

Integrated Sustainable Waste Management in Bangalore

Lessons learnt from the UWEP Programme in India



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Anselm Rosario
Anne Scheinberg

Series editor: Verele de Vreede
Anne Scheinberg

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Cover photo: Swabhimana a major participant in the UWEP programme

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TABLE OF CONTENTS

TABLE OF CONTENTS	1
CHAPTER 1 INTRODUCTION	3
1.1 The ideas behind the UWEP Programme.....	3
1.2 Desired results of the UWEP Programme	4
1.3 Methodology in development: the hallmarks of the UWEP Programme	4
1.3.1 Co-operation with the South.....	4
1.3.2 Thematic focus on locally relevant aspects of recycling and waste management.....	4
1.3.3 Regional information exchange.....	5
1.3.4 Focus on South professionals	5
1.3.5 Sharing, co-operating, and facilitating access to information and knowledge.....	5
1.3.6 Pushing the boundaries of knowledge and information	5
1.3.7 South focus, ownership and sustainability	6
1.4 Overview of The UWEP Programme: Development co-operation and waste management.....	6
1.5 The concept of Integrated Sustainable Waste Management (ISWM)	7
1.5.1 The dimensions of ISWM	7
1.5.2 Stakeholders, the first ISWM dimension.....	8
1.5.3 Waste system elements, the second ISWM dimension	9
1.5.4 The third dimension: Sustainability aspects	10
1.5.5 ISWM as a framework for the UWEP Programme activities.....	10
1.6 City case studies	11
CHAPTER 2 THE PROCESS OF IMPLEMENTING UWEP IN BANGALORE, KARNATAKA STATE, INDIA	13
2.1 Case Study: Bangalore, India	13
2.2 Introduction to the Bangalore Case study	13
2.2.1 How was contact with UWEP initiated?	13
2.2.2 Description of the geographic area and statistics about the city.....	13
2.2.3 Description of Mythri/Waste Wise and the origins of its involvement.....	18
2.2.4 What motivated the partners and stakeholders to ask for UWEP support?..	19
2.2.5 Who were the key owners of the process?	21
2.3 Overview of the UWEP interventions in Bangalore, 1995 – 2003.	21
2.3.1 Ward level approach – Ward No.14, Nagapura.....	23
2.3.2 Health Care Waste Management	23
2.3.3 The Role of the Swabhimana platform.....	25
2.4 Situation at the end of UWEP I.....	25

2.5	The UWEP Plus context	27
2.5.1	Focus of UWEP Plus and KaR	28
2.5.2	Stakeholder Assessment Gaps and Process	30
2.5.3	Results of the Stakeholder Process	31
2.5.4	ISWM Assessment	32
2.5.5	Other potential pilot project activities associated with UWEP Plus.	36
CHAPTER 3	PILOT PROJECT: FEATURED CASE STUDY-THE LAND LAB	39
3.1	Introduction.....	39
3.2	Why this pilot project is featured here?	39
3.3	Why there was a need for these initiatives and their objectives?	39
CHAPTER 4	THE IMPACT OF UWEP ON THE REGION	46
4.1	Situation in Bangalore before UWEP	46
4.1.1	Capacity of local actors	46
4.1.2	Appropriate Models	46
4.1.3	Functional systems	47
4.2	Situation of Bangalore now:.....	47
4.2.1	Capacity of local actors	47
4.2.2	Appropriate models	47
4.2.3	Functional systems	48
4.3	Obstacles and barriers.....	48
4.4	Conclusions.....	49
4.4.1	Key lessons and conclusions of the UWEP years	50
REFERENCES:	52

CHAPTER 1 INTRODUCTION

The Urban Waste Expertise Programme, funded by the Dutch Ministry of External Affairs, Division for International Co-operation (DGIS), and implemented by WASTE, Advisers in Urban Environment and Development, lasted from 1996 to 2004, in two sub-programmes, now referred to as “UWEP I” and “UWEP Plus”. UWEP I focused on understanding local processes in waste management and recycling, and then on applying the general lessons learned in four specific intervention cities, called the Pilot Project Settings, or PPS cities. UWEP Plus focused on abstracting from those lessons an integrated approach for Northern and Southern partners to work together on systematic improvement of the urban environment. This approach, called Integrated Sustainable Waste Management (ISWM), now forms the basis for a number of other initiatives, including the ISSUE programme, “Integrated Support for a Sustainable Urban Environment”, which takes Ecological Sanitation as its main subject. In UWEP Plus ISWM was used for integrated waste management assessment and planning in the four PPS cities, and the assessment methodology was crystallised, applied and validated in an additional five cities, for a total of nine UWEP cities world-wide.

The goals of the programme were strongly related to building capacity and generating knowledge, with the goal of supporting Southern stakeholders to mobilise and improve their own urban environment. The initial subjects were solid waste, liquid waste, and sanitation, with solid waste and recycling having the main focus between 1996 and 2004. Over the course of the programme, there were three major activities: research on solid waste and recycling (1995-1998); application of the lessons in four PPS cities (1997-2001); and ISWM assessment and planning in nine UWEP Plus cities (2001-2004). The PPS cities were also the focus of innovative research on the relationship of integrated waste management to cycling of carbon and nitrogen and generation of greenhouse gases.

A very important line throughout the UWEP programme years has been working with local experts, supporting their expanding capabilities and connecting them in networks, as local capacity has a key relationship to knowledge management and sustainability. During UWEP Plus, especially, the regional organisations and local experts co-ordinating ISWM activities became increasingly autonomous and took on ever more directive roles in the decentralised management of the programme. Bearing this in mind, a fourth activity can be described as exploring and implementing horizontal partnerships between North and South in service to participatory urban environmental development.

1.1 The ideas behind the UWEP Programme

The Urban Waste Expertise Programme (UWEP) was formulated in response to a complex of problems that Klundert and Rijnsburger saw in their work in East Africa in SNV, the Dutch voluntary service. These problems included the following:

1. The way that development assistance was done meant that neither the agencies in the Netherlands, nor the local host organisations, had any significant institutional memory or tools;
2. Most knowledge came from the North and was applied in South settings without sufficient attention to the local context, and also, without local consultation with stakeholders;

3. There was an assumption that more, better, or more appropriate technology would solve all of the problems
4. The informal sector and small business were not a focus of the development community, but they were clearly an interesting but highly stressed sector; and
5. There was within development assistance, neither a critique nor an active discourse about these problems and about whether it was important to develop a different way of working.

1.2 Desired results of the UWEP Programme

In a real sense, the UWEP programme was developed most directly in relation to number 5, and constituted a long-running attempt to foster discourse and explore alternative and sustainable modalities of working between committed partners in the North and South. While the formal goals of the programme have to do with improving waste management, there is the most to be seen from the five desired results, quoted here below:

1. “A comprehensive set of appropriate waste related knowledge and experience has been generated and customised for dissemination, both at the practical level of organisations in the South and at the policy level of authorities and development agencies.
2. Local waste handling and waste management expertise has been acquired which responds to the demand for expertise by organisations in the South, and y authorities and development agencies developing community and micro-enterprise-related waste policies.
3. Organisations in the South have gained access through local sources in their respective country or region to appropriate waste-related knowledge and experiences.
4. Responsible governments and donor agencies have been subject to promotion of community and micro-enterprise oriented waste policies.
5. Organisations in the South have received assistance to develop and formulate qualitative proposals for improvement and to channel these through responsible governments and donor agencies.

These five results can be characterised by the short names: (1) appropriate knowledge, (2) local expertise; (3) facilitating Southern access to information and expertise; (4) community and MSE policy focus; and (5) Northern experience in service to Southern goals.

1.3 Methodology in development: the hallmarks of the UWEP Programme

1.3.1 Co-operation with the South

The major methodological focus of the UWEP programme was and has remained on the South: southern stakeholders formulate their needs and agendas, southern researchers and local experts execute programmes; management is shared between Northern specialists (who also mobilise Northern funds) and Southern experts and stakeholders; and there is horizontality and mutual respect in every aspect of the North-South relationship.

1.3.2 Thematic focus on locally relevant aspects of recycling and waste management

The second methodological focus was pursuit of themes which arose inductively from local research, and therefore which have inherent relevance to the local situation. This created a need

for Southern involvement in all phases of the programme, from identifying the themes to evaluating the results of the activities. The themes were devised based on needs and activities identified in the field, based on identification and characterisation by the local researchers themselves.

1.3.3 Regional information exchange

The third methodological focus was formulated as regional information exchange, and can be interpreted as having both a substantive and strategic element. The substantive element is to make information from one region available and accessible to those in another region with a similar type of activity and a corresponding general level of technological complexity. This makes the knowledge more directly applicable.

The strategic element focuses on counterbalancing traditional post-colonial dependencies, as a result of which information, energy, transport, and goods and services flow North-South between former colonial masters in the North and former colonies in the South, by creating or strengthening South-South channels of information exchange and empowering regional nodes to take on this function.

1.3.4 Focus on South professionals

The UWEP programme had a strong focus on working with and on behalf of a quite specific target group: local experts. The strong emphasis on local research, involving younger specialists or students, and the commitment to contracting work to young professionals relate strongly to the idea of building knowledge and expertise in the South.

1.3.5 Sharing, co-operating, and facilitating access to information and knowledge

These three aspects of the UWEP approach focus on identifying and filling gaps in a collaborative mode, rather than re-inventing the wheel or competing for economic niches. The strategic edge here is to reduce Southern (and donor) dependency on (high-cost) Northern professionals, in order to be able to use more of the available funds for development goals in the South.

1.3.6 Pushing the boundaries of knowledge and information

In UWEP I, this had mainly to do with “daring” to focus on the activities of the informal sector, and to criticise the activities of the formal political authorities for failing to do so. A second radical element in UWEP I was the idea that communities could have a voice, even a systematic one, in the development of urban infrastructure in their own communities and the city as a whole.

In UWEP Plus, WASTE and its partners took the further radical step of analysing the effects of waste management interventions on the cycling of carbon and nitrogen, a line of work done locally by scientific researchers and at WASTE by the C-N Theme Co-ordinator. UWEP Plus was also innovative in the extent to which the regional programme management partner organisation set their own agendas for activities in their regions.

1.3.7 South focus, ownership and sustainability

The leitmotif of South focus has an important effect on, ownership and sustainability. In reducing dependency on the North and supporting knowledge and knowledge-based nodes in the South, there is a commitment to building continuity that doesn't depend on political fads or international donor funds. The focus on ownership puts both the process and results of the interventions into the hands of key city stakeholders, including but not ever limited to the formal local authorities. This ensures, first, that what happens is relevant and important to the local citizens and businesses, and secondly, that they retain control, so that the exit of the programme, donor, or external consultant has only a minor impact and the activities continue on their own.

1.4 Overview of The UWEP Programme: Development co-operation and waste management

The UWEP Programme operated for nine years, with a first contract from 1995-2001, and an extension called UWEP Plus running from 2001 through June 2004. The practical focus and activities are show in Table 1.

Table 1. Overview of activities in UWEP I and UWEP Plus

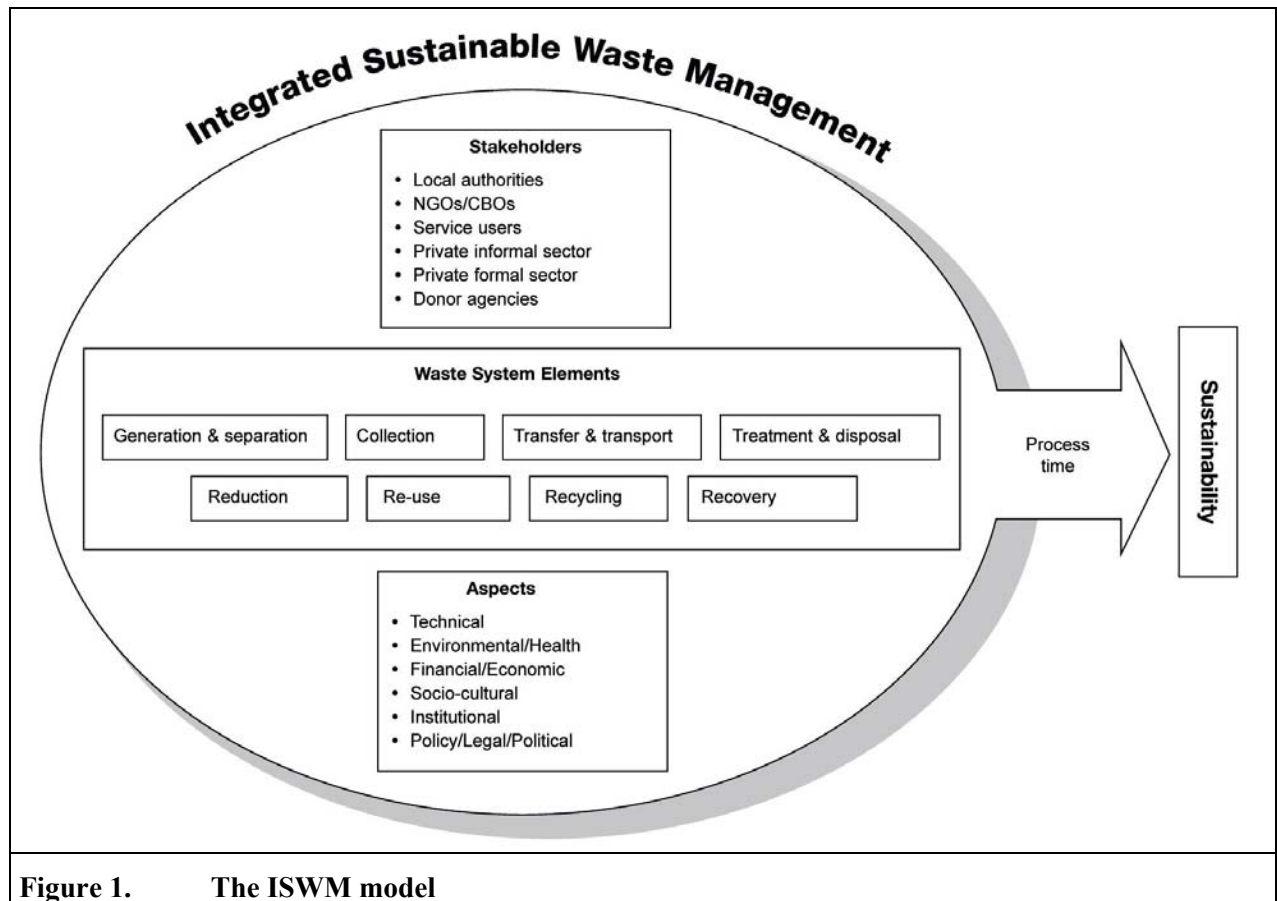
UWEP Phase	Regions or countries	Activities
UWEP 1-1 Research	Latin America, Asia, W. Africa	Intensive research on local waste management and recycling using young local researchers, complemented by periodic working meetings for the researchers
1-2 Formulation of themes and topics	same	From Gouda, identification of themes such as community participation, linkages, knowledge and expertise-sharing, social sustainability, stakeholder platforms, micro-privatisation, and the like
1-3	parallel to UWEP	Based on the themes, and parallel to the UWEP process, articulation of the concept and framework of Integrated Sustainable Waste Management (ISWM)
1-4 Design of Pilot Project Settings	Central America, Philippines, India, Mali	Working with local organisations, design and implementation of practical pilot projects, and documenting them increasingly using the ISWM framework
1-5	All	Reflection, refining the ISWM concept, and formulation of follow-up activities.
UWEP Plus phase 1	Central America, South America, Philippines, India, Mali, Middle East, Eastern Europe	Engagement of the local authorities for an ISWM Assessment and planning process; mobilisation of stakeholders and execution of a Memorandum of Understanding (MoU)
U+ phase 2	All	engagement of stakeholders in an ISWM assessment and planning process in nine cities
U+ phase 3	Central America, Philippines, India, Mali	additional capitalisation of pilot projects and completion of pilot project cycle
U+ phase 4	Central America, Philippines, India, Mali	Validation of the ISWM approach to planning

UWEP Phase	Regions or countries	Activities
U+ phase 5	Research in the regions on C and N cycles	Material balance analyses of the effects of integrated approaches to waste management on the emissions of carbon and nitrogen to atmospheric cycling of these materials and to climate change.
U+ phase 6	All	Increasing importance of the ISWM discourse, together with reflection and discussions on peer relations, partnerships, horizontality and transparency, and the like.
U+ Closing	All	discussions about programme exit, careful exit strategies, explicit (and ceremonial) transfer of project ownership to local stakeholders

1.5 The concept of Integrated Sustainable Waste Management (ISWM)

1.5.1 The dimensions of ISWM

The concept of Integrated Sustainable Waste Management (ISWM) recognises three important dimensions in waste management: (1) the stakeholders involved in waste management, (2) the (practical and technical) elements of the waste system and (3) the sustainability aspects of the local context that should be taken into account when assessing and planning a waste management system.



1.5.2 Stakeholders, the first ISWM dimension

The first ISWM dimension is the **stakeholders**. A stakeholder is person or organisation that has a stake, an interest, in –in this case- waste management. A number of potential stakeholders are listed in below. However, stakeholders in waste management differ in each city, so they need to be identified in the local context. Stakeholders may vary in the intensity or breadth of their roles and interests in relation to waste management, but they can co-operate for a common interest. In addition, the stakeholders in a particular city or region share a common social and geographic context, and may be bound together by other systems in addition to solid waste¹. Some typical stakeholders in ISWM are:

- ◆ local authorities
- ◆ community groups
- ◆ NGOs, CBOs
- ◆ local, regional or national institutions, such as schools, hospitals, trade unions, the military, government departments, national parks; tourism associations
- ◆ recycling industries
- ◆ private waste management companies and their clients
- ◆ social and religious groups
- ◆ activists and lobbyists

¹ For example: clan, caste, ethnicity, professional affiliation, religion, school or university background, commercial relationship, kinship, sport.

- ◆ politicians
- ◆ private sector industry and commerce and the associations or trade industry lobbyists that represent them;
- ◆ small and micro-enterprises and entrepreneurs
- ◆ other self-identified parties and individuals with **a stake** in the urban environment in general, and solid waste in particular.

1.5.3 Waste system elements, the second ISWM dimension

The waste system elements are sometimes referred to as the technical components of waste management. Most waste system elements are also stages in the life cycle of materials. This life cycle movement, or flow, begins with extraction of natural resources, and continues through processing, production and consumption stage towards final treatment and disposal. The waste system elements generally form the “back end” of the life cycle.

ISWM labels the technical side of waste as the basic waste activities:

- ◆ Waste prevention and minimisation
- ◆ Reuse and repair
- ◆ Collection
- ◆ Transfer
- ◆ Street sweeping
- ◆ Recycling, also called materials recovery
- ◆ Composting, also called macro-nutrient cycling or organic materials recovery
- ◆ Energy recovery
- ◆ Safe disposal

Many countries have prioritised these waste management activities into the so-called *waste management hierarchy*, which varies between an operational policy guideline and an injunction that is part of a national environmental law. This waste management hierarchy, shown in Figure 2, is also a cornerstone of the ISWM approach and has been a governing principle in the UWEP programme.

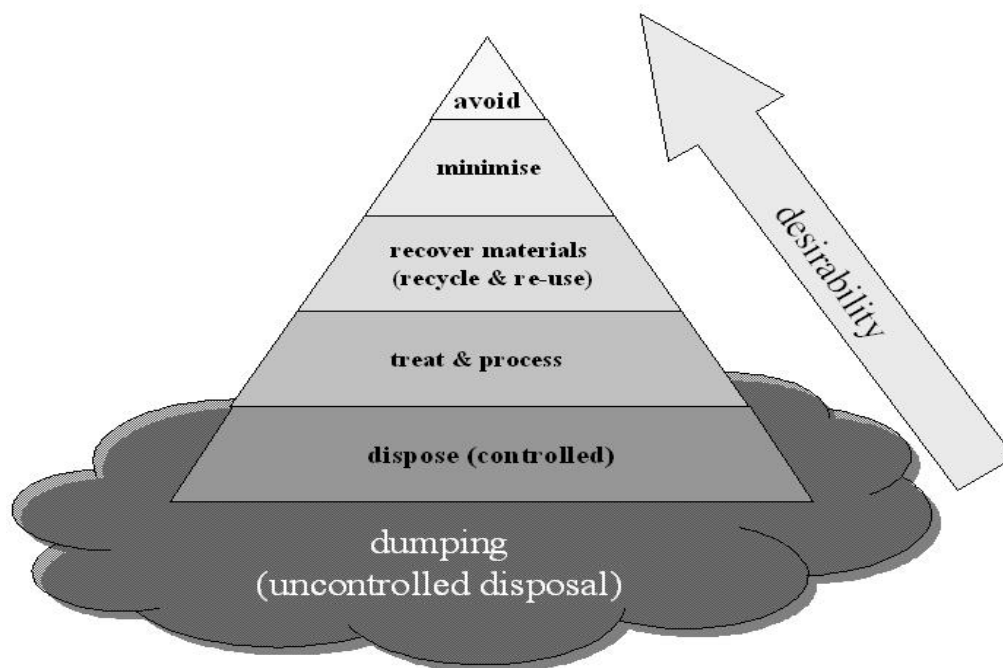


Figure 2. The Waste Management Hierarchy

Source: combined ideas about the hierarchy from Dutch and English-language sources.

1.5.4 The third dimension: Sustainability aspects

Within ISWM the third dimension consists of six sustainability aspects, or lenses, through which the existing waste system can be assessed and with which a new or expanded system can be planned. The sustainability aspects, ranging from political-legal to technical and performance, cover the range of factors influencing solid waste activities and include.

- ◆ The policy or legal aspect;
- ◆ The institutional and organisational aspect;
- ◆ The cultural and social aspect;
- ◆ The financial and economic aspect;
- ◆ The technological and technical aspect; and
- ◆ The environmental aspect.

1.5.5 ISWM as a framework for the UWEP Programme activities

ISWM developed in parallel with the UWEP programme activities, and is in that sense interwoven with their history. The paper where the ISWM concept was articulated for the first time was given at the Ittingen conference in 1997, an event that launched the CWG, a professional information-sharing group of international waste management specialists.

During UWEP I, the pilot projects were designed to capture and apply insights from extensive field work in the regions, but especially in Latin America. There was not, at the time of design, any clear methodological approach, and the ISWM framework was in some sense articulated, based on practical experience, to fill the methodological void, capture the successful approaches

tested in the field, and introduce consistency and comparability across cities. ISWM became the main activity and methodological focus of the UWEP Plus phase of the UWEP Programme.

1.6 City case studies

The UWEP programme was active in the four PPS cities: Bamako, Mali; La Ceiba, Honduras; Bangalore, India; and Batangas Bay, Philippines; for a period varying from seven to nine years. It was and remains unusual, in development co-operation, for a Northern organisation to co-operate horizontally with South partners, for such an extended period of time, in the same locations. The kinds of information that emerge from such a long period of intervention can be useful for colleagues both in the North and the South. For this reason, WASTE and its partners have decided to prepare case studies of the four PPS cities, highlighting both process and results.

This is one of four city case studies, documenting the work of the Urban Waste Expertise Programme in Mali, Honduras, India, and the Philippines. This work focused on bottom-up solid waste management and development in four communities, and was based on, and contributed to, the concept of Integrated Sustainable Waste Management (ISWM).

The purpose of these case studies is:

1. to document the activities of the UWEP programme and the results achieved in the cities;
2. to capture the institutional memory of the UWEP programme and make it available to future initiatives that build on these results;
3. to make data and information available to the city itself;
4. to enrich the methodological information on integrated sustainable waste management (ISWM).

The case studies are designed to be read by:

- ◆ present and incoming staff of the local authority and provincial, regional, and national government representatives;
- ◆ consultants working on urban services, recycling, or waste management;
- ◆ representatives or staff of other local stakeholders including community groups, NGOs, and the private sector;
- ◆ entrepreneurs wishing to expand or strengthen their solid waste portfolios;
- ◆ academicians and scholars in urban environmental management;
- ◆ the press, especially when seeking background materials;
- ◆ donors interested in supporting future waste management activities;
- ◆ local experts interested in using or replicating the results;
- ◆ other interested parties.

Each of the four case studies focuses on one of the so-called “Pilot Project Setting” cities. These four cities differ widely in climate, character, socio-economic circumstances, and on many different parameters.

The four PPS cities were selected in UWEP I in the period 1996-1998, based on opportunism, serendipity, and a rather loose application of certain criteria, including:

- ◆ a demonstrated interest in improved solid waste management;
- ◆ a commitment to bottom-up processes;
- ◆ willingness to host one or more pilot projects, and ideas about focus for it/them;
- ◆ involvement of a regional programme co-ordination organisation and a local pilot project co-ordinator; and
- ◆ presence of a local NGO or local expert counterpart (with the exception of La Ceiba, where such a counterpart was created by the UWEP programme partners);

CHAPTER 2 THE PROCESS OF IMPLEMENTING UWEP IN BANGALORE, KARNATAKA STATE, INDIA

2.1 Case Study: Bangalore, India

Solid Waste Management (SWM) is a universal problem with Bangalore being no exception. Over the years the city has grown significantly both in population and in density, which has resulted in great pressures being forced on the resources of the city, which in turn has contributed to an exponential increase in the generation of solid waste, to a level which is beyond the city's ability to cope.

2.2 Introduction to the Bangalore Case study

This document traces the advent of the Urban Waste Expertise Programme (UWEP) of WASTE, Netherlands, its impact on the past, present and future situation in Bangalore, in accordance with the institutions and stakeholders involved. It attempts to capture the ongoing efforts with comprehensive analysis and a variety of perspectives on SWM issues, in particular with reference to the waste system elements, and further to this, the technical, institutional, legal, socio-economic and environmental aspects. It also forms the basis for understanding the strategic planning process in Bangalore, through which the city is defining an Integrated Sustainable Waste Management road map for the years ahead.

2.2.1 How was contact with UWEP initiated?

Bangalore holds a long history of cooperation with Dutch researchers, development activists and Universities. The seed for this cooperation was sown when a Dutch PhD student, by the name of Ms. Marijk Huijsman, visited Bangalore for a study on waste pickers and the informal waste sector in the late 1980's. Ms. Huijsman's involvement in this informal sectors issues prompted the interest of the University of Amsterdam, who in turn implemented national level research on the same topic, in conjunction to organizing a regional level workshop on "Linking formal and informal systems" in the early 1990's. Through this process, the workshop and related activities profiled the flourishing neighbourhood-based decentralized system, something which had evolved out of the sheer necessity of the city to find localized solutions to these problems, which were operated in conjunction with NGOs, CBOs and in some cases, the waste pickers themselves. The middle of the 1990's saw the Bangalore City Corporation – The Bangalore Mahanagara Palike (BMP) taking a keen interest in these alternative approaches to waste management, and, in turn, sought assistance from practitioners and experts alike. This process coincided with the development of UWEP I research-based activities, which therefore naturally prompted a collaborative relationship between UWEP functionaries, BMP officials, key NGOs and experts in the region. The following gives an overview of this relationship, and thereafter, an appraisal of those processes which are occurring at present, as of December, 2004.

2.2.2 Description of the geographic area and statistics about the city.

Bangalore is the capital city as well as the political, social and economic hub of the State of Karnataka. It is also the 5th largest city in all of India as well as one of the fastest growing metropolitan areas. Topographically, Bangalore is located on the South Deccan plateau, while it

stands at an average elevation of 3113 ft from MSL. Owing to this elevation, Bangalore is bestowed with a healthy climate, characterised by mild summers and cool winters. It has been labelled the Garden City of India owing to its amazing quantity of flowering trees and expansive parks. However, in more recent times, it has emerged as the technological leader in India, due to the abundance of leading IT companies, research organisations, and biotechnology establishments who have located their headquarters in the city.

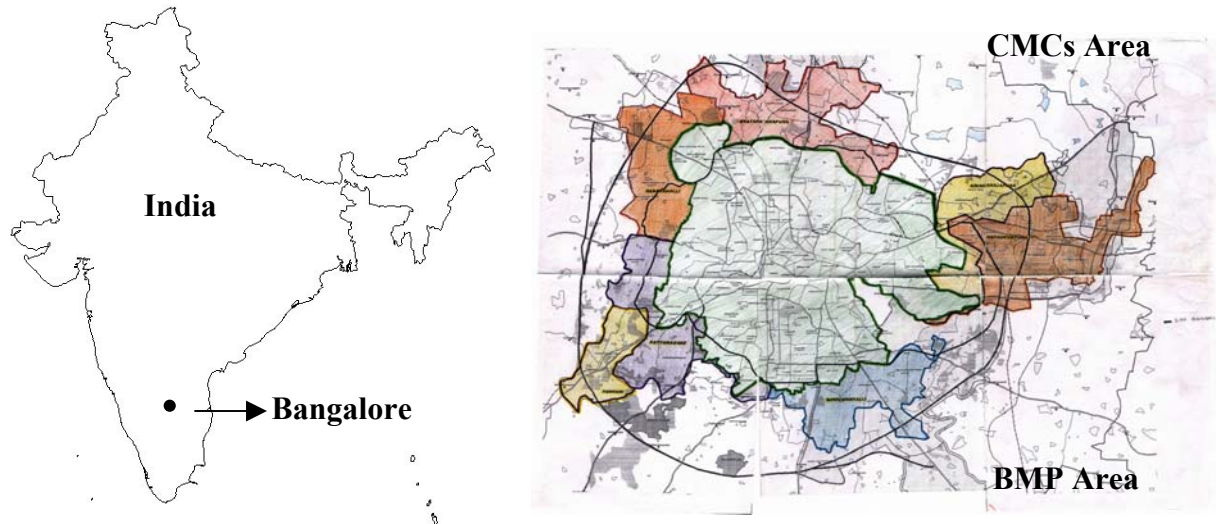


figure 3. Geographical information on Bangalore

Population

Bangalore City encompasses an area of over 531 sq. km, while geographically, the city centre is an area of approximately 226 sq. km. This core area is administered by the Bangalore Mahanagara Palike (City Corporation), which is the principal municipal service provider.

WARDWISE POPULATION DENSITY - BANGALORE

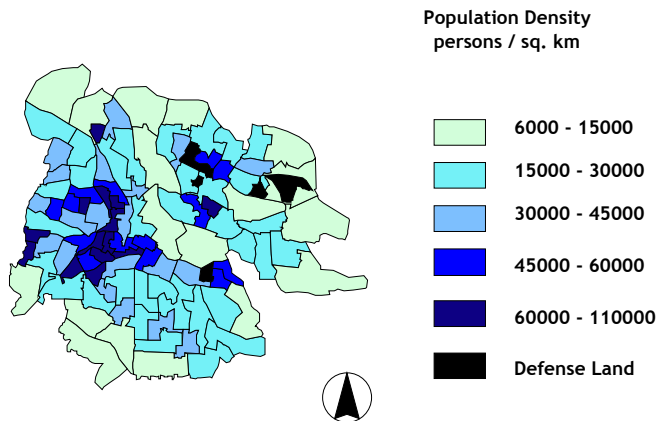


Figure 4. Population density in Bangalore

Presently, Bangalore is one of the fastest growing cities in Asia with a population that has almost doubled in the past decade, from 2.6 million in 1991 to 5.6 million in 2001. This, however, can be attributed to the fact that the limits of the municipal corporation were extended between 1991-2001, and thus came to include the Greater Bangalore area population as well as the core area. In conjunction to this, the population density has increased in this same period from 9.7 persons per km² (1991) to 10.7 persons per. km² (2001). In addition, the city has a daily floating population of between 0.5 – 0.7 million people.

Owing to the large growth in population as well as a significant influx of migrants from the countryside, Bangalore today faces serious problems of traffic congestion, inadequate infrastructure and an increased demand on resources. This, in turn, has affected the quantity and composition of municipal solid waste, which is further straining the city's resources.

Economy & Socio-Cultural Sketch

Bangalore is one of Asia's fastest-growing economies and, if current predictions and statistics hold, is poised to become a mega-city by 2015. The boom in the Indian Information Technology (IT) sector has seen Bangalore being dubbed the "Silicon Valley" of the Indian sub-continent, and for good reason, seeing as software exports in Bangalore alone had earnings of Rs.34 billion (US\$7 million) in 2001 (GMR-Bangalore Dec 2002). The Bangalore computer industry has also attracted \$5 billion in foreign direct investments since 1999 (Newsweek Oct-Dec 2003), while GDP growth stood at 5.8% for 2003 (Cushman and Wakefield Research Newsletter). The benefits of this for Bangalore is illustrated in the fact that the per capita income in the city is more than twice that the national average, while the continued global demand for IT products and services has spurred remarkable economic growth.

Existing institutional framework for solid waste management in BMP area

As stated previously, the rapid growth in population has created many pressures on all civic services within Bangalore, including SWM. Currently, the BMP is responsible for managing municipal solid waste in Bangalore, while at present it manages about 40% of waste

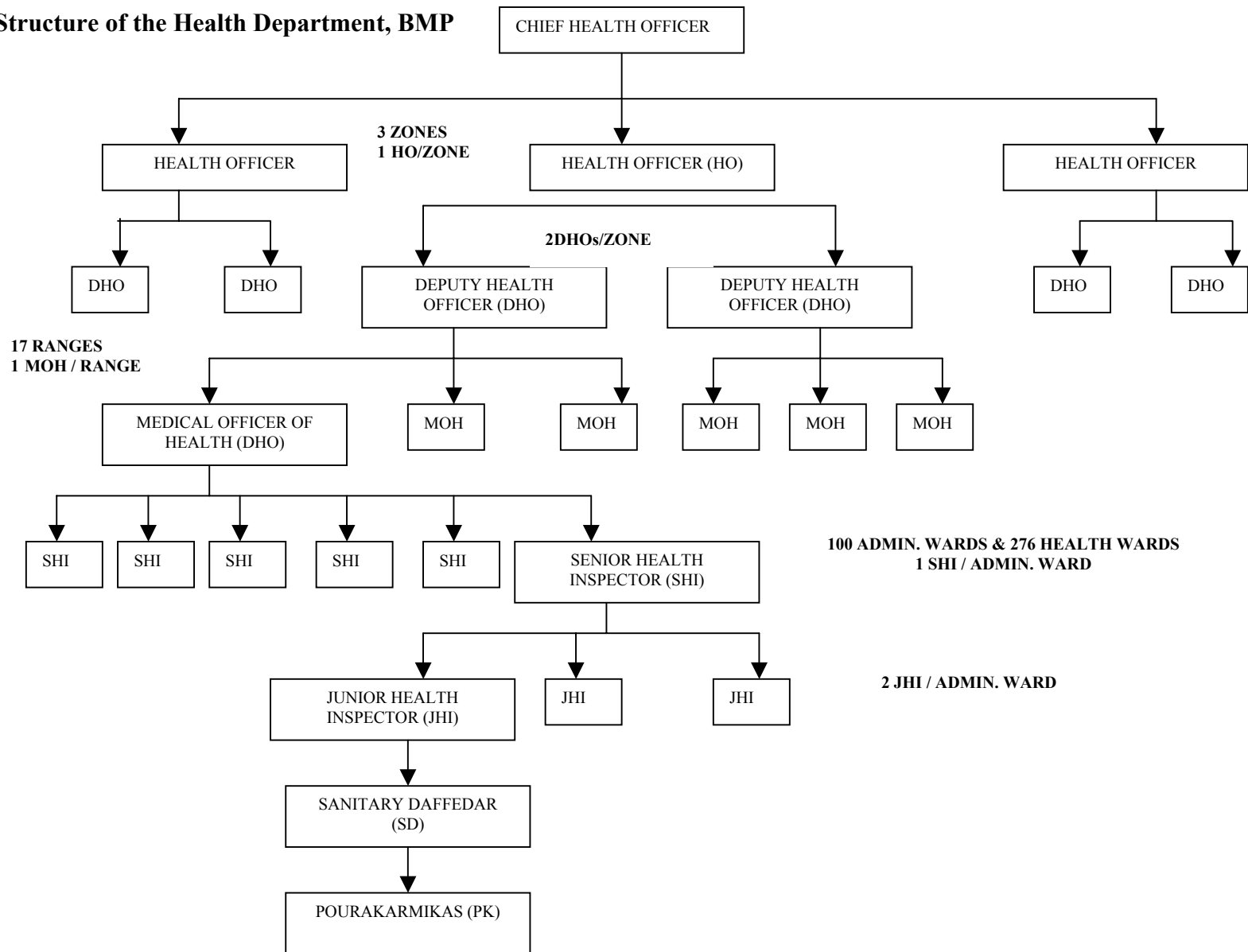
management in the entire BMP area, utilising its own infrastructure and workforce, while the rest is contracted out to private companies and-or individuals who provide SWM services.

BMP as SWM Service Provider

Presently, the BMP is engaged in various efforts to provide an effective SWM system for the city, incorporating a series of approaches such as citizen involvement, investment in appropriate infrastructure and technology, as well as monitoring the various systems that are at this time managing the present mix of actors and techniques.

For a more effective and efficient approach, the city has been divided into different administrative units, the smallest of which is the *Health Ward*. Currently, there are 294 *Health Wards* within the BMP structure. Two to three *Health Wards* form a political *Ward*, which represents the basic unit of administration. Presently, there are 100 such administrative or political Wards in Bangalore. In addition to this, two to four wards form an intermediate unit called a *Range*. There are currently 30 Ranges within the city, which in turn are grouped into 3 *Zones* – South, East, and West.

Organizational Structure of the Health Department, BMP



Within the BMP, there are two departments which are directly involved in solid waste management, they being the Health Department and the Engineering Department. The Health Department is primarily responsible for collection (including street sweeping), transportation and disposal of municipal waste. The Engineering Department of BMP is responsible for the removal of construction and demolition waste, whilst they also provide technical & infrastructural support to the Health Department.

Waste generation

Bangalore city generates about 1746 tons of municipal solid waste per day (TPD). Such statistics include bulk waste, construction debris and Health Care waste. (Source: BMP-BATF Survey, 2001). As per the TIDE quantification survey of 2001, they estimate that the average waste generation rate per capita is 0.27 kg per day, based on a population of 5.6 million people (including Greater Bangalore).

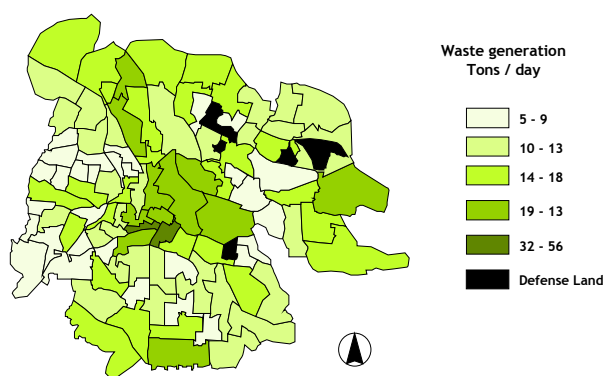


Figure 5. Waste generation in Bangalore

Table 2. Municipal Waste Generation in Bangalore in 2001

Source	Quantity (Tons/day)
Residences & Shops	1562
Markets	84
Hotels and Restaurants	96
Commercial Premises	6
TOTAL	1783

Source: BMP-BATF Survey, 2001, adjusted by UWEP staff to remove redundant information

2.2.3 Description of Mythri/Waste Wise and the origins of its involvement

Mythri Sarva Seva Samithi (Mythri) is a non-governmental, non-profit making organization, which became an officially registered NGO in 1987. Mythri specializes in working with the urban poor, as well as waste related issues of the urban environment in Bangalore. Its project, Waste Wise, was specifically designed to promote a decentralized, community-based waste management system incorporating the integration of the waste pickers themselves.

Mythri has been involved with the UWEP project from the time of its inception, through its project, the WasteWise Resource Centre. Initially, this involvement incorporated indirect collaboration through staff participation in UWEP programs. However, in the UWEP Plus phase, Mythri became the official partner organisation, as well as regional programme manager, whilst they also became members of the SURCO association. Both Mythri and WASTE have continued this association in subsequent programmes.

Mythri is also a member of Swabhimana, a Bangalore stakeholder platform comprised of various NGO's. Swabhimana concentrates on the following issues and focus areas at the city level:

- ◆ Solid waste management;
- ◆ The encouragement of corporate relationships in the delivery of urban services;
- ◆ Facilitating community participation in services, thereby increasing transparency and efficiency;
- ◆ Facilitating greater interaction between citizens and service providers;
- ◆ Spreading awareness on environmental and civic issues by targeting the general public, students and community-based groups.

Both Mythri and Swabhimana were active at the city level when UWEP approached them and offered them the opportunity of support for intensive research on waste management, utilising local expertise. Mythri subsequently identified some of those local experts in preparation for this research phase. However, mid-way through the UWEP 1 phase, the position for Regional Manager for South Asia became vacant, with the Director of Mythri, Mr. Anselm Rosario, being contacted and appointed for same. Thus was born a productive relationship between Mythri and UWEP.

2.2.4 What motivated the partners and stakeholders to ask for UWEP support?

- ◆ Despite MSWM representing a major activity of local governments, typically accounting for up to 20% to 50 % of the municipal budget, Urban Local Bodies (ULB's) were incapable of providing adequate services.
- ◆ Most ULB's did not possess reliable data on MSW generation estimates.
- ◆ The collection and transportation systems in place were inadequate, resulting in left over garbage heaps attracting stray animals, clogging drains and subsequently, the spread of diseases.
- ◆ The practice of mixing all forms of waste in the municipal stream was common, whereby, bio-waste would be combined with medical as well as industrial hazardous waste;
- ◆ The disposal of this waste was not sufficiently controlled, and was based simply on an open dumping policy, where the suitability of the recipient land was not ascertained. This resulted in foul odours developing, the generation of leachate, and the contamination of local soil, ground water and air.
- ◆ The municipal staff themselves lacked adequate training to handle complex materials and associated issues in waste generation. Further to this, they were incapable in meeting new demands related to the globalising waste stream.
- ◆ The communication programmes for effective MSWM procedures were not considered a priority, and as a result received little or no official attention, effort, or resources.

- ◆ There was glaring inequity in the waste services provided: wealthy areas were comprehensively-covered with a relatively high level of service, however, large sections of poorer settlements lacked the basic amenities for civic cleanliness.
- ◆ All these factors and more hampered the efficiency and effectiveness of MSWM services provided by the Urban Local Bodies

Bangalore has been the site of various attempts by both local government and civil society to address the issues of solid waste management, dating from the mid-1980. The late 1980's through to the mid-1990 saw these concerns translating themselves into a great variety of practical actions on the ground. While local government focused on strengthening its infrastructure by utilising more vehicles, as well as the induction of consultative studies to assist in managing municipal waste, the civil society groups began setting up alternative decentralized models. These alternative models began to draw attention from various quarters, which, in turn, exposed the inability of local government to address solid waste issues in a technically appropriate manner.

A public interest litigation filed in the Supreme Court of India by one of the members of Swabhimana, resulted in the whole country waking up to the drastic situation faced by India in relation to its civic cleanliness, as well as those public health hazards posed by the waste generated in its cities and towns. Consequently, Bangalore has witnessed numerous experiments in solid waste management since the late 1980's. The level of these experiences ranged from decentralized collection, transportation and disposal to separate systems for non-degradable and bulk wastes. Most of these initiatives were localized, limited to a few streets or neighbourhoods, and were often founder-driven, with corresponding difficulties in replication. The authorities generally encouraged or recognized these initiatives, but they have not accorded them any institutional or legal status.

During the mid-1990s, a progressive appointee to the position of Commissioner of BMP took the initiative of identifying, mobilizing, supporting, and consolidating these solid waste management activities, as well as initiating a joint planning and implementation programme at the city level, with the assistance of NGO's and other concerned groups. This represented the impetus so badly needed for the formation of the Swabhimana platform, with its mission to examine city level waste management issues and civic related concerns.

This was also the period in which UWEP had virtually completed its research work and findings, which were subsequently, shared among the city managers of WASTE as well as with members of the Swabhimana platform. In many ways, UWEP was perfectly poised for initiating its pilot projects in the region, based on local demand and solid partnerships. Interaction with the Commissioner of BMP, members of Swabhimana and other NGOs articulated common concerns and the need for financial and technically supported initiatives in the form of pilot projects in Bangalore.

Following a series of meetings and discussions, the partnership between the BMP, Swabhimana and WASTE, Netherlands was spawned. Further to this, as a result of those discussions undertaken, Bangalore was chosen as one of UWEP I's pilot project settings for the region, with a specific mission to upscale localized activities to the city level. A Memorandum of

Understanding was signed in 1997 between BMP, Swabhimana and WASTE outlining the aims, roles and responsibilities of the project, along with clearly defined targets and time frames for implementation.

2.2.5 Who were the key owners of the process?

During the initial phase, the key owners of this process were the UWEP programme staff, the BMP and Swabhimana. Within the BMP itself, and taking into account the turnover of Commissioners involved, the main motivators for this process were the Commissioners of Bangalore, who were also administrators to the city. However, this was also a period wherein council elections were being stalled due to court proceedings. Nonetheless, the dual position of Commissioner/Administrator to the city meant that he had the necessary power to implement any development processes for the city. He was, in turn, assisted by NGOs such as the Bangalore Environment Trust (BST), the Centre for Environmental Education (CEE), Civic, Mythri Sarva Seva Samithi(MSSS), Awaz and the Public Affairs Centre (PAC). Within the Swabhimana framework, the main impetus came from BST, CEE, MSSS and PAC. Initial inputs came in the form of data gathering, identification of potential neighbourhoods for decentralized waste management, interaction with lower rung officials, training programmes, public meetings, clean up drives, the establishment of models, the extension of technical and managerial support to start up programmes, back stopping, reporting and documentation. Therefore, by the processes end, the results were “owned” by the city level platform, the BMP and local stakeholders, who were predominantly CBO’s

Subsequently, the BMP made available practically all of its officials of the municipal corporation for training, knowledge sharing and planning. The Swabhimana Platform, for its part, possessed members who were key NGOs, particularly concerned with waste and governance issues, along with other stakeholders at the community level. An ideal platform was created to evolve a solid partnership, which could jointly and cooperatively work together. Since the Commissioner of Bangalore was directly involved, the UWEP start up process began quite smoothly and in the final was virtually owned by the city.

Therefore, in the initial phase of UWEP, the partners involved in the pilot project settings were also the key owners of the process. And subsequently, during UWEP plus, the BMP, the Bangalore Agenda Task Force (BATF), Mythri, a few local NGOs and WASTE, Netherlands became the key owners of the process.

2.3 Overview of the UWEP interventions in Bangalore, 1995 – 2003.

For the duration of 1995, UWEP was preoccupied with its research, or “knowledge generator” phase, with an emphasis on compiling information and data on waste-related issues at the local level. Both field and literature research was undertaken for the purpose of case study reports and further working documents. These studies assisted those involved in understanding the needs and demands arising from the target groups, whilst it further assisted them in both producing and adapting the relevant knowledge to fit the local demands. The guiding principle of this research was, therefore, to gather the necessary information, and disseminate it amongst the local stakeholders, for the overall purpose of building local capacity.

By 1997, the research phase of UWEP had been completed and subsequently phased out; however, in the aftermath of this research, the programme managers took the decision to offer its resources to key groups, to assist them in setting up pilot projects within their own regions. Bangalore provided the perfect setting for this process, particularly owing to the good partner organizations already in place, who were more than suitable for the implementation of small-scale, locally-conceived pilot projects, in conjunction to the modest financial support as proffered by UWEP. A Memorandum of Understanding (MOU) was signed between BMP, Swabhimana and WASTE outlining the aims, roles and responsibilities of each stakeholder, along with clearly defined targets and time frames. Local government, for their part, reinvigorated their support for the activities of Swabhimana, as well as its member organizations. These pilot projects proved to be very useful, when utilised as small-scale experiments, where full use was made of all those stakeholders involved, which provided subsequent benefits in the decision making process. This, in turn, helped to develop the Swabhimana platform, and to build a culture of cooperation, based on mutual understanding, planning, and implementation.

After a considerable amount of discussion, three main pilot project activities were identified for financial and technical support, whereby a separate contract was drawn up for each of those agencies concerned. The Bangalore PPS (Pilot Project Setting) included:

- ◆ PP-1. The strengthening and support of city level initiatives through staff support to, and the subsequent strengthening of, the Swabhimana Platform.
- ◆ PP-2. A ward level approach to solid waste, with particular reference to Ward No.14, in Nagapura, represented the second of the PPS activities, which had a clear and deliberate emphasis on community based waste management, segregation of organic waste, and the house-to-house collection of waste, which was in turn, to go to community composting sites near the source. (Nagapura was chosen after an unsuccessful start-up in a different ward). The idea was to experiment on a ward level, and then to scale up to 50,000 households.
- ◆ PP3. With reference to Health Care Waste, working in close cooperation with the Ramaiah Medical College, PP3 was set up as a unique experiment in Health-Care Waste Management (HWM). The aim of this experiment was to address the issue of the safe management of medical waste through a stake-holder focused, problem-solving approach, with the potential for documentation, replication to other institutions, and further expansion within the institutions for the purposes of new approaches and new materials.

In 1997, WASTE, the Bangalore Mahanagara Palike (BMP – Bangalore City Corporation) and Swabhimana (City level NGO stakeholder forum) signed an MOU to execute three pilot projects in Bangalore under the UWEP I program. To take place in three separate Wards, the first of these was a community based solid waste management project; the second, a project to develop a health care waste management system; and the third, to provide on-going support to those activities which would strengthen Swabhimana, and promote it as an effective platform for the stakeholders of the city. The primary focus of UWEP I was, therefore, on stakeholder integration and on creating a critical mass for a sustainable waste management planning process.

2.3.1 Ward level approach – Ward No.14, Nagapura

The local office for the national para-statal organisation, the Centre for Environmental Education (CEE), implemented the ward level approach in Nagapura, after an unsuccessful attempt to do so in a different Ward. The local office of CEE were the key owners of the programme and their staff took on the responsibility of providing technical, managerial, and communicational support to its pilot project sites. The financial support for this project came from UWEP, while the on-site assistance was provided, where necessary, by the BMP and elected representatives of the area.

The actual implementation of this process was undertaken by localized community-based organizations that took care of the day-to-day management of waste collection, transportation and disposal. The project concentrated on the entire Ward in terms of data collection, whilst they produced base line documents, with relation to the number of households involved, commercial establishments, the solid waste management infrastructure, the quantities of waste generated, disposal points etc. Their main activities incorporated door-to-door collections of organic and dry waste, and the further composting of this organic waste in a community composting facility developed in a public park in one of the sub wards (14 C – Health Ward) of Nagapura. This pilot project proved to be a useful small-scale experiment in educating those involved as to what works well in a specific situation and what was not viable. It also identified a number of areas where intervention was needed in the form of awareness raising, training and capacity building. By the end of this project period, all operations were handed over to the community groups with the help of the Swabhimana platform, whilst those lessons learned were applied to other initiatives which were in operation at that time at the city level. The project operated through a multi-stakeholder process, incorporating elected representatives of the area, officials involved in solid waste collection and transportation, waste pickers, students, and experts, amongst others.

The pilot project on community based waste management, emphasized the effort required in building a critical mass for strong, efficient and sustainable waste management at the Ward level. The principles of waste minimization, segregation, recycling near the source, community mobilization, education, waste picker's integration, as well as working in collaboration with the official system were promoted through this pilot project. Furthermore, that vital link between the primary and the secondary collection system and means of disposal, had been established. The project also generated considerable data records, experience and expertise in designing systems at the Ward level. Those systems established are still in operation today and have made a significant contribution towards finding alternative solutions in waste management practices at the city level.

2.3.2 Health Care Waste Management

The UWEP intervention in Health Care Waste Management began with a stakeholder workshop on Integrated Sustainable Waste Management (ISWM), where key stakeholders expressed their views on the need for particular attention to be paid to health care waste, and the need to arrive at more sustainable management approaches to such waste. This pilot project offered all those concerned an opportunity to test the development of a sustainable health care waste management system, as well as to field-test key concepts of ISWM in a Ward of Bangalore. The project proposal evolved over a series of brainstorming and interactive sessions, in collaboration with

field experts and policy-makers. The implementing agency for this Health Care Waste Management project was MS. Ramaiah Medical College, (MSRMC) Bangalore, whilst the project itself attracted a number of stakeholders, from owners of health care establishments, to government authorities, private entrepreneurs, students, experts, and indeed the community of Malleshwarem itself.

A three-pronged strategy was implemented to engage the stakeholders and secure their longer-term participation.

- ◆ With the owners of health care operations, the key strategy was to elicit support by disseminating information on health care waste, its hazards, and the laws applicable to this.
- ◆ With the practitioners of health care, the approach was in the form of training and pro-active involvement.
- ◆ The collaboration of governmental authorities was established through seeking their involvement and recognition of the initiative at every stage.

This was a multi-layered strategy, which proved very useful in gaining institutional recognition and buy-in from both doctors and “lower-level” hospital staff and functionaries. An informal network referred to as the Health Care Waste Management Cell was formed, with leadership from doctors, nurses, and staff. This represented a grand amalgamation between the Community Medicine Department of MSRMC, the Department of Ecology and Environment, the Government of Karnataka, the BMP, Swabhimana, Tata Energy Research Centre (TERI), the Centre for Environmental Education South Region and a number of other organizations.

This project provided the basis for benchmarking, replication and expansion, whilst the dissemination of information was facilitated through professionally organized seminars, training modules and documentation.

Health Care Waste Management pilot project assisted in creating a demand for a health care waste management service within and outside the pilot project area; in creating a unique platform for discussion; as well as providing an exchange of information and evaluation of technology in health care waste. Hailed as a pioneer approach in HCWM for the whole country, HCWM, supported by UWEP I, continues to demonstrate the practical application of a waste ideology at city level. In addition, it facilitated the Government in notifying and framing rules to implement national laws and guidelines on the management of medical waste. Further to this, it has created a forum for the safe management of medical waste at the city level thus providing an opportunity for generators of medical waste, authorities and entrepreneurs to come together in a process of dialogue and common solutions. At the national level, HCWM has furnished comments on draft rules, has pressurized the national government in passing legislation with regards to such issues, while such rules have been circulated widely to those establishments who generate medical waste. The HCWM cell continues to operate in Bangalore and is the main stakeholder in all conferences and activities related to medical waste management.

2.3.3 *The Role of the Swabhimana platform*

This Swabhimana platform is a unique force in bringing together officials and other stakeholders for developing technically appropriate waste management systems for the city. From its inception, it has facilitated numerous initiatives that have pushed the city to adopt sound principles for managing waste and other urban infrastructure systems.

The BMP and Swabhimana provided an umbrella for all of the UWEP pilot programmes, by facilitating local initiatives with governmental support. A number of city level meetings, public hearings, neighbourhood programmes, to organise the initiatives took place in the period 1995-96. According to reports, there were as many as 45 localized, neighbourhood community-based models for managing solid waste during this period.

While the Ward level approach has thrown up a number of insights into both the benefits and indeed, those limiting factors associated with community based decentralized waste management, the successful Health Care Waste Management initiative created a strong demand from several institutions within Bangalore and in the State of Karnataka for a replication of this system. Following a visit by members of the UWEP Plus programme staff to Bangalore in 2002, it was reported that the Health Care Management Waste initiative had been replicated in 129 hospitals, nursing homes, and related health-care institutions.

2.4 **Situation at the end of UWEP I**

At the conclusion of UWEP I, the following situation has prevailed in Bangalore:

- ◆ The city launched the “Swacha Bangalore” programme, which facilitated the door to door collection and transportation of waste, covering nearly 70% of the city’s population².
- ◆ Many NGO/CBO initiatives which had existed prior to the advent of the macro programme for the city, were absorbed into Swacha Bangalore, which actually resulted in apparent discontent among some of the pioneers of neighbourhood initiatives.
- ◆ Although there was overall general support and enthusiasm across all sections of society, there were also numerous problems associated with the services associated with a project of this scale.
- ◆ Those pilot projects and experiments undertaken in Bangalore attracted a great deal of attention from various other Indian cities, whilst the city itself now possessed a catalogue of models to showcase itself.

The administration were keen on promoting and supporting alternative models of waste collection and transportation, where contracts were issued out to various NGO’s/CBO’s within the city, rather than conventional private contract systems.

² Since Bangalore has been an experimental ground for many forms of waste management systems adopted by community groups, NGOs and others, the awareness and expertise generated pushed the city to launch a new, comprehensive collection and transportation of waste programme, called the “Swacha Bangalore” programme.

By the conclusion of UWEP I, these three elements of the PPS were operating, but without much direct influence on each other or on the overall waste management activities of the BMP. If there was an element that held them together, it was that they were all supported by UWEP, and also that they all shared some staff. Swabhimana also provided a binding influence for these three PPS activities. However, it could well be said, that in the overall analysis, there was a lack of cohesion, and also that, while there was a clear interest in interventions at a higher level that the strategy for introducing them was not yet in place. In this respect, Bangalore, more than any other PPS city in the UWEP programme, was ripe for the next phase, that being the UWEP Plus initiative.

Nevertheless, prior to considering those activities contained under the UWEP Plus initiative, it is important to note what was the current situation in Bangalore in terms of solid waste management services and policy. First of all, it must be noted that the ‘knowledge generator’ component of UWEP, the pilot project settings and numerous other localized initiatives in Bangalore, had contributed immensely in shaping the programmes and policies of the local government in relation to SWM. In conjunction to this, those Waste Laws enacted by the National government had also contributed significantly to the overall situation very positively.

By November 1999, the State Government of Karnataka formulated the Bangalore Agenda Task Force (BATF), a unique public private partnership model, designed to be a driving force for the Bangalore Agenda. This Agenda had provided for in its remit, the modernizing of the city’s infrastructure, implementing an efficient provision for public services, and expanding the resource base, amongst other things. Solid waste management was placed as the focal area of concern for the BATF, who subsequently launched “Swacha Bangalore”, (Clean Bangalore) a door-to-door collection of segregated waste. After two years of this Swacha Bangalore programme, the city was given a rich experience in relation to door to door collections, as well as in the training and involvement of officials and Civil Society groups. It has produced not only ground level experiences but also capacity building models for different stakeholders, as well as operational guidance provisions which can address day-to-day operations.

During 2001, two important documents evolved out of the city’s experience in waste management. The first of these documents was prepared by the BATF, and was entitled “A Strategy Paper for Solid Waste Management,” whilst the second was prepared by AusAid, and was entitled, “A Strategic Action Report on Solid Waste Management”. Both these documents provided much needed understanding on technical issues related to solid waste management, such as storage procedures, segregation, the collection of waste, its transfer, processing and disposal, as well as those salient features that need to be taken into consideration when planning and up-grading for the future. Finding suitable land for disposal, the creation of transfer stations, the creation of technically appropriate disposal options along with infrastructure for the upgrading and segregation of waste, as well as people’s participation in such processes, were considered priority areas within these documents. However, although these documents had a consultative process among stakeholders during its preparation and completion, they could not be termed as documents of planning, which had emerged out of a participatory process, involving all those concerned.

2.5 The UWEP Plus context

The introduction of UWEP plus and the KaR project in Bangalore at the beginning of 2001, coincided with an increase in interest in solid waste management, and the most active period in the activities of the Bangalore Area Task Force (BATF). Bangalore, like any other Indian city, possesses a centralized power structure supported by the Indian Civil Service, focused on the Office of the Commissioner. This makes the continuity of this process highly dependent on the interests and skills of each individual commissioner, and becomes fragmented when commissioners are subject to frequent transfers, as was the case between 1999 and 2003. During the tenure of committed, professional, progressive commissioners there is progress; in contrast, during the tenure of commissioners who are political appointees possessing a different agenda, those initiatives created through progressive commissioners are rolled back without support and the process consequently stands still, or indeed becomes regressive. Further to this, every new commissioner, as well as their staff, needs to be briefed on these programmes. Therefore, by the time they are capable of familiarizing themselves with the material and arrive at their own vision of what is happening, they are transferred. This has resulted in highly significant losses in the institutional memory of this Office, and consequently, in the implementation of its decisions and achievements.

In effect, the city level platform, Swabhimana, has functioned as the organ of continuity and institutional memory,. However, due to the fact that legally they are a civil society group and not a formal governance structure, their legitimacy and ability to contribute to the formal decision making process remains constrained. Based on the interests of the current BMP Commissioner, Swabhimana and its members are typically consulted on specific “soft” issues, such as citizen’s participation or the promotion of more citizen groups, but they are not consistently interpreted as serious stakeholders in relation to “hard” technical issues critical to solid waste services.

The Bangalore Area Task Force (BATF) has a very different status. This group of high-tech businesses were formed with a view to transforming Bangalore into world class city. Typically Government appointed task forces meet, deliberate and set out recommendations for the Government to act upon. However, this is usually in an advisory capacity. The BATF adopted a dramatically different operating model. It had ensured its members (15 in number, and predominantly professionals in the business sector) were appointed by Government order. The political support given to BATF by the then Chief Minister was the key determinant in setting up this model.

From the outset, BATF decided that it did not want to add to the pile of reports and recommendations already in existence, as there were already enough recommendations on what needed to be done. The challenge was in collaborating with Government departments in order to make it happen. So BATF took on the role of catalyst. It worked with already identified civic stakeholders like the BMP, the Police, the Telephone Department, Bangalore Development Authority, the Water Board, and the Transport Department, amongst others. Whilst the stakeholders set out the goals, the BATF aided them in implementation wherein it was desired. In addition to this, BATF undertook some projects on its own initiative to build credibility with the stakeholders, and to illustrate best practice. Because of its high profile, BATF succeeded in receiving a formal designation as an officially constituted advisory body, which gave them the

legitimacy and status which Swabhimana lacked, in spite of Swabhimana's relatively longer involvement and deeper level of technical knowledge. In fact, BATF drew on Swabhimana's resources extensively in the initial phases of its operations, including hiring a former UWEP I-supported Swabhimana staff-person, yet, this did not contribute in the short term to legitimising Swabhimana, although that did eventually occur.

2.5.1 Focus of UWEP Plus and KaR

The focus of the UWEP Plus phase, *taking city processes to scale*, fit in quite well with the situation in Bangalore at the beginning of UWEP Plus. UWEP Plus focused on performing ISWM assessments, and ISWM/Strategic Planning, as a way of engaging the local authority and capitalising on the progress made in UWEP I.

The UWEP Plus approach is based on the framework of Integrated Sustainable Waste Management (ISWM) and provides a critical approach to planning that considers the institutional, economic, social, environmental, technical and policy-legal aspects of the solid waste plan with a participative as well as inclusive process which focuses on giving stakeholders the tools for finding long-term, sustainable solutions to waste management.

The Knowledge and Research (KaR) project was based on field-testing the Strategic Planning Guide (SPG) developed by the Environmental Resources Management (ERM), a group of international experts on municipal solid waste management, for the CWG, the Collaborative Working Group on solid waste in low-income countries. The combined focus of the UWEP Plus programme component, and the KaR project, was to contribute to a comprehensive, broad-based, stakeholder-driven participatory process and to arrive at a broadly supported strategic planning framework, which in turn would provide the basis for an ISWM Strategic Plan.

It is against this background that the KaR project, together with the application of the ISWM planning tools, were introduced to key officials, members of BATF and other stakeholder groups. Since the city had no history of planning processes that involved key stakeholders, the policies and programmes were decided jointly by the BMP and the BATF, and were implemented as the situation demanded.

Because of the nature of the organisation, its political legitimacy, its mandate for planning, and its close cooperation with the BMP, the Bangalore Agenda Task Force was identified as the principal agency to promote ISWM and a strategic planning process. Whilst going through the planning process, it was also decided to engage in a number of capacity building activities that would promote a stakeholders forum, as well as complement institutional strategic planning processes for Integrated Sustainable Waste Management.

Swabhimana and Mythri soon joined this process and spearheaded the initiative, receiving additional funding and technical support from the KaR project. Those officials involved in the BMP implementation activities participated somewhat reluctantly, and were in general more interested in action than engaging in the institutional planning process.

The goal of UWEP plus was to engage the city in the ISWM assessment and planning process, and to experience the effects that this could have on trust-building, governance, and the effective

mobilisation of local resources. To initiate and strengthen such a process, a number of activities were planned and introduced at both city and local levels, and were scheduled to include:

- ◆ Conducting a baseline analysis and establishing a data and information resource baseline to support the ISWM assessment and planning process;
- ◆ Consolidating the pilot projects begun in UWEP I, and to utilise these projects and ideas in the next phase;
- ◆ Working with WASTE on the experimental line of C/N environmental research;
- ◆ Strengthening Mythri's organisational effectiveness and reach with UWEP staff and communications equipment;
- ◆ Supplementing tools and resources for training and capacity building;
- ◆ Strengthening local initiatives such as Swabhimana, and community initiatives such as RISE;
- ◆ Adding a website and web presence to the WasteWise resource centre;
- ◆ Consolidating and formalising a regional network of practitioners in SWM; and
- ◆ Facilitating peer-to-peer exchanges.

The ISWM assessment and planning process, paired as it was with the KaR field-testing of the Strategic Planning Guide (SPG), did not take off overnight. In Bangalore, the planning process went through a series of ups and downs, primarily due to the shortness of tenure and frequent transfer of responsible commissioners and other officials, which resulted in there being two commissioners and three special commissioners (equal to the status of the commissioner and in charge of SWM operations) over a span of only three years. Meanwhile, in the persistent gap which always occurs between the transfer and appointment of special commissioners, all decisions and actions came to a halt in the BMP. In such times, the standard is to wait until the new commissioner/special commissioner takes charge, and subsequently briefs them on the issues at hand, whilst familiarizing them and eventually getting their consent, before furthering planning process took place. This greatly affected the overall planning process, fragmenting its continuity and delaying the implementation of necessary actions.

A draft MoU was prepared in consultation with the BATF defining the role of BMP, BATF and WASTE in early 2002, and was subsequently passed to the legal department of the BMP for signing. At first, the MoU process stalled, due to a negative experience on behalf of the city's administrators with respect to another civil society initiative, whereby an NGO had taken the BMP to court for the lack of fulfilment of certain commitments made in an MoU, with reference to a stray dog menace. For many months, it appeared that all attempts to sign a MoU or institutionalise the ISWM planning process were going to fail for various reasons. The BMP itself was preoccupied with troubleshooting, fire fighting and the routine activities of the day-to-day operations of SWM. There was hardly any time or interest to go into a long term planning process that would involve key stakeholders. And despite UWEP 1 and SWACHA Bangalore's experience, it took almost three years for the city to sign the MoU, and to commit to and commence the ISWM assessment and planning process.

Initially, a baseline document and stakeholders assessment was carried out by independent consultants engaged by Mythri, who were also tasked to work on the UWEP Plus programme component. As was pointed out earlier, Bangalore is a huge city with 6 million people, while it

possesses a huge infrastructure of personnel and equipment for SWM operations. It is not easy for an NGO, nor indeed any other group perceived as private or having its own agenda, to penetrate the governmental administrative structure unless that group has been constituted, and its members appointed, by the State Government through a government order, as in the case of the BATF.

Therefore there were many difficulties in obtaining data for the base line document. An initial baseline document which was compiled and included in the KaR project inception report, looked mostly at the technical aspects of the existing systems, but not in detail at the “meta”-dynamics of the planning and development processes, which are ongoing in Bangalore. These “meta” issues were the source of the most potent information for the needs analysis. Besides critical factors like finance, the budget for SWM was totally absent from the document because of the BMP’s legal hesitation about providing that information.

2.5.2 Stakeholder Assessment Gaps and Process

The first round of stakeholder identification had many gaps. Those two formal planning processes undertaken in Bangalore by the BMP/BATF and AUSAID, had identified and consulted a narrow range of stakeholders, mostly limited to service providers and public officials. These people were considered to be the only legitimate protagonists in the planning process, and were in turn consulted and provided with information which was used in formulating the plans and programmes. At the BMP level, the field staff constantly referred to those problems they faced in implementing routine services, in the form of a lack of equipment, personnel and vehicles.

In general, there was no socialisation of information: even those few stakeholders involved were not invited to provide feedback on the plans themselves, nor did they have any role in ongoing management or monitoring of the services provided. There were also grievances emerging from stakeholders and citizens due to their non-consultation, as well as the fact that their constituencies or Wards were not functioning as well as might be expected.

A secondary analysis of these patterns proved quite fruitful, as it was possible to see both the complaints and the limitations of the stakeholder process as being related to a limited vision of information flow. The most glaring omission from the process was that there was no permanent or active channel of communication for feedback. Stakeholders could provide information but their opinions or experiences were not considered relevant. Thus, it also became clear that the baseline process had missed the opportunity for the identification, mobilisation, classification and/or consultation with a range of other, informal or indirect stakeholders, whose interests and influence were also relevant to the process.

This stimulated a new round of investigations, in the course of which, the stakeholder report document was revisited. It was at this point that it became clear that through the existing format, a large number of stakeholders were effectively excluded from the planning or indeed, the implementation of waste management programmes. Therefore, another round of stakeholder meetings took place, which sought to bring in a wider range of actors and to understand their interests and influence. These stakeholders could be roughly classified as follows:

- ◆ *Key stakeholders* in a SWM plan are those who can significantly influence the plan and who are important to its success.
- ◆ *Primary stakeholders* are those people and groups ultimately affected by the integrated solid waste management plan. This includes intended beneficiaries or those negatively affected (for example, those involuntarily resettled).
- ◆ *Secondary stakeholders* are the intermediaries in the process of delivering a waste management service to primary stakeholders. They can be divided into funding, implementing, monitoring and advocacy organizations, or simply governmental, NGO and private sector organizations.

There were also other stakeholders identified who were not included in the earlier assessment:

- ◆ Self-identified stakeholders had not yet been recognised;
- ◆ Expected stakeholders (based on a general knowledge of solid waste planning processes);
- ◆ Resource stakeholders: those whose participation can enrich or bring resources to the process;
- ◆ Risk stakeholders: those whose reactions or forgotten interests represent risks to the process.

The identification of the stakeholders to be included in this stakeholder analysis was done through the collaborative efforts of Mythri and WASTE representatives for the KaR project, for the South Asian region. In drafting the stakeholder tables and the consequent analysis, these organisations made use of the experience they had built-up during the UWEP I programme (1995-2001), which had included Mythri, Swabhimana and WASTE.

2.5.3 Results of the Stakeholder Process

The BATF and the Swabhimana Platform were, not surprisingly, seen as the two key stakeholders, and both were anticipated to play a dual role in the planning process: firstly, of facilitating and/or mobilizing the planning process, and secondly, as stakeholders involved in, and having interests and influences on, solid waste management activities in Bangalore.

Table 3 is a sample of the results of this process. It also gives an overview of the assumptions per stakeholder and the risk-level of these assumptions not holding. This is an example of one type of analysis which was undertaken in the course of the second round of the stakeholder process.

Table 3. Sample results of the UWEP Plus Stakeholder Analysis

Stakeholder	Assumptions	Risk
Households	- Willing to participate in the MSWM activities through cost sharing - Increased awareness on the importance of MSWM	Medium
Shops/Commercial /Office Establishments		Low
Waste Collectors / Waste pickers	- Continuation of waste picking activities	Low
Industrialists	- Willing to participate in MSWM activities - Increased awareness on the importance of MSWM	Low
Hospitals	- Willing to participate in MSWM activities	Low

Stakeholder	Assumptions	Risk
	- Increased awareness on the importance of handling medical waste	
House Builders	- Willing to participate in the MSWM activities through cost sharing - Increased awareness on the importance of MSWM	Medium
Recycling Industries	- Willing to participate in MSWM activities - Increased awareness on the importance of MSWM	Medium
Slums	- Willingness to make optimum utilization of the services extended by BMP	Low
Community Based Organizations	- Willingness to take active part in SWM activities through organising programmes related to raising collective conscience	Low
Nongovernmental Organizations/Swabhimana/CI VIC		Low
People's Representatives	- Willingness to take active part in SWM activities through enlisting of support of the community and other stakeholders	Medium
Associations - Hotel, Choultry (Marriage Hall), Hospital, Plastic Manufacturer's Association, Industries Association, Association of Recycling Industries	- BMP recognises the key role of these organizations - Willingness to act upon their duties and responsibilities	Low
Bangalore Mahanagara Palike	- SWM is the obligatory duty of the BMP	Low
Bangalore Agenda Task Force	- Continued support for BMP's initiatives through financial and other support systems	Low
BMP Employees Association	- Formal recognition by the Association of BMP as a key player	Medium
Private Contractors in BMP	- Continuation of the private contracting system	Medium
Environmentalists	- MSWM strategies recognise the role and importance of environmentalists	Low
Research Institutes	- Association with SWM research activities	Low
Commercial Organizations involved in Waste Management - MIRIDI, KCDC, Private Composting Industries	- Continued Public-Private participation in MSWM activities	High

2.5.4 ISWM Assessment

Before arriving at an assessment of ISWM, multiple activities ranging from meetings, workshops, capacity building programmes, and the support of ground level actions, were undertaken both by Swabhimana and Mythri teams. An informal task force was formed to carry out such programmes. Further to this, in July 2003, a regional workshop was planned to supplement their skills and expertise. It was then the BATF became interested and agreed to collaborate on a joint planning process, using the ISWM and Strategic Planning Guide tools and instruments. For the first time, a comprehensive, mutually beneficial platform was created to look at the ISWM planning process and the SPG. A working group consisting of hands-on SWM practitioners (BMP, BATF, NGOs and other organizations) was formed and they received methodological guidance from the regional coordinator of WASTE, Netherlands.



Photo 1. Working group in action

It was decided that an “Advisory Panel” consisting of SWM opinion makers, experts and governmental organizations, would also support the working group. The working group deliberated over a number of sittings and prepared a **conceptual note** describing the objectives, activities and results foreseen for the proposed planning process. This process drew much of its direction from SPG and other ‘best practices’ available globally.

A comprehensive plan in the form of conceptual note included the following flow diagrammes explaining how the planning process could be influenced and made feasible



The need to plan

- To adhere to National laws and polices
- To avoid fire fighting and hoc actions
- To improve financial efficiency

Establish best practices model

Figure 6. Input for the planning process for strategic ISWM planning for Bangalore

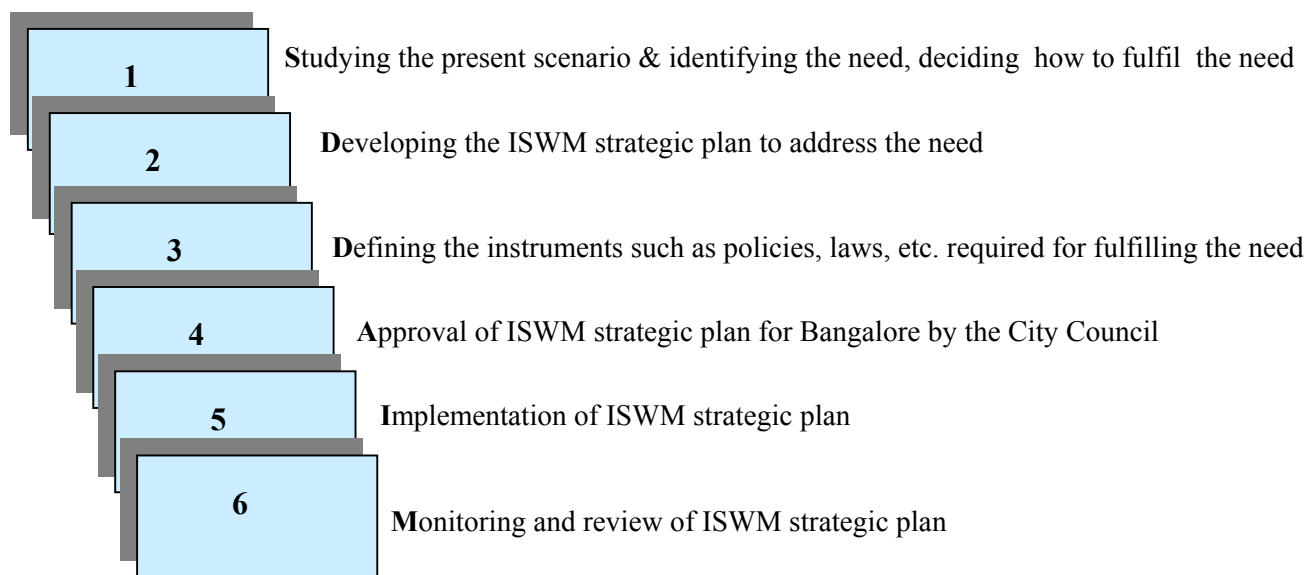


Figure 7. Stages of ISWM planning

The Special Commissioner of BMP in turn presented this to a citywide audience, stakeholders, officials, practitioners and resident groups. This gave impetus to a process aimed at delivering a so-called **SWM Road Map for Bangalore** (SP Guide and ISWM framework), even though, by then the programmatic component of UWEP Plus was in the process of being phased out. Nonetheless, this process continued following the formal closing of the programme, and as of December 2004, there is in place a comprehensive base line; system and stakeholder documentation; planning guidelines; and the results of the strategic planning process. Further to this, a strategic planning framework describing the ISWM road map for Bangalore has been developed. This framework defines the strategic vision for the city, the scope, as well as key issues with objectives and targets. The content of this document has been socialized at various levels; however, it is not yet complete. Efforts to complete this process are ongoing.

Table 4 gives an overview of activities undertaken during the implementation of the strategic planning process in UWEP Plus:

Table 4. Activities during implementation of UWEP Plus planning process

Assessment and Planning Step	Months	Activity	Stakeholders involved
Step 1	November 2001	Project start up meeting in San Jose, Costa Rica, Agreeing project	WASTE – ERM ³ – MYTHRI

³ Environmental Resources Management, a UK environmental consultancy, was the primary author of the Strategic Planning Guide (SPG). ERM participated as a partner in the DFID-co-financed Knowledge and Research (KaR) project, which field-tested the SPG in three of the four UWEP PPS cities, and ERM staff were also involved in the planning process in Bangalore.

Assessment and Planning Step	Months	Activity	Stakeholders involved
Step 2	December 2001 - March 2002	Literature review, Base line document preparation, Stakeholder analysis, initial mobilization activities, MoU preparation, Meeting with Key stakeholders	Local coordinator, Regional coordinator, BMP, BATF
Step 3	May – June 2002	Workshop introduction-phase. Sharing of concept and ideas on ISWM and SPG	Key stakeholders, BMP and representative from WASTE
Step	July to September 2003	Bi-weekly Task force meetings to plan, implement and review <ul style="list-style-type: none"> - Data gathering on Wards - Research work on auto tipper versus push carts - Meetings at the Ward level - Complementary pilot activities like plastic carry bags recuperation, apartment collection, mobilizing citizen groups at the Ward level and socializing ISWM planning process 	Health officer (at least one), middle level officials, Swabhimana, NGOs and CBOs Volunteers, consultants, middle level BMP officials
Step 3	October – December 2002	<ul style="list-style-type: none"> - ISWM workshop - Secondary waste collection study - Quantification of infrastructure requirement - Digitization of Ward maps - Ward level meetings 	Stake holders, key BMP officials, LC and RC, volunteers, professionals
Step 4	January – March 2003	<ul style="list-style-type: none"> - Workshops and meetings at the ward level - Waste Characterization workshop and study - Influencing tendering process 	Resident groups, officials elected representatives, civic wardens, LC, RC, key stakeholders of the area and the officials
Step 5	April – June 2003	<ul style="list-style-type: none"> - Improving infrastructure 	Task Force, BMP
Step 6	July 2003	<ul style="list-style-type: none"> - Informal relationship with BATF, brainstorming with RC, initiation of planning process and formation of a working group - Announcement workshop and socialization of the planning process with City level stakeholders 	RC, LC, BATF
Step 7	August – November 2003	<ul style="list-style-type: none"> - Identification practitioners, creation of data base of activities, assessment - Formation of Advisory panel consisting of different departments of the government, experts and professionals - Refinement of baseline document with inputs from BMP, cluster meetings - Assessment of existing scenario on SWM - Identification of key issues and problem statements 	Working group, with advisory panel, expert and RC inputs. <i>The process is on going with schedules drawn till March 2005</i>

The planning process can be seen both as a vehicle and process for capacity building on the one hand, and as a directed exercise leading to a series of products and results, on the other. The overall impact of this capacity building process could be summarized as a harvesting and

consolidation of a variety of partially isolated thinking processes in existence, as well as an integration of information and results from the many years of local and community initiatives on the ground.

The overall product or specific result for this was in the preparation of a strategic plan for integrated solid waste management for Bangalore. This plan consists of:

- ◆ *The SWM Road Map: The Vision*
- ◆ *The Framework plan: The approach and methodology to achieve the Vision*
- ◆ *Instruments/Tools: Enablers to achieve this "Vision"*

The strategic plan derives guidance from National and State legislations/guidelines, which include:

- ◆ The Karnataka Municipal Corporations Act, 1976;
- ◆ The Municipal Solid Waste (Management & Handling) Rules, 2000;
- ◆ Guidelines provided by the Central Pollution Control Board;
- ◆ Guidelines provided by Karnataka State Pollution Control Board; and
- ◆ Lessons learned from good practices and outcomes, supplemented by the experience of using the SPG and ISWM tools.

To date, the working group remains active, meeting periodically with targets and reviews. The scope, roles and responsibilities and terms of reference of the working group, advisory panel and technical cells have all been defined. The time lines of activities and schedules for targets have also been elaborated. The advisory panel have met twice and a number of cluster meetings involving stakeholders have taken place. However, in order to take this endeavour ever forward, a number of events have been organized. For this purpose, the working group has developed draft problem statements for various aspects of SWM, from the techno managerial level, through to the socio-cultural, financial, institutional, legal and environmental level, following after a series of discussions with relevant stakeholders. The baseline document has also been enriched with active and up to date informational support from the BMP and other Governmental Departments with regards to aspects of SWM. Although admittedly belatedly, it is a strongly held belief, that Bangalore has set itself on a process of planning which is irreversible.

2.5.5 Other potential pilot project activities associated with UWEP Plus.

UWEP Plus had a number of activities to complement the ongoing ISWM planning process of Bangalore city. Some of them were completed; others stopped or did not take off, due to local circumstances or the relationship between ambitions and realities. Some were projects of Swabhimana, others were initiated by Mythri. Such projects included:

- a. Collaboration with the citizen group RISE in setting up a Ward Wise composting facility and eco-centre;
- b. A Film Plastic Prevention, recycling and environmental improvement pilot project;
- c. The Livelihood Improvement of Waste Pickers through ILO partnership;
- d. Second level collection of dry waste;
- e. Land Laboratory operated by Mythri;
- f. Apartment collection of segregated waste;

There were many lessons learned from each of those pilot projects undertaken. The Resident Initiative for Safe Environment (RISE) could not take off due to a government stipulation which stated that any contract of the government could only be executed through a legally constituted body with a formal registration, something which RISE did not have, and was not in a position to get.

The Film Plastic Prevention project was related to the recovery of the thinnest plastic bags. This project proved highly successful initially, and had collected upwards of 7 tons of plastic waste through a network of junk dealers and manufacturers. However, this initiative had to close down when the laws related to thin plastic drastically changed.

The Livelihood Improvement of Waste Pickers, was a project related to improving the livelihood opportunities and employment stability of women involved in waste picking. Yet, this project was abandoned when it became clear that it could not rely on the cooperation of those officials involved on behalf of the Government of India. The conditions which they stipulated for the release of funds for project purposes were, for many NGO's, unacceptable.

The second level collection of waste initiative, utilising the informal sector, was dropped when the official concerned was transferred to another department.

The apartment collection scheme spearheaded by Swabhimana, proved very successful, where lessons learned were incorporated into further policies on the collection of waste from apartments. The mainstreaming of this experience, while an indicator of success, meant that it was no longer possible to consider this a pilot project.

Table 5 shows the projects within UWEP Plus and how they ended, based on verifiable indicators.

Table 5. Overview of objective and status of projects in UWEP Plus

<u>Specific objectives</u>	<u>Status at the end of the programme</u>
a. To conduct ISWM assessment	<ul style="list-style-type: none"> - Base line document elaborating status of SWM, stakeholder analysis problem statement and key issues produced - ToR of working group signed
b. Training and capacity building	<ul style="list-style-type: none"> - Training on ISWM, waste quantification, time motion study on secondary collection held and proceedings documented
c. Pilot project	<ul style="list-style-type: none"> - Well functioning sustainable pilot project – land lab initiated
d. C/N Research	<ul style="list-style-type: none"> - C/N research completed and report sent - Well functioning library is in operation
e. Establishment of data and information resource base	<ul style="list-style-type: none"> - Regional office strengthened
f. Strengthening office infrastructure with personnel and equipments	<ul style="list-style-type: none"> - Web site established
g. Website and web presence	<ul style="list-style-type: none"> - A regional network Alliance for Waste Management established
h. Regional net work of practitioners in SWM	<ul style="list-style-type: none"> - Steady team of visitor, official, NGO's, elected representatives, CBOs etc. are visiting land lab and other city level operations in Bangalore.
i. Peer to peer exchange	<ul style="list-style-type: none"> - Visits being recorded

CHAPTER 3 PILOT PROJECT: FEATURED CASE STUDY-THE LAND LAB

3.1 Introduction

One of the key justifications for pilot projects in UWEP Plus was that there was a need to complete UWEP I pilot project activities for which the UWEP I programme structure provided insufficient resources or time. Bangalore had three UWEP I pilot projects, but two of them, the Health Care Waste Management initiative and Swabhimana, had in effect matured and made an exit from programme dependency by the end of UWEP I.

The Community Waste Management pilot project in Nagapura was not suitable for up-scaling or continuation, but Mythri and other stakeholders saw a clear need to build on the concepts and experiences in Nagapura, and to take the concept of decentralised, community waste management to a new level. The land lab is, in effect, a representation of this up-scaling and broadening of community waste management as a strategy.

3.2 Why this pilot project is featured here?

The guiding principle of the pilot project during UWEP 1 and UWEP Plus is to complement the city's efforts in improving and sustaining waste management. Such pilot projects evolved or were created, based on demand and replicability features. The land lab serves as a sustainable model that answers multiple needs of small municipalities and towns.

3.3 Why there was a need for these initiatives and their objectives?

When the land lab facility began to become operational, there were few operating decentralized approaches to municipal waste in the Bangalore area. The wealth of community programmes that operated prior to, or during UWEP I had largely been made redundant due to the city's efforts in complying with the National Rule on solid waste management, which mandated that not only were municipal bodies to take care of the collection and transportation of waste, but also, to find appropriate land fill sites to dispose of this waste.

At the best of times, their coverage had been limited to a few hundred households, with operations generally dependent on a few committed citizens, whose individual energy and resources in time, became exhausted. Some of these volunteers also considered that their mandate to bring about change was satisfied with the passage of the National Rule on solid waste management, for which Swabhimana was an active lobbying force. This combination of circumstances contributed to the closure of many of the community initiatives. Without some form of continuity, there was a high risk that the lessons learned and the models explored would simply go into the "black hole" of lost institutional memory, even though they provide a valuable technical and institutional alternative to the conventional, centralised waste management models imported from the UK.

One urgent need for this pilot project stemmed from the fact that it provided a model for small-scale waste management that met an important need. State of Karnataka has as many as 250

small towns and cities and the large-scale city models of collection and sanitary landfilling do not fit their needs, capacity, or budget. In spite of progress made in Bangalore and other large cities, most of these municipalities have no clue as to how to manage the waste appropriately. While Bangalore had invited a number of them for meetings, trainings and exposure, there was not an adequate facility that demonstrates effective solution to waste disposal. The UWEP staff saw an interesting opportunity to further develop the model of community waste management which proved modestly successful in Nagapura, to serve the needs of smaller municipalities and peri-urban communities. Thus the land lab was created to address the specific problems of the municipalities and informal sector that is involved in handling waste.

An year after the commencement of UWEP Plus, the concept of piloting professional waste management services that would address specific problems of the municipalities and the informal sector were given serious thought. A literature review as well as discussions with entrepreneurs revealed that there were multiple avenues by which to earn revenue through such waste management services. A feasibility study was undertaken in order to identify the different sources of income, as well as the availability of the market for such services and products. It was by this token that the 'Land Lab' was conceived, in order to render high quality professional waste management services, undertaken by experts and those in the informal sector, and subsequently, to tie up the cycle of waste disposal.

Since professional waste hauling and management services involve a lot of procurement, sales, client servicing and other such business activities, the Board of Mythri decided to create one more legal non-profit entity in line with Mythri's concerns. A new organisation called the "Waste Wise Trust" was formed and was legally registered as a non-profit organisation in 2003. Following this, all Land Lab operations were brought under the remit of Waste Wise Trust, the new subsidiary of Mythri Sarva Seva Samithi.

The Land Lab today is a unique concept, financially supported by WASTE, Netherlands as part of the UWEP Plus programme. The Land Lab functions as a storehouse of information, learning, research and development in the use of wet organic material as well as dry recyclable waste. An area of agricultural land measuring approximately 2 acres in size, has been situated on the outskirts of Bangalore City (City municipal council area, where solid waste management activities are inadequate), and has been procured for Land Lab purposes on a five-year lease. Previously, this land contained two old thatched sheds, which had been primarily used for poultry purposes, whilst in addition there were a number of fruit bearing trees. These sheds were repaired and stacks measuring 3 x 1.5 metres were constructed to accommodate the projected 1.5 metric ton of waste, which would be treated. Ten such stacks were constructed and two motorised, medium sized, 3- wheeler type vehicles were purchased for waste hauling purposes. The potential market for waste hauling services was explored, whilst potential clients were enlisted for their segregated waste, a service for which they were to pay a nominal fee. Separate windrow facilities were also made to accommodate excess organic waste. The land lab facility officially came into operation at the beginning of 2002.

The Land lab has been designed with the following objectives in mind:

- ◆ To be a demonstrative model of small-scale municipal waste management. It functions to deal with the collection, transportation and disposal of municipal solid waste (approximately 2 to 5 tons per day), as well as with the manufacture and application of compost.
- ◆ To promote research on all forms of technically appropriate composting, pot/roof/kitchen gardening and urban agriculture.
- ◆ To function as a place of learning with regards to waste minimization/home gardening and other such activities which promote the safe handling of waste.
- ◆ To become self-sustaining through compost/dry waste sales, plant sales, tools, service charges, course fees etc.
- ◆ To be showpiece for the promotion of decentralized waste management.

The focus is on two aspects:

- ◆ To enable better working conditions and economic returns to the waste pickers.
- ◆ To embrace and develop a socially responsible, economically sound and ecologically sustainable, waste management system.

The land lab operation involves four main steps:

- ◆ *Waste collection services:* The segregated waste from households (apartments) is collected by waste pickers using separate bins and motorized vehicles.
- ◆ *Transportation:* The collected waste is transported to the land lab area or the waste-processing zone. There, the organic waste is sent for composting, whilst the dry waste is stored, sorted and sold to junk dealers. The reject waste (rags, rubber pieces, non-recyclables) is transported to a dumping area.
- ◆ *Composting:* Three methods of composting are in operation in the land lab. They involve composting through a forced aeration method, vermin composting and microbial culture composting. This process generally takes two months, in order to produce good quality compost.
- ◆ This compost material is then sold on the market or used for agricultural purposes around the land lab. Seasonal yielding vegetables, ornamental plants, and fruit bearing plants are grown on the land lab grounds.

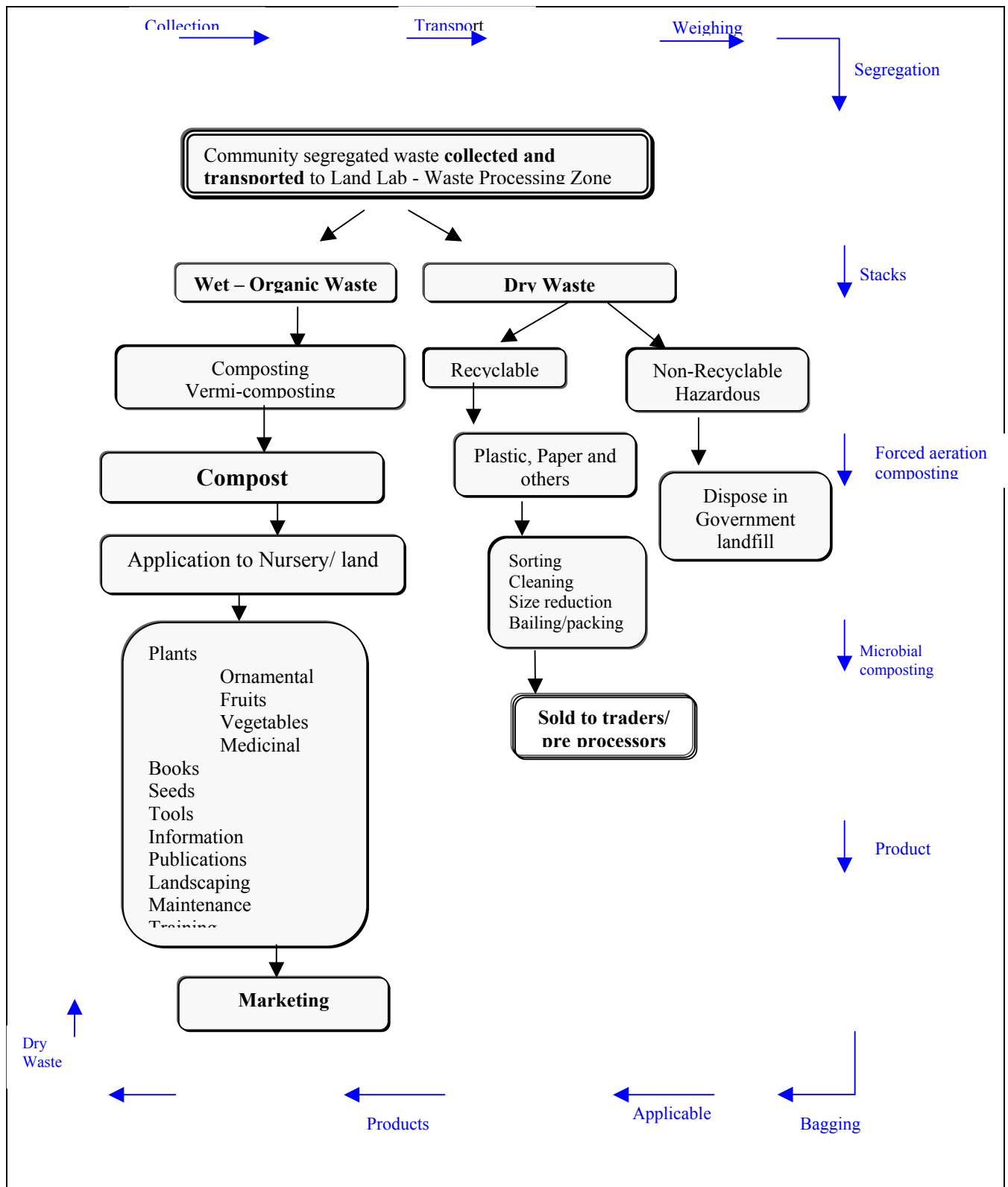


Figure 8. Flowchart of Land Lab Operations

Table 6. Initial Investment costs

Labour	50,001	
House & Roof	77,564	
Capital - Waste Trading	18,120	
Vehicle	354,436	
Stacks (Composting)	83,922	
Machinery	17,046	
Fabrication	2,435	
Agriculture Investments	7,279	
Sum - Indian Rupees	610,802	12,000 Euros Approximately

As per current guidelines with regards to municipal regulations, apartments containing more than 20 in number within a single building/campus are considered commercial establishments and are therefore required to make their own arrangements with regards to the disposal of household waste. However, Waste Wise Trust envisaged this as a great opportunity to extend their paid service to such households, with regards to the collection and disposal of their waste. A series of campaigns and canvassing procedures amongst these apartments resulted in Waste Wise obtaining a substantial number of clients for this service. The project currently incorporates approximately 2000 households and commercial establishments in the vicinity for its services, which has resulted in revenues sufficient enough to sustain the operational costs involved. Over the course of a months operations, this pilot project generates more than one lakh in Indian rupees (1800 Euros), whilst it has expenditure almost equal to the income generated. Thus, these operations are breaking even, however the capital costs accrued from investments have not yet been recovered. Presently, Waste Wise collects approximately 1 to 2 tons of waste per day, and also composts the organic material contained in such collections. The produced compost is enriched with additional natural compounds and applied to 2 acres of land around the Land Lab operations. That compost which is not required for the purposes of the Land Lab is then sold back to those households who initially supplied the waste.

Revenues for the Land Lab are accumulated through the following means:

- ◆ Waste collection fees (service fee);
- ◆ Waste trading: Sales of recyclable dry waste like Plastic, Paper or Glasses;
- ◆ Composting: The compost is sold to individuals, households, nurseries, plantations etc. This compost is also used for the Land Labs own urban agriculture activities;
- ◆ Worms: In the vermin-composting process, worms are bred. These worms are sold to individuals, households, agriculturists etc;
- ◆ Vegetables, fruits and plants: The produce of those urban agriculture activities undertaken are subsequently sold on the market under the brand 'Bio Wise.'

Table 7. The land lab Staff:

• Workers	• 15
• Drivers	• 3
• Maintenance/Driver	• 1
• Farm manager	• 1
• Operation Manager	• 1
• General Manager	• 1

Currently the land lab operates with a staff of 22 people, of which 19 are drawn from those of waste picking background. Indeed, the drivers are also recruited and trained from among the waste pickers. Those waste dealers who buy the dry recyclable materials from the land lab have also made separate arrangements to engage 7 waste pickers in the sorting process. Those involved in this process, i.e. the waste pickers, are subsequently, trained and inducted into the land lab activities.

All these projects operate under the guise of the Waste Wise Trust (WWT), and have facilitated as many as 30 waste pickers, and in particular, women, in finding independent waste hauling services, either at an individual level or in small teams of 2 to 3 persons. Such activities incorporate the collection of dry waste recyclables only, from offices and commercial institutions, which can then be sold to dealers. This process also incorporates collections from groups of apartments, the hauling of food waste to piggeries, waste clearance procedures, as well as odd cleaning jobs. Over a period of three years, such activities have gained such credibility so as to attract a stream of visitors, ranging from individuals to policy makers, thus fulfilling its purpose of being a sustainable learning model.

Problems and constraints:

- ◆ The land lab facility is situated on the outskirts of Bangalore City, which therefore necessitates the waste pickers having to travel long distances simply to attend work. This causes a high turnover of staff and at times jeopardizes the regularity and reliability of Waste Wise services.
- ◆ High maintenance costs related to vehicles, uniforms and other small equipment requirements, often subtract considerable revenue from that generated during the months activities.
- ◆ An inability to expand its services due to the costs associated with the purchase of new vehicles / recruitment of personnel, which typically involve unattainable capital investments.
- ◆ Disposal of rejects – the costs associated with the disposal of material that is of no re-sale/recyclable value, e.g. rags, multi-layered plastic pouches, rubber and leather slippers, old mats and other condiments.
- ◆ The invasion of stray dogs on Land Lab property who in turn rummage through exposed windrows and scatter piles of waste.
- ◆ In the rainy season, heavy rains flood the surrounding fields, submerging and destroying all crops.
- ◆ At times, the smell and fly nuisance causes intolerable conditions for the workers, which is typically as a result of improper composting procedures.

- ◆ Waste management services have to operate seven days a week and throughout the calendar year. This necessitates the deployment of workers and vehicles on all days of the month, including Sundays and public holidays. This greatly hampers giving sufficient rest periods to staff as well as vacation periods.
- ◆ Waste handling is a messy business and despite much precautionary steps taken, picking staff often tend to stray into their old habits of not wearing gloves, shoes, uniforms and other safety apparels. Therefore, constant supervision and enforcement are needed for this, which is often despised by those involved.
- ◆ Currently, the whole operation is owned by WWT with clear norms, roles and responsibilities. Numerous opportunities are created for democratic functioning, participatory management, incentives and sharing of profits and yet, the majority of pickers view the establishment as the employer while their role is simply to fulfill their tasks. The idea of partnership has not been grasped.

Conclusion:

From a financial perspective, the land lab could function independently for a few more years. However, the continuance of the land lab depends on the extension of its land lease period. For the present (December 2004), the local municipal council (Mahadevapura Municipal Council – ULB) has invited WWT to undertake an extensive information, education and communication programme to motivate the stakeholders on segregation, waste minimization, recycling and decentralized waste management. It is likely, ISWM planning tools could be utilized in this municipality in the coming years.

CHAPTER 4 THE IMPACT OF UWEP ON THE REGION

4.1 Situation in Bangalore before UWEP

The specific UWEP Plus goals are to contribute to:

- ◆ Building capacities of the local actors
- ◆ Development of appropriate models
- ◆ Establishment of functional systems

With respect to these three goals, the situation before UWEP began was as follows:

4.1.1 Capacity of local actors

There was considerable capacity at the informal level, in Swabhimana and in the local community experiments, but it was fragmented and had little legitimacy within the BMP. The NGOs were busy with experiments at local level, and had limited ability to get the attention of the BMP; as a result, there were few channels for translating of practical innovations into policy or practice at city level.

The parallel situation at BMP was that there was significant technical capability, but also severe lacks: there was no means to capture institutional memory about innovations in practice, and the officials were not used to (nor did they have a priority interest in) exercising certain governance capacities, such as consulting key constituencies or analysing demand from the field.

4.1.2 Appropriate Models

India followed a basic Western approach to the management of waste in urban areas, rather than seeking to adapt these models to local circumstances. As was the case in many Southern cities, the early nineties was a time of rapidly increasing awareness on the hazards of inadequate solid waste management, while practical actions were limited to Western-style collection in wealthy areas, and no collection in poor areas. Where waste was collected, the focus was on removal and transportation out of the city, leading to open dumping. The result was a coverage rate of about 60 % of the waste collected, but no organised disposal. This resulted in garbage heaps around community bins and many unauthorized dumping areas.

Early nineties was also a time during which number of localized models of decentralized waste collection, transportation by neighbourhood communities and recycling to compost near the source, flourished. However, these models were limited to few hundred households especially in well to do localities. They have had good amount of weight and credibility among the public, because such success stories were covered regularly by the media and newspapers, which emphasised the contrast to the dismal performance of the municipal bodies.

Prior to UWEP, Swabhimana had begun the process of trying to reconcile these two realities, but they lacked resources to contextualise these problems in the larger phenomenon of modernisation of urban waste systems.

4.1.3 *Functional systems*

The most common system ULBs used across India is to collect municipal waste by any means and dispose it indiscriminately. Segregation, people's participation, waste minimization and all the elements of good waste management practice were not on the horizon of the formal waste systems, and were beneath the notice of city managers and special commissioners.

During 1995, Bangalore went for a cleanliness drive by then Commissioner who began to introduce good elements of decentralized systems into municipal operation. In course of time this became a norm and gradually evolved into door to door collection programme of "Swacha Bangalore". However, in the absence of designated land fill site, or organised source separation, the waste is collected in mixed form and disposed without any form of environmental protection. The system functioned in wealthy areas, but its performance was at a low level.

4.2 **Situation of Bangalore now:**

With respect these three goals, the situation in Bangalore now can be characterized as follows:

4.2.1 *Capacity of local actors*

There has been significant increase in capacity, reach, and legitimacy of a number of key local actors. Swabhimana now has a great deal of legitimacy and weight in Bangalore, and also quite some national and international recognition as an example of the development potential of a multi-stakeholder platform. Swabhimana members have participated in ISWM and KaR planning processes, and have learned a great deal while bringing about real changes in their city and even at national level.

Mythri and its WasteWise Resource Centre have matured significantly, both in their role as a local multi-issue NGO (with both social and environmental lines of activity) and in terms of its capabilities to conceive, formulate, mobilise, and manage international projects.

There have also been important shifts in the way that the formal political structures and stakeholders, especially BMP, but also the medical establishment and the high-tech industry, relate to grass-roots initiatives. This represents an increase in institutional and political capital and improved governance capacities.

4.2.2 *Appropriate models*

Much has changed in Bangalore since 1995, in part as a result of UWEP and KaR activities, and in part as a result of the more general process of modernisation of the Bangalore waste system in the context of national rule-making. What is unique about Bangalore among the UWEP PPS cities, is that these two processes had a tremendous amount to do with each other, with resulting synergy leading to quite large-scale change.

The idea of community-based decentralised waste management has achieved a certain level of legitimacy through the land lab, which also captures and consolidates the institutional memory of the period of community experimentation in the 1990s. The models of apartment house recycling

and separate collection of dry components, which represent location-specific adaptations of the Western model of waste management, have achieved a certain level of acceptance.

In general, it can be said that where there was no room for adaptation and experimentation in 1995, there is now, nearly 10 years later, a modest space for the development, testing, and institutionalisation of alternative models, and that, as these mature and prove their usefulness, that space can be expected to grow.

4.2.3 Functional systems

The synergies between the top-down high-profile BATF initiative and the longer-term, bottom-up Swabhimana platform have resulted in greatly increasing the functionality of the waste management system in Bangalore. In contrast to 1995, there is now collection in all BMP areas and in many areas outside of BMP jurisdiction as well. While these systems are not all functioning equally well, there is a broad recognition that they need to remain operating and see continual improvement.

While there is not yet a state of the art disposal facility for the waste generated in Bangalore, there is recognition of the need for such and some initiatives to bring it about. Nonetheless, two sites suitable for the disposal of waste according to modern environmental standards have been identified. A special task force possessing the technical know-how have been incorporated to evaluate in the tendering process, which would represent a significant step in the development of SWM. The mechanisms to monitor, supervise and to record daily and weekly sweeping and collection services, have been greatly enhanced. Extensive pilot projects have seen the specialised collection of apartments and institutional areas, separate dry waste collection drives, utilising the services of the waste pickers, as well as the segregation of waste with yellow bags, and in some cases, decentralized collection and disposal services, all being implemented and encouraged. The city has devised means to enhance citizen involvement by formally appointing 750 '*suchi mitras*' (civic wardens) to work closely with local officials and elected representatives. In conjunction to this, the private contract system, which covers three-quarters of the city, has been refined through a rigorous process (in tender document), where a compilation of standards and performance have been outlined, which include aspects such as minimum wage issues and worker safety standards.

Perhaps more importantly for the long term, the system of consultation and communication around solid waste (and other urban environmental issues) has received a boost, and can now be said to be a reasonably functional system. There are permanent channels of communication and feedback, which contribute to the information base on where and how the system is functioning or failing.

4.3 Obstacles and barriers

A city of Bangalore's size and scope will quite obviously have difficulties and inadequacies in addressing urban issues. With regards to the SWM, where effective and consistent management is perennial to its own efficiency, the primary concern must be with the frequent transfer of officials at the top. There is a consistent and often sudden change of political and bureaucratic

heads, which in turn impacts upon the process, where improvements required are typically stalled for long periods of time. Further to this, there is a dearth in the professional capacity of SWM within BMP to plan and manage needs and requirements at the administrative and field levels. Despite the many advances made, the private initiative, either emerging locally or from outside the country, is looked upon with suspicion, where many well designed and well intentioned plans go astray due to a lack of motivational support.

In addition, there are legislative vacuums that are impeding inter-institutional coordination. Currently, no formal consultation mechanisms exist between the various institutions. Typically, informal consultation takes place between the various institutions and is more *person dependent* mechanisms, which lead to the instability of decision-making. Different authorities functioning in greater Bangalore, including the BMP, the Bangalore Development Authority and The City Municipal Council, act within their official jurisdiction. Many fringe boundaries are not clearly defined resulting in inefficient services and posing real threat to public health. While there is generally little political interference in the daily activities of SWM, when it comes to contracting, issues of tender and other such critical matters, the elected representatives tend to want to have their own say, which further jeopardizes efficient functioning systems.

The relative absence of enforcement mechanisms; the lack of financial planning; a general ignorance with regards to overall costs; the absence of an independent reviewing authority; the non-compliance with environmental norms due to inadequate legal and institutional infrastructures; as well as other factors related to nepotism and corruption stand as barriers to the effective implementation of ISWM in Bangalore.

4.4 Conclusions

The ISWM Planning Process is well lodged within the city's accepted structure and committed working group is functioning to further it. The top level bureaucracy and political set-up have extended support. An Advisory panel for ISWM planning has been formed, consisting of top level officials from the Urban Development Department of the State Government, the Directorate of Municipal Administration which controls 240 city municipalities and own municipalities, the Karnataka Urban Infrastructure Development Corporation (an agency which finances all the infrastructure development in the State), representatives from the Bangalore Development Authority, Bangalore Water Supply and Sewerage Board and other important wings of the Government. This panel is getting constantly updated with data and information and in turn would advise on the direction to follow. Hence the planning process itself is already getting socialized among different actors of the state. Ironically, serious thinking in any one of the city's issues likes traffic; town planning, health etc. are discussed in terms of **“planning for 2020 with the citizen's perspective”** thus percolating down the concepts of post modern approach to city's issues. Bangalore being the capital of Karnataka state is already a leader in many fields. It is constantly looked up as the desired destination for people from different walks of life. It is likely, anything that is happening which could be replicable would be taken up by neighbouring cities and states.

The Land Lab has been conceived right from the beginning as an independent entity creating its own resources for sustainability once the investments are made from UWEP Plus. Currently, the operational cost of the plant is taken care of by the revenue generated. It would take one more year to recover the capital and investments costs. The land lab functions as ideal decentralized model for small municipalities which generate 5 to 10 metric tons of organic waste per day. The functioning of the Land Lab demonstrates that small municipalities need not go for acquiring large track of land for dumping waste. Instead, they can have two or three facilities in different locations of the city to handle waste with ISWM principles and approaches. The land lab is attracting steady stream of visitors from different walks of life for learning.

The C-N research has provided a beginning in terms of understanding the effect of integrated interventions on the atmosphere and the local and global environment. It also contributed to the capacities and research fields of the researchers involved.

4.4.1 Key lessons and conclusions of the UWEP years

1. Role/acceptance/attitude/cooperation of local government units has been very vital in implementing ISWM programme. It is important that the local chief executive understands and is committed to the project.
2. Demand driven interventions work better. Some of the pilot projects which didn't work out, failed to take off because they were initiatives of Mythri or UWEP project staff, rather than of the stakeholders themselves.
3. Involvement/participation of stakeholders results in better awareness and a more positive attitude due to beneficial effects or organised solid waste management for households and communities. Knowledge building, hand-on experience of stakeholders in the implementation of ISWM activities and ownership of the program have been very important components to ensure sustainability.
4. In spite of extensive consultations, certain groups of households don't want to pay or participate in an ISWM-based system. They remain convinced that it is government that should make all the decisions and manage solid waste in its own way, and that is what they have a budget for.
5. Development programs including SWM are vulnerable to being influenced or stalled by political conflicts, or the effects of frequent turnover in political appointees.
6. Execution of MOU facilitates smooth working relations with stakeholders.
7. Using other issues such as health and tourism can enhance appreciation of SWM management program. Many people relate better to the ISWM when they appreciate the benefits in other aspects of their lives.
8. The lack of a national legal framework hampers work in solid waste and implementation of the project.

9. Having a “Champion” in the community and political will of the local officials are a must in ISWM projects. Otherwise, there is a tendency for the project to collapse when the programme is finished and the intervention agents are gone.
10. Caution is needed in informing project stakeholders and beneficiaries about project funds. There is a tendency among beneficiaries to consider project funds as dole out they can get just by asking for it without justification and/or not working for it
11. Baseline and local initiatives studies are necessary in the proper identification of problems, issues, resources and concerns of key partners and stakeholders. They provide important guide to planners and development agents.
12. Hiring skilled, dedicated and committed project staff should not be overlooked. The staff can make or break the project since they are on the frontlines in the “battle field” of urban environmental management programmes.

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