources CBWM Project in Nam Ngum, Laos

A Canadian NGO, International Development and Research Centre (IDRC), implemented a community-based natural resource management project to resolve watershed resource conflicts in Nam Ngum, Laos in the late 1990s. Based on their experiences they recommended the following strategies to employ in future projects.

**Recommended Strategies:**

- Avoid a generalized approach to watershed management;
- Use local knowledge and participation of communities and local authorities;
- Need to develop conflict pre-emption and resolution procedures;
- Include more participatory impact assessment procedures for externally conceived projects;
- Resolve ambiguity of both individual and community resource tenure, as it is a basic source of competition;
- Provide district-level government staff with support—both technical and organizational;
- Clarify ambiguities in government policy; specifically defining rights and duties regarding resource management planning and enforcement measures; and
- Recognize potential sources of conflict, including:
  - Between and within communities: ethnicity, proximity, old and new settlers, etc.;
  - Between different topographies: upland/lowland, or upstream/downstream;
  - Between sectors: resource, subsistence/commercial; and
  - Between levels: national development ➔ local livelihoods.

Source: (IDRC, 1999)

C1.2  Gender and Development: The Role of Women

Box C.3  
Women as Community Managers: Guayaquil, Ecuador

A case study with a spontaneous settlement in Guayaquil showed that the role of women in the management of community affairs affecting the environment, infrastructure, and social services was critical. Women were found to be more effective and motivated as community mobilizers. Even given their hardships of additional work with childcare, employment and other household work, women were the motivators and organizers who mobilized community support, initiated self-help improvements, and petitioned government officials for services. It was found that while men were often engaged with political activities related to personal prestige, promotion of their businesses and/or direct profit, women were more concerned with improving the living conditions of their families.

Source: (Moser 1987)
Box C.4
A Word about Gender Analysis

Often the first step toward determining appropriate measures for supporting women's participation is to obtain good information about gender roles, needs, activities, access to and control over resources, existing institutions, and the constraints operating against women's participation. This can be done through gender analysis, which, if effective, elicits the views of women and often involves gender awareness training for facilitators or interviewers. Gender analysis (GA) leads to the formulation of a gender strategy that addresses practical gender needs (roles and responsibilities) and strategic gender needs (systemic issues of equity and empowerment). Effective gender strategies pay particular attention to resource allocation at both household and community levels.

Therefore GA is seen as a method to better understand, document, and plan for differences in gender roles, activities, needs, and opportunities according to each context. It can involve a multitude of techniques that disaggregates quantitative data according to gender and can be used to highlight differences associated with culture, class, ethnicity, income, education and time. Gender analysis takes into account women's roles in production, reproduction, and management of community and other activities. There are generally five sources of information which comprise gender analysis (World Bank 1996):

- needs assessment;
- activities profile;
- resources, access, and control profile;
- benefits and incentives analysis; and
- institutional constraints and opportunities.

In the crafting of potential CBWM initiatives, GA may be instrumental in identifying gender-based differences which negatively affect development intervention outcomes. Accordingly, GA may be used to mitigate effects which unfairly burden women's roles in production, reproduction, and the management of community and other activities. Therefore, GA can be a strategy for ensuring project goals of representation, equity, and that access to resources are reaching all their intended beneficiaries. It can also be used as a method for sensitivity training for external project staff and aid in the crafting of training strategies.

Evidence suggests that to be effective gender analysis must be treated as a companion to the development process, not simply an add-on. This entails incorporating GA throughout the project management cycle: from policy formulation to community goals setting to monitoring and evaluation. Accordingly, gender components and strategies during project or policy design should be explicitly highlighted for each stage of the management process.

Source: (World Bank 1996)
Box C.5
The Empowerment Approach to Social Intermediation for CBWM

There are generally two types of outreach associated with social intermediation: the extension approach and the empowerment approach. The extension approach is more top-down, where NGOs or support agencies are usually involved in sector specific projects which focus more on funnelling information and resources rather than creating a process that enfranchises community management. The empowerment approach is much more in line with the principles and goals commonly associated with CBWM.

The empowerment approach concentrates on community organization, empowerment, and capacity building for self management. This approach requires support agencies to initially invest more time and resources until community capacities are sufficiently built up or enabled. The empowerment approach to social intermediation is therefore seen as a process whereby community groups eventually inherit and take over all the roles and responsibilities of the support agencies. The following aspects of the empowerment approach highlight the key roles and principles for support agencies and field workers to adhere to during the development process.

- Defining the purpose of outreach—empowerment;
- Nature of the task—active community involvement;
- Role of the field agents—as facilitators, catalysts and organizers for empowerment;
- Identifying needed skills and characteristics of field agents—generally the most important skills are their ability to motivate and work with communities to diagnose problems and organize to solve them through coordinated group action;
- Defining who controls which decisions—initial conditions are with the executing agency and this is replaced where the control over management details are left with the community;
- Clarifying the role of information—mass media is typically used as a complement to interpersonal exchanges to publicise the availability of the program and to establish transparency;
- Establishing accountability—agents are accountable to community groups; and
- Defining performance outcomes desired at the community level—key outcome is that community groups have organized for self management and show increased capacity for coordinated action.

Source: (Narayan 1995)
Box C.6
A Menu of Methods for Participatory Rural Appraisal (PRA)

Participatory Rural Appraisal (PRA) is a series of techniques that support agencies can use to work together with communities to plan and implement programs. PRA is a move away from extractive survey questionnaires and techniques and towards participatory appraisal and analysis in which local participants are active in carrying out activities. PRA is a growing family of approaches and methods to enable local people to share, learn, enhance and analyze their knowledge of life and conditions. While PRA started out as a tool for rural areas, it is increasingly being adopted and modified for use in urban centres.

PRA borrows from:

- Activist participatory research which includes participatory research, and Participatory Action Research (PAR)—focusing on awareness raising and empowerment;
- Agroecosystems analysis which looks at agroecosystem properties of productivity, stability, sustainability and equitability, borrowed from Rapid Rural Appraisals (RRA) including transecting, informal mapping, diagramming, innovation assessment;
- Applied anthropology which looks into community members knowledge and ability to assess outsiders and insiders influences—highlights the role and influence of the field researcher;
- Field research on farming systems which highlights how farmers experiment and innovate, contrary to scientific schools; and
- Rapid rural appraisals which refers to a philosophy, approaches and methods for rural research, planning and analysis (Boehmer 1997).

PRA focuses on key variables to optimize data collection and triangulation using a diversity of information techniques and sources. Some of these techniques and methods are briefly described below.

- **Secondary data**—search existing information sources;
- **Direct observation**—observing community activities and interactions (ideally while being aware of personal biases which may affect observations);
- **Seek community experts for input**—locating those community residents who may have specialized knowledge or insight regarding community skills and behaviour;
- **Probing questions to identify key issues**—ask lead-in, open-ended questions to elicit community coping mechanisms and interrelationships;
- **Household case studies**—study specific crisis instances and determine how it was addressed and resolved;
- **Group interviews**—the nature and degree of group interviews is broad with either formal or casual processes employing numerous techniques;
- **Do-it-yourself**—where residents are the experts: teaching and supervising outsiders who participate in daily community activities;
- **Mapping and modelling**—participatory mapping and modelling has many different approaches from more formal bioregional mapping techniques to informal drawing and colouring on the ground using sticks, seeds, and stones. Maps and models can be instrumental in identifying biophysical, social, health or demographic issues; they can be used as an educational device for the larger community. Maps can be used to display available resources, or as topic maps (for water, soils, trees, etc.), or for service or opportunity maps, or as three-dimensional models of watersheds, etc. Mapping and modelling have been used to illustrate other PAR techniques like well-being rankings, transects, and linkage diagrams;
- **Local analysis of secondary sources**—where residents analyze and assess secondary information sources likes maps, photographs, reports, etc;
Box C.6 (Continued)

- **Transect walks**—systematically walking with key informants through an area while observing, listening, asking, discussing, and learning about issues. Transect can complement other PAR techniques like direct observation, resource inventory mapping, key probes, etc;
- **Timelines and trend and change analysis**—chronologies of events are recorded, listing major local events with approximate dates;
- **Seasonal calendars**—where events and activities are recorded according to specific times of the year: for example, the distribution of days of rain; amount of rain; crops and patterns; women's, children's, and men's work;
- **Daily time use analysis**—this analysis provides a daily activity profile or a day-in-a-life snapshot for an individual or family including relative amounts of time for activities and their degrees of drudgery. Ideally, an analysis will disaggregate by gender, class, socio-economic standing, age, etc;
- **Institutional or Venn Diagramming**—are used to categorize people into specific groups and determine the community power structure of individuals or institutions and in the process highlight patterns of influence and relationships;
- **Linkage diagrams**—are used to link flows or connections between actions and reactions;
- **Well-being grouping (or wealth ranking)**—are used as a means to group individuals or households according to local criteria (normally wealth or status) and determine who are the leaders and the followers. Serves as a lead-in to discussions regarding livelihoods of the poor and how they cope;
- **Matrix scoring and ranking**—can be used for a multitude of activities and gauges a group's preference and/or performance with regards to a specific activity or for comparing different variables like soil and water conservation techniques, etc;
- **Team contracts and interactions**—involves the use of contracts by teams (between local people and/or outsiders) for a given activity where there is agreement on the norms of behaviour, modes of interactions within teams, or actions to be taken, etc;
- **Shared presentation and analysis**—where maps, models, diagrams, and findings are presented by local people and/or outsiders and discussed, checked and corrected with the larger community, especially at community meetings;
- **Contrast comparisons**—a technique that comparatively assesses events or issues, normally according to specifically segregated groups. This technique is particularly used in gender analysis where men are asked to analyze how women spend their time; and
- **Drama and participatory video making on key issues.**

Source: (IIED 1999)

Box C.7

**PRA and CBWM: Potential Key Areas to Focus on**

The following list illustrates some potential key areas that might be addressed during a PRA process on a CBWM project:

- Environmental constraints or problems, like flooding, water supply or water quality issues;
- Human activities or land uses that are perceived to be affecting environmental health;
- Institutional issues, such as effectiveness of laws/regulations or enforcement capabilities;
- Human issues, such as environmental awareness, educational opportunities or population pressures; and
- Economic issues, such as relationships between local socio-economic development and the watershed environment.

*Applying Community-Based Watershed Management Strategies to Informal Settlements*
Box C.8
Participatory Techniques Used to Determine Demand: A Case Study in Lao PDR

In 1997 a World Bank-financed water and sanitation project (in the provinces of Phongsali and Oudomxai) was carried out to use participatory techniques to determine health and hygiene awareness among poor, isolated communities and assess their needs. These resulting dialogues with communities drew from participatory rural appraisal (PRA) and participatory hygiene and sanitation transformation (PHAST) methodologies. Some of the techniques used were as follows:

- Community history profiling (time line);
- Wealth classification (criteria for identifying the poorest);
- Gender analysis of task roles: household and community level;
- Social and natural resources mapping;
- Community participation profile in past development projects;
- Priority problems of villagers;
- Health awareness assessment;
- Hygiene awareness; rationale for existing behaviours;
- People's perception of routes of fecal-oral contamination in the community;
- People's perception of ways of blocking contamination routes;
- Water supply ladder (existing water system and menu of options with associated costs and levels of services);
- Sanitation ladder (similar to water supply ladder);

Source: (Maniphousay 1997)

Box C.9
Workshop-Based Methods Used by the World Bank

Workshop-based methods—also called "action-planning workshops—are used to bring stakeholders together and work collaboratively to design development projects. A trained facilitator guides the process and uses techniques to build consensus. Three methods advocated by the World Bank include: Appreciation-Influence-Control (AIC), Objectives-Oriented Project Planning (ZOPP), and TeamUp.

Appreciation Influence Control (AIC)

AIC is both a process and philosophy that focuses on power dynamics to gain a clearer understanding of the development process. It is used as a strategy to help participants identify a common purpose and recognize the range of relevant stakeholders, and it is used as a supportive environment to work collaboratively. The activities concentrate on improving appreciation through listening, influence through dialogue, and control through action.

Objectives-Oriented Project Planning (ZOPP)

ZOPP is a project planning and management process that principally uses two methods—matrix building and stakeholder workshops. Through a series of iterative workshops participants come together to set priorities and plan for implementation and monitoring, ideally throughout the life cycle of the project. The bulk of the workshop sessions focus on building a project planning matrix (similar to a logical framework) which articulates the activities, desired results and the conditions necessary for success. The activities involved during the development of the matrix include five aspects: participation analysis, problem assessment, objectives setting, alternative generation, and assumption analysis.

TeamUp

TeamUp is a flexible, team-oriented, workshop approach for improving both the substance and process of project management. It is designed to be more accessible for institutional use and builds on the benefits of ZOPP. The TeamUp process is broken down into a series of 12 modules that focus on strengthening essential management skills (starting from team cohesion activities and ending with action-related skills building).

Source: (World Bank 1996)
Box C.10
Community-Based Methods Used by the World Bank

Community-Based methods—also referred to as collaborative decision-making—are used as a means to support and build participatory processes with local people to design development works. In this case, local knowledge is emphasized and outsiders are there to learn and catalyze the process. There are two principal techniques widely employed by the World Bank: participatory rural appraisal (PRA) and SARAR (self-esteem, associative strength, resourcefulness, action planning, and responsibility).

Participatory Rural Appraisal (PRA)

Evolving primarily from rural rapid appraisals (see Box C.6 for more information), PRA is a menu of participatory approaches and methods that can be used in both urban and rural settings to enable local people to make their own appraisals, analyses, and plans. The main purpose for PRA is to facilitate stakeholders and local groups to work together to plan programs suitable for their communities. The methods typically associated with PRA include the following: semi-structured interviewing, focus group discussions, preference ranking, mapping and modelling, and seasonal and historical diagramming.

SARAR

SARAR is a participatory approach that seeks to utilize local knowledge and build upon local capacities for self-management. The approach specifically targets training of local personnel in a way that emphasizes a) multisectoral and integrated planning, b) the importance of using local knowledge, and c) empowering participants. SARAR focuses on creating a supportive, non-hierarchical environment for people to participate and share their life experiences, perspectives, and feelings, through a series of flexible activities. The key attributes in nurturing participation involve self-esteem, associative strength, resourcefulness, action planning, and responsibility.

Source: (World Bank 1996)

Box C.11
Stakeholder Consultations Used by the World Bank

Stakeholder Consultation methods—are used as a means to obtain feedback (through consultations with different stakeholder groups) and make development interventions which are ideally more responsive to demand. Two methods are widely used by the World Bank: Beneficiary Assessment (BA), and Systematic Client Consultation (SCC).

Beneficiary Assessment (BA)

BA is a systematic method for incorporating beneficiary concerns into project and policy formulation. The two general purposes for BA are to give a voice to the poor (and other underrepresented individuals that an intervention is intended to reach), and to obtain feedback about interventions. BA commonly uses in-depth interviews, focus groups, and direct observation as its principal sources of information. Generally, BAs are carried out by locally trained people and are used for problem identification during the project cycle and also used to carry out poverty assessments for poverty reduction strategies.

Systematic Client Consultation (SCC)

SCC is a set of tools to improve communication between stakeholders and service providers with the principal aim of improving demand-side management. SCC involves three steps: systematic listening to clients' attitudes and needs (consultation), developing a process of continuous communication (action), and incorporating client feedback into project and policy designs (follow-up). SCC normally utilizes surveys, community surveillance, BA, and PRA.

Source: (World Bank 1996)
C1.4  Community Selection and Mobilization

**Box C.12**

**Commentary on the Prerequisites Considered for Community Mobilization**

The incentives for communities to participate in a development initiative are many fold. Each community will have its own catalysts and possible reasons for wanting to participate. For some communities, any contact or support provides a certain amount of validation and encourages involvement as isolation breeds vulnerability for residents who are squatting illegally. For other communities, there may be so much animosity with local government authorities that it may take outside agencies to act as intermediaries to bridge the gap of mistrust. These external agencies may use a multitude of methods for beginning the trust building process: from interactive dramas to skills and training workshops.

To gauge the effectiveness of external intervention some international agencies have developed a set of criteria to consider before any community group is considered for selection on a development project. These criteria are considered prerequisites for successful community groups (Narayan 1995).

- The group must address a felt need and a common interest;
- The benefits to individuals of participating in the group must outweigh the costs;
- The group should be embedded in the existing social organization;
- Leadership;
- Knowledge and skills to manage the tasks; and
- The group must own and enforce its own rules and regulations.

C1.5  Community Management

**Box C.13**

**Pilot Projects: The Experience from the Orangi Pilot Project (OPP), Pakistan**

One of the most illustrative cases to show how pilot projects can serve as a catalytic step in the community development process is the Orangi Pilot Project (OPP) in Pakistan. The project was initiated by a small amount of external funding and grew from a desire to promote community self-help and to provide sewerage systems in the squatter communities of Karachi. They were able to inform the residents of the link between health and poor sanitation which resulted in a community-led program that grew to provide sanitation services to over one million people for one-eighth of conventional costs. As community groups better mobilized their resources (and became more enfranchised) they became more effective at lobbying the municipality for support and expanded their development process beyond the sanitation pilot project, to include: housing upgrading, basic health and family planning, income generation and training for women, micro-credit programs, and basic education.

Source:  (Khan 1992)
Box C.14
An Illustrative Governance Structure for CBWM

The following figure demonstrates what a local community-based management structure may look like and how it would tie into a larger watershed management framework.

Communities would form a local environmental management committee to deal with pressing issues like water and sanitation (there could be numerous committees, e.g. one could be formed for the administration of a communal fountain). The community would also elect a representative for a subwatershed (or zone) management committee, this committee would feed into a larger or municipal watershed committee and would assist and coordinate the different community committees (these committees could also serve as an intermediary between communities and public utilities or NGOs, etc.). These municipal watershed committees would in turn feed into a basin, city or state watershed steering committee, which ultimately reports to an overarching state department or collaborative inter-agency body formed to specifically oversee and implement the watershed management program. An illustration of this governance structure is provided below.

[Diagram of governance structure]

Applying Community-Based Watershed Management Strategies to Informal Settlements
Box C.15
A Revolving Fund: A Case Study in Rufisque, Senegal

In a community-based urban environmental project in nine low-income communities located in Rufisque, a community revolving fund called FOCAUP (community fund for sanitation in low-income districts) was established. The fund was responsible for the management and mobilization of local savings within the communities. Initially, the assets for the fund were provided by international organizations. Typically residents would apply for a subsidized or low interest loan to invest in an improved sanitation system. FOCAUP also established a trust fund that could be used to finance other local environmental and public health initiatives. FOCAUP was guaranteed by a local management committee and allowed any household, community, or local authority to apply for credit involving a household level sanitation system.

Once established, the fund operated on repayments from previous loans and by popular savings which accounted for the majority of the fund. The financial specifics for the projects generally consisted of the beneficiaries contributing 30-70% of the capital costs of the sanitation system; they also financed infrastructure maintenance and 50% of the depreciation of the materials.

Experience from the revolving fund showed that repayments were assisted, since benefits were highly visible and quick in coming. Repayments were also assisted by the fact that the fund was financed by the community itself, through loan agreements between households and representatives from the local management committee. There were also benefits when people were educated with the knowledge that their repayments would enable others to receive credit to fund initiatives. Repayments were also encouraged with low overhead costs, especially when these costs were shown to be decreasing. During the first four years of this project, cost recovery levels increased from 32% to 67%, and management costs were reduced to 8%.

Source: (Gaye 1997)

Box C.16
Illustration of How A Community Revolving Fund Could Operate

The following describes how a hypothetical revolving fund could be operationalized for CBWM. Initially a community watershed committee would be granted in-kind credit. The committee would decide on how beneficiaries would be eligible to apply for a loan or line of credit (these funds would be prioritized, at least partially, to address environmental management factors that would be directly related to watershed health). Once a request is made from a potential beneficiary, it will need to be endorsed by a chair person and the treasurer of the committee. Conditions of the credit line could involve:

- No collateral (could be a collective endeavour, therefore distributing liability);
- Applicant must sign an agreement;
- Beneficiaries decide what they are capable of repaying within agreed time limits;
- Commitment is done in their peers' eyes;
- Revolving fund reinvests 10% of capital directly into watershed related projects; and
- Options are provided to those with no credit, collateral, or legal tenure.

Source: (Menéndez 1991)
Box C.17
Alternative Community Financing Option: Local Exchange Transfer System (LETS)

One such alternative local currency system which has been promoted for use in low-income communities for water and sanitation projects is a LETS system. It is a type of registered barter system where two parties negotiate on the terms of exchange for goods and services, where the LETS currency is part of a mutual credit system. The larger the number of participants in the system, the greater diversity of services there will be available to pay for specific services (like capital or operating costs for water or sanitation) or exchange for other goods and services. A LETS system of trade is known to improve cooperation and encourage trade inside a community.

The additional advantages of a community LETS system for a development project are four-fold: to overcome the chronic lack of start-up financing for projects; to provide a viable option for the 'poorest of the poor' who may be willing to pay for services but not have the means to pay money; to provide families who are experiencing temporarily financing problems with a cushion where they can run up a debt; and to create a local community finance system that recycles money, goods and services in the community.

Other forms of alternative local currency systems which may be appropriate for use with CBWM include Robust Complementary Community System (ROCS), Time Dollar Service Exchange, and Ithaca Dollars. These systems are all similar to a LETS system in many ways, but differ in that they use hours as the unit of account and vary slightly in how they are implemented and applied. For example, a ROCS system charges a demurrage fee on any accounts—that have either a credit or debit—to encourage a quicker recycling of resources.

Source: (Transaction Net 2000)

C1.6 Community-Based Design

Box C.18
Community-Based Urban Environmental Management in Rufisque, Senegal

Rufisque is a small township on the outskirts of Dakar that had serious water, sanitation, and solid waste collection problems. In 1991, with the help of an international NGO and external funding, an integrated community-based development project was initiated in nine low-income communities. The key aspects of the project involved community-controlled low technology, job creation (primarily targeted at youth and women), development of a revolving fund, and partnerships with NGOs and other agencies to address problems for the provision of water, sanitation, drainage and the collection of solid wastes in low-income communities. The resulting plan adopted a holistic approach whereby:

- garbage was collected using horse-drawn carts (a common form of transport);
- waste water and sewage used a network of low-cost narrow plumbing pipes;
- sewage, waste water and garbage all arrived at a community-run (youth employed) purification and recycling centre;
- aqua-biotic purification system used local water lettuce; and
- compost was sold to market gardens.

Achievements included:

- Cost of drainage and sanitation systems were respectively 5 and 3 percent of conventional systems;
- Most of the funding came from the community (initial credit was from international funders, maintenance and operation based on a local revolving credit system);
- Rate of repayment for small-scale private sanitation credit loans was 90 percent. (see section 7.2 for more details);
- Women and youth were active at all levels of project phases; and
- No external technical expertise was required.

Source: (Gaye 1997)
C1.7 Community Watershed Assessments

Box C.19  
Some Key Points to Keep in Mind for Performing a Community Watershed Assessment

Rather than discussing what constitutes a community watershed assessment or how it may be carried out (the management tasks and activities for a Community Watershed Assessment are illustrated in Section 2.3.2 Designing CBWM Stage), this box provides an overview, or checklist, to illustrate some of main concepts and principles that need to be highlighted for performing a community watershed assessment.

There are a number of excellent sources for listing and detailing the different aspects of an integrated watershed assessment; these sources typically are quite technically focused detailing the different options for assessing the condition of surface water, groundwater, soil, aquatic and terrestrial resources, and land use patterns. Experience dictates that there must also be an equal emphasis on the socio-economic and institutional factors that have a critical effect on a watershed’s health.

A community watershed assessment is a systematic procedure for characterizing physical, biological and human processes active within a watershed, their distribution, history and inter-relationships. It provides information to move from identification of issues to the development of planning and/or community solutions. Ideally it should link land-use, management decisions, and environmental impacts, address cause-effect relationships in a spatial context; aim to understand trends in human activities and land-use and environmental conditions; integrate field analyses; and aim to understand relationships between institutions actions and land and water use characteristics.

A community watershed analysis should answer the following questions (Boehmer 1997):
• how does the landscape work?
• how does the community work and function?
• what has happened in the past?
• what are the current conditions?
• what are the trends in watershed conditions?
• how sensitive is the watershed to future water and land management options?

There are a host of techniques and methods which can be used during a community watershed assessment, many of these include participatory procedures discussed in other sections of this Resource Book; for the range of specific integrated watershed assessment tools, techniques and methods, the reader is encouraged to refer to the sources in Appendix A: Annotated Bibliography.

Points to emphasize during a Community Watershed Assessment:

Consistency  
Each community watershed will be nested into a larger regional watershed, and that into a sub-basin, and that into a river basin. There is a need for consistency with larger watershed plans, where community watershed plans are nested into and fit together with larger ones.

Scale of an assessment  
The scale of an urban watershed plan is extremely important since most plans are considered at too large a scale. The Centre for Watershed Protection recommends planning at the subwatershed level which is defined between 5 to 15 square miles. This should be taken into account when considering where and how a community defines itself. Therefore if a community considers itself too large then the layers of complexity expand proportionally—too many stakeholders and too many causes can slow a plan to a stand still—making it difficult to monitor and map at any meaningful scale (Schueler 1995).
**Box C.19 (Continued)**

What to include on a map

To put the community watershed in context it is helpful to develop an integrated resource map that may include the following: catchments, steep slopes, floodplains, stream buffers, wetlands, forest conservation areas, parks, open spaces, existing development, future zoning, restoration projects, monitoring stations, etc.

Interdisciplinary approach

The integration of findings is critical to understanding the inter-relationships which determine the cause and effect linkages. Therefore, analyzing disciplines in isolation is a typical fault and obstacle to overcome. That is a major benefit of using a community watershed assessment because it serves as a node and focal point for collaborating and working across disciplines and sectors—through sharing and joint critical analysis and looking for interrelationships. This combined with the logical pathway of the hydrologic cycle helps to mitigate isolation and promote critical thinking among the data gatherers and analyzers.

Technical tools

Beyond the participatory techniques included in this Resource Book, there are some technical tools associated with Integrated Watershed Management which may be useful in analyzing data sets and providing some insight into the interconnections between management actions and health impacts. These include: GIS, which can spatially analyze data sets; alternative pathway analysis models, time sequence of change, hierarchal frameworks and trade-off analysis have been used for IWM in the past (Boehmer 1997).

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**C1.8 Community and Sustainability**

**Box C.20**

**Scaling Up Successful Participatory Watershed Development Projects: Case Studies from India**

This box summarizes the experiences of a series of participatory watershed projects carried out through the Indo-German Watershed Programme (IGWP) in over 74 watersheds in the district of Maharashtra, India.

These projects found that there were problems associated with scaling up small, successful participatory watershed management projects. Once a successful blend had been developed, its replication seemed to have to follow the same arduous path for each successive village. When initiatives were implemented on a wider scale (like many government sponsored approaches) they often lacked local ownership and group coherence required for more sustainable management. The experiences with IGWP concluded that projects needed to determine the factors necessary for scaling up and these must be integrated into the design of projects from the beginning.

Some of the conditions that were identified to be important for replicating and scaling up successful projects included the following components to be built into the project design (Farrington 1997):

- creation of a long-term vision for what constitutes permanent improvement in the conditions of the intended beneficiaries;
- creation of a mechanism to closely engage stakeholders at each stage of the planning and management process;
- creation of a local watershed planning methodology which is defensible to funding agencies;
- creation of a governance framework for collaboration between stakeholders;
- creation of a mechanism for channelling funds directly to local organizations; and
- creation of a mechanism for promoting the approach across major political and administrative boundaries.
C2 Environmental Strategies

Environmental strategies are used to provide a range of specific methods and tools which are available to successfully address urban environmental problems and which could be used for CBWM. These strategies primarily illustrate appropriate technologies (and other methods) that urban managers and community managers may use, or generate ideas from, to mitigate specific environmental issues (for example, problems related to water, sanitation, drainage, solid waste management, etc., within informal settlements).

C2.1 Defining Community Land Use Areas

Box C.21
A Word About Geographic Information Systems (GISs)

Geographic Information Systems (GISs) are increasingly being used and promoted for watershed management. A GIS is a rather complex tool that allows a trained technician to input and manipulate geographically explicit data. It also supports a geographical analysis of most of the problems in environmental management. Once created GIS maps can be used to overlay with future development scenarios or assist in the development of management strategies to mitigate continued or worsening environmental conditions.

In developing countries, GIS has become the backbone of land development and urban planning and management and increasingly used by regulatory agencies. One of the problems with GIS systems for peri-urban areas and/or informal settlements is that it requires good and comprehensive data sets; this is rarely the case in most Third World cities. Another main criticism for using GIS on CBWM is that it is non-participatory and bottle-necks information for decision-makers who must rely on a technician who inputs, analyzes and then displays the available data. To this end, there are new advances promoting collaborative GIS technologies which aid environmental management. But these technologies require even more money and training and skills to effectively use.

Therefore, depending on the available resources, there may need to be an emphasis on lower-technological options to assist in the delineating, identification, and analysis of geographical watershed and land use information for CBWM. Community-based mapping and bioregional mapping are well established techniques that offer potential low-tech, cheap methods for this task. Moreover, these techniques support large numbers of community residents participating and getting more informed about the issues and concerns that face their neighbourhoods. Therefore, these techniques could also be instrumental as community education and mobilization tools.

Applying Community-Based Watershed Management Strategies to Informal Settlements
C2.2 Rehabilitation of Residential Areas

Box C.22
Planning for Precarious or Vulnerable Residential Areas

Residential areas identified as hazard-prone areas (like flood plain, or land slide areas) are particularly common and problematic for informal settlement residents, who must live in a heightened state of threat. Although it may be illegal and dangerous for residents to live in these precarious areas, their normal close proximity to the city and employment make them very desirable abodes, regardless of the dangers.

For CBWM, the management options may be very limited for these precarious areas. However, some of the following management strategies have been identified to assist local planning authorities to better deal with and mitigate some of the more harmful conditions associated with these areas.

- Improve citywide environmental management to reduce vulnerability;
- Clarify land tenure to encourage investments in housing and infrastructure improvements that will withstand hazards;
- Allow appropriate use of these areas provided that the necessary management controls are in place;
- Ban development where hazardous conditions cannot be mitigated through appropriate development; and
- Carry out the necessary enforcement measures (and service alternative sites) to ensure new migrants do not resettle in the areas.

Source: (Bernstein 1996)

C2.2.1 Water

Box C.23
Water and Sanitation Technologies: "Beosite" ® Production Facilities

For many community water and sanitation projects there is a need for water tanks, water containers, well-linings, san-plats, toilet seats, and support structures; concrete is a material which is frequently desired and used for these materials. Unfortunately concrete and cement have drawbacks such as being expensive, not particularly ecological, difficult to repair, and are hard to recycle or dispose of afterwards. “Beosite” is a Dutch-state-of-the-art technology building material which is ideally suited for many low-income community-based projects.

It provides an ecological, hygienic, cost-effective alternative for concrete tanks, reservoirs, well linings and water pipelines, using local deposits of—or recycled—gypsum or anhydrite. With minimal training and resources, a community can set up a local “Beosite” production facility to produce the needed materials. The production facility also has the potential for additional economic benefits after a project is completed. The facility may be converted to construct building materials (like load-bearing structures and create a substitution for using wood); or to provide a weather-proofing material for mud walls; or to be used for supplying creative materials for artisans.

Source: (Manning 2000)
Box C.24  
Water Pumping Technologies

There is a smorgasbord of different types of water pumps which can be used for different situations. While not necessarily appropriate for urban use, many may be appropriate in situations on the outskirts of urban areas (peri-urban areas) where wells and pumping may provide a viable means for addressing water quality and quantity problems. While not going into great detail, this box provides a brief overview of some of the available pumping technologies which could be used in informal settlements, under the right conditions.

There are centrifugal pumps, diaphragm handpumps, flexible impeller handpumps, horizontal axis pumps, liquid ring pumps, peristaltic pumps, piston pumps, rotary vane pumps, etc. Two of the more innovative and potentially appropriate pumping technologies which are being advocated by practitioners for low-income communities are solar spring pumps and water oscillation handpumps.

Solar pumps have been used for deep wells, pumping water up hundreds of feet at a system cost of under US$3000. They use solar energy to power the system. They only require maintenance every 5 to 10 years. Best for sunny climates; the more sun the higher the efficiency and water flow.

Water oscillation pumps represent a major technological advance in pumping technology when they were first invented during the mid-1980s. Their chief innovation is that they take advantage of the oscillatory cycles of the water column in the feed pipe, rather than having to rely on a mechanical device. They are, therefore, a very robust and simply constructed pump which removes the need to have movable parts below the ground surface; this innovation greatly reduces potentially expensive breakdown costs. They are also known to be:

- inexpensive with low operating and maintenance costs;
- versatile & adaptable to many physical and geological conditions;
- easy to use, especially by children; and
- their low technology has opportunities for local production of pumps and spare parts.

Source: (Manning 2000)

C2.2.2 Sanitation

C.25  
Ecological Sanitation

One of the most recent contributions to address the increasing sanitary crisis in Third World cities involves the concept of ecological sanitation, or eco-san. Promoted by the Swedish International Development Cooperation Agency, eco-san is an ecosystem approach which promotes the use of composting toilets and using the resultant wastes as valuable outputs to be recycled and used as fertilizer for food production. The benefit of an eco-san approach is that it prevents pollution rather than controlling it afterwards. It has two principal components—sanitizing the human excreta and faeces and then recycling it as an agricultural resource. The sanitizing component typically involves separating the nutrient rich urine from the potentially unhealthy faeces, which is then rendered harmless through (1) dehydration or (2) decomposition. The dehydration process normally entails a double pitted latrine so that while one is in use, the other has desiccating faeces. The composting toilet only requires a single vault, but requires matrix which will allow the aerobic biological breakdown of materials.

Source: (Esrey 1998)

Applying Community-Based Watershed Management Strategies to Informal Settlements
Box C.26
Eco-San Vegetable Growing in Mexico City

In 1988 an eco-san pilot project was started, by a network of NGOs called Anadeges, which consisted of growing vegetables in plastic containers and using human urine as a fertilizer. Growing out of an observed community need for affordable produce and access to space for gardening, over 1200 households participated in this innovative urban agriculture project. The project started with Anadeges selling a kit to each family, which consisted of 10 containers, three car tires turned inside out, seedlings, and one kilogram of worms. After a few months, there would be enough worms for the family to return two kilograms of them to Anadeges; thus paying off the loan plus interest.

There are a wide variety of plants which can be grown by each family. A study of the project revealed that urine fertilized plants were healthier, larger, required less water than conventional agricultural techniques, and proved remarkably resistant to insects. It was also found that edible leaf plants performed exceptionally well. The problem for how to grow root crops was solved by using car tires which had been turned inside out.

Recipe for the Planters: Fill 18-20 litre light plastic buckets with tree leaves or grass cuttings and top with 3-5 centimetres of composted soil; a drainage hole is put in the bucket approximately 5 to 10 centimetres from the bottom (hole size depends on plants); and urine, which has been stored in 2 to 5 litre containers for 3 weeks, is diluted with water by a ratio of 1:10 and applied to the containers.

Source: (Esrey 1998)

Box C.27
Strategic Sanitation Approach (SSA)

One of the most recent trends, which appears to be synonymous with many internationally funded sanitation development projects, is the Strategic Sanitation Approach, or SSA. Originally developed and promoted through the UNDP-World Bank Water and Sanitation Programme, SSA is an approach that applies demand-responsive principles to sanitation. SSA approaches call for a wider selection of technologies in the choice of household sanitation; an unbundling of sanitation services; economic replication; and responsive institutional arrangements. Principles commonly associated with SSA include:

- interventions should be based on local effective demand;
- water and sanitation should be considered economic as well as social goods;
- needs of the community (in general) and women (in particular) must be basis for interventions; and
- interventions should be incentive driven and demand-based.

A key component of SSA is the use of incentives to shape behaviour and ultimately increase the coverage of sanitation services. These incentives typically involve rules and rewards, which must be reflected in the institutional framework. This takes the form of the following: more involvement from the private sector, transparency and accountability, decentralized management, and optimum cost recovery. Some of the rules that have been used by a SSA approach include:

- First come first served;
- No materials would be distributed until the committee had received complete payment;
- Small groups to pay for labour;
- Complaints must be made during construction; and
- Construction of private toilets and the connection to the main is the households responsibility.

SSA has been criticized as a vague approach which bundles established principles commonly used for participatory development. It is therefore seen as a very generalized program lacking any guidance for how to initiate, design, and implement sanitation interventions. It has also been criticized for not paying enough attention to behavioural change and health practices; focusing on finances before technical and institutional considerations; and limiting community participation through their willingness to pay for services.

Source: (Cotton 1998; Wright 1998)
Box C.28
Innovations in Sewerage Systems: Brazil's 'Condominial' Sewerage System

The 'condominial' system—developed by Brazilian engineer Jose Carlos de Melo—is an innovative approach for the provisioning of sanitation to low-income communities. The approach embraces appropriate technologies and participatory demand-side management.

Rather than treating each household as a separate entity, the 'condominial' system treated each neighbourhood like an apartment block; allowing a smaller, flatter, shorter sewer pipe network to connect the homes, usually through people's backyards. Not only was there materials savings from a radically different layout, but construction costs were found to be one-quarter of a conventional system, and there were additional savings from fewer connections into the main feeder sewer.

The other key component of the 'condominial' system was the active participation of residents in planning their own sewage system. Residents were formed into neighbourhood blocks who would negotiate with project personnel and develop a plan and common agreement as to layout, how to share maintenance costs, and their commitment to participate and pay for a portion of the capital costs. Basically, a plan entailed each household deciding on three service level options: 1) no change, 2) hook-up to the conventional system, or 3) connect to a 'condominial' system. Neighbours who initially opted out of an upgrading scheme typically succumbed to peer pressure once their neighbours had filled in the drainage system at the back of their properties and the sewage smell became intolerable.

One of the additional benefits of the 'condominial' system was its flexibility: each negotiation process was unique and ultimately reflected the needs and concerns of each neighbourhood block.

The 'condominial' system has been used successfully to provide services to hundreds of thousands of urban people in Northeastern Brazil, however evaluation of some 'condominial' systems replicated in other areas of Brazil showed mixed results. The general consensus was that where it failed there had been a lack of attention towards the social aspects of participation and a focus on the physical aspects of the infrastructure. When there was good social capital however the systems performed very well.

Source: (Bartone et al. 1994; Briscoe 1996; Black 1994; Ostrom 1996)
C2.2.3 Solid Waste Management

Box C.29  
Community Based Waste Disposal: A Case Study in Bangalore, India

A community solid waste project was initiated using former waste pickers who were employed by a local NGO. After receiving permission to use part of a park for a composting area, the collectors were equipped with baskets and handcarts. Working in pairs they would visit each household in the community everyday and collect and separate wastes according to organics, dry recyclables, and residual wastes (disposed of in a communal bin). The households would pay a small fee for this service which would pay for the collectors wages and materials. The collectors would also receive free training, tea and food. While there have been numerous complications to implementing this system, 70 percent of the households were paying for the services.

Source: (Furedy 1992)

Box C.30  
Community-Based Solid Waste Management: Rufisque Senegal, Africa

As mentioned in Box C18, a community-based environmental management project was developed in a small township on the outskirts of Dakar with the help of an international NGO. Prior to the project, city garbage trucks never collected any wastes (partially because the alleys were too narrow) from these communities and garbage would pile up in their neighbourhoods. One component of this project included a solid waste management system involving horse carts.

The horse carts collected the garbage and rubbish from door to door and delivered it to official collection points and then sorted the garbage for biodegradable waste, which was taken to one of two community treatment plants. The system was locally organized and managed; the cart belonged to the neighbourhood organization and the driver had a contract with them. Each household in the system paid the cart driver a small sum for this service. The 20 carts in system collected two-thirds of the refuse of the neighbourhoods concerned and had a big impact on the local environment and of the pride of the inhabitants in their neighbourhood.

There were two sewage treatment plants which purified and recycled the wastewater using water lettuce (Pistia stratiotes) in one plant and bacteria and micro-algae in the other. The vegetable biomass collected from the reservoirs and the biodegradable solid waste collected by the horse carts, combined with the purified water formed a rich compost which was either sold in the public market or used in a community garden. This scheme had the added advantage of creating employment primarily for women and youth, creating 58 permanent jobs and 24 temporary ones.

Source: (Gaye 1997)
C2.2.4 Other Environmental Considerations

Other environmental considerations which may be integrated into a CBWM strategy include the following components: drainage and erosion control systems; road and pathway networks; transportation system or access to transportation; specific health-related programs; income generating aspects; alternative fuel systems; recreational and/or market areas; housing upgrade projects; habitat restoration projects; etc.

C2.2 Conservation and Protection of Resource Appropriation Areas

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**Box C.31**
**Measures to Encourage More Sustainable Resource Use**

The following measures are recommended to encourage more sustained resource management on public lands, including:

- Formally recognize local people's rights of access;
- Transfer control over resources to local groups;
- Instituting systems of joint management and cost-sharing of final products; and
- Extending leases to cooperatives or associations.

Source: (Molnar 1990)

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**Box C.32**
**Co-Management of Forests: Gujarat, India**

In an effort to reduce widespread illegal forestry practices and conflicts (and in many cases murders) between forestry officials and communities and offenders, a new joint management forestry program was initiated with communities. The program entailed public meetings, forest protection meetings, and profit sharing of 25 percent of timber returns with local groups. The main impacts of the program were reduced conflicts between officials and community groups, community groups assumed the enforcement duties in the forests, and productivity of land and returns to villages increased dramatically.

Source: Quoted in (Narayan 1995)
Box C.33
Common Pool Resource (CPR) Management Groups

Common Pool Resource (CPR) management groups is one method which have been used to better control and regulate resources found on public land. The essence of CPR groups is their ability to exclude outsiders to a resource; they therefore act as a means to establishing collective private property. CPR regimes typically have three common features associated with them, including:

- The state does not have the capacity to enforce rules governing resource access and use;
- There is difficulty in managing individual users because defining boundaries is problematic and because of the high cost to individuals who police them;
- The private management of these resources only benefit one group and therefore there are negative equity impacts because most of the resources have multiple users and uses (Carney and Farrington 1998).

There are typically eight distinct aspects or principles used for designing a CPR regime, including (Ostrom 1992):

1. Clearly defined boundaries defining both the resource area and the individuals or households with rights to the resource;
2. Proportional equivalence between benefits and costs—defining the rules which govern resource use and share for each member and how these relate to local conditions and the rules requiring labour, materials, and/or money inputs;
3. Collective choice arrangements allowing individuals affected by operational rules an opportunity to modify these rules;
4. Monitoring having monitors who audit resource use being accountable to the users and/or themselves;
5. Graduated sanctions having a system of graduated sanctions for those violators who break operational rules;
6. Conflict resolution mechanisms having rapid access to low-cost local arenas to resolve conflicts between users and/or officials;
7. Minimum recognition of rights to organize—having a system where the rights of users to organize and form institutions are not challenged by external government authorities; and
8. Nested enterprises having an integrated and multiple layers of nested enterprises that incorporate appropriation, provision, monitoring, enforcement, conflict resolution and governance activities.

Evidence suggests that these CPR regimes are not for every situation. Where they have failed has been a result of not properly addressing the heterogeneity of the community and their control by a small group of elites, or the breakdown of the system caused by population pressures, or the privatization of many CPRs by industries or wealthier sectors; or due to the lack of equity in distributing the benefits of the resource being appropriated (Molnar 1990).

There is, however, broad agreement that when CPR regimes function properly they are more effective than state agencies at managing natural resources. Unlike governments, CPR groups have a direct stake in the future of the resource. While there has been mixed debate over their use and effectiveness, the emphasis these days seems to be on finding the necessary conditions to make CPR groups robust (Carney and Farrington 1998).
### Box C.34
**Common Pool Resource Management Groups: Criteria for Assessing Robustness**

The following list is an abridged set of criteria identified by Carney and Farrington, in their book *Natural Resource Management and Institutional Change*, for assessing the robustness and stability of CPR regimes.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group size</td>
<td>the smaller the number of users the better; generally a minimum number of individuals are necessary with a maximum number between 30 and 40 members.</td>
</tr>
<tr>
<td>Boundaries</td>
<td>the more clearly defined the boundaries of the group are the better.</td>
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<tr>
<td>Power</td>
<td>the greater the power of any sub-group benefiting from the commons, the better likelihood of success.</td>
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<tr>
<td>Problem resolution</td>
<td>the greater the existing arrangements present for discussing problems, the greater the chances of success.</td>
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<tr>
<td>Mutual obligations</td>
<td>the greater the importance of social reputation, the better chances of success.</td>
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<tr>
<td>Punishments</td>
<td>the more the users already have enforceable rules in place, the better.</td>
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<tr>
<td>Membership</td>
<td>there must be consensus about who the users are and what their rights are before collective action.</td>
</tr>
<tr>
<td>Equity</td>
<td>decision-making rights and user rights must be considered fair.</td>
</tr>
<tr>
<td>Location</td>
<td>the closer the proximity between user residences and the resource, the better.</td>
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<tr>
<td>Necessity</td>
<td>the greater the demand and the more vital the resource, the greater the chances of success.</td>
</tr>
<tr>
<td>Resource capacity</td>
<td>the greater the capacity of a resource to meet short-term benefits, the better.</td>
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<tr>
<td>Local knowledge</td>
<td>the more local knowledge is incorporated, the better.</td>
</tr>
<tr>
<td>Security</td>
<td>the more confidence there is in the security of future benefits, the greater the likelihood that users will invest in the resource.</td>
</tr>
<tr>
<td>Flexibility</td>
<td>the more flexible the governing rules respond to local conditions, the better the chances of success.</td>
</tr>
<tr>
<td>Representation</td>
<td>the more an individual can participate in modifying rules which affect them, the better.</td>
</tr>
<tr>
<td>Sanctions</td>
<td>the more noticeable sanctions (and therefore cheating) are, the better the chances for success.</td>
</tr>
<tr>
<td>Accountability</td>
<td>the more accountable monitors are to the users, the better the chances for success.</td>
</tr>
<tr>
<td>Intervention</td>
<td>the less the state can intervene and enforce private property rights, the better.</td>
</tr>
<tr>
<td>Conflict resolution</td>
<td>the more accessible low-cost, conflict resolution mechanisms are, the better.</td>
</tr>
<tr>
<td>Integration</td>
<td>the more integrated the activities of appropriation, enforcement, monitoring, governance, etc. are, the better the chances are for success.</td>
</tr>
</tbody>
</table>

Source: (Carney and Farrington 1998)
Box C.35
Community-Based Protection of Forests: Watershed Planning in Pohnpei, Micronesia

In 1987, after witnessing the rapid depletion of their forested lands, the Pohnpei state government passed watershed protection legislation, designating 5100 ha as forest reserve and a further 5525 ha as protected mangrove areas. Unfortunately, with no community input and little appreciation of traditional customs, the proposed protective measures led to resistance from resource users and had no effect at curbing homesteading or forest removal for kava plantations—the two principal land use impacts responsible for the disappearance of the forests.

Using participatory rural appraisal (PRA) workshops as the backbone of community involvement, a new watershed management program was initiated in 1992, with the assistance of the US Forestry Service. This led to a technical assistance program starting in 1994 which focused on using GIS, aerial photography, detailed integrated watershed management plans, sustainable income generating opportunities, and establishing a project office. The resulting comprehensive plan (called the Watershed Management Strategy) identified how resource use would be monitored and how community developed land-use guidelines would be enforced.

Some of the conclusions that this community-centred planning process made include the following:

- Communities need to be involved not just in the planning but also in the management and implementation of the recommended guidelines and policies.

  ➔ This led to the creation of community committees, which were created from traditional governance institutions. These committees were instrumental in developing Community Action Plans that served as both a structure for management as well as a mechanism for community involvement. These plans also served as an agreement between communities and the state government for how resources were to be managed.

- It is difficult to define bio-physical boundaries for three reasons: because they were only able to consider public land boundaries which did not always match the watershed boundaries; many of the public land tenure categories are rather vague without clear boundaries; and because the watershed reserve boundaries did not take into account indigenous land use patterns which frequently used the reserve areas or impacted on the adjacent watersheds.

  ➔ The reserve boundary was therefore re-delineated as a part of the community-based planning process to include private properties, public land tenure areas which have ‘fuzzy’ boundaries, and traditional resource appropriation areas. This new watershed boundary even included areas where the legislation did not apply. The process to re-delineated boundaries was flexible enough to allow communities to interpret and delineate areas differently, depending on their history and perceptions. In general, five land management zones (outside the reserve area) are defined and considered in each community's action plan, including:

  (1) limited use reserve—government lands allowing low impact sustainable use;

  (2) community supported reserve—commonly held lands with limited use and attention on conservation;

  (3) community-based management areas—commonly held lands with a management focus on low impact sustainable use;

  (4) landowner education areas—private lands located in environmentally sensitive areas and attention on educating owners in sustainable land use; and

  (5) development areas—various tenure lands not in environmentally sensitive areas and a focus on sustainable development.

Source: (Dahl 1996)
C3 References


Applying Community-Based Watershed Management Strategies to Informal Settlements

Appendix C  Case Studies Illustrating Community-Based and Environmental Strategies  Page 246


