Stakeholders' Consultation Workshops for Integrated Waste Management Plan Pune

Prepared for
UNEP DTIE IETC
and
Pune Municipal Corporation (PMC)

Prepared by
Dr. Prasad Modak
Consultant

With Support from
Environmental Management Centre
India

July 2007

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Preamble

The solid waste quantities generated as well as its ever changing characteristics is at an alarming proposition. The inability to fully grasp the problems of waste generation and characterization have resulted in transforming Solid Waste Management as one of the most compelling problems of urban environmental degradation. Individual or fragmented approach is bound to become unsustainable in view of increasing complexity of the waste streams, increased urbanization and industrialisation. The approach of managing these waste streams has to be in the integrated format with due consideration not only to the various forms of wastes but also to the existing systems. Integrated Solid Waste Management (ISWM) refers to a strategic initiative for the sustained management of solid waste through the use of a comprehensive integrated format generated through sustained preventive & consultative approach to the complementary use of a variety of practices to handle solid waste in a safe and effective manner.

Pune Municipal Corporation (PMC) and International Environmental Technology Centre (IETC) of the United Nations Environment Programme (UNEP) are in the process of formulating the Integrated Solid Waste Management (ISWM) Plan for Pune. The Plan for Pune has been developed using the Strategic Planning Process. This Report for the ISWM project for Pune city aims to present the summary of the Stakeholders' consultative workshops held to facilitate the planning process.

The Strategic Action Plan Report shall be based on outcomes of the workshops conducted with PMC, MPCB, other the stakeholders and the numerous discussions and brainstorming sessions with its officers. The Report has been compiled within limited time and resources. The information sources are Annual Reports of Maharashtra Pollution Control Board (MPCB), Pune Municipal Corporation (PMC), Environmental Status Reports, other relevant research and survey reports that were made available and could be accessed, regional and issue-specific environmental research papers etc. Information has been collected from personal interviews / discussions with PMC staff, various technology providers working in the waste sector, NGOs, Citizen Activists and other local corporators. The data collected thus represents the "state of affairs" over the last five to six years and the same has been used to develop a model Strategic Action Plan.

The Strategic Planning framework discussed in this report can be used by the City Municipal Corporations to develop their individual Strategic Action Plans. Allocation of budget, time and human resources for primary data collection, data update and data management to periodically update the action plan should be developed. Action Plans are dynamic and need to be tracked, updated and strengthened as demanded by the external and internal situations. This requires that the Action Plans are well supported through appropriate institutional adoption with work instructions and proper allocation of responsibilities. It should be noted that this Strategic Action Plan is not an approved document of PMC. The reader of this document is thus advised to concentrate more on the process of action planning and its application to an organization such as the PMC.

Acknowledgements

This assignment is a demonstration of a participatory and consensus driven strategic planning approach to developing an Integrated Solid Waste Management Plan for Pune city for Pune Municipal Corporation in India.

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Other stakeholders like NGOs, local corporators, citizen activists, media and various technology providers working in the waste sector.

Cooperation and active participation of all PMC staff in the consultation workshops is gratefully acknowledged. We also acknowledge the various individuals who have spared their valuable time to participate in the workshops and also through individual discussions for highlighting the issues on SWM in Pune.

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Executive Summary

Integrated Solid Waste management system proposes to take a comprehensive approach across all types of solid waste streams and involves the use of a range of options for managing the issues of Solid Waste. In combination with economic and social considerations, this approach would help waste managers to design more sustainable solid waste management systems.

The overall approach for the ISWM plan development process for Pune takes into consideration not only the internal dynamics of the waste generation but also the various pressure points, past initiatives and the overall uniqueness relevant to the city.

The unique approach to this plan development process has been its consultation focus. The planning process has been facilitated at every stage by involving stakeholder consultations. Through a series of consultation workshops, the stakeholders related to each type of waste have been conferred for various activities of the management functions of the solid waste management. The inputs received are being factored in the final plan being developed for the management of the solid waste in the city of Pune.

The Driving Forces – Pressure – State – Impact – Response (DPSIR) Framework was being used to formulate the ISWM plan. This process began at a Launch Workshop on 22nd December, 2006, which discussed the programme of the ISWM project. A Working Group comprising of a conglomerate of various stakeholders was formed. The Working Group members have representatives from the regulatory bodies, technology providers, Non-Governmental Organizations (NGOs) working specifically in the waste related fields and citizen representatives. The basic aim for formulating such a group was to discuss and debate on the Vision, Mission, Goals and Objectives of the ISWM Plan. In order to further attend to specific waste-stream related issues, a series of consultation workshops were organized.

A working Group meeting was organized on January 29, 2007 to kick start Strategic Planning process towards preparation of Integrated Solid Waste Management Plan for Pune The Working Group comprised of select representatives of PMC, Key Institutions, NGOs, Industries, Electronics and IT sector, etc. A draft Vision & Mission statement for ISWM plan was developed during this meeting.

Subsequent to these workshops, a series of consultation workshops were organized. Each of the workshop themes focused on one waste stream. In order to facilitate discussions and gather the inputs from all stakeholders, the workshops were designed comprising of sessions with a lead discussion followed by reactions/inputs from Key Presenters. The web based portal that was specially developed for the ISWM Plan for Pune (http://iswm.emcentre.com,) was used as one of the medium to disseminate the information about the workshops.

To have an effective out reach the major stakeholders from each of these specific sectors were involved. For the **Municipal Solid Waste Management** workshop – I, various NGOs working in the area of door to door collection along with institutions specializing in waste processing were present. The workshop on MSW management – II was attended by diverse technology providers for centralized and decentralized treatment.

The **E-waste** workshop was organized involving the Software Technology Parks of India (STPI) that represents Ministry of Communication and Information Technology, Government of India and Software Exporters Association of Pune (SEAP) representing the Pune based stakeholders from IT sector.

For consultation workshop on **construction and demolition waste** the Promoters and Builders Association of Pune (PBAP) and their respective members were involved.

The workshop for **Biomedical Waste Management** was organized involving the Indian Medical Association, Pune chapter, hospital association and various health care facilities.

The conduct of these workshops was emphasised with the aim to gather maximum inputs from the stakeholders. Each of the workshops started with the presentation of some key findings and issues based on the situation analysis study carried out as part of the project. Various experts and technology /service providers for the particular stream of waste were invited as panellists to facilitate the discussions with the sharing of their experiences and views through presentations. The presentations by panellists were followed by discussion involving the key stakeholders, technology/service providers, NGOs, representatives of various educational and research institutions and concerned PMC officials. The participants were also briefed on the Action Plan being developed as well as the Vision, Mission and Objectives being framed for Pune. They were encouraged to give their feedback on the same.

The feedback received during these workshops has been looked up during the preparation of the action plan for ISWM. The highlights and key outcomes of these consultation workshops are presented in this report.

The Structure of this report is as follows:

Chapter 1 gives the introduction to the solid waste streams that commonly found in a city and the conventional approaches to manage the problem of Solid waste. **Chapter 2** brings up the concept of Integrate Solid Waste Management, and its relevance in the Pune Context. **Chapter 3** describes the Strategic Planning process for the ISWM Plan. It emphasizes on the DPSIR Framework for the plan. This chapter also mentions the methodology used during the Planning process. **Chapter 4** describes in details the Stakeholder Consultation process that was extensively used for making the ISWM Strategic Action Plan. This chapter also contains review of the participants' profile that shows the overall representation from diverse group of stakeholders for the series of workshops. **Chapter 5** contains the proceedings of all the Consultation workshops. **Chapter 6** contains the highlights of the workshops. The key remarks and suggestions of the workshops that are addressed in the Strategic Action Plan are present in this chapter. The schedules of the Consultation Workshops lit of participants and Speakers, comments on the Vision< mission Statement of ISWM Plan and the copy of the news articles related to the project are present in the **Annexure**.

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Chapter

1

1. Introduction

The city of Pune has touched the 3 million mark of population in 2006[1]. About 5 years back, in 2001 the census had reported the population of the city at 2.54 million. This translates to an average addition of a million people to the city every year. This growth of the city is characterized by increase in economic and developmental activities. Over the years, the economic activities have been mapped with the manufacturing and construction activities; however the recent advancements in the information technology sector have added a new dimension in the present times. Obviously, the boosted economies has attracted people coming in search of better job opportunities thereby contributing to the ever increasing load on existing infrastructural amenities.

The improved standard of living and extent of commercialization in the city has significantly changed the consumption patterns. Like every other city in this country the growth is characterized by the growing population density and relatively slow growth of public infrastructure. These, among others, have accentuated the city's waste management issues. With time, the management of solid wastes has transformed to one of the most compelling problems of urban environmental degradation.

Typically the focus of solid waste management in cities has highlighted the continuously increasing Municipal Solid Waste (MSW) quantities along with its changing characteristics. The MSW contains biodegradable waste such as vegetables, leftover foods; non biodegradable materials such as plastics, and hazardous material like used batteries; thereby rendering it to be a complicated situation to handle. However, a closer look at the city's solid waste generation scenario also brings to the forefront the wastes generated from commercial establishments and from industries. These together add a different dimension to the solid waste generation scenario. The industrial hazardous wastes if mixed into MSW create unsafe conditions. Furthermore, the issues of bio-medical waste (BMW) and the electronic waste (E-waste) management make a complex situation for solid waste management for the city.

From the solid waste generation perspective, the waste generation in Pune can be typically classified as:

- Municipal Solid Waste *including* Plastic waste (MSW)
- Construction and Demolition waste (C&D)
- Hazardous solid wastes
- Bio-medical waste (BMW)
- Electronic waste (E-waste)

1 Environmental Status Report of Pune, 2006

Like most Indian cities, the heightened awareness and the increasing regulatory requirements has resulted in increased pressure on the government bodies. This has also resulted in the involvement of various agencies like government, private and non-government organizations; to undertake pilots and projects in partnership. However, an integrated and strategic approach is still missing. In most cases the projects and initiatives have remained either isolated or not up-scaled or replicated. Individual or fragmented approach is bound to become unsustainable in view of increasing complexity of the waste streams. Unless the approach is strategic and cross-sectional, ad-hoc waste management will always remain a challenge.

In order to execute the strategic approach, a plausible solution would be an integrated approach towards waste management. This approach would include collective management of all types of wastes and implementation of the concept of **3R** (***Reduce, Reuse and Recycle***) in policies, strategies and action.

Keeping the perspective of managing all forms of the solid waste generation in an integrated manner, the Pune Municipal Corporation (PMC) and the United Nations Environment Programme represented by Division of Technology, Industry and Economics, International Environmental Technology Centre (UNEP-IETC), have undertaken to collaborate in implementing the project, "Development and Implementation of an Integrated Waste Management Plan for Pune".

The overall approach for the ISWM plan development process for Pune takes into consideration not only the internal dynamics of the waste generation but also the various pressure points, past initiatives and the overall uniqueness relevant to the city.

The unique approach to this plan development process has been its consultation focus. The planning process has been facilitated at every stage by involving stake holder consultations.

Through a series of consultation workshops, the stakeholders related to each type of waste have been conferred for various activities of the management functions of the solid waste management. The inputs received will be factored in the final plan being developed for the management of the solid waste in the city of Pune.

The obvious advantage of this approach is development of a rounded plan in consultation with all the key stakeholders to solid waste management in the city.

Chapter

2

2. Integrated Solid Waste Management

Integrated Solid Waste Management (ISWM) refers to a strategic initiative for the sustained management of solid waste through the use of a comprehensive integrated format generated through sustained preventive & consultative approach to the complementary use of a variety of practices to handle solid waste in a safe and effective manner. In the context of the project, it proposes to take a comprehensive approach across all types of solid waste streams and involves the use of a range of different options. Such a system will be developed from generation to disposal and builds around the other management steps encompassing all types of solid wastes being generated. The selection of the most appropriate waste management systems and sustainable technologies are also the identified requirements needed to deliver an optimum and sustainable ISWM system. In combination with economic and social considerations, this approach would help waste managers to design more sustainable solid waste management systems.

Thus for the management of solid waste the following is the preferred hierarchy of approaches

- Reduction at source meaning incorporation of tenets of waste management at every stage of consumption from design, manufacture, purchase, or use of materials to reduce the amount or toxicity of waste generated.
- Environmentally suitable reuse and recycling to conserve natural resources and energy through systematic segregation, collection and reprocessing.

The various interpretations of the Integrated Solid Waste Management can be seen in **Figure 2.1.**

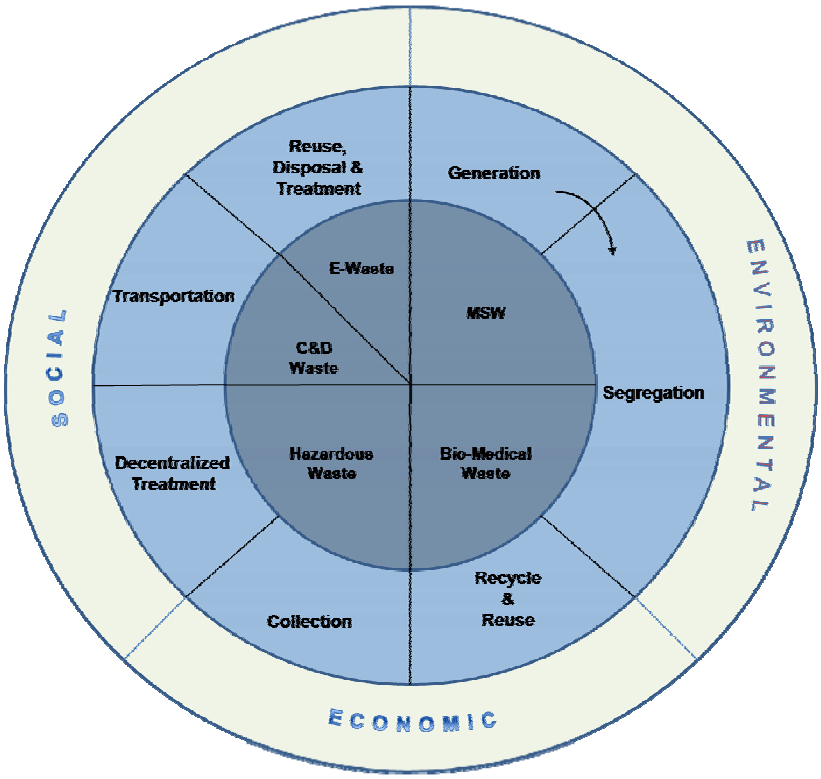

Figure 2.1: Integrated Solid Waste Management Concept

The ISWM concept has been adapted with the view that effective management schemes need the flexibility of design, adaptation, and systems in ways which best meet current social, economic, and environmental conditions. These are likely to change over time and vary by location. The need for consistency in quality and quantity of recycled and recovered materials (compost, energy), the need to support a range of disposal options, and the benefit of economies of scale, suggest that the ISWM systems should be organized on a large-scale. The schemes put to operation must be market-orientated.

Some of the major features of the adapted ISWM in the context of Pune can be listed as follows:

- Holistic approach to all waste streams thus maximizing synergetic benefits in collection, recycling, treatment & disposal
- Maximizes the opportunities for resource recovery at all stages - from generation to final disposal
- Accommodates aspirations of all stakeholders – from waste generators to waste management and service providers
- Facilitates life cycle view of products and materials; thus, promoting greater resource use efficiency
- Integrates different response functions such as technical, managerial, financial, policy, etc.
- Greater local ownership & responsibilities / participation through a consultative approach

Chapter

3

3. Strategic Planning Process

The Integrated Solid Waste Management concept as per definition involves the entire life-cycle process from generation to disposal of varied waste streams. This issue not just involves different sources of waste generation but also diversities in terms of waste characteristics, involved stake-holders and required technological know-how. In order to deal with this complex issue, for arriving at an optimal solution a number of difficult choices will have to be made. Prediction of waste generation and characterization is crucial for developing a robust waste management plan. However, these parameters being a function of several factors, the prediction will have to be done following the scenario building approach. The present Indian scenario shows that there are several waste streams that are currently not regulated while some require formalizing in terms of institutional policies. A plan for managing such diverse streams will hence need a flexible approach involving varied organizations and stake-holders and generating alternatives based on participatory approach.

The scenario based approach; participatory frame-work and analysis of alternatives to come up with a robust alternative are some of the key principles enshrined in the Strategic Planning Process. Hence this process has been adopted as the basis for developing the Integrated Solid Waste Management Plan. The Strategic Planning process focuses more on adaptability to change, flexibility and importance of strategic thinking and organizational learning. **Figure 3.1** explains the basic steps in SP.

Figure 3.1: Steps in Strategic Planning Process

It may be observed that SP is a continuous process and not a one-time or quantum activity. The process begins with a situation analysis, i.e. an assessment of the internal as well as external environment. The present situation is carefully evaluated to find out if the organization is on track towards meeting its goal and vision. If no goals/objectives have previously been set then the new goals / objectives are set and the SP process is geared towards achieving targets under each objective.

This is followed by development of action plan on how to meet targets. The action plan is then monitored to check if targets have been attained or not. In case targets are not achieved, the process is repeated till the desired targets are met.

3.1 Strategic Planning

SP[2] is a management tool that helps an organization to achieve its goals. The term strategy is used for the process because it prepares the organization to respond to circumstances related to organization's dynamic environment. The process is about planning because it involves setting of targets or goals and developing a framework to achieve these goals.

SP process helps determine what will be the situation or different scenarios in future, how we can control the future scenarios based on present situation, what are the mechanisms for that and how to plan to get there. In terms of waste management, we can build scenarios for future waste generation and management based on present situation analysis. Thus the SP process envisages both the internal (in terms of infrastructure, technology etc) as well as the external factors (such as waste generation, segregation etc), to an organization and is hence dynamic. Although, no process can guarantee success when it comes to external and therefore ungovernable factors, SP provides a tool to counteract the external factors by generating and evaluating alternatives on a proactive basis. Importantly, this process builds strong teams in the board and staff, and keeps the organizations together. **Box 3.1** summarizes some of the benefits of SP.

Box 3.1: Benefits of Strategic Planning[3]

- Provides a clear definition of organization's purpose (vision/mission) and helps to establish and achieve realistic goals and objectives in a defined time-frame within the organization's capacity.
- Helps in communicating the vision/mission, goals and objectives to the constituents of the organization.
- Focuses the organization's resources on key priorities hence ensuring an efficient use.
- Provides a monitoring base from which progress can be measured and establishes a mechanism for informed change when needed.
- Brings together everyone's best and most reasoned efforts: this has important value in building a consensus about where the organization is going.
- Helps in developing a sense of ownership of the plan when implemented in a participatory manner

2 Note that in the past, organizations usually referred to the phrase "long-range planning". More recently, planners use the phrase "Strategic Planning". This new phrase is meant to capture the strategic (comprehensive, thoughtful and well-placed) nature of this type of planning.

3 Strategic Planning. Available at: http://www.mapnp.org/library/plan_dec/str_plan/str_plan.htm

Today, SP approach is adopted by variety of institutions and organizations. Be it a fortune five-hundred company or a small non-governmental organization (NGO), any organization can apply this planning approach and ensure a better and more efficient functioning. Even in environmental arena Strategic Planning is being looked at for developing robust environmental management plans. Several institutes such as the Environmental Protection Agency (US-EPA) are now turning to the Strategic Planning process. Recently, the concept of Strategic Planning was applied to Maharashtra State Pollution Control Board (MPCB). MPCB initiated a process of strategic planning at the State level in order to develop short term as well as long term action plans. These plans may be implemented by making optimal use of available financial and human resources and by drawing select external assistance for most needed and relevant areas.

Strategic planning seeks to answer questions such as:

- "What is our vision?"
- "How should we be organized?"
- "How should we allocate resources to our programs and services?"

By answering these questions (and many others), strategic planning assists in creating a desired future. The process as explained in **Figure 3.1** begins with a situation analysis, i.e. an assessment of the existing status of the organization, known as "strategic analysis". Here, key areas of concern are identified based on "values" and strategic directions are set. The action plan is then monitored to check its effectiveness. **Figure 3.2** shows the milestones in Strategic Planning following the above process.

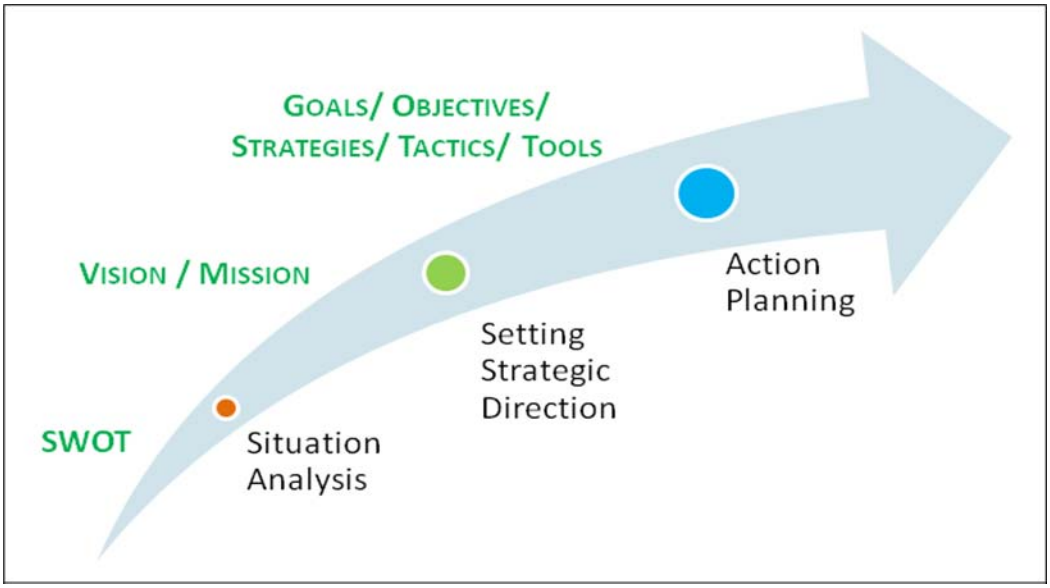

Figure 3.2: Milestones in Strategic Planning

The process of Strategic Planning has also been adopted in the context of Solid Waste Management. The experiences of various countries in this respect are presented in **Box 3.2**.

Box 3.2: Experience of SP in the context of Solid Waste Management

Integrated Waste Management Act, 1989 – Strategic Plan for California State, USA

With the vision of sustainable California State, the main objective of this plan was to promote environmentally sound and financially viable waste prevention and materials management practices among all sectors in the life cycle of products and services. The integrated waste management board defined the strategic goals in the plan which were to Increase participation in resource conservation, creation of sustainable market for waste diversion, education to public in resource conservation, mitigate the impacts of solid waste on public health and safety, improve efficiency of integrated waste management board, integrate environmental justice into boards programs and to promote "Zero Waste California"

Accomplishments:

- Sustainable building has been practiced with optimum usage of recycled and reusable building materials,
- A recycled products trade show and a used oil recycling forum was held,
- The Board developed and approved a "Model Integrated Waste Management Plan" and the implementation of reduction of waste sent to landfills by 25 percent by 2002 and by 50 percent by 2004 was on schedule,
- The Board's integrated waste management education curriculum was updated and revised.
- The Board approved plans for a comprehensive, cross-media assessment of Municipal Solid Waste landfill environmental performance.

A program would be designed to identify, assess, enforce and cleanup of closed Illegal and abandoned waste disposal sites and a state-wide public awareness campaign to encourage buying of products made with recycled materials would be done.

The Strategic Planning tool in Bangalore, India.

It was noted that stakeholders in this location often found it difficult to step outside their specific roles and responsibilities to both work with people from other stakeholder groups and to conduct an objective analysis of Municipal Solid Waste Management (SWM) problems. It became clear that in order for the Steering Committee to arrive at a consensus of the existing Municipal SWM problems and to start to think strategically about how these problems could be solved in practice it was necessary to remove stakeholders from their everyday environment and encourage them to work together in the analysis of the system. Applying this tool provided stakeholders with a unique overview of the existing Municipal SWM system and a visual baseline from which the strategic vision, strategy and action plan could be developed. This helped the group develop a shared purpose and strategic direction[4].

4http://www.wastekeysheets.net/pdf/ks2_02_tot_eng_copy.pdf

3.1.1 Methodology

Some of the significant lessons learnt after reviewing the application of the various projects applying Strategic Planning Process for Solid Waste Management are as follows:

- Most of the ISWM Plans are more focused towards Municipal Solid Waste Management
- Though many of the Strategic Planning had defined a vision and mission, the implementation was complicated due to the individual objectives and actions getting mixed together
- The targets with respect to time that were set by the plans needed to be updated in order to achieve all the goals and some of the plans were still being implemented
- Reduce, Reuse and Recycle Waste Management methods were a common feature among most of the ISWM Plans

For development of this Plan a participatory format is being used. The process includes consultation with stakeholders. Above and over this, the proper plan is being developed through a continuous dialogue with a working group represented by all key stakeholders including regulatory, technical and financial organizations, key personnel representing the non-governmental organizations and professionals.

Task 1

To streamline the information capture and analysis, data formats were developed. The **Data Collection Formats** have been evolved based on discussions with the various agencies as well as the "*Guidelines for Data Collection and Analysis*" compiled by IETC-UNEP as the base document, Pune city specific information and understanding the national and local legal requirements. This document has already been submitted and approved by the project proponents. The available data from the various sources have been captured and analysed to assess the prevailing solid waste management systems in terms of efficacy and effectiveness and including compliance with applicable legislations. The analysis is done based on the ***DPSIR*** (Driving forces, Pressure, State, Impact & Response) format.

Task 2

The above exercise leads to the preparation of the quantification and characterization information available based on the secondary data generated which is the compiled **Waste Inventory**.

Task 3

Based on the past data available, the future developmental activities and available trends of development, scenarios are being developed for the future. Using the various scenarios the gaps will be elaborated in terms of infrastructure; institutional capacities, arrangements and human resources; financial constraints; etc. the outcome of the exercise would be the **Gap Analysis**.

The output of this exercise is the establishment of the existing scenario of Solid Waste Management or the **Situation Analysis Report**.

Task 4

The efforts so far would form the base for the development of the **Integrated Solid Waste Management Plan** for Pune. The development of the plan would be carried out using the ***Strategic Planning*** process. To assist the plan development a review of various ISWM plans implemented across the world has been done.

These would provide key inputs in terms of the features as well as help in avoiding pitfalls. Simultaneously the review of ISWM related planning, if any, existing in the Pune context would be reviewed. Both these outputs are yet to be submitted.

The planning process would be facilitated at every stage by involving stakeholder consultations. A ***Working Group*** has been formed in consultation with PMC and through invitation to have representations from all the stakeholders. The stakeholders would be led through the strategic planning process to develop the ISWM Plan incorporating:

Vision --- Mission --- Goals, Objectives, Targets --- Strategies & Tactics ---Tasks with responsibilities, resources required, proposed institutional arrangements & expected capacity building

Simultaneously through a series of consultation workshops, the stakeholders related to each type of waste would be conferred for the various activities of the management functions of the Solid waste management. The identification of the sustainable technologies and systems would be addressed using the "***Sustainable Assessment of Technologies***" (SAT) methodology.

The outcome of the whole of the above process would be the refined and final version of the **Integrated Solid Waste Management Plan for Pune**.

A vision is a guiding image of success formed in terms of a contribution to society. A vision describes the future destination; it provides an image in words of what success would look like. It is built on reasonable assumptions about the future.

Expressions of a Vision could be external as well as internal.

An external vision focuses on how the world will be improved, changed, or different if the organization achieves it purpose.

An internal vision describes what the organization will look like when it's operating effectively to support the external vision.

A mission statement answers the questions: *Why does our organization exist? What business are we in? What values will guide us?* A vision, however, is more encompassing. It answers the question, *"What will success look like?"* It is the pursuit of this image of success that really motivates people to work together.

The mission statement is thus a precise description of what an organization does. The mission statement reflects the overall purpose of the organization. When wording the mission statement, organization's products, services, markets, values, and concern for public image must be considered.

The process envisaged is presented diagrammatically in **Figure 3.3.**

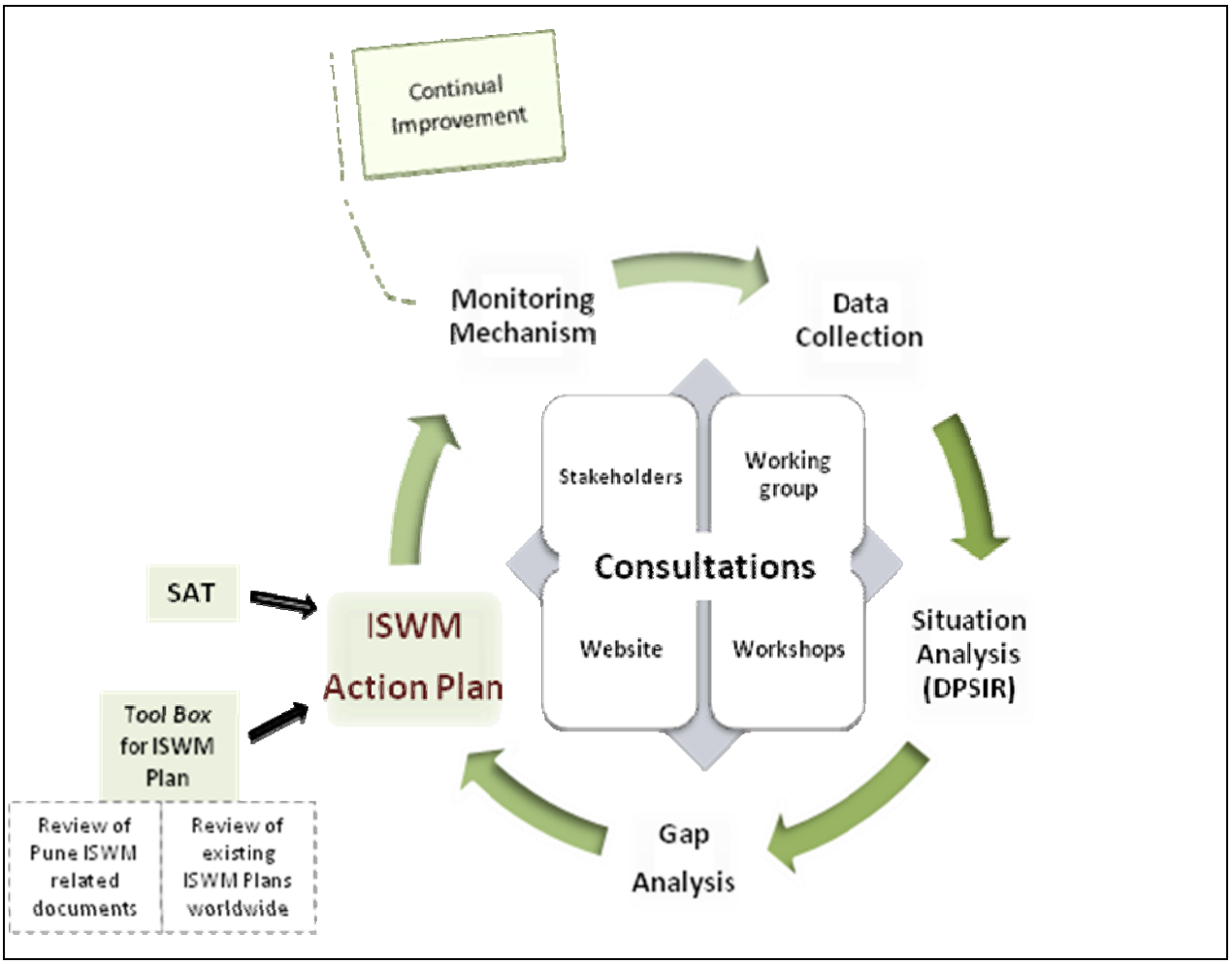

Figure 3.3: The Process of Developing ISWM Plan for Pune

3.2 Situation Analysis

The Situation Analysis includes conducting a brief scan or review of the organization and its environment. Understanding the overall 'situation' both in terms of environmental concerns and its institutional mechanism is the first step of the strategic planning process. Thus, the situation analysis can be classified into mainly two categories, namely:

- External situation analysis which aims at providing an overview of the existing environmental issues and challenges. Additionally, this analysis will also highlight the driving forces and pressures giving rise to environmental concerns and resulting impacts. Thus, the external situation analysis is an attempt at presenting a complete overview of the impacts of socio-economic and infrastructure development on the environment.
- Internal situation analysis brings to light the key organizational capacities in terms of human and infrastructure resources and identifies resource limitations and the capacity building needs. This analysis is essential in order to assess the capability of the organization for implementation of a feasible and manageable strategic action plan.

The purpose of this analysis is to enable the effective mapping of external environmental challenges with internal institutional capabilities and resources towards drawing out a feasible strategic action plan. Once the issues are identified, both across internal and external environment, the next process in Strategic Planning is to set an appropriate strategic direction. This is done by establishing a vision /mission statements and the goals. In many ways, Situation analysis stimulates formation of vision and mission statements. Vision and mission statements often find roots in the basic objectives and functions of the organization and are generated through brainstorming sessions.

3.2.1 The DPSIR Framework

The Driving force – Pressure – State – Impact – Response (DPSIR) framework used in this situation analysis, assumes cause-effect relationships between interacting components of social, economic, and environmental systems. This framework attempts to effectively report the complex interrelationship between the causes of environmental impacts and their effects. As a result, the DPSIR framework leads the way towards Strategic Action Planning.

Some of the key terms used in the **DPSIR framework** are outlined below.

Driving Forces (D)

A driving force is a human activity that is generated to satisfy a 'need'. Driving forces can be of two types - *primary driving forces* which are related to activities to fulfil the needs for shelter, food and water, and *secondary driving forces* which are activities to satisfy the need for mobility, entertainment and culture. The following are some of the typical driving forces:

- Population growth
- Industrialization (resource extraction and processing)
- Urbanization
- (Lack of adequate) Infrastructure
- Intermittent driving forces such as religious- or leisure-based tourism

Pressures (P)

The driving forces exert a stress on the available environmental resources which in turn induce pressures on the environment. These pressures can be divided into two main types, namely:

- *Depleting pressures*, which are induced by driving forces that extract environmental resources, such as declining forest cover and reduced levels of groundwater table, etc.
- *Degrading pressures*, which are induced by driving forces that discharge pollutants into the environment such as air pollution, water pollution and soil erosion.

State (S)

As a consequence of the pressures, the state of the environment – its quality and quantity - gets affected. The state of the environment is represented by the following:

- Air quality

- Water quality and reserves
- Soil quality
- Productivity of land

Impacts (I)

The physical, chemical or biological changes in the state of the environment impact the quality of environmental resources, including biodiversity and health and welfare of humans. Polluted environmental resources have health and/or economic impacts, threatening the sustainability of all economic activities. The following are some typical impacts:

- Status of biodiversity
- Human health

Response (R)

Due to an undesired impact, a response is triggered to address the change(s) in the environment. A response is directed specifically towards regulating driving forces, pressures or impacts to mitigate environmental pollution. A response should ideally be a part of the larger Action Plan. Response measures under an Action Plan can be categorized under four heads, namely:

- **Policy** – A Policy is a definite course or method of action that guides and determines present and future decisions. It is the overall framework that embraces the general goals and procedures of an institution (in this case a government body). A Policy is usually directed towards regulating the Driving Forces (D)
- **Plan** – A Plan is defined as a detailed formulation of a programme of action. It can be described as intent to carry out an action. A Plan targets to regulate the Driving Forces (D) and Pressures (P).
- **Programme** - A Programme is a system of projects and services. A Programme, like the Plan, targets to regulate the Driving Forces (D) and Pressures (P).
- **Project** - A Project is the most location-specific response that may be planned under a Programme. A Project targets to change the State (S) of the Environment.

Figure 3.4 shows the relationship between Strategic Action Planning and the DPSIR framework.

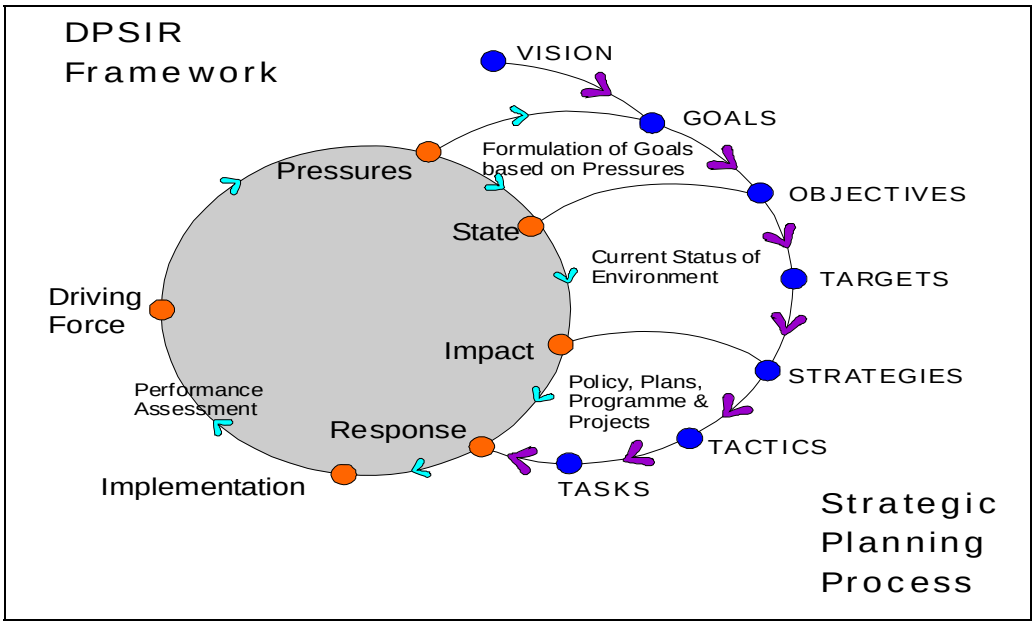

Figure 3.4: The Relationship between Strategic Action Planning and the DPSIR Framework

Following the DPSIR Framework, the process of formulating an ISWM plan for Pune was formally announced at a **Launch Workshop on 22nd December, 2006**. A Working Group comprising of a conglomerate of various stakeholders was formulated. The Working Group members have representatives from the regulatory bodies, technology providers, Non-Governmental Organizations (NGOs) working specifically in the waste related fields and citizen representatives. The basic aim for formulating such a group was to discuss and debate on the Vision, Mission, Goals and Objectives of the ISWM Plan. In order to further attend to specific waste-stream related issues, a series of consultation workshops were organized.

The following vision, mission and goals have been derived in Pune ISWM following the working group meeting and the consultation workshops and they are as shown in **Figure 3.5.**

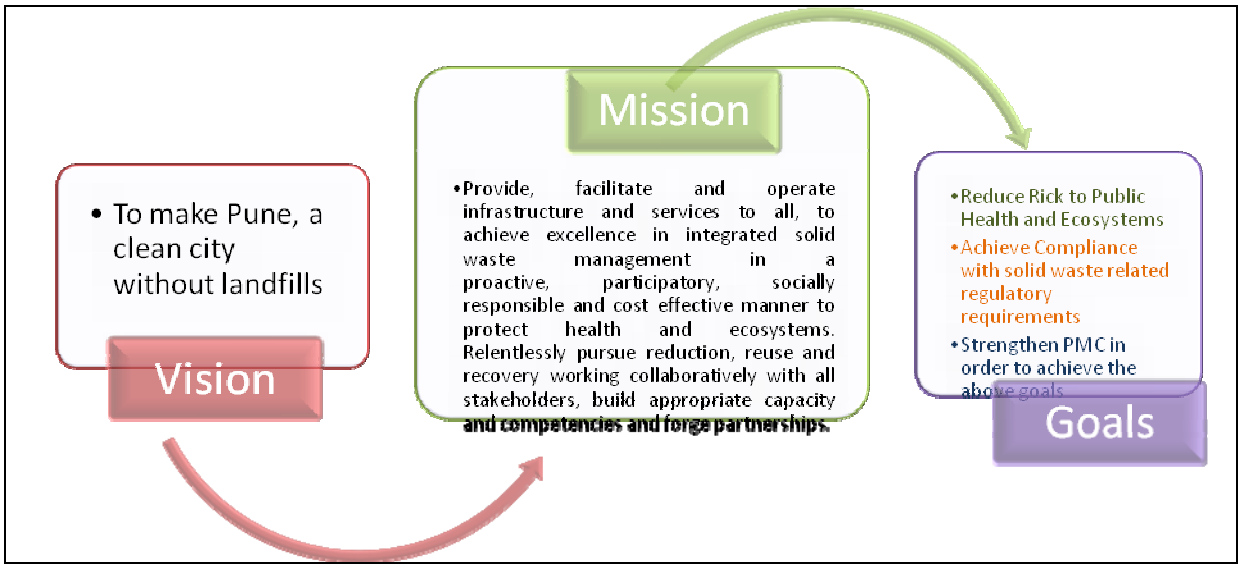

Figure 3.5: Vision-Mission-Goals derived in Pune ISWM

For each goal, the following objectives have been derived which are shown in **Table 3.1.**

Table 3.1: Goals and Objectives of Pune ISWM

	Goal 1 Reduce Risk to Public Health and Ecosystems	Goal 2 Achieve Compliance with solid waste related regulatory requirements	Goal 3 Strengthen PMC in order to achieve the above goals
Objective 1	Minimize human exposure to solid wastes	Achieve Compliance with MSW (M&H) Rules	Build internal capacity of human resources in terms of adequacy and competency
Objective 2	Minimize exposure of environmental components (air, water, soil, flora and fauna) to solid wastes	Achieve Compliance with Biomedical (M&H) Rules	Improve internal SWM infrastructure
Objective 3	Minimize the quantum of solid waste generated, transported, treated and disposed	Achieve Compliance with Hazardous Waste (M&H) Rules	Make operations of SWM department transparent, accountable, efficient and cost-effective
Objective 4		Achieve Compliance with Other Legislation (Plastic recycling, Batteries etc.)	Forge synergistic partnerships with stakeholders

In order to achieve the final vision of converting Pune into a clean city without landfills, several options were looked at and analyzed on the basis of the present situation.

Chapter

4

4. Stakeholder Consultation

In order to understand the aspirations of the various stakeholders, the prevailing bottleneck as well as the salient features of the existing Solid Waste Management in the city, various sections representing the stakeholders on SWM have been consulted. While the various identified representatives of organizations and groups were individually consulted the larger sections amongst the stakeholders were consulted through a series of workshop. The identification of stakeholders was done in close consultation with the Pune Municipal Corporation (PMC).

Each of the workshop themes were kept considering the waste streams under focus. In order to facilitate discussions and gather the inputs from all stakeholders, the workshops were designed comprising of sessions with a lead discussion followed by reactions/inputs from Key Presenters. Each session culminated in open discussions.

Prior to the consultation workshops, two separate workshops were organized. The ISWM project was launched in Pune through a launch workshop on December 22nd, 2006. The workshop was also supported by the Maharashtra Pollution Control Board (MPCB). The workshop was opened by ***Dr. Nitin Kareer***, IAS, Municipal Commissioner and ***Dr. Dilip Boralkar***, Member Secretary, Maharashtra Pollution Control Board (MPCB). ***Mr Surya Chandak***, Dy. Director of IETC-UNEP, Japan was also present and delivered a presentation on IETC-UNEP's approach and programme on ISWM.

The workshop included a number of presentations from experts and technology/service providers involved in various aspects of SWM. The presentations covered status of MSW, waste recycling initiative, biomedical waste management and MPCB's work on hazardous waste and e-waste management. This workshop had representatives from most of the stakeholders related to solid waste management. In all 47 delegates participated in the workshop. Representations varied from regulators to administrators and technology providers to citizen activists. Representatives from other urban bodies besides Pune Municipal Corporation were also present.

Through this workshop the stakeholders and the media at large were informed about the ISWM initiative as well as the future course of action to be taken.

Subsequent to this a workshop was organized along with the Working Group on January 29, 2007 to kick start Strategic Planning process towards preparation of Integrated Solid Waste Management Plan for Pune The Working Group comprised of select representatives of PMC, Key Institutions, NGOs, Industries, Electronics and IT sector, etc. During the day long workshop a draft Vision & Mission statement for ISWM

plan was developed. Further, Goals and Objectives were formulated with a discussion on strategies that could be deployed to achieve the targets.

Subsequent to these workshops, a series of consultation workshops were organized. In order to maximize the participation, besides the invitations being sent by the PMC, information was disseminated through the website **http://iswm.emcentre.com**, a web portal specially created to share the various outputs produced in the Integrated Solid Waste Management Plan development process as well as to solicit views and pool resources.

Box 4.1: Website on Integrated Solid Waste Management for Pune City

A website dedicated to ISWM plan for Pune city is launched to encourage the communication between stakeholders, policy makers and the planners. This website has served as a common platform for people to comment and provide suggestions in the planning process. The website is continuously updated to inform about the upcoming events related to Solid waste management in the city of Pune.

This interactive site also holds about 42 publications in all which includes the reports, publications and the presentations that were made during the Consultation Workshops. Opinion poll was one of the features of the website, wherein various themes were put up for views. The other features include Quick Comments and photo gallery.

There are now about 120 members registered on the site who are actively involved in the discussions and other activities on the website. The member composition consists of students, professionals, researchers, NGO representatives, Industry people as well as Government officials.

The **Table 4.1** lists the series of consultation workshops addressing various solid waste streams and their respective dates

Table 4.1: Consultation workshops

Sl. No.	Consultation Workshop	Date
01.	Municipal Solid Waste – I Focus: Generation, Segregation, 3Rs and Decentralized Treatment Systems	February 17, 2007
02.	Municipal Solid Waste – II Focus: Treatment, Recovery and Disposal	February 24, 2007
03.	Electronic Waste Management	March 24, 2007
04.	Construction & Demolition Waste Management	March 28, 2007
05.	Bio-Medical Waste Management	March 30, 2007

All the workshops had participation not only from the concerned individuals, but also from the general public. The MPCB representation was sought for all the workshops and legal related issues were discussed by

their representatives. For some of the workshops experience sharing was facilitated by the involvement of senior representatives from Municipal Corporation of Greater Mumbai.

To have an effective out reach the major stakeholders from each of these specific sectors were involved. For the Municipal Solid Waste Management workshop – I, various NGOs working in the area of door to door collection along with institutions specializing in waste processing were present. The workshop on MSW management – II was attended by diverse technology providers for centralized and decentralized treatment.

The E-waste workshop was organized involving the Software Technology Parks of India (STPI) that represents Ministry of Communication and Information Technology, Government of India and Software Exporters Association of Pune (SEAP) representing the Pune based stakeholders from IT sector.

For consultation workshop on construction and demolition waste the Promoters and Builders Association of Pune (PBAP) and their respective members were involved.

The workshop for Biomedical Waste Management was organized involving the Indian Medical Association, Pune chapter, hospital association and various health care facilities.

The conduct of these workshops was emphasised with the aim to gather maximum inputs from the stakeholders. Each of the workshops started with the presentation of some key findings and issues based on the situation analysis study carried out as part of the project. Various experts and technology /service providers for the particular stream of waste were invited as panellists to facilitate the discussions with the sharing of their experiences and views through presentations. The presentations by panellists were followed by discussion involving the key stakeholders, technology/service providers, NGOs, representatives of various educational and research institutions and concerned PMC officials. The participants were also briefed on the Action Plan being developed as well as the Vision, Mission and Objectives being framed for Pune. They were encouraged to give their feedback on the same.

All consultation workshops were held at Captain Vadke Hall of Pune Municipal Corporation. The inputs received during these workshops have been looked up during the preparation of the action plan for ISWM. The highlights and key outcomes of these consultation workshops are presented in the next section, below.

The schedules for each of the workshops are placed in Annexure I. The list of speakers and attendees for all the Consultation workshops are attached as annexure II and III respectively.

The handouts designed for soliciting inputs on the Draft Vision and Mission statements formulated in working group meeting were circulated in all workshops. The responses obtained from the participants are put in Annexure IV.

The consultation process received considerable media attention. Various news coverage in the local media reported about the proceedings as well as on the approach of the planning process. Some of the news items of these workshops are showcased as clippings in the Annexure V.

4.1 Review of Participant Profile

The consultation workshops were organized with the aim of involving representatives from all stakeholders relevant to the waste stream in focus. A review of participant profile indicates that this objective has been fulfilled. Figure 4.1 presents the overall representation from diverse group of stakeholders for the series of workshops.

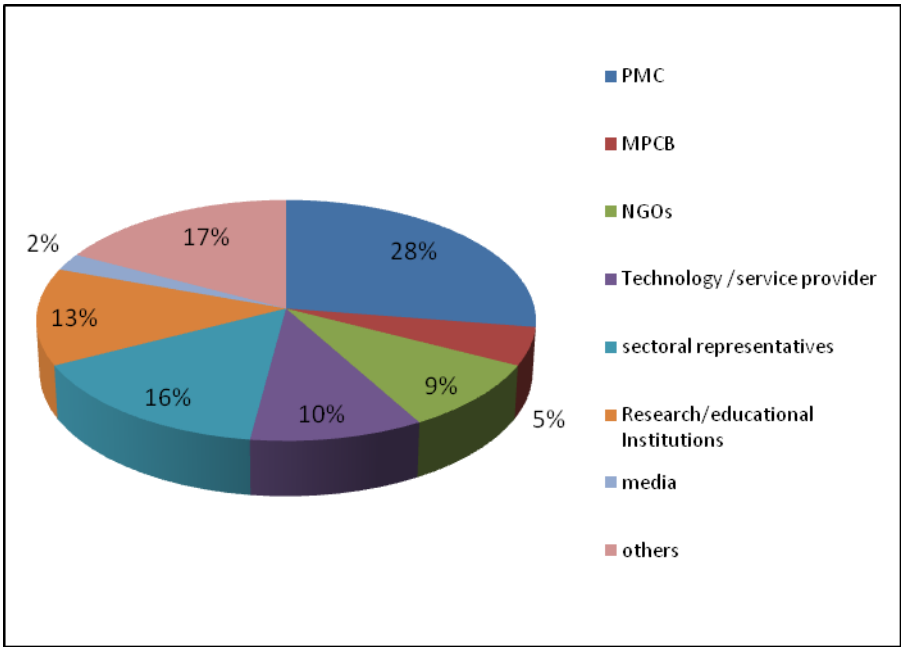

Figure 4.1: Distribution of participants

For the individual workshops, the analysis of the profiles of the participants is presented in **Figures 4.2 to 4.6**.

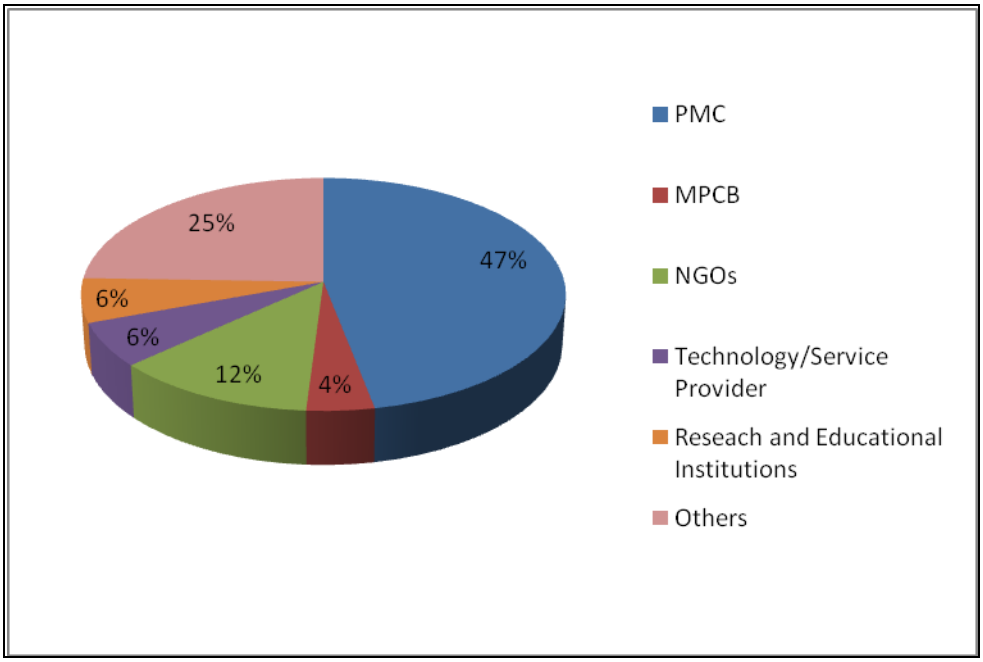

Figure 4.2: Participants at MSW Management Workshop I

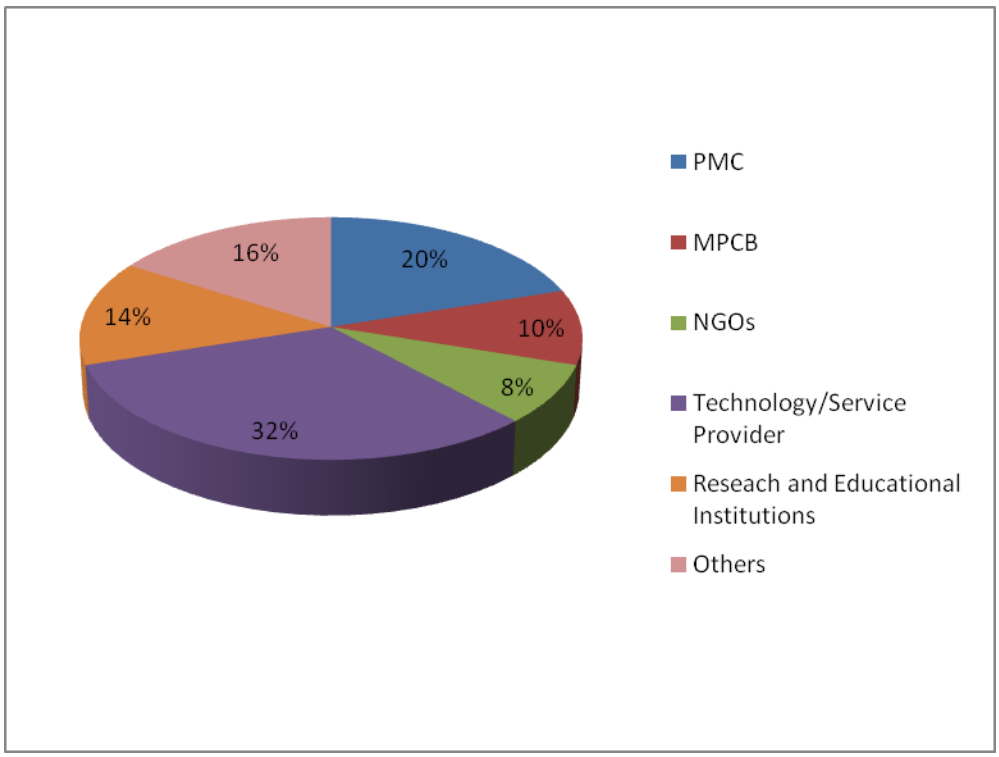

Figure 4.3: Participants at MSW Management Workshop II

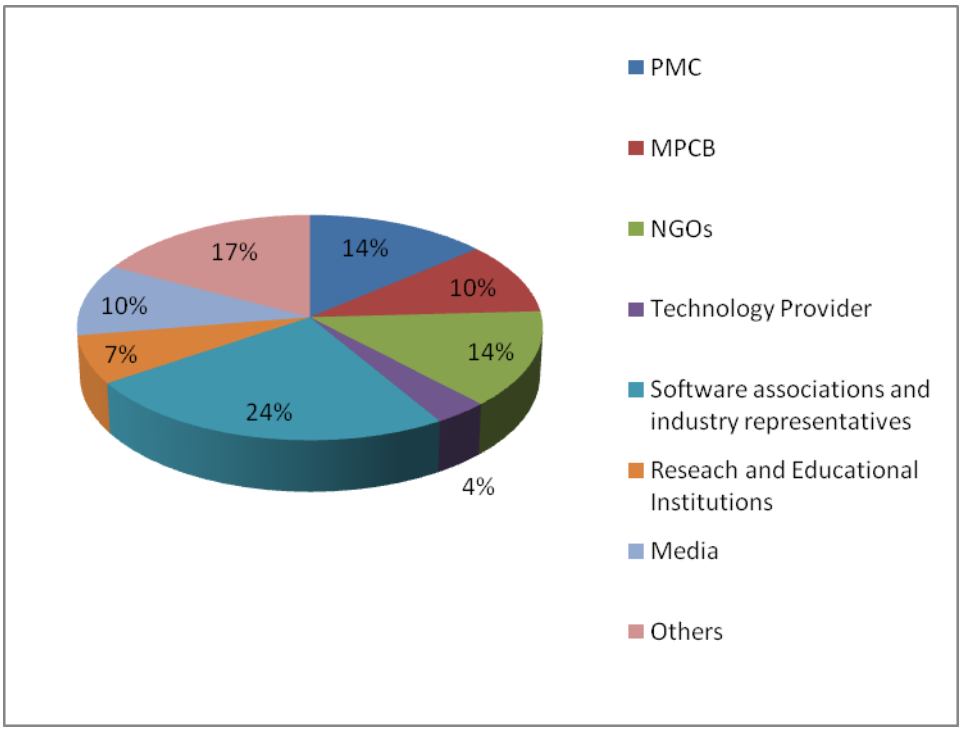

Figure 4.4: Participants at E-waste Management Workshop

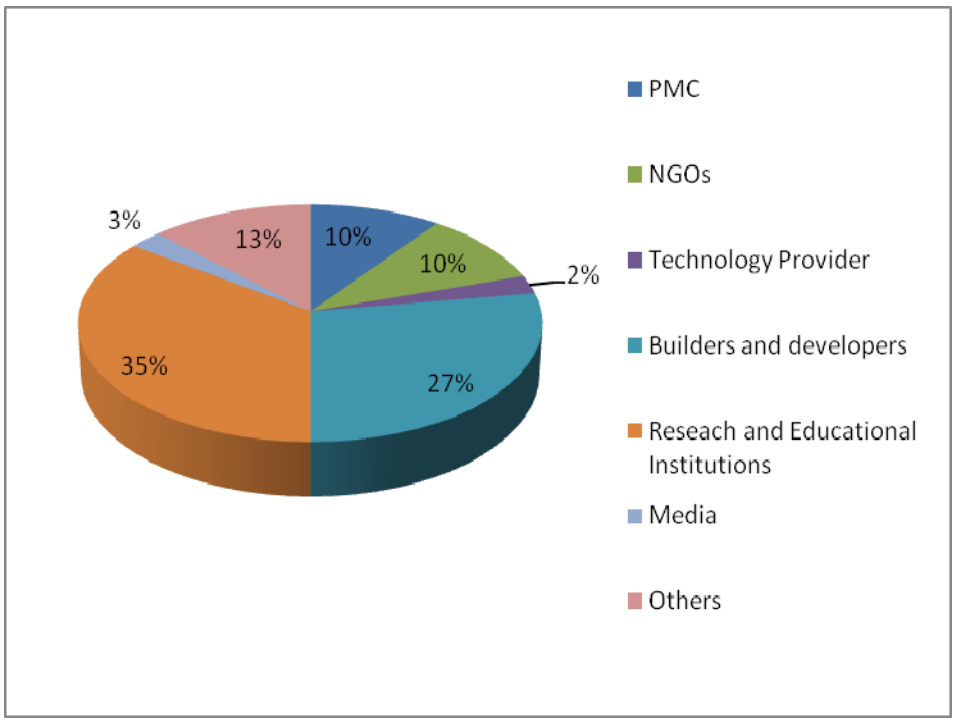

Figure 4.5: Construction and Demolition Waste Management workshop

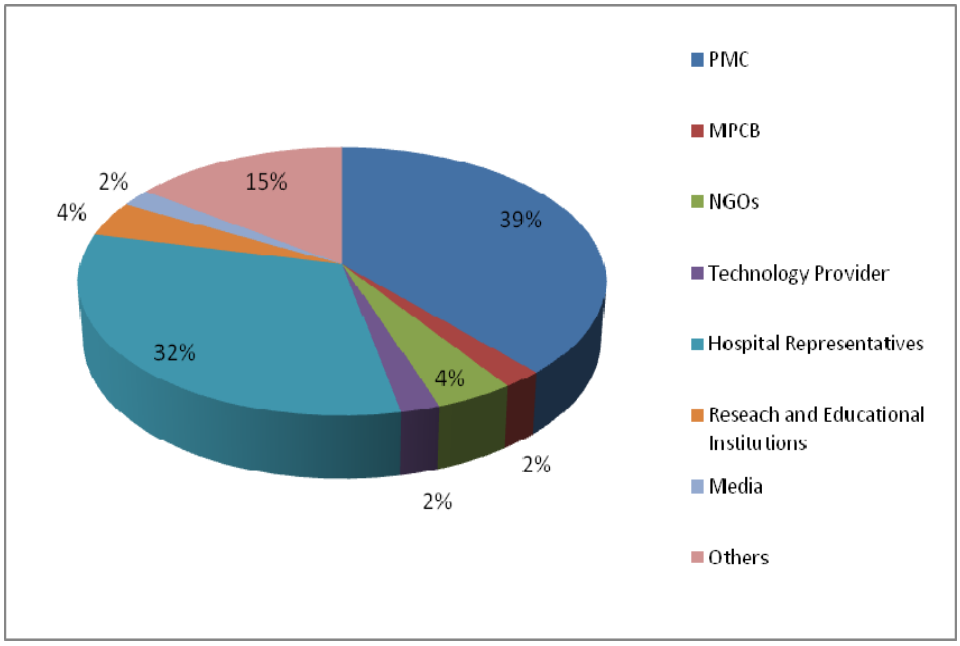

Figure 4.6: Participants at Bio-medical Waste Management workshop

It is also observed that more than 20% participants attended more the 2 workshops in the series of consultation workshops.7.5 % participants attended more than 3 workshops (ref **Figure 4.7**).

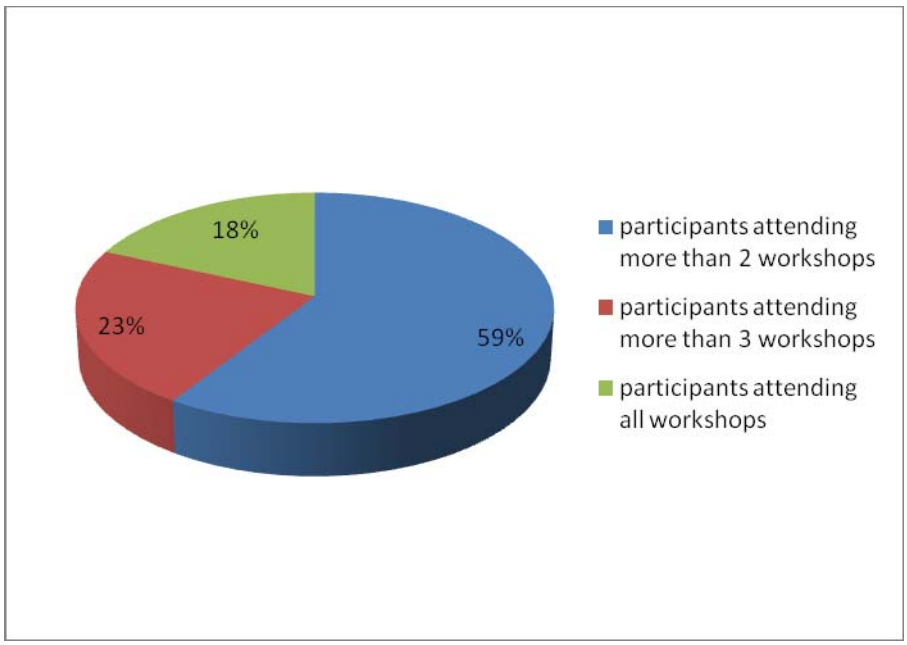

Figure 4.7: Participation received for the series of workshops

Chapter

5

5. Consultation Workshop Proceedings

This chapter presents the proceedings from the five workshops. The details of the progress in each of the workshops, the discussion points and recommendations resulting from these workshops are included. The proceedings are presented in the sequence in which the workshops were held. In series, there were five consultation workshops were organised, proceeding of each workshop is given below:

5.1 MSW Management Workshop - I

A consultation workshop on MSW was organized on Saturday, February, 17, 2007 from 10 00 am to 05 15 pm at Capt. Vadke Hall in Pune Municipal Corporation Building. The focus of the workshop was to look at the stages of Solid waste Management from generation, storage, segregation to the various decentralized processing methods adopted. Various agencies and individuals involved in collection of municipal solid waste, awareness, recycling, and decentralized processing participated in the workshop Dr. R.R.Pardeshi from PMC opened the workshop with a welcome note and urged all the participants to actively participate in the discussions during the proceedings of the day.

Dr. Prasad Modak introduced the concept of integrated approach for Solid Waste Management Plan. He explained how integrated approach operates with various themes and at various levels. **Integrated approach can look at various waste streams together as well as economical, environmental and social aspects together.** Dr. Modak also gave an introduction of the project and a roadmap of the project. He made an announcement about the website dedicated to the Integrated Solid Waste Management Project and appealed participants to visit and participate in web based discussions.

The details of the proceedings of the workshop are as below:

Session A: Key Observation on MSW Generation and Segregation in Pune

Mr. Shantanu Roy presented some key points about the scenario in Pune about generation and segregation of solid waste from the available data. Some statistical and graphical representation of the data regarding generation with respect to area of the wards, commercial index was presented.

Figure 5.1: Participants at MSW management Workshop - I

Panellists : Mr. Ravi Chaudhari, Mr. Sachin Bhagat

Mr. Ravi Chaudhari explained the objective behind the Chakachak movement was to target the next generation citizens to make them aware about the Solid waste management issues right from the school age. Some positive points that have emerged in last few years like a separate budget for Solid Waste Management, improved interaction between citizens and Ward Medical Officers. He also proposed that there should be some minimal remuneration allotted for the consultants who assist people for vermicomposting. He informed that the NGOs supported this movement very enthusiastically but their participation decreased drastically due to some unknown reason. There should be efforts to organize the NGOs which are working in this field and streamline the process of collection and segregation of waste. The vermicomposting facility which is mandatory for post 2002 constructions seem to be not working well as stated by Mr. Chaudhari. **Separate system should be operated for collection of waste form the slums and also from bulk generators.** He suggested that experts with the management and planning background should be included in the department with the medical officers. He also recommended that some fine should be imposed on citizens and organizations that do not segregate their waste and it should be implemented strictly. The proper use of the fine collected should be canalized in advance.

Mr. Sachin Bhagat from Vighnaharta Vikas Partishthan shared his experiences about the door to door collection system practiced by his organization. He mentioned that if given regular and consistent service people also would respond positively for segregation. **He proposed to work for decentralized processing options which can be operated in single ward on an experimental basis.** The processing options should be flexible as per the area/ward requirement. The staff for Solid waste management is less than 50% compared to what is required which is also a constraint as mentioned by Mr. Bhagat.

Session B: Key Observations 3Rs practices in MSW management in Pune

Panellists: Ms. Suvarna Bharekar, Mr. Shantavan Shinde, Mr. Sham Deshpande

Ms. Suvarna Bharekar representing Disha Foundation shared their experiences and suggested that there should be better allocation of the waste pickers. She also proposed that PMC should pay some basic wages to the waste pickers to ensure their livelihood.

Mr. Shantavan Shinde from Abhiyan Foundation stated that they started the organization with the objective to keep the city clean and to generate the employment. The main challenge for all agencies working in the door to door collection is **awareness level of citizens.** Many times people do not pay the monthly charges to the workers catering door to door collection services. The workers have to spend money for the repairs and maintenance of the vehicles they use because the vehicles are not in good conditions. He proposed that Pune Municipal Corporation should give the safety equipments to the waste pickers and collectors.

Mr. Sham Deshpande who is Corporator from Dahanukar Colony area stated that it is not fair to ask citizens to treat their waste when it is a duty of the Municipal Body. The root cause of the problem is the generation and lack of segregation. Study the consumption pattern in the city carefully is a need of an hour. He expressed his views on vermicomposting and other available processing technologies being operated at decentralized level could not be feasible option if operated at society level. If it is done at open spaces in the area or ward it could be successful.

Figure 5.2: Participants discussion at MSW Management workshop

After the Session B there was a special presentation by **Mr. A.R.Khan, Assistant Executive Engineer, Bombay Municipal Corporation**. He shared the management of Solid Waste Management in BMC and discussed various initiatives BMC has taken to reduce and manage the solid waste issues. The conservancy department comes under the Engineering department and not Health Department. He talked about the waste transportation and processing facilities. BMC also have the transport vehicle tracking system based on Global Positioning System. (GPS) The collection, transportation and also the task of creating awareness are privatized on comprehensive contract for 5 years. He mentioned that Bombay has Cleanliness and Sanitation bylaws formed in 2006. He also shared the **'Advanced Locality Management'** and **'Slum Adoption Scheme'** and their work. Incentive in terms of solving their problems on priority basis is given to the ALMs by BMC. BMC has vermicomposting plants at the three vegetable markets and has subsidized the compost fertilizer. The price of the compost is as low as Rs.1/truck. The C& D waste is also very systematically disposed off through the appointed agency.

Session C: Key Observations on MSW Collection, Storage and Transportation

Panellists: Dr. Sanjeev Wavre, Mr. Madhukar Gholap, Mr. Dilip Kulkarni

Dr. Wavre, Ward Medical Officer, Ghole Road Ward Office mentioned the need for data collection to be done by authentic agency for so as to get a quality data. He mentioned that there was a poor response to the awareness programmes that they conducted. He proposed that the bulk generators should process their wet waste in their premises. He shared the problems he faces as Ward Medical Officer. The irregularity and inconsistency of the waste pickers is a problem. He suggested that there is a need to provide the space for waste pickers to segregate the waste. Some decisions could be taken at ward level like maintenance of the transportation vehicles used for Solid waste. He also suggested that **the Ward medical officers should be consulted for the purchase of the new vehicles or equipments for Solid Waste Management.** Ward medical officers should get some kind of assistance as they are heavily occupied with the work other than Solid waste Management.

Mr. Madhukar Gholap, Deputy Sanitary Inspector, Vishrambaugvada also shared the response form the parents to Chakachak movement which was discouraging. He mentioned that the **timings of collection of waste could be an important thing** to take into consideration.

Mr. Dilip Kulkarni, Depot Superintendent, Transport Department mentioned that there is only one depot catering services at Gultekdi. The transport department also faces budget constraints. The numbers of vehicles that are allotted for Solid waste transportation are less as mentioned by Mr. Kulkarni. He also mentioned that the contract labour force that is employed for transportation is big problem.

Session D: Community level and decentralized MSW treatment in Pune

Panellists: Ms. Manjushree Tadvalkar, Mrs. Jyoti Shaha

The session was mainly scheduled to understand the issues and constraints related to the decentralized treatment of MSW in Pune.

Ms. Manjushree Tadvalkar stressed that the success of the decentralized processing will happen with the help of **five Ps i.e. political will, policy, people participation, plan of action and profitability.** The processing should be given to the learned people who are aware about the technology while the present approach towards decentralized processing is very casual. According to her there is a good market for compost fertilizer. But some constraints about the fertilizer quality to be put if it has to be marketed at a higher scale.

Mrs. Jyoti Shaha pointed that the decentralized processing options of the waste should be as simple as possible to be implemented by common people. She also stressed that the ward medical officers are very co-operative. She stressed that there is **need to give training on awareness about the solid waste issues** to whole Solid Waste Management Department.

After the last sessions **Mr. Rahul Datar** presented the Excel based model which is being developed in order to analyze present scenario of Solid waste management and also to predict the changes in different parameters which are dependent on each other like percentage of recycling, quantity of waste being processed and the quantity of waste going for landfilling.

Figure 5.3: Presentation of the Excel based model for Solid Waste Management

The workshop was closed with the summary of the workshop and vote of thanks to the participants and panellists for actively participating in the workshop and giving their valuable inputs.

5.2 MSW Management Workshop - II

The second consultation workshop on MSW management was organized on **February 24, 2007** from 10 00 am to 05 15 pm at Capt. Vadke Hall, Pune Municipal Corporation Building.

The workshop started with a welcome note by **Dr. R. R. Pardeshi.** He explained the background of the project to the participants and also about the consultation workshops that have been conducted in the past three months. He mentioned that Draft vision statement, 'To make Pune a clean city, without landfills' is really an ambitious statement providing us the dream that we all should look forward to complete. He also expressed that the planning process will give out an ideal plan which could be implemented to be a model city for Solid Waste Management.

Dr. Prasad Modak introduced the concept of Integrated Solid Waste Management to the participants. He explained that the term "integrated" has different facets like integration of the different waste streams, integration of all the stages in the waste management process or integration of social, economic and environmental factors. Dr. Modak told participants about the new website put up by Environmental Management Centre for Integrated Solid Waste Management Project and appealed the participants to participate in the web based discussions. He also elucidated the roadmap of the project.

Figure 5.4: Participants at MSW Management - II Workshop

Session A: Landfill Mining and Remediation

Mr. Shantanu Roy explained the schedule for the day to the participants. He presented some key observations about the landfill requirements like citing criteria and the waste supposed to go to the landfill. He also explained the concept of Sustainable Landfill which mainly says that the waste impact should not be carried to the next generation.

Panellist: Mr. G.M.Tendulkar, ECO designs Pvt. Ltd.

Mr. G.M Tendulkar presented his experiences about the **dumping site closure** and **landfill preparation** in Pune. Ideally only inert material should go to the landfill but the waste still comes in non segregated manner. So there are two main issues that should get an utmost attention are protection of health and protection of environment. He explained some facts and **feasibility of landfill mining** and **putting up bioreactor** at landfill site.

Session B: Biomethanation and Composting technologies

Panellists: Colonel Suresh Rege, Mr. T.R.Rao, Mr. Harshad Gandhi

Mr. Harshad Gandhi from Excel Industries started the presentation with the activities of Excel Group of industries. He explained some difficulties and constraints that they face for promoting the composting technology. One of the problems is the concrete platform which is made mandatory to avoid leachate problem which increases the cost. The mixed waste and the demand for the compost are the two factors which should be taken into consideration. Demand for the compost is post monsoon and the production is round the year. He opines that compost is not a saleable commodity and it cannot replace fertilizer but it can only act as land curing system.

He expressed that there is a need to have some incentive for the people who adopt the system of composting to convert the wet waste.

Mr. T.R.Rao , Oilfield Techniks expressed that the Municipal Solid Waste should be looked at as a 'single entity' and not in a segregated manner. He presented the technologies for conversion of the various components of MSW to various products. He also explained the function of automated segregation plant.

Colonel Rege stressed upon the **need of segregation for biomethanation**. In his viewpoint there is a demand for Biomethanation, as it can be a source of alternative fuel. He expressed that the problem of the wet waste segregation should be solved with the help of combination of various technologies and should not be dependent on only one technology. This can be made possible only if entrepreneurship is brought into the MSW management sector.

Figure 5.5: Panellists from MSW Management workshop - II

Session C: Thermal based Waste to Energy Technologies

Panellist: Dr. Prasad Modak

Dr. Modak introduced various options of technologies which can be used for the conversion of waste to energy using high temperatures. He discussed various technologies like RDF, gasification etc.

The waste characteristics in India typically involve high amount of moisture content and lower net calorific value. Hence it becomes necessary to develop technologies to remove moisture to support whatever final technology is selected for waste treatment and disposal. In this context **Mr. Gore** presented the technology of Airless Drying.

Dr. Modak also introduced the method of **Sustainable Assessment of Technologies (SAT)** to the participants and explained how does the system works.

Session D: Carbon credits in MSW Management

Panellist: Mr. Amar Modi

This session typically dealt with the how carbon credits can be acquired in various practices of solid waste management e.g. avoiding or capturing GHG emissions. The **Clean Development Mechanisms (CDM) potential of MSW management** practices was also discussed. The project cycle for CDM and the stages of the process were discussed.

5.3 E-waste Management workshop:

The consultation workshop on E-waste Management was organized on March 24, 2007 in Capt. Vadke hall in Pune municipal Corporation Building from 02 00 pm to 05 00 pm.

Figure 5.6: Participants at the E-waste management workshop

The workshop started with introductory note by **Mr. P. Venugopal**, President, Software Technology Parks of India. He strongly expressed the need for legislatory framework as that more and more software companies as well as hardware technology companies are coming up. He also mentioned that there formalization in terms of the E-waste recycling, disposal and overall management is necessary.

Figure 5.7: Speakers in the inaugural session of e-waste workshop

Shantanu Roy introduced the concept of segregation to the participants and roadmap of the project of Integrated Solid Waste Management Plan. The brief idea about the workshops happened earlier was also

given. He also appealed to participants to participate in various features on the website specially put for this project www.iswm.emcentre.com .

The session started with the presentation by **Mr. Hemant Pardeshi**, Sub-regional Officer, Maharashtra Pollution Control Board. He expressed that rapidly growing electronic industry rapid product obsolescence and use and throw attitude are the causes behind rapidly increasing waste. He mentioned the need of addressing various issues like defining the term 'E-waste', hazardous contents of this type of waste and more importantly requirement of legislatory framework to manage the problem E –waste. He mentioned that about 2584 MT E-waste is getting generated in Pune alone per annum. A comprehensive discussion took place after this presentation brought about many points like extended producer responsibility, need of making related stakeholders aware of the scenario. The issues like problem of assembled market in quantification or tracking the sources, responsible advertising were also discussed. Mr. Pardeshi mentioned that in any case the disposal of E –waste should not be done with Municipal Solid Waste.

Figure 5.8: Representative from MPCB explaining the role of regulator

Mr. Shantanu Roy presented the E-Waste Management initiatives in India. He dealt with some initiatives in India like formation of national working group on e-waste in 2004, studies on e-ate assessment, some other rules and regulations partly covering E-waste management. Mr. Roy also talked about the Bangalore and Delhi case studies. Inventorization and classification of E-waste, establishing regulatory framework, encouraging recycle/recovery through ESTs (Environmentally Sound Technologies) and awareness and training to the concerned stakeholders are some of the key issues which need to be addressed in E-waste management.

After tea break **Mr. B.K.Soni**, Managing Director, Infotrek Syscom Ltd. He gave information about E-waste recycling facility which is coming up at Taloja with the capacity of treating 12 tons /day of electronic waste. He discussed some initiatives like Global public private initiative called Solving E-waste problem (StEP) with the aim of standardization of recycling processes, extending product life etc. The discussions happened over the various issues like putting standards of discharge on recyclers and possibility of scaling down the facility at Taloja for a single software park as the facility should be close to electronic industry Hub.

Mr. Rahul Datar explained the various features of the regulations related to electronic industry, Restriction on Hazardous Substances (RoHS), Waste Electronic and Electrical Equipments (WEEE) and Electronic

Industry Code of Conduct (EICC). He stressed on the impacts of these regulations on Indian market while exporting the products to European market.

5.4 Construction and Demolition Waste Management workshop

The consultation workshop on Construction and Demolition Waste was organized on March 28, 2007 at Capt. Vadke Hall from 02 00 pm to 05 00 pm.

The program started with Welcome note by **Dr. R.R.Pardeshi**, of PMC. He stated that the problem of Construction and Demolition waste has become significantly and visibly important because of the situation of flood occurred in Mumbai during Monsoon. Though there is no regulation in place for management if Construction and Demolition waste, it should not go to municipal solid waste. Dr. Pardeshi expressed that Pune could also formulate some legislation regarding Construction and Demolition Waste Management on the basis of the rules formulated by Municipal Corporation of Greater Mumbai.

Mr. Shantanu Roy introduced the concept of Integration to the participants. Integration in terms of Solid Waste Management could be in terms of all the waste streams or integration of social, environmental and economic aspects. He also explained the roadmap of the project and the theme of the earlier consultation workshops. He presented some key facts about Construction and Demolition waste as this kind of waste has a wider canvas but primarily include inert and non-biodegradable waste. Construction and demolition waste contributes to about 10-12% of Municipal Solid Waste and about 12-14.7 million tons of C& D waste is generated annually all over India. The amount of C & D waste generated during is demolition (500-300kg/sq.m.) is higher than that which generates during construction or repair works (40-60kg/sq.m). The management of this waste should take an institutional and regulatory approach. The main issues regarding C & D waste are inventorization and its separation from Municipal Solid Waste. More emphasis should be given to adopting reuse and recycling options and creating awareness for the same.

Figure 5.9: Participants at the C&D waste workshop

Mr. Sachin Jain from NICMAR explained the possible routes for recycling of the wastes originating from Construction and Demolition activities. The Waste management hierarchy starting from prevention should be followed. He put an emphasis on waste minimization and use of recycled products.

Mr. Dilip Shrotriya, Executive Engineer, Municipal Corporation of Greater Mumbai explained the various features of the Rules for Construction and Demolition Waste Management. He mentioned that the inventorization of this kind of waste is a major problem. He explained the system put by Municipal Corporation of Greater Mumbai for management kind of waste and all the necessary permissions to be taken by various agencies before carrying out any construction activity. He told participants all the information about these rules is put on the website of MCGM. Discussion about various tactics as well as strict monitoring majors to be employed took place amongst the participants.

Mr. Bejoy Davis, CIDCO Yuva Building Centre showed a short film on a technology for Recycling of waste from construction and demolition activities.

He explained that CIDCO Yuva Building Centre have put up a Debris Recycling Bank wherein you can generate a product out of the waste that you are depositing. They have a waste recycling technology which processes t 1 ton waste/day and convert that into the interlocking pavements, hollow blocks etc.

Figure 5.10: Initiatives from Mumbai being shared with C&D workshop participants

Figure 5.11: Concept of debris recycling bank being shared with C&D workshop participants

5.5 Bio-medical Waste Management workshop:

The consultation workshop on Biomedical Waste Management was organized on March 30, 2007 from 02 00 pm to 05 00 pm in Capt. Vadke Hall, Pune Municipal Corporation Building.

Figure 5.12: Participants at BMW workshop

Dr. R.R. Pardeshi from PMC welcomed all the participants He expressed the need to cope with the new technologies but also to check the environmental impacts of the technology. He reiterated about the use of new Environment-friendly technologies for resolving the problem of Solid waste management. He appealed all the participants to take part in the discussions and give their valuable inputs in this consultation process towards making an Integrated Solid Waste Management Plan for Pune.

Dr. Prasad Modak explained the background of the project and also the work done up till now on this project. He introduced the term "Integrated" to the participants in context with the Solid waste management.

The integration could be in terms of different waste streams or in terms of the various processes in the waste management like collection, transportation, disposal etc.

Mr. Shantanu Roy presented the current scenario for the bio-medical waste management. The bio-medical waste as it is defined comprises of human and animal waste. About 700 MT of Bio-medical waste is generated in the city of Pune in one year while the common Bio-medical waste treatment facility receives only 438 MT per year. Two big hospitals in Pune have their own Bio-medical waste treatment facilities. The waste is collected from 250 collection points along 4 routes from the city. The inventorization of Bio-medical waste needs to be updated. He stressed that the segregation which is an important aspect of Bio-medical waste handling and management is not getting implemented properly in Pune. Various technologies for treatment of bio-medical waste have emerged over the years which should be looked at as an option.

Mr. Savant from Maharashtra Pollution Control Board presented the regulatory approach towards Bio-medical Waste Management. He expressed the need for awareness and training as many of the concerned stakeholders are not fully aware of the legislatory requirement. He briefly explained the role of different agencies and stakeholders in the Bio-medical waste management. He also explained the regulatory measures that are taken against non-compliance like fine or notice for closure for the bio-medical waste treatment facility provider. However strict action like closure of the hospitals is generally avoided as it affects the patients in the hospitals or nursing homes directly.

Mr. Laxminarayan, General Manager, Sun Enviro Management Pvt. Ltd., the facility operator for Pune area, introduced the facility. There is a provision of twin chamber incinerator working at high temperature of 1100^{O}C. The air pollution is controlled by provision of wet scrubber. He mentioned that about 1200 medical organizations are currently using this facility. He mentioned that facility of door-step collection of BMW presently available in hospitals greater than 20 beds. The cost ratio for transport to treatment is as 30:70 for Bio-medical Waste treatment.

Some observations from his discussions are as follows

- As per the estimates of the facility operator, only 8-9% of the general practitioners, 80-90% of the nursing homes and around 90% of the pathological labs are the members of this common facility
- Lack of willingness to pay, low motivation amongst medical fraternity were sited as barrier to join common bio-medical treatment facility
- 90% of the hospitals give their plastic waste to the scraps dealers

The facility's willingness to increase the no. of collection vehicles and frequency of collection provided more and more Medical practioners and nursing homes join the facility was also made during the workshop

Dr. Nitin Bhagali, President of Hospital Association, Indian Medical Association and Dr. Vaijayanti Patwardhan, President, Indian Medical Association, Pune chapter presented the views of Medical fraternity and the problems they face. They expressed that some specific situations need a change or modification in the law. Some key points from their discussion are as follows.

The highlights of their discussions are as follows:

- Strict action against the medical practioners and the nursing homes those are not treating their waste nor are sending it to the common treatment facility.

- Suggestion for reviewing the criteria for charging to the nursing homes. Instead of bed basis right now, it could be based either on either occupancy or weight of the waste.
- Survey amongst members of common treatment facility to get a feedback and review the serviced provided
- Permission to more than one common biomedical treatment facility provider

Figure 5.13: Discussion of participants with the speaker

Dr. D.D.Chandakkar, from PMC expressed the PMC and the government's views in the context of the queries raised by the medical fraternity. He mentioned that they have had various meetings and discussions with Indian Medical Association and similar agencies. Awareness campaigns for the staff of hospitals were conducted .Some nursing homes had been penalized for non-compliance.

Figure 5.14: The PMC's views being clarified to participants

Some observations from his discussions are as follows

- Weighing of the waste could be problem in terms of logistics, calibration of the instruments etc.
- Ministry of Environment and Forest (MoEF) guidelines allows waste from various nursing homes up to 10,000 beds in total can be treated at one facility in the radius of 150km

Chapter

6

6. Consultation Workshop: Highlights

As discussed earlier in the previous chapter the consultation workshops were successful in bringing out valuable inputs to make the ISWM plan more effective. The highlights of the discussion for each of the waste streams are presented below.

6.1 MSW Management

- The Focus of this workshop was on generation of waste, segregation of the same, 3Rs (Reduce, Reuse, Recycle) and various Decentralized technologies for the treatment of Municipal Solid Waste at ward level.
- PMC's initiative, *Chakachak*, was discussed. The *Chakachak* concept was initiative of PMC along with citizens of Pune to induct the awareness about the municipal solid waste. However, participation of Non Governmental Organizations (NGOs) decreased in Chakachak project suddenly. He suggested that PMC should again bring them to one stage and provide some remuneration to them to sustain the project.
- Experiences about the door to door collection system practiced in the city were shared. If regular and consistent service were provided, people would respond positively for segregation.
- The PMC is understaffed for Solid waste management of the city with about 50% less than the requirement which is also a constraint to provide better service.
- The awareness level of citizens towards the segregation was identified as an issue.
- The other point that came out was of allocation of waste pickers as per respective wards or zones for collection of waste.
- A study on consumption pattern of resources across the city was also proposed.
- Poor responses to the awareness programmes were highlighted.
- The need for efficient and accurate system for data collection and interpretation related to solid waste management. The monitoring system for collection and segregation done by waste pickers was also recognized to be of importance.
- Space requirement for waste pickers to segregate the waste would add to the effective MSW management of the city.
- The constraints faced by the vehicle depot were discussed.
- On decentralized treatment systems being practiced in Pune, sustainability of the mechanism was expressed to be dependent on various activities including segregation of waste to marketing mechanism for the products of the treatment systems.

- Decentralized processing options which can be operated in single ward on an experimental basis were proposed to start with. Success could be achieved if done at ward level, which would make the project sustainable was the view.
- The constraints faced by biomethanation and composting technologies in terms of promotion of such technologies and other infrastructural problems were brought out
- How carbon credits can motivate the entire process of treatment of municipal solid waste was also discussed.

6.2 Electronic Waste (E-waste) Management

- The recent inventory of e-waste to highlight the status of generation in Pune city was brought out, probably for the first time.
- According to that study, the amount of e-waste generated in Pune is 2584 MT per annum.
- Many points like extended producer responsibility, need of making related stakeholders aware of the scenario, were discussed.
- Initiatives on recycling of E-waste were brought out.

6.3 Construction and Demolition (C&D) waste Management

- Key facts about the construction & demolition waste generation in Pune were highlighted. It was reported that about 10 – 12 % of municipal solid waste generated in Pune is C&D or inert waste
- The main issues regarding C & D waste are inventorization and its separation from Municipal Solid Waste, it was reported.
- More emphasis was sought for adopting reuse and recycling options and creating awareness for the same.
- The possible routes for recycling of the wastes originating from Construction and Demolition activities were discussed. The emphasis on waste minimization and use of recycled products had o be a key factor, the group agreed.
- The inventorization of this kind of waste is a major problem. The need for an efficient monitoring system for the betterment of overall management of C&D waste was highlighted.

6.4 Bio-Medical Waste (BMW) Management

- On BMW management prevailing in Pune city it was reported that about 700 MT of Bio-medical waste is generated in the city of Pune in one year of while the common Bio-medical waste treatment facility receives only 438 MT per year. The waste is collected from 250 collection points along 4 routes from the city.
- Two of the big hospitals in Pune have their own Bio-medical waste treatment facilities besides the common facility.
- The regulatory approach towards Bio-medical Waste Management was discussed with the need for awareness and training being a major requirement.
- The role of different agencies and stakeholders in the Bio-medical waste management were also discussed.

- The treatment facilities estimate on the status of BMW management was highlighted. About 8-9% of the general practitioners, 80-90% of the nursing homes and around 90% of the pathological labs are the members of this common facility. Lack of awareness was highlighted as the major constraint.
- The views of Medical fraternity and the problems they face also were discussed. These included some specific situations which need a change or modification in the law, which of course was agreed to be beyond the PMC.
- Possibility of modification of the criteria for the charges payable towards the treatment was also discussed.
- A general agreement of the view that strict actions should be taken against the BMW generators who are not cooperating in the management of BMW wastes.

For each workshop, various points discussed amongst the different stakeholders, the key points put forward by the participants have been presented as table 6.1. These points were raised during these workshops and accordingly plan of action and their benefits/barriers were also addressed. These key out comes from these consultation workshops would be discussed in working group meeting along with the feedback received during these workshops on draft vision and mission. Huge participation from various stakeholders made this consultation process for the preparation of ISWM plan successful.

Table 6.1: Key remarks from the Consultation workshops

No.	Subject		Waste Stream	Remarks
01.	**Separate system should be operated for collection of waste from slums and also from bulk generators**		Municipal Solid Waste	The slum cover dense population and generate high quantity of MSW, the solid waste collection and transportation should be done more frequently
	Plan of Action	Assess any slum for verification and to take pro active actions		
	Benefit	Cleanliness of slum with hygienic living standards		
	Barriers	---		
02.	**Increase the staff for collection of the waste**		Municipal Solid Waste	As the number of PMC personnel allocated in MSW management is too less, an appropriate measure is required. The proposed measure is thought to be effective.
	Plan of Action	To introduce public private partnership (PPP)		
	Benefit	More job opportunities, efficient cleaning		
	Barriers	---		
03.	**Awareness raise among citizens for segregation of waste**		Municipal Solid Waste	It is still in practice that the separation of dry and wet waste is not being done. The citizen is to be made aware of the various treatment options of waste so that the basic requirement of segregation of waste could be implemented.
	Plan of Action	Organise awareness programmes		
	Benefit	The segregation of waste happens at source hence it be comes easy to handle and treat the waste		
	Barriers	Lack of awareness, lack of infrastructure to support this initiative (it gets mixed at the transfer station)		
04.	**Operating decentralized treatment systems i.e. vermicomposting at ward level to make them sustainable**		Municipal Solid Waste	The wet waste generated at society level or house hold level is not that big, hence if the waste is collected at some designated place and if processed, the results would be better and it the quantity will make the project feasible.
	Plan of Action	----		
	Benefit	It will process the waste in respective ward and the quantity going for landfilling can be reduced.		
	Barriers	The space required to have such facility		

No.	Subject		Waste Stream	Remarks
05.	**Up gradation of the existing transport systems**		Municipal Solid Waste	Vehicles used are not proper as the waste litters from vehicles themselves, application of GIS can make the transportation efficient, maintenance of vehicles takes time and other resources.
	Plan of Action	A study should be carried out to know the clear view of situation		
	Benefit	More efficient transport systems		
	Barriers	---		
07.	**Increase in the fleet of waste collecting and transporting vehicles**		Municipal Solid Waste	
	Plan of Action	---		
	Benefit	Better and efficient transportation		
	Barriers			
08.	**The schedule for MSW collection should be revised periodically**		Municipal Solid Waste	This will help in allocating vehicles, citizens will also be able to deposit the waste in time
	Plan of Action	A schedule should be prepared		
	Benefit	Proper management of MSW		
	Barriers	---		
09.	**Provide some incentive if appropriate decentralized treatment systems are applied**		Municipal Solid Waste	At present some incentives are provided but considering the other issues like space constraints, infrastructure, equipments and market hinders this application
	Plan of Action	---		
	Benefit	Reduction in the quantity that goes for open dumping, Revenue generation opportunities		
	Barriers	Space to operate, equipments		
10.	**Assistance in marketing the products those have yielded from such treatment systems**		Municipal Solid Waste	There is little market for compost fertilizer in the case of vermi-composting.
	Plan of Action	To explore the market conditions and carry out viability analysis		
	Benefit	Increase in such types of projects hence reduction in quantity going for open dumping		
	Barriers	---		

No.	Subject		Waste Stream	Remarks
11.	**Estimate the carbon credit potential for MSW in Pune**		Municipal Solid Waste	By implementing eco friendly technologies and treating the waste through vermicomposting, biomethanation etc., escape of methane can be reduced.
	Plan of Action	Identify and study suitable technologies in transportation and processing of waste		
	Benefit	Reduction in GHG as well as gaining monitory benefits		
	Barriers	Authentic data generation and collection of the same		
12.	**Inventorization and classification of E-waste in context of Pune city**		E-waste	There is no available data on generation of electronic waste, on collection pattern and processing of the same.
	Plan of Action	MPCB has carried out the survey as the data would be available soon but then to identify its impacts would be important		
	Benefit	Handling and management of e-waste can be streamlined		
	Barriers			
13.	**Establishing regulatory framework**		E-waste	The regulatory framework on e-waste in India does not exist.
	Plan of Action	To approach regulatory body		
	Benefit	Handling and management of e-waste can be streamlined		
	Barriers	---		
14.	**Awareness and training to the concerned stakeholders for appropriate E-waste Management.**		E-waste	It is relatively new field, there is no regulation existing hence there is unavailability of any guideline, it becomes difficult to handle and monitor this waste stream.
	Plan of Action	Organise awareness generation workshops		
	Benefit	Handling and management of e-waste can be made efficient		
	Barriers	Unavailability of guidelines		
15.	**Encourage stake holders to adopt recycle and reuse techniques for e-waste management**		E-waste	This is seen as proactive/precautionary approach to e-waste management so that the quantity going for open dumping can be reduced
	Plan of Action	Prepare checklist of items those can be reused/recycled and dissemination of the same		
	Benefit	Resource conservation and reduction in quantity of waste going for open dumping can be reduced		
	Barriers	Identification and study of the LCA of E-waste		

No.	Subject		Waste Stream	Remarks
16.	**Inventorization of C&D waste for Pune city**		Construction & Demolition Waste	Recently, Pune is witnessing rapid development in urban infrastructure; hence the generation of waste by demolition of old building is very high. C&D waste handling and management related regulations are developed by MCGM, in similar passion PMC can develop or replicate regulations and guidelines.
	Plan of Action	Generate, assimilate and compilation of data on C&D waste		
	Benefit	Resource conservation		
	Barriers	---		
17.	**Identification of adequate technologies for separation of C&D waste from Municipal Solid Waste**		Construction & Demolition Waste	
	Plan of Action	Study Best Practices being implemented in other cities		
	Benefit	Resource conservation and less amount of waste generation		
	Barriers	---		
18.	**Promote the use of recycled products in construction sector**		Construction & Demolition Waste	
	Plan of Action	Study Best Practices being implemented in other cities		
	Benefit	Resource conservation and less amount of waste generation		
	Barriers	---		
19.	**To develop Rules for construction and demolition waste management in same line of MCGM**		Construction & Demolition Waste	
	Plan of Action	Study the rules being implemented by MCGM as a case study and prepare it for Pune city		
	Benefit	Better handling and management of C&D waste, Resource conservation, less amount of waste generation		
	Barriers	---		
20.	**To adopt efficient monitoring to ensure the compliance**		Construction & Demolition Waste	There are incidents that at various locations the construction debris has been dumped and that is causing lot of troubles.
	Plan of Action	To develop strategy and to train officials		
	Benefit	Effective implementation of such regulations		
	Barriers	To prepare the regulation and guidelines		
No.	**Subject**		**Waste**	**Remarks**

			Stream	
21.	**To ensure that proper segregation takes place which is an important aspect of Bio-medical waste handling and management**		Bio-Medical Waste	A small quantity of infectious waste mixed with MSW can make the whole waste infectious.
	Plan of Action	☐ Surprise checking of hospitals, bins etc. ☐ Train medical practioners on BMW (M & H) Rules 1998		
	Benefit	Proper handling and management of BMW		
	Barriers	---		
22.	**The need for awareness and training on legislatory requirements regarding BMW management**		Bio-Medical Waste	Many from medical fraternity are unaware about BMW rules. They are not aware of various categories of BMW hence the separation at times is not done.
	Plan of Action	Organise series of seminar on BMW (H&M) rules		
	Benefit	Segregation of BMW will take place and the dumping of BMW in MSW bins will stop		
	Barriers	---		
23.	**Monitoring and reviewing for the service provider for BMW**		Bio-Medical Waste	This point was stressed by IMA, Pune chapter as the service provider has shown some irregularities towards collection of BMW
	Plan of Action	Strategy can be developed for monitoring and monthly meeting with feed backs can be arranged		
	Benefit	Quality and efficiency of service will improve		
	Barriers	---		
24.	**To incorporate the subject on BMW management in college syllabus**		Bio-Medical Waste	This point was also stressed by IMA, Pune chapter to introduce this subject in curriculum at university level.
	Plan of Action	---		
	Benefit	Awareness creation on BMW rules		
	Barriers	---		
25.	**To take action against those who are non complying with the regulations**		Bio-Medical Waste	According to IMA and PMC, there are many medical practitioners who are not registered with PMC, IMA or service provider and no actions have been taken against them and they are still continuing to practice and dump the BMW along with MSW.
	Plan of Action	Take action against such professionals, institutions and hospitals.		
	Benefit	Proper handling and management of BMW rules		
	Barriers	---		

Annexure

Annexure I

Schedule of each consultation workshop

Integrated Solid Waste Management Plan for Pune

Consultation Workshop on MSW
Focus: Generation, Segregation, 3Rs and Decentralized Treatment

Jointly Organised by
Pune Municipal Corporation (PMC) with support from
International Environmental Technology Centre of United Nations Environment Programme (IETC-UNEP)

Date: 17th February, 2007

Venue: Capt. Vadke Hall, 3rd Floor, PMC Building, Shivaji Nagar, Pune

Programme

10:00 **Opening Remarks** 10:05 **About the Project and Consultation Workshop**	*Dr R R Pardesi, PMC* *Dr Prasad Modak*
10:20 Session A **Key Observations on MSW Generation and Segregation in Pune** 10:30 Reactions/inputs from Key Panellists followed by Open Discussion	*Shantanu Roy* *Panellists:* • *Sachin Bhagat* • *Ravi Chaudhari*
11:15 Tea / Coffee Break	
11:30 Session B: **Key Observations 3R practices in MSW management in Pune** 11:40 Reactions/inputs from Key Panellists followed by Open Discussion	*Shantanu Roy* *Panellists:* • *Suvarna Bharekar* • *Sham Deshpande* • *Shantavan Shinde*
12.45 Presentation on MSW management in Mumbai	*A.R.Khan,(A.E.E, BMC)*
13:00 Lunch Break	
13:45 Session C: **Key Observations on MSW Collection, Storage and Transportation** 14:00 Reactions/inputs from Key Panellists followed by Open Discussion	*Shantanu Roy* *Panellists:* • *Dr. Sanjeev Wavre* • *Madhu Gholap* • *Dilip Kulkarni*
15:15 Tea / Coffee Break	
15:30 Session D: **Community level & decentralised MSW treatment in Pune** 15:40 Reactions/inputs from Key Panellists followed by Open Discussion	*Shantanu Roy* *Panellists:* • *Jyoti Shaha* • *Manjushree Tadvalkar*
17:15 Presentation of Excel based model on MSW data of Pune	*Rahul Datar*

Integrated Solid Waste Management Plan for Pune

Consultation Workshop on MSW
Focus: MSW Treatment, Recovery & Disposal

Jointly Organised by
Pune Municipal Corporation (PMC) with support from
International Environmental Technology Centre of United Nations Environment Programme (IETC-UNEP)

Date: 24th February, 2007

Venue: Capt. Vadke Hall, 3rd Floor, PMC Building, Shivaji Nagar, Pune

Programme

10:00 **Opening Remarks**	***Dr R R Pardesi**, PMC*
10:05 **About the Project and Consultation Workshop**	***Dr Prasad Modak***
10:20 Session A: **Key Observations on Landfill Mining and Remediation**	***Shantanu Roy***
10:30 Reactions/inputs from Key presenters followed by Open Discussion	• ***GM Tendulkar**, Eco Designs*
11:00 Tea / Coffee Break	
11:15 Session B: **Key Observations on Biomethanation & Composting Technologies**	***Shantanu Roy***
11:25 Reactions/inputs from Key Presenters followed by Open Discussion	• ***Harshad Gandhi**, Excel Industries* • ***T. R. Rao**, Oilfield Techniques* • ***Col. Suresh Rege**, Mailhem Engineers*
13:00 Lunch Break	
13:45 Session C: **Thermal based Waste to Energy Technologies**	***Dr. Prasad Modak***
15:15 Tea / Coffee Break	
15:25 Introduction to the various features of ISWM website	***Preeta Mujumdar***
15:30 Session D: **Carbon Credits in MSW Management**	***Shantanu Roy***
15:40 Reactions/inputs from Key Presenters followed by Open Discussion	• ***Amar Mody**, Birla Carbon Management*
17:00 **Next steps in the context of Strategic Planning Process of ISWM Plan**	***Dr. Prasad Modak***
17:15 Closing Remarks	***Dr R R Pardesi, PMC***

Integrated Solid Waste Management Plan for Pune

Consultation Workshop on E-waste Management

Jointly Organised by
Pune Municipal Corporation (PMC) with support from
International Environmental Technology Centre of United Nations Environment Programme (IETC-UNEP)

In Cooperation with

Maharashtra Pollution Control Board (MPCB)

Also Supported by
Software Technology Park of India
Software Exporters Association of Pune

Date: 24th March '07 (Saturday)
Venue: Capt. Vadke Hall, 3rd Floor, PMC Building, Shivaji Nagar, Pune

Proposed Programme

14:00	**Inaugural Session**	*Mr. P. Venugopal, Director, Software Technology Park of India*
14:15	**About the Project and Consultation Workshop**	*Shantanu Roy, Environmental Management Centre (EMC), Pune*
14:20	**E-waste Generation in and around Pune**	*Mr. Hemant Pardeshi, Sub- Regional Officer, MPCB*
14:50	**Initiatives on e-waste management in India**	*Shantanu Roy, Environmental Management Centre (EMC), Pune*
15:15	Tea / Coffee Break	
15:30	**How do we manage E-waste in and around Pune** *Reactions/inputs from Key presenters followed by Open Discussion*	*Mr.B.K. Soni*
16:30	**Emerging Environmental and Social Imperatives in the IT Sector** ● *Restriction of Hazardous Substances* (*RoHS*) ● *Waste Electrical and Electronic Equipment (WEEE),* ● *Electronics Industry Code of Conduct (EICC)*	*Rahul Datar, Environmental Management Centre (EMC), Mumbai*
17:00	**CLOSE**	

Integrated Solid Waste Management Plan for Pune

Consultation Workshop on C&D Waste Management

Jointly Organized by

Pune Municipal Corporation (PMC) with support from

International Environmental Technology Centre of United Nations Environment Programme (IETC-UNEP)

Date: 28th March '07

Venue: Capt. Vadke Hall, 3rd Floor, PMC Building, Shivaji Nagar, Pune

Programme

14:00	**Opening Remarks**	***Dr R R Pardeshi**, PMC*
14:05	**About the Project and Consultation Workshop**	*Shantanu Roy, Environmental Management Centre (EMC), Pune*
14:10	**C&D waste management**	*Shantanu Roy, Environmental Management Centre (EMC), Pune*
14:20	**C&D waste management: Mumbai Initiative**	*Mr. Shrotriya, Exec. Engr. BMC*
15:00	Tea / Coffee Break	
15:15	**C&D waste management: Recycle & Reuse**	*Mr. Bego Davis, CIDCO Yuva Building Centre, Navi Mumbai*
15:30	**C&D waste Management**	*Mr. Sachin Jain, NICMAR*
15:45	Reactions/inputs from Key presenters followed by **Open Discussion**	
16:15	**Closing Remarks**	***Dr R R Pardesi, PMC***

Integrated Solid Waste Management Plan for Pune
Consultation Workshop on Bio Medical Waste Management
Jointly Organised by
Pune Municipal Corporation (PMC) with support from
International Environmental Technology Centre of United Nations Environment Programme (IETC-UNEP)
In collaboration with
Maharashtra Pollution Control Board (MPCB)
and
Indian Medical Association, Pune Chapter
Date: 30th March '07
Venue: Capt. Vadke Hall, 3rd Floor, PMC Building, Shivaji Nagar, Pune

Programme

14:00	**Opening Remarks**	*Dr D. D. Chandakkar, PMC* *Dr R. R. Pardeshi, PMC* *Representative of IMA-Pune Chapter*
14:05	**About the Project and Consultation Workshop**	*Dr. Prasad Modak*
14:15	**Status and Observations on Biomedical Waste Management in Pune**	*Shantanu Roy, Environmental Management Centre (EMC), Pune*
14:45	**BMW (Management and Handling) Rules and Role played by MPCB**	*Mr Sawant, MPCB*
15:00	Tea / Coffee Break	
15:15	**BMW Management Experiences in Pune**	*Mr. Lakshmi Narayana, Sun Enviro*
16:00	Reactions from participants	
16:45	Closing Remarks	*Dr R. R. Pardeshi, PMC*
17:00	CLOSE	

Annexure II

List of Speakers

Table 1: 1st MSW Management Workshop

No.	Name	Organization	email address
1	Ravi Chaudhari	Chakachak Pune, PMC	ravichaudharipune@yahoo.co.in
2	Sachin Bhagat	Vighnharta Vikas Pratishthan	
3	Suvarna Bherekar	Disha Foundation	
4	S.B.Shinde	Abhiyan Foundation	
5	Sham Deshpande	PMC	
6	Mr. A.R.Khan	BMC	
7	Dr. Sanjeev Wavre	Ward Medical Officer,PMC	sanjeev.wavare@rediffmail.com
8	Madhukar Gholap	DSI, PMC	
9	D.V.Kulkarni	PMC	
10	Manjushree Tadvalkar	INORA	inora@ vsnl.com
11	Jyoti Shah	citizen activists	

Table 2: 2nd MSW Management Workshop

No.	Name	Organization	email address
1	G.M.Tendulkar	Ecodesigns India Pvt. Ltd.	ecodesigns@vsnl.net
2	Harshad Gandhi	Excel Industries	hvgandhi@excelind.com
3	T.R.Rao	Oilfield Techniks	raotr@hotmail.com
4	Colonel Suresh Rege	Mailhem Engineers Pvt. Ltd.	
5	Amar Mody	Birla Carbon Management	amar.mody@gmail.com
6	Dr. Prasad Modak	Consultant-IETC-UNEP	pmodak@vsnl.com

Table 3: E-waste Management Workshop

No.	Name	Organization	email address
1	Hemant Pardeshi	MPCB	pardeshihd@rediffmail.com
2	P. Venugopal	Software Technology Parks of India	pvenugopalmumbai@stpi.in
3	B.K.Soni	Infotrek Syscom Ltd.	
4	Rahul Datar	Environmental Management Centre	rahul.datar@emcentre.com

Table 4: Construction & Demolition Waste Management Workshop

No.	Name	Organization	email address
1	Dilip Shrotriya	Executive Engineer, Municipal Corporation of Greater Mumbai	
2	Sachin Jain	NICMAR	sjain2704@yahoo.com
3	Bejoy Davis	CIDCO Yuva Building Centre	bejoy.davis@gmail.com

Table 5: Bio-medical Waste Management Workshop

No.	Name	Organization	email address
1	Chetan Sawant	MPCB	
2	C.H.Laxminarayan	Sun Enviro Management	sales@sunenviro.net
3	Dr. Vaijyanti Patwardhan	Indian Medical Association	vsssp@rediffmail.com
4	Dr. Nitin Bhagali	Hospital association, IMA	nsbhagali@dataone.in
5	Dr. Dhananjay Chandakkar	Dy. Medical officer of Health	dchandakkar@yahoo.co.in

Annexure III

List of participants for each consultation workshop

Table 1: List of Participants at MSW workshop I

No.	Name	Organization	Email address
1	Dr. R.R.Pardeshi	Dy. Medical Officer of Health	sainchirie@hotmail.com
2	Ravi Chaudhari	Chakachak Pune, PMC	ravichaudharipune@yahoo.co.in
3	Dr. D.A.Borse	Ward Medical Officer,PMC	
4	Suvarna Bherekar	Disha Foundation	
5	Rekha Popalghat	Disha Foundation	
6	Jui Dongre	Kumar Builders	landscape@kumarbuilders.com
7	Prof. V.S.Ghole	Department of Environmental Sciences, University of Pune	
8	Mr. Ajay Phatak	Jopasana Software	ajay@jopasana.com
9	Ajay Bhave	Department of Environmental Sciences, University of Pune	ajaybhave84@tahoo.com
10	Manjushree Tadvalkar	INORA	inora@ vsnl.com
11	Nutan Bhajekar	INORA	inora@ vsnl.com
12	Dr. Rajendra Joshi	Ward Medical Officer, PMC	rajjoshi1066@yahoo.com
13	Dr. Rekha Labade	Ward Medical Officer,PMC	
14	Lata Shrikhande	Apex Committee Member	
15	Ashish Rojatkar	Friends' Society	
16	Dr. B.L.Rao	citizen activists	
17	Dr. S.B.Patole	PMC	
18	Dinesh Girolla	PMC	dineshgirolla@yahoo.co.in
19	Dr. Vadge	Ward Medical Officer,PMC	
20	Dr. Sanjeev Wavre	Ward Medical Officer,PMC	sanjeev.wavare@rediffmail.com
21	Dr. Rajesh Dighe	Ward Medical Officer,PMC	
22	Dr. Amit Shah	Ward Medical Officer,PMC	
23	Madhukar Gholap	DSI, PMC	
24	S.B.Shinde	Abhiyan Foundation	
25	Dr. A.D.Kher	Ward Medical Officer,PMC	
26	G.M.Tendulkar	Eco-design	ecodesigns@vsnl.net
27	S.V.Kapre	MPCB-Pune	
28	Jyoti Shah	citizen activists	
30	Dr. Santosh Mule	Ward Medical Officer,PMC	
31	Kalpana Raval	Utkarsha Mahila Vikas Pratishthan	
32	Sachin Bhagat	Vighnharta Vikas Pratishthan	

No.	Name	Organization	Email address
33	D.V.Kulkarni	PMC	
34	Indrajeet Karve	Adya Environmnetals	
35	Dr. Vaishali Jadhav	Ward Medical Officer,PMC	
36	Dr.S.E.Deokar	Ward Medical Officer,PMC	
37	Sham Deshpande	PMC	
38	Tara Warrior	citizen activists	
39	S.S. Chabukswar	PMC	
40	M.Y.Kulkarni	PMC	
41	ShivraJ Sharma	Environmental Management Centre	shivraj.sharma@emcentre.com
42	Rahul Datar	Environmental Management Centre	rahul.datar@emcentre.com
43	Dr. K.S.Baliwant	Ward Medical Officer,PMC	
44	Poornima Gokhale	Environmental Management Centre	poornima.gokhale@emcentre.com
45	Dr. S.P.Ranade	Science and Technology Park	ranadeindia@gmail.com
46	Neha Chandorikar	Environmental Management Centre	neha.chandorikar@emcentre.com
47	Anil Sawant	PMC	
48	Shantanu Roy	Environmental Management Centre	shantanu.roy@emcentre.com
49	Preeta Mujumdar	Environmental Management Centre	preeta.mujumdar@emcentre.com

Table 2: List of Participants at MSW workshop II

No.	Name	Organization	email address
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2	Dr. Rajesh Dighe	Ward Medical Officer, PMC	rajesh_dighe2004@yahoo.co.in
3	Dr. D.A.Borse	Ward Medical Officer, PMC	
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7	A.C.Jadhav	MPCB	
8	Pramod Doke	MPCB	dokeps@rediffmail.com
9	Ranjit Gadgil	Janwani	ranjit.gadgil@janwani.org
10	M.Y.Kulkarni	Pune Municipal Corporation	
11	Utkarhsa M	NEERI	utkarhs@rediffmail.com
12	Harshada G	AQM Cell, PMC	harshada.g@rediffmail.com
13	C.V.Rao	Oilfield Techniks	cv@oilfieldtechniks.com
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16	T.R.Rao	Oilfield Techniks	raotr@hotmail.com
17	Poornima Chikarmane	Kagad Kach Patra Kashtakari Panchayat	wastematterspune@gmail.com
18	Dr.A.D.Aher	Ward Medical Officer, PMC	
19	Dr.P.V.Salve	Pimpri Chinchwad Municipal Corporation	pcmc@vsnl.com
20	Dr.A.B.Vaidya	Ward Medical Officer,PMC	arvind.vaidya@yahoo.com
21	Dr..R.B. Labde	Ward Medical Officer,PMC	
22	Dr.S.B.Patole	Pune municipal Corporation	
23	Shailendra Jaiswal	GEPIL, Surat	skjaiswal31@rediffmail.com
24	Dr. Amit Shah	Ward Medical Officer,PMC	doamit_shah@yahoo.com
25	Sharad Pawar	MPCB, Mumbai	sharayu2679@yahoo.com
26	Niranjan Welankar	MSW student, Karve Institute	niranjan50@rediffmail.com
27	Dr. Vaishali Jadhav	Ward Medical Officer,PMC	
28	Ajay Bhave	Department of Environmental Sciences, University of Pune	ajaybhave84@yahoo.com
29	Amar Mody	Birla Carbon Management	amar.mody@gmail.com
30	G.M.Tendulkar	Ecodesigns India Pvt. Ltd.	ecodesigns@vsnl.net
31	Bhim Kumar Sharma	DISHA Foundation	bhimkumarsharma@yahoo.co.in
32	Imran Khan Ilyasi	MSW student, Karve Institute	imran_ilyasi54@yahoo.com
33	Prava Manju Pokhul	MSW student, Karve Institute	pravamanju83@yahoo.com
34	Gita Vir	National Society for Clean Cities	rajanvir@eth.net

No.	Name	Organization	email address
35	Deepak Pundlik	Ecodesigns India Pvt. Ltd.	dspindlik@gmail.com
36	D.S.Junnarkar	Nilkamal Ltd.	ro@nilkamal.com
37	A.S.Fulse	SRO,Pimpri Chinchwad, MPCB	mpcbasrppc@rediffmail.com
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39	Swati Agarawal	Ecodesigns India Pvt. Ltd.	swati1812@gmail.com
40	Colonel Suresh Rege	Mailhem Engineers	info@mailhem.com
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46	Rahul Datar	Environmental Management Centre	rahul.datar@emcentre.com
47	Shivraj Sharma	Environmental Management Centre	shivraj.sharma@emcentre.com
48	Poornima Gokhale	Environmental Management Centre	poornima.gokhale@emcentre.com
49	Neha Chandorikar	Environmental Management Centre	neha.chandorikar@emcentre.com
50	Preeta Mujumdar	Environmental Management Centre	preeta.mujumdar@emcentre.com

Table 3: Participants at E-waste Management workshop

No.	Name of the Participant	Organization	Email Address
1	Dr. R.R.Pardeshi	Deputy Medical Officer of Health	saintchirie@hotmail.com
2	Hemant Pardeshi	MPCB	pardeshihd@rediffmail.com
3	Supriya Valse Patil	MPCB, Pune	priya_wg@yahoo.com
4	P.M.Bhosale	MPCB	
5	B.K.Soni	Infotrek Syscom Ltd.	bksoni@vsnl.com
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7	Ahay Phatak	Software Exporters Association of Pune	ajay@jopasana.com
8	Vijayendra Surve	Suma Soft	
9	Sandeep Agarawal	Neilsoft	sandeep.agarwal@ neilsoft.com
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11	Vinayak Kulkarni		vinayakskulk@yahoo.co.in
12	Anagha Pranjape- Purohit	Bhanuben Nanavati College of Architecture	anaghap@gmail.com
13	Mandar Parasnis	Energy Environment Knowledge Management	mandarp@gmail.com
14	Sheila Christian	Appex Committee member	sheila_chrst@yahoo.co.in
15	Gita Vir	Appex Committee member	rajanvir@eth.net
16	Laxmi Narayan	Kagad Kach Patra Kashtakari Panchayat	wastematterspune@gmail.com
17	Ranjit Gadgil	Janwani	ranjit.gadgil@janwani.org
18	Nitin Patil	Maharashtra Herald	
19	Gouri Atahle	The Economic Times	gouri.athale@timesgroup.com
20	Rahul Khaladkar	Samana	
21	Dr.S.B.Patole	PMC	
22	Mukund Kulkarni	PMC	
23	Anil Sawant		
24	Shantanu Roy	Environmental Management Centre	shantanu.roy@emcentre.com
25	Rahul Datar	Environmental Management Centre	rahul.datar@emcentre.com
26	Shivraj Sharma	Environmental Management Centre	shivraj.sharma@emcentre.com
27	Poornima Gokhale	Environmental Management Centre	poornima.gokhale@emcentre.com
28	Sneha Sahasrabuddhe	Environmental Management Centre	sneha12sa@rediffmail.com

Table 4: Participants at Construction and Demolition waste management workshop

No.	Name	Organization	Email address
1	Dr..R.R. Pardeshi	Deputy Medical Officer of Health, PMC	saintchirie@hotmail.com
2	Dilip Shrotriya	Executive Engineer, Municipal Corporation of Greater Mumbai	
3	Sachin Jain	NICMAR	sjain2704@yahoo.com
4	Bejoy Davis	CIDCO Yuva Building Centre	bejoy.davis@gmail.com
5	Gita Vir	NSCC Member	rajanvir@th.net
6	Sheila Cheristian	NSCC Member	sheila_chrst@yahoo.co.in
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10	Sushil Nikam	Ultra Tech Solutions	
11	Amruta Kale	DSK developers	amrutak@dskdl.com
12	R.N.Bhandari		
13	Gaurav Nashte	K Raheja Corporation	gaurav_nashte@yahoo.com
14	Pallavi Dani	K Raheja Corporation	pallavi.dani@yahoo.co.in
15	Sarvesh Javadekar	Vilas Javadekar and Associates	sarvesh@javadekars.com
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17	Basangi M.B.		
18	Anagha Paranjape-Purohit	Bhanuben Nanavati College of Architecture	anaghap@gmail.com
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20	V.P.Krishna	Goel Ganga Group	
21	Schin Sonawane	Ecologic	ecologic.sachin@gmail.com
22	Gandhali Darvekar	Bhanuben Nanavati College of Architecture	gandhe@rediffmail.com
23	Sujata Kodag	Design Consortium ,Pune	sujata@kodage@rediffmail.com
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27	Anshul Gujrathi	Bhanuben Nanavati College of Architecture	anshulshah@yahoo.com
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31	Jaymala Pawar	AQM Cell, PMC	jaymala_pawar@rediffmail.com
32	D.L.Pharate	Pune municipal Corporation	
33	Sudhir Jadhav	PMC	
34	Dr. S.B.Patole	PMC	
35	Nitin Patil	Maharashtra Herald	

No.	Name	Organization	Email address
36	Shanatnu Roy	Environmental Management Centre	shantanu.roy@emcentre.com
37	Shivraj Sharma	Environmental Management Centre	shivraj.sharma@emcentre.com
38	Poornima Gokhale	Environmental Management Centre	poornima.gokhale@emcentre.com
39	Sneha Sahasrabuddhe	Intern-Environmental Management Centre	sneha12sa@rediffmail.com
40	Pooja Ranade	Intern-Environmental Management Centre	psranade@gmail.com

Table 5: Participants at Biomedical Waste Management workshop

No.	Name of the participants	Organization	Email address
1	Dr.Pramod Dhaygude	Medical Officer Of Health, PMC	-
2	Dr.D.D.Chandakkar	Dy.Medical Officer of Health, PMC	dchandakkar@yahoo.co.in
3	Dr. R.R.Pardeshi	Dy.Medical Officer of Health, PMC	saintchirie@hotmail.com
4	Chetan Sawant	MPCB	-
5	C.H.Laxminarayan	Sun Enviro Management	sales@sunenviro.net
6	Dr. Vajyanti Patwardhan	Indian Medical Association	vsssp@rediffmail.com
7	Dr. Nitin Bhagali	Hospital association, IMA	-
8	Avinash Darshade	K.E.M.Hospital	
9	Abhay Naik	K.E.M.Hospital	
10	Rajendra Pradhan	Institute of Urology	
11	Dr.B.M.Fransis	Kamla Nehru Hospital	
12	A.M.Tadphale	Prayag Hospital	
13	Sujata Bayas	Jahangir Hospital	
14	P.D.Sani	Sancheti Hospital	
15	Dr. Ravindranath	Poona Hospital	
16	Dr. Sengupta	Poona Hospital	
17	Dr.S.S.Javadekar	B.J.medical College	
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19	Shaila Shirolkar	Ratna Hospital	
20	Latika Kusalkar	Ratna Hospital	mmf@vsnl.com
21	Dr.Vaishali Jadhav	Ward Medical Officer,PMC	
22	Dr.Sanjeev Wavare	Ward Medical Officer,PMC	sanjeev.wavare@rediffmail.com
23	Dr. Rajendra Joshi	Ward Medical Officer,PMC	rajjoshi1066@yahoo.com
24	Dr.Santosh Mule	Ward Medical Officer,PMC	
25	Dr. Sunil Andhale	Ward Medical Officer,PMC	
26	Dr.Amit Shah	Ward Medical Officer,PMC	doamit_shah@yahoo.com
27	Dr. Rekha Labde	Ward Medical Officer,PMC	
28	Dr. Kalpana Baliwant	Ward Medical Officer,PMC	
29	Dr. Rajesh Dighe	Ward Medical Officer,PMC	rajesh_dighe2004@yahoo.co.in
30	Dr.S.E.Deokar	Ward Medical Officer,PMC	
31	Dr.S.B.Patole	Pune municipal Corporation	
32	Dr.D.A.Borse	Ward Medical Officer,PMC	
33	A.S.Sawant	Pune municipal Corporation	
34	S.C.Shukla	Pune municipal Corporation	
35	M.Y.Kulkarni	Pune municipal Corporation	
36	Ranjit Gadgil	Janwani	ranjit.gadgil@janwani.org

No.	Name of the participants	Organization	Email address
37	Saroj Badgujar	Centre for Environmnetal Education	saroj.badgujar@ ceeindia.org
38	Pooja Ranade	Indsearch	psranade@gmail.com
39	Sneha Sahasrabuddhe	Indsearch	sneha12sa@rediffmail.com
40	Saket Ambarkhane	Economic Times	
41	Shantanu Roy	Environmental Management Centre	shantanu.roy@emcentre.com
42	Rahul Datar	Environmental Management Centre	rahul.datar@emcentre.com
43	Poornima Gokhale	Environmental Management Centre	poornima.gokhale@emcentre.com
44	Shivraj Sharma	Environmental Management Centre	shivraj.sharma@emcentre.com
45	Preeta Mujumdar	Environmental Management Centre	preeta.mujumdar@emcentre.com
46	Neha Chandorikar	Environmental Management Centre	neha.chandorikar@emcentre.com
47	Nassera Ahmed	Environmental Management Centre	nassera.ahmed@emcentre.com

Annexure IV

Feedback on Draft Vision and Mission statements

Draft Vision Statement for ISWM plan for Pune
To make Pune, a clean city without landfills.

Some comments and suggestions:

Comments	**Person**
Very proactive statement. Must be maintained	Manjushree Tadvalkar, INORA
To develop, operate and maintain a completely wholesome and efficient waste cycle for Pune	Ajay Bhave, University of Pune
May be difficult to achieve	B. Lalitha Rao
100% door to door collection which would be 100% efficient To form area wise units of waste collection The only way to dispose should be door step collection So the dependence on waste pickers will increase and they can insist on segregation Should aware housewives as they are people who can make a	D. Amit Shah, Ward Medical Officer
Systematic Awareness Programmes Building permissions rules to be revised Some processing for Bulk generators Transport system to be revised Fine and punishments should be imposed on not segregating the waste To make use of co-operation of students and NGOs effectively to create awareness	Ravi Chaudhari, Co-ordinator, Chakachak, Pune
Can healthy be added along with clean? This will include the "hazards of waste" and their redressal.	Anagha Paranjape, Bhanuben Navavati Collge of Architecture

Draft Mission statements for ISWM plan for Pune

Provide, facilitate and operate infrastructure and services to all, to achieve excellence in integrated solid waste management in a proactive, participatory, socially responsible and cost effective mannerto protect health and ecosystems. Relentlessly pursue reduction, reuse and recovery working collaboratively with all stakeholders, build appropriate capacity and competencies and forge partnerships.

Some comments and suggestions:

Comments	Person
Soil health, human health should be considered	Manjushree Tadvalkar, INORA
To protect and conserve health of the universal ecosystem should be the statement	Ajay Bhave, University of Pune
Should follow a dynamic, programmatic plan as put forth by Bombay Municipal Corporation	Dr. B. Lalitha Rao
Decentralized biogas plants should be employed because they are space effective and unit should be linked to the group of waste pickers so that wet waste will get processed and dry waste will go recycling	D. Amit Shah, Ward Medical Officer
To make use of Bachat Gat of women for awareness To put buckets to collect the waste at the door of the society as buffer Movable vermiculture plants	Ravi Chaudhari, Co-ordinator, Chakachak, Pune
Relentlessly is a very good word. Community health should be placed instead of heath.	Anagha Paranjape, Bhanuben Nanavati College of architecture

Annexure V

Newspaper Coverage of the consultation workshops

The newspapaer clippings covering the consultation workshops are as below.

Meets on solid waste mgmt

BY A STAFF REPORTER
reporters@sakalherald.com

SHIVAJINAGAR: Under the ongoing collaboration between the Pune Municipal Corporation (PMC) and the International Environmental Technology Centre of the United Nations Environment Programme (IETC-UNEP), two workshops on solid waste management were conducted recently.

The workshops dealt with Generation, Segregation, 3Rs & Decentralised Treatment and Treatment, Recovery & Disposal, informed Dr Prasad Modak, advisor to UNEP-IETC. With the consultative approach as the key, a series of workshops and one-to-one meetings are being organised for the stakeholders to gather inputs in solid waste management in the city, he added.

The workshop comprised four sessions and inlcuded storage & transportation and decentralised MSW treatment. Ravi Chaudhari of Pune Sanskriti Vaibhav Trust, Shantavan Shinde of Abhiyan Foundation, Suvarna Bharekar of Disha Foundation, Manjushree Tadvalkar of INORA, compost consultant Jyoti Shaha, corporators Sachin Bhagat and Sham Deshpande, representatives of PMC Dr Sanjeev Wavre, Madhukar Gholap, and Dilip Kulkarni attended the workshop.

The Assistant Executive Engineer of Bombay Municipal Corporation, A R Khan shared his experience in solid waste management in Mumbai and the various initiatives that BMC has taken to reduce and to manage the solid waste issues. He also highlighted the Public, Private and Partnership (PPP) model, the Advanced Locality Management (ALM) and Slum Adoption Scheme (SAS) initiatives of BMC.

Clipping 1: Newspaper coverage by Maharashtra Herald, Mrach5,2007

Maharashtra Herald
March 25, 2007
4

E-waste an inevitable e-vil on the e-arth

BY A STAFF REPORTER
reporters@sakalherald.com

SHIVAJINAGAR: With the purpose of forming a legislation to bring the growing levels of electronic waste (e-waste) in check, the Maharashtra Pollution Control Board (MPCB) will soon be forwarding their final report to the State as well as to the central agencies, said Hemant D Pardeshi, Sub Regional Officer of MPCB on Saturday.

He was speaking at the Consultation Workshop on E-Waste Management jointly organised by Pune Municipal Corporation (PMC), MPCB, and Environment Management Centre (EMC) among others.

Pardeshi further said, " The rapidly expanding

electronic industry coupled with the rapid product obsolescence and fast growing discarded material are some of the reasons for the mounting e-waste levels. The western countries too are sending scrap under the pretext of exporting used computers to India. Since the government has not officially defined the term e-waste as yet, there are chances of loopholes through which people might escape. The hazardous constituents like cadmium, lead and mercury in the e-waste are threats to humans. People should pressurise the government to form a legislation to take steps against this situation."

He added, " . An American institute called International Resources Group (IRG) was given the task to study the situation in India in 2005. They will give their final report within a fortnight."

Pune ranks 3rd in the State in e-waste

Pardeshi said that at present Pune ranks 3rd in the State in the e-waste generation and Pune's mass of e-waste would grow up to 3,500 tons by the year 2015. While Maharashtra ranks first in the country, Mumbai tops the cities' list. The collection of e-waste from Pune is done at the Chikali and some other parts from PCMC area and after segregation is sent forward to Mumbai.

Clipping 2: Newspaper Coverage by Maharashtra Herald, March 25,2007

सामना

पुणे परिसर

पुण्यात २०१५ नंतर वर्षाला साठणार ३५०० टन

पुणे, दि. २४ (प्रतिनिधी) - राज्यातील इलेक्ट्रॉनिक कचऱ्यासंदर्भात अमेरिकेतील एका संस्थेने अभ्यास केला आहे.

याबाबतचा अंतिम अहवाल राज्य प्रदूषण नियंत्रण महामंडळ तयार करत असून, येत्या १५ दिवसांत तो राज्य शासन आणि केंद्रीय प्रदूषण नियंत्रण महामंडळाकडे पाठविण्यात येईल, अशी माहिती राज्य प्रदूषण नियंत्रण महामंडळाचे उपविभागीय अधिकारी हेमंत परदेशी यांनी दिली. २०१५ नंतर पुण्यात वर्षाला साडेतीन हजार टन ई-कचरा तयार होईल. गेल्या काही वर्षांत सर्वसामान्यांमध्ये युज अँण्ड थ्रो ही प्रवृत्ती वाढीस लागल्यानेच मोठ्या प्रमाणावर इ-कचरा निर्माण होत असल्याचे त्यांनी स्पष्ट केले.

पुणे महापालिका, इंटरनॅशनल एनव्हायरन्मेंटल टेक्नॉलॉजी सेंटर, युनायटेड नेशन्स एनव्हायरन्मेंट प्रोग्रॅम यांनी संयुक्तपणे पुण्यासाठी घनकचरा व्यवस्थापनाचा आराखडा तयार करण्याचे ठरवले आहे, त्याअंतर्गत इलेक्ट्रॉनिक कचरा व्यवस्थापन (ई-वेस्ट) या विषयावर आयोजित चर्चासत्रात परदेशी बोलत होते. सॉफ्टवेअर टेक्नॉलॉजी पार्क्स ऑफ इंडियाचे संचालक पी. वेणुगोपाळ, महापालिकेच्या आरोग्य विभागाचे उपप्रमुख डॉ. आर. आर. परदेशी, एनव्हायरन्मेंटल मॅनेजमेंट सेंटरचे शंतनू रॉय आदी या चर्चासत्रात सहभागी झाले होते.

अमेरिकेतील संस्थेकडून राज्यातील 'ई-वेस्ट'चा अहवाल

परदेशी म्हणाले, २००५ पासून प्रदूषण नियंत्रण महामंडळाने ई-कचऱ्यासंदर्भात एक सर्वे सुरू केला. त्याबाबत अभ्यास आणि अहवाल राज्य प्रदूषण नियंत्रण महामंडळाने तयार केला आहे. येत्या १५ दिवसात तो राज्य शासन आणि केंद्रीय प्रदूषण नियंत्रण महामंडळाकडे पाठविण्यात येईल.

ई-कचऱ्यासंदर्भात राज्य शासनाने अद्याप तरी कोणता कायदा केला नाही. त्याचा पाठपुरावा करण्याचे काम स्वयंसेवी संस्थांनी पाहणी करण्याचे काम अमेरिकेतील इंटरनॅशनल रिसोर्सेस ग्रुप या संस्थेला देण्यात आले. या संस्थेने ई-कचऱ्यासंदर्भात परिपूर्ण पाहणी केली आहे. यासंदर्भातील अंतिम

पुणे, रविवार, दि. २५ मार्च २००७ ३

'ई-कचरा'

करावे, असे नमूद करून ते म्हणाले, संपूर्ण देशात महाराष्ट्रात सर्वाधिक ई-कचरा तयार होतो. संपूर्ण महाराष्ट्रात दरवर्षी तब्बल २० हजार टन ई-कचरा तयार होतो. एकटया मुंबईत ११ हजार टन, तर पुण्यात २ हजार ५८४ टन ई-कचरा दरवर्षी तयार होतो. पुण्यासारख्या शहरात ई-कचऱ्याची विल्हेवाट लावण्याची सोय नाही. हा कचरा चिखलीला पाठविण्यात येतो. या कचऱ्याचे तेथे वर्गीकरण केले जाते. तेथून तो मुंबईला पाठविण्यात येतो.

ई-कचऱ्याची विल्हेवाट योग्यरीतीने लावण्याची गरज आहे. या कचऱ्यात अनेक घातक विषारी पदार्थ असतात, असेही त्यांनी स्पष्ट केले. राव म्हणाले, ई-कचऱ्याची योग्य विल्हेवाट लावली गेली नाही, तर त्याचे गंभीर परिणाम भविष्यात निश्चितच जाणवतील. पुण्यात अनेक सॉफ्टवेअर आणि इलेक्ट्रॉनिक वस्तू निर्माण करणाऱ्या कंपन्या आहेत.

Clipping 3: Newspaper Coverage by Samana, March 25,2007

Annexure VI

Background Material

A Note
on

Development of
Integrated Solid Waste Management Plan
for
Pune

For updates and further announcements about this project please keep checking the announcements on the website [*http://iswm.emcentre.com*](http://iswm.emcentre.com)*.

** The website http://iswm.emcentre.com has been launched in order to share the various outputs produced in the Integrated solid Waste Management plan development process as well as to solicit views and pool resources.*

The **Project Progress in brief**

The Launch Workshop was organised on December 22nd, 2006 and was opened by ***Dr. Nitin Kareer***, IAS, Municipal Commissioner and ***Dr. Dilip Boralkar***, Member Secretary, Maharashtra Pollution Control Board (MPCB). ***Mr Surya Chandak***, Dy. Director of IETC-UNEP, Japan was also present.

The workshop included a number of presentations from experts and technology / service providers involved in various aspects of SWM. The presentations covered status of MSW, waste recycling initiative in Pune, biomedical waste management in Pune and MPCB's work on hazardous waste and e-waste management. Around 45 stakeholders attended the workshop.

Subsequently a meeting of the Working Group was held on January 29, 2007 to kick start Strategic Planning process towards preparation of Integrated Solid Waste Management Plan for Pune The Working Group comprised of select representatives of PMC, Key Institutions, NGOs, Industries, Electronics an IT sector, etc. During the day long workshop a draft **Vision & Mission** statement for ISWM plan was developed. Further, Goals and Objectives were formulated with a discussion on strategies that could be deployed to achieve the targets.

Following the Working Group meeting, a series of consultation workshops have been organized and proposed to further attend to specific waste stream related issues.

The 1st workshop on municipal solid waste management with focus on ***Generation, Segregation, 3Rs and Decentralized Treatment*** was held on February 17th, 2007. The workshop was attended by over **50** participants representing citizens, NGOs, key-institutions, PMC officials, industry representatives and experts.

The discussions in this workshop were organised in four sessions focussing on MSW **Generation and Segregation, 3R practices, Collection, Storage and Transportation** and **Community level & decentralised MSW treatment.**

The 2nd workshop on municipal solid waste management with focus on ***Treatment, Recovery and Disposal*** was held on February 24th, 2007. The workshop, attended by over **50** participants, was designed at resource conservation as an aim and the term "*treatment*" predominantly reflected processes which recovers value from the waste and reduces the volume requiring final disposal in landfill.

The discussions in tis workshop were organised in four sessions focussing on MSW **Biomethanation & Composting Technologies, Thermal based Waste to Energy Technologies, Landfill Mining and Remediation, and Carbon Credits in MSW Management.** The proceedings were facilitated by ***Dr. Prasad Modak***, consultant to UNEP-IETC.

The next workshops in this series focus on e-waste, C&D waste and BMW management.

1.0 Background

The city of Pune has been experiencing a rapid growth in the recent years. The flourishing economy of the city is evident in the increased construction activities as well as in the growing industrial and commercial activities in and around the city. Pune has already emerged as a throbbing IT-hub and a destination for automobile sector. All these developments are catalysing the growth of city population, which in turn is increasing the pressure on the city infrastructure, especially management of solid waste.

The solid waste quantities generated as well as its ever changing characteristics is at an alarming proposition. The household waste contains biodegradable waste such as vegetables, leftover foods; non biodegradable materials such as plastics, and hazardous material like used batteries; thereby rendering it to be a complicated situation to handle. In addition to this the wastes generated from commercial establishments and from industries add a different dimension to the waste generation scenario. The industrial hazardous wastes if mixed into Municipal Solid Waste (MSW) create unsafe conditions. Furthermore, the problems of bio-medical waste and the electronic waste (E-waste) generation lead to complicated waste generation and management scenario.

From the solid waste generation perspective, the solid waste generation in the city of Pune can be typically classified as:

- Municipal Solid Waste including Plastic waste (MSW)
- Construction and Demolition (C&D) waste
- Hazardous solid wastes
- Bio-medical waste (BMW)
- E-waste

Pune generates a myriad of waste streams like Municipal Solid Waste (MSW), Bio-Medical Waste (BMW), construction debris (C&D), hazardous wastes, E-waste (electronic waste) and other special wastes (like batteries, used oil etc). Due to the magnitude and diversity of the problem the need is to examine these waste streams in a proactive and integrated manner. This is a challenge that the Pune Municipal Corporation (PMC) wants to tackle with active participation from all the stake holders.

The International Environmental Technology Centre based in Japan, representing the United Nations Environment Programme **(IETC-UNEP)** has come forward to support Pune Municipal Corporation **(PMC)** in formulating the Integrated Solid Waste Management (ISWM) Plan for Pune. Accordingly a framework of cooperation has been signed. (Box 1 explains the concept of ISWM in the context of this project).

The development of the Integrated Solid Waste Management Plan (ISWM)[1] for Pune is a process where the review of the past practices, present status and the systems adopted elsewhere are the building blocks. But the effectiveness and workability of a plan depends on the acceptability by the user, ease of plan implementation and effectiveness of the plan itself. Therefore for development of this Plan a participatory format is being used. The process will include consultation with stakeholders. Above and over this, the plan proper will be developed through a continuous dialogue with a working group comprising of all key stakeholders including regulatory, technical and financial organisations, key personnel representing the non-governmental organisations and professionals.

[1] Please refer to ***Annexure 1*** for a commentary on Integrated Solid Waste Management.

Box 1: Integrated Solid Waste Management (ISWM) in the context of this project

ISWM refers to a strategic initiative for the sustained management of solid waste through the use of a comprehensive integrative format generated through sustained preventive & consultation approach to the complementary use of a variety of practices to handle solid waste in safe and effective manner.

Solid waste in this context refers to all the forms inclusive of municipal solid waste including plastic waste, construction & demolition waste, hazardous waste, bio-medical waste, e-waste, etc.

For the management of solid waste the following is the preferred hierarchy of approaches

- Reduction at source *meaning incorporation of tenets of waste management at every stage of consumption from design, manufacture, purchase, or use of materials to reduce the amount or toxicity of waste generated.*
- Environmentally suitable reuse and recycling *to conserve natural resources and energy through systematic segregation, collection and reprocessing.*
- Environmentally sustainable waste disposal *through appropriate methods and supported by environmentally sustainable technologies.*

This concept of ISWM is presented diagrammatically in figure 1.

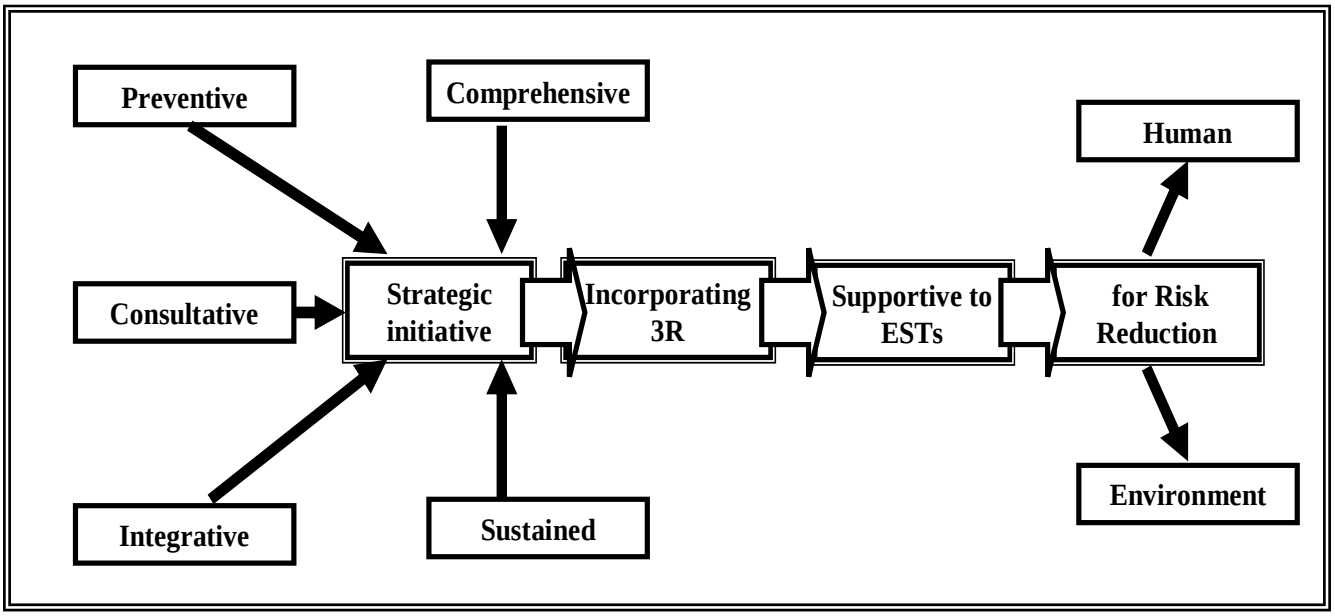

Figure 1: The Integrated Solid Waste Management Concept

The process envisaged is presented diagrammatically in figure 2.

While the PMC being the intended implementer of the plan, will be expected to contribute at every stage, the MPCB, NGOs and the other stakeholders of solid waste management will be consulted for their inputs.

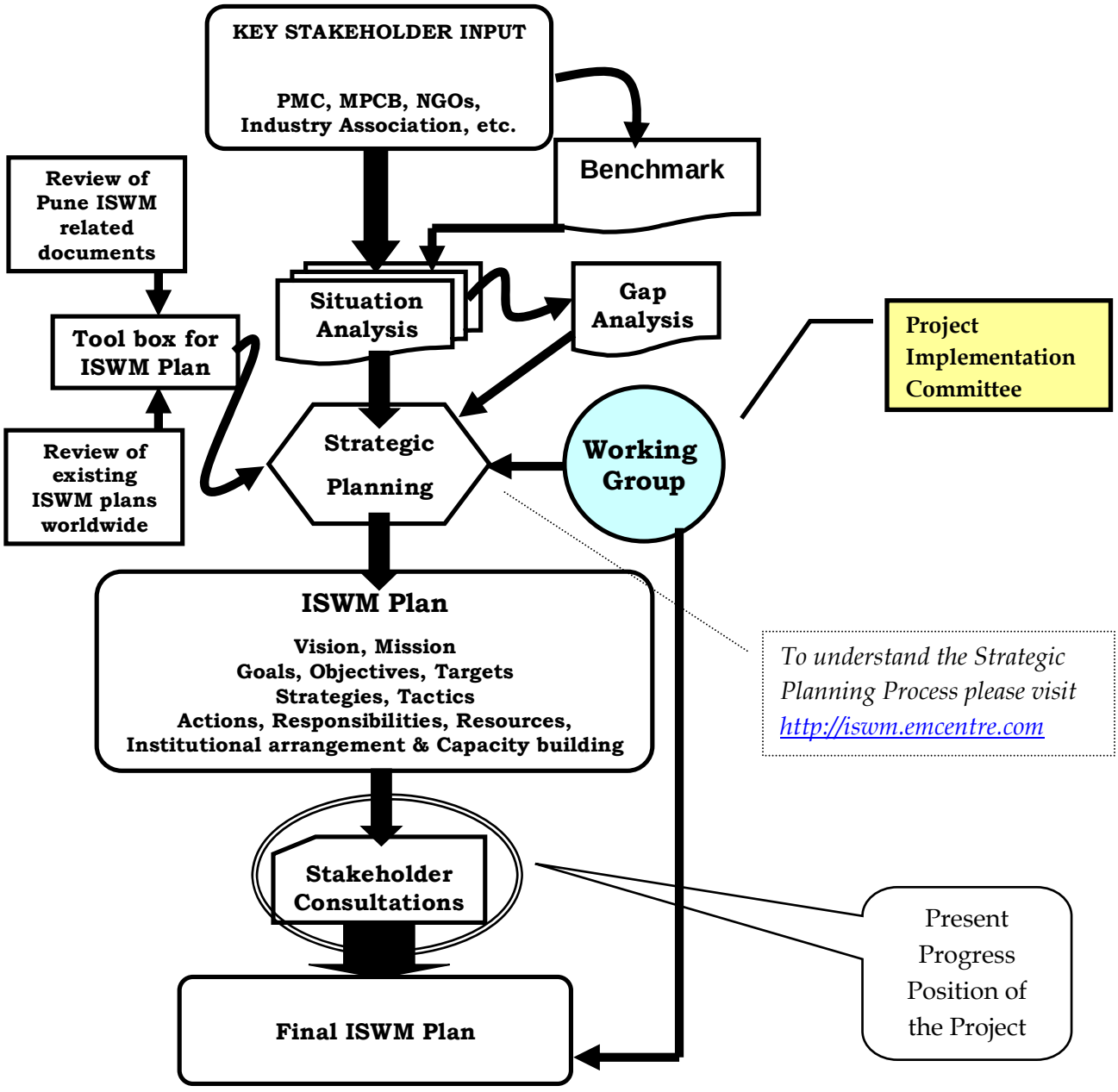

Figure 2: The Process of Developing the ISWM Plan of Pune

The overall project is being implemented in the supervision of a Project Implementation Committee represented by the project partners – PMC and UNEP-IETC. UNEP-IETC appointed ***Dr. Prasad Modak*** to assist them to assess the current situation in City of Pune (India) and to develop an ISWM plan that also includes the identification of Environmentally Sound Technologies based on the Methodology for ***Sustainability Assessment of Technologies*** (SAT)[2] for all the stages of ISWM.

As mentioned at the start, a consultation approach is the prime feature of this plan development process. While the existing management practices for all types of wastes is being reviewed it becomes imperative also to discuss and understand the intricacies, expectations and the barriers associated. With this view the consultations are being held. The following consultation themes have been addressed for the Municipal Solid Waste Management in the past workshops.

- Generation, Segregation, 3Rs and Decentralized Treatment
- Treatment, Recovery and Disposal

Besides the above, all the other stakeholders of all forms of solid waste are being consulted. While a working group represented by various stakeholders are reviewing the plan as it is getting unfolded, the draft plan would also be presented to all the stakeholders through specifically designed workshops subsequently.

2.0 The Workshop Approach

The intention of the workshop is to encourage consultation and the design of the workshop therefore has been done to achieve this. The day has been divided into ***sessions*** for discussions and presentations**.** The workshop will have a short '*starter*' presentation to present the compiled information on the theme. Invited presenters will then present their perspective and experiences on the theme. Subsequently, open discussions will be facilitated to address the key concerns.

The inputs thus received through the group work would then be compiled, which the Working Group members may further review on a later date but within a limited time frame. This would then be used for developing the ISWM Plan integrating inputs from the other consultation workshops for all the solid waste streams.

The ISWM Plan to be developed would comprise of the *Vision, Goals, Objectives, Targets, Strategies, Tactics & Tasks* and would be presented to all the stakeholders in a workshop to be announced.

In order to share the various outputs produced in this process including the outcome of the workshops, the draft plan as well as to solicit views and pool resources, a dedicated website has been launched. The URL of the website is http://iswm.emcentre.com (*See Box 2 for the aim and features of the website).*

[2] For a copy of the Report on "Sustainability Assessment of Technologies" prepared by Environmental Management Centre (EMC) write to emcentre@vsnl.com.

Box 2: The highlights of the Website http://iswm.emcentre.com

Access to all the publications related to ISWM project that include reports, concept notes and presentations on issues.

Announcements on ISWM related events; Other events that are happening related to ISWM in Pune are also welcomed.

Opinion polls, Quick comments to allow Citizens to express their views on ISWM in Pune.

Discussion Forum where all are encouraged to participate in focused discussions. Some of the current topics for discussion are,

- ☐ How do we promote segregation of waste at source?
- ☐ How do we bring entrepreneurship in waste processing sector?
- ☐ How do we compare technology options for waste processing?

A Photo gallery where photos on unsound practices as well as good practices related to ISWM can be posted.

All are invited to view and login at this website and make contributions. For more details on ISWM Project, please contact Dr Prasad Modak at pmodak@vsnl.com or Shantanu Roy at shantanu.roy@emcentre.com.