

The Occupational Health Aspects of Waste Collection and Recycling

An inventory study in India



UWEP Working Documents

UWEP Working Document 4, Part II

Maartje van Eerd

September 1997

Copyrights

This report is part of the Urban Waste Expertise Programme carried out by WASTE. The research for this report received financing from the Dutch Ministry for Development Cooperation. Citation is encouraged. Short excerpts may be translated and/or reproduced without prior permission, at the condition that the source is indicated. For translation/and or reproduction as a whole, WASTE would be notified in advance. Responsibility for the contents and the opinions expressed rests solely with the author. This publication does not constitute an endorsement by the Dutch Ministry for Development Cooperation.

...\document\wdoc4-2.w61

TABLE OF CONTENTS

TABLE OF CONTENTS	1
FOREWORD.....	3
SUMMARY PART I.....	4
SUMMARY PART II	6
CHAPTER 1 INTRODUCTION.....	9
1.1 Historical background	9
1.2 Research question	9
1.3 Methodology	9
1.4 General introduction to India.....	10
1.5 Outline.....	12
CHAPTER 2 INDIA'S GOVERNMENT POLICY ON OCCUPATIONAL HEALTH	13
2.1 Government policies on urban solid waste management.....	13
2.1.1 National policies	13
2.1.2 Municipal policy in Calcutta on solid waste management	14
2.2 Legislation on occupational health.....	15
2.2.1 Perspective-protective acts: the factories act.....	15
2.2.2 A Curative Act: the Employees State Insurance Act.....	16
2.2.3 A Compensatory Act: the Workmen's Compensation Act	17
2.3 Threshold Limit Values (TLVs)	17
2.3.1 Shortcomings of the TLVs.....	18
2.4 Reactions from resource persons.....	18
CHAPTER 3 CHILD LABOUR	20
3.1 Child labour internationally	20
3.1.1 Child labour in India	22
3.2 Reactions of the resource persons	23
CHAPTER 4 THE OCCUPATIONAL HEALTH RISKS OF WASTE COLLECTION AND RECYCLING	25
4.1 Waste and health, two case-study evaluations	25
4.2 Reactions from the resource persons	29
4.2.1 Waste collection by waste pickers	29
4.2.2 Waste collection by municipal garbage workers	30
4.2.3 Waste recycling.....	30

CHAPTER 5	STRATEGIES TO IMPROVE WORKING CONDITIONS IN WASTE COLLECTION AND RECYCLING	31
5.1	Strategies to improve the working conditions of waste pickers.....	31
5.1.1	Suggestions to improve the actual working conditions	31
5.1.2	Alternative solutions	32
5.2	Strategies to improve working conditions for municipal garbage workers	32
5.3	Strategies to improve working conditions in recycling enterprises	33
CHAPTER 6	CONCLUSIONS	35
6.1	Occupational health aspects of waste collection and recycling.....	35
6.2	Actual strategies and activities	36
6.3	Recommendations	40
ANNEX 1	DESCRIPTION OF THE ORGANIZATIONS THAT WERE VISITED IN NEW DELHI, CALCUTTA AND BANGALORE	43
ANNEX 2	CHECKLIST	55
REFERENCES.....		58

FOREWORD

This document is the follow-up of the desktop study I have undertaken at the office of WASTE in Gouda on the topic of occupational health related to waste collection and recycling. The results of that study are published in the UWEP Working Document 4 - Part I.

In the mean time WASTE selected Bangalore as a pilot project setting for the Urban Waste Expertise Programme (UWEP). As a lot of the information collected for Working Document 4 - Part I came from organizations in India and because the assumption was that more information would be available in India, it was decided to carry out a similar study in New Delhi, Calcutta and Bangalore.

Many people contributed to this research, and I am particularly grateful to the resource persons that participated in the interviews in India. Furthermore, I would like to thank Sunita Narain (CSE), Dr. Gosh (Calcutta Municipal Corporation), Mr. Alamgir and Dr. Mukherjee (FOCUS) and Dr. Sengupta (DISHA) for their help and guidance during my visit. Many thanks go to Esha Shah, Kasturi Sharma and Bhuvana Ramaneshwari for their company and help in Bangalore.

I am also grateful to the WASTE team for offering me the opportunity to undertake this research in India. A word of special thanks goes to Inge Lardinois who has guided and supported me with a lot of enthusiasm. I would also like to thank Anne-Lies Risseeuw for supplying language corrections and editing the text.

My sincere hopes are that this study will contribute to the distribution of knowledge on occupational health related to waste collection and recycling, in India and in other countries. Hopefully it will help to improve working conditions for all those people working with waste.

Gouda, September 1997

Maartje van Eerd

The photos in this document were taken by the author in India.

SUMMARY PART I

This summary is taken from the UWEP Working Document 4 Part I, published in 1996. That desktop study on 'the occupational health aspects of waste collection and recycling' was conducted on behalf of WASTE, Gouda, as part of their Urban Waste Expertise Programme (UWEP). The aim of that study was to analyse existing information and to give an overview of the state-of-the-art on occupational health aspects in waste management.

Literature studies on working conditions and occupational health in general and case-study researches on occupational health aspects of handling waste were analysed. A questionnaire was sent to organizations active in the field of health and waste.

Risks associated with waste collection and recycling can be divided into:

1. Occupational accidents
2. Physical risks
3. Chemical risks
4. Ergonomic risks
5. Psychological risks
6. Biological risks
7. Others

In identifying the health impact of chemical and biological agents, possibly obstructing factors are:

1. The long period before the effect becomes manifest
2. The multiplicity of causes of diseases, which makes it difficult to distinguish occupational diseases from diseases caused by, for instance, unhygienic living conditions
3. The lack of knowledge on mechanisms involved in the pathogenesis of human chronic diseases
4. A wrong classification of diseases

In controlling occupational exposure, a nine-step plan is advised (Boleij *et al.*, 1995) which may lead to an effective and efficient reduction of exposure:

1. Define problem
2. Agree on aims
3. Rank sources
4. Identify mechanisms
5. Devise strategy
6. Select programme
7. Implement controls
8. Evaluate effect
9. Maintain situation

A four-level strategy that is used by the Labour Inspection in the Netherlands has been applied to the entrepreneurs recycling used oil, household batteries and photo chemicals by van der Meer (1994).

This strategy comprises the following measures:

1. Measures at source

2. Ventilation
3. Separation of persons and source
4. Personal protection

The micro-organisms that in certain concentrations and under specific conditions can be detrimental to the health are: bacteria, fungi, protozoa, viruses and other agents.

In the Netherlands few specific regulations exist covering biological agents at the workplace that are potentially detrimental to health. Nor does legislation concerning most other substances exist in other countries. Only for dust MAC values have been formulated.

The case studies focused on wastewater, plastic, paper, mixed wastes and compost. It appeared to be difficult to draw straightforward conclusions on the health effects of working with waste, mainly due to methodological problems and lack of scientific information. Also the number of studies were limited, so general conclusions were difficult to draw.

What can be concluded from the literature review is that:

- Health effects may differ very much per type of activity (e.g. risks are different for waste pickers at dump sites on the one hand and itinerant waste buyers on the other) and per type of material used.
- The list of risks as well as the four-level-strategy provide tools to define possible improvements.

The following recommendations were made:

- To do a literature research in India and interview Indian resource persons
- To organize an international workshop
- Based on the available information, it was advised to supply financial and technical assistance to small-scale waste entrepreneurs. An apparent need for awareness raising was noted.

SUMMARY PART II

This study is the follow-up of Working Document 4 Part I, which focused on the occupational health aspects of waste collection and recycling. This second study has been undertaken in India and the report has been written at the office of WASTE in Gouda. The study focuses on the health aspects of waste collection and recycling and the possibilities of improving working conditions in that sector, in particular in India.

In India resource persons from NGOs, municipalities, international organizations and research institutions have been interviewed on the topic, while literature was collected.

The research question of the study is: **What are the occupational health aspects of waste collection and recycling and which strategies are being used in the Indian context?**

Government responsibilities

At the Indian national level, the Ministry of Urban Development is responsible for solid waste management. It deals with matters of national importance. At state level, solid waste management is dealt with by the Municipal affairs Department. But most of the responsibility lies within the municipalities. The major cities have different departments dealing with solid waste management, such as the Health department and the Engineering Department. In the smaller municipalities, solid waste management usually falls under the responsibility of the Medical Health Officer.

Legislation

In India, the legislation that regulates the safety of the work environment and occupational hazards can be divided into three categories:

1. Perspective-protective acts
2. A curative act
3. A compensatory act

Ad 1.: The Factories Act is a perspective-protective act that is applicable to enterprises that fall within the following criteria:

- a. A manufacturing process is being carried out.
- b. The manufacturing process must be such as to employ ten persons with the use of power or twenty persons without the use of power.
- c. The workmen must be employed as part of the manufacturing process.

The Factories Act does not cover the small-scale recycling enterprises of less than 10 labourers. Furthermore, most of these enterprises are operating illegally or semi-legally.

Ad 2.: A curative act is the Employees State Insurance Act, which can be used by the worker in case of an occupational disease or accident. The Employees State Insurance Act does not apply to seasonal establishments. Furthermore, the act is applicable in the first place to 'factories' as defined under the Factories Act, so workers in small factories, are not covered by any health insurance.

Ad 3.: A compensatory act is the Workmen's Compensation Act which is the basic legislation dealing with compensation to workers in cases of industrial accidents and occupational diseases. The act excludes casual workers.

Threshold Limit Values refer to the concentration of chemicals in the air. Workers are exposed to a certain amount of chemicals every day. There is an average limit to which workers can be exposed without being affected. Three types of TLVs are being used in India:

1. The TLV-TWA is the Time Weighted Average to which a worker is allowed to be exposed in the workplace.
2. The TLV-STEL (Short Term Exposure Limit) shows the amount of chemicals one can safely breathe in a span of fifteen minutes.
3. The TLV-C (Ceiling value) gives the upper limit of exposure to a given chemical at any given point of time. This limit should never be passed at any time. The TLV-C is not prescribed for all chemicals.

Child labour

Because many children are involved in waste picking, attention has been paid to this subject. The discussion on child labour is very much alive, both in India and in the Netherlands. It is a controversial issue on which the opinions widely differ. Both in waste picking and waste recycling a lot of children are involved. The main dilemma with the involvement of children in waste activities is, whether their actual working conditions should be improved or whether they should be excluded from working and sent to school.

The majority of the resource persons share the opinion that child labour is a consequence of poverty, and they do not believe in initiatives that try to push back the use of child labour.

Health effects

The case-studies on occupational health effects of waste activities analysed in this report, confirm the conclusions drawn in Working Document 4 Part I. Regarding the health effects of waste collection and recycling, it is very difficult to link the health of people working with waste to the occupation they perform. Because of the generally poor living conditions, diseases can also be related to the living environment.

Most of the resource persons share the opinion that waste collection and recycling pose dangers to health. But on the other hand, they agreed that you have to look at it from the Indian context because it is a very important source of income for many of the urban poor.

Improving working conditions

From the government side no initiatives are undertaken to improve the working conditions of waste pickers. Only some NGOs are involved in projects with waste pickers.

Those NGOs are involved either in:

- A. Improving the actual working conditions
- B. Looking for alternative employment

Municipal garbage workers are offered protective devices such as gloves, boots and raincoats, but in practice they do not wear them.

Although there are no experiences with improving working conditions in recycling enterprises in India, there was a general consensus among the resource persons that there is a need for improvements and that there are possibilities for those improvements.

Recommendations

The following recommendations are made:

- To organize an international workshop in India for resource persons working in the field of occupational health and waste related activities.
- Practical research has to be undertaken to identify possible improvements in waste collection and recycling.
- Capacity building has to be undertaken. A manual could be compiled and a training programme could be set up for the different groups working in the field of occupational health.
- In the long term legislation should be adapted towards the integration of small-scale enterprises.
- Pilot projects could be executed in recycling enterprises to test improvements.

CHAPTER 1 INTRODUCTION

This chapter deals with the background of this study, the research question and methodology used. It also contains a general introduction to India.

1.1 Historical background

Within the Urban Waste Expertise Programme (UWEP) of WASTE one of the activities is an in-depth analysis of plastic recycling (UWEP 4). UWEP 4 focuses on the economic setting, working conditions and on-site pollution of plastic recycling. Since not much is known about working conditions nor about on-site pollution of recycling activities in general, it was decided to start an inventory study into this topic. In 1996 a desktop study was carried out which focused on the occupational health aspects of waste collection and recycling. The results of that study were published in Working Document 4 - Part I.

A lot of information that was collected for the desktop study came from India. Also a lot of responses on the questionnaire that was sent to organizations in several countries came from persons and organizations active in the field of waste collection and recycling in India. As it was assumed that more information would be available in India and as Bangalore was chosen as a pilot project setting for the UWEP programme with the future possibility to test improvements in enterprises¹, it was decided to do a similar study in several cities in India.

1.2 Research question

The aim of this report is to analyse existing information and to give an overview of the state-of-the-art on occupational health aspects in waste management from information collected in India. The research question of the study is: **What are the occupational health aspects of waste collection and recycling and which strategies are being used in the Indian context?**

1.3 Methodology

For this study it was decided to interview resource persons and to look for literature in libraries in New Delhi, Calcutta and Bangalore. Reasons for selecting these three cities are that the majority of the responses to the questionnaire for Working Document 4 - Part I came from organizations in these cities. As Bangalore was chosen as a pilot project setting it was decided to include this city specifically. Furthermore, it would have been impossible to visit more cities simply due to time constraints.

The organizations visited are working in different fields. Resource persons working with a municipality in the field of policy making in solid waste management were interviewed as well as persons working for the International Labour Organization and the World Health Organization. Also persons working for research institutions involved in research on the health of waste pickers were interviewed. And organizations working with waste pickers were interviewed on their opinion on improving working conditions for waste pickers.

¹ In order to execute pilot projects UWEP has chosen four cities: Batangas Bay (the Philippines), Bangalore (India), La Ceiba (Honduras) and Bamako (Mali).

Appendix I contains further information on the organizations that were visited and the resource persons who have been interviewed.

A checklist (see Appendix II) was used as a guideline during the interviews with the resource persons. The checklist was adapted by the interviewer depending on the field of work of the resource person. Not all the questions were applicable to all resource persons. The checklist contained questions on:

- ◆ Opinions of the resource persons on the occupational health hazards of working with waste.
- ◆ Experiences and opinions on improving working conditions for waste pickers and in small-scale recycling enterprises.
- ◆ Legislation on occupational health.
- ◆ The opinions of the resource persons on child labour.

The issue of child labour has been included, since several organizations are working with street children involved in waste picking.

Also libraries were visited and literature was collected on legislation, public and occupational health and improving working conditions in small-scale enterprises.

1.4 General introduction to India²

Political system

India has a parliamentary government system. The government consists of a lower house known as the Lok Sabha, and an upper house known as the Rajya Sabha. The lower house can be dissolved, but the upper cannot. Elections for the lower house must be held every five years, if the government does not call for one earlier.

The country is subdivided into 25 states and 7 Union Territories. The Union Territories fall under direct power of the National government but the States have their own governments. There is a strict division between the activities handled by the States and by Central Government. The police force, education, agriculture and industry are reserved for the State Governments. Certain other areas are jointly administered by the two levels of the government.

Economy

The agricultural sector, during a long period the main sector in the Indian economy, now accounts for only about 32% of the GDP, yet employs approximately 50% of the population. The main crops are rice and wheat, but cotton, tea and coffee are the major agricultural export products.

The industry accounts for approximately 17% of the GDP, mining for 10% and services for 40%. The most important export products are textiles and ready-mades (23%), jewellery and precious stones (15%), machinery (12%), chemical products (8%), leather (products) (7%) and ores (5%) (Kooiman, 1994).

2 The information for this paragraph is mainly derived from: Finlay *et al.*, 1993, and: Kooiman, 1994.

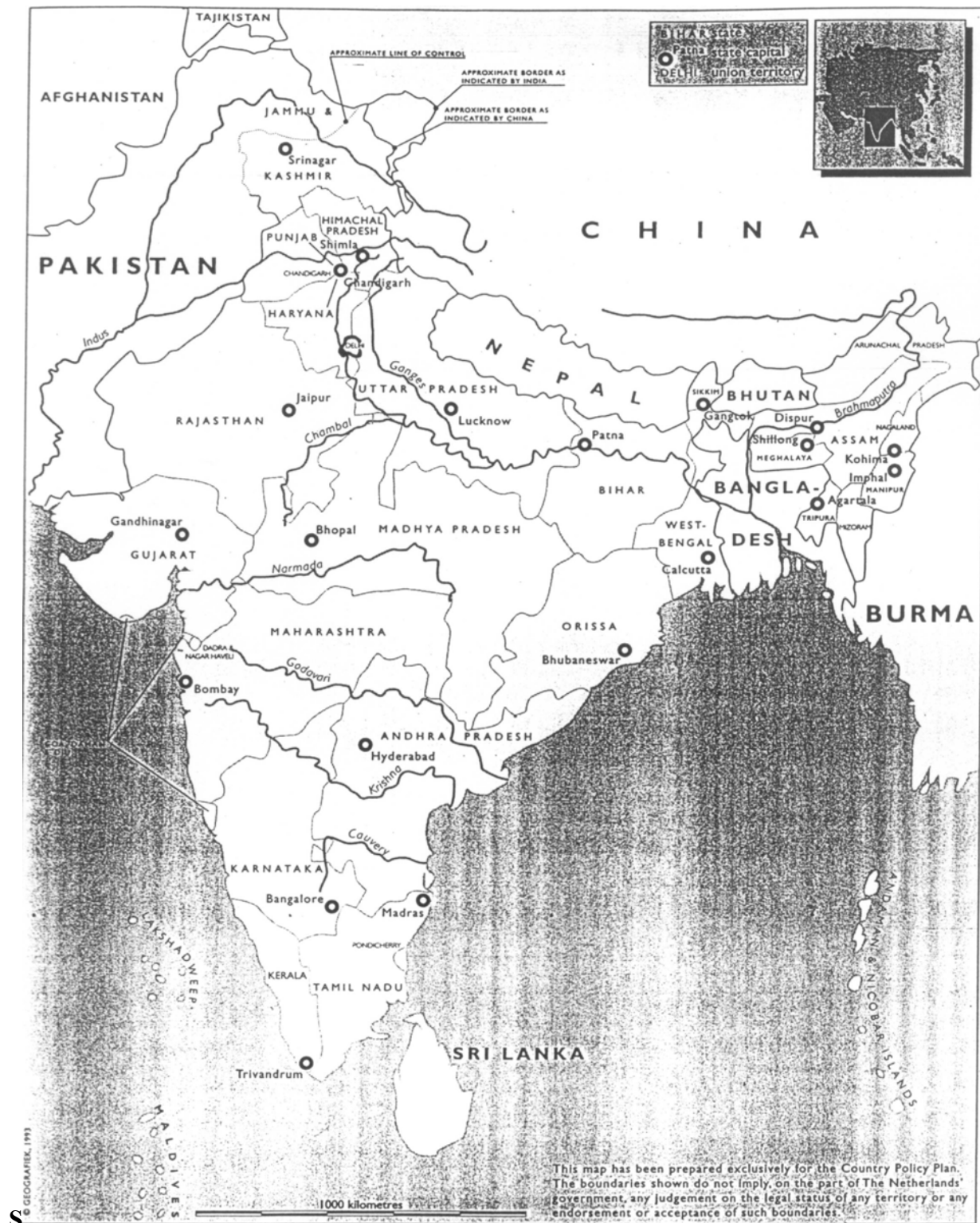


Figure 1: Map of India

Social aspects

At the latest census (1991) India had 844 million inhabitants. With a growth rate of 1.8% a year, it will have 950 million by mid 1997 and before the year 2000 will be reached, India has 1 billion inhabitants. The number of inhabitants per square kilometre is very high, especially in the fertile plains of the Indus and Ganges, the coastal area of Bengal and in Kerala.

Although most Indians are Hindu, there are large minorities of other religions. These include 75 million Muslims, making India one of the largest Muslim countries in the world. Christians number about 16 million, Sikhs 13 million, Buddhist five million and Jains three million. About seven percent of the population is classified as 'tribal'.

The literacy rate is 64% among men and 39% among women (1991). The literacy rate varies enormously from state to state, in Kerala it is very high (91%) but in Uttar Pradesh it is only 42%.

In 1992, India was 135th on the Human Development Index (Canada was no. 1 and the Netherlands no. 9). The average per capita income is 290 dollar (1993).

The numbers of inhabitants (1991) in the major cities in India are:

Bombay	12.6 million
Calcutta	11 million
New Delhi	8.4 million
Madras	5.4 million
Hyderabad	4.3 million
Bangalore	4.1 million

1.5 Outline

Chapter 2 evaluates information on the occupational health risks of waste collection and recycling. It contains an analysis of case studies, as well as the opinion of resource persons on the topic.

Chapter 3 presents the governmental and municipal planning on urban solid waste, legislation on occupational health and limited values of chemicals in the air in India, and the reactions from the resource persons on the subject.

Chapter 4 deals with strategies to improve working conditions in waste collection and recycling, experiences from NGOs, and reactions from the interviewed resource persons.

Chapter 5 presents an overview on the topic of child labour. It describes the global discussion and the different points of view on the topic and the reactions from the resource persons on child labour in the Indian context.

Chapter 6 deals with the major conclusions from this study. Also recommendations are given.

Annexe I lists the names and addresses of persons and organizations visited in New Delhi, Calcutta and Bangalore; it also gives a short overview of their activities. **Annexe II** contains the checklist used in India to interview the resource persons.

At the end of the Document, a list of **References** is added.

CHAPTER 2 INDIA'S GOVERNMENT POLICY ON OCCUPATIONAL HEALTH

This chapter deals with the legislation on occupational health in India. It describes the government policy in general and the municipal policy in Calcutta³.

Furthermore, this chapter describes laws designed for factories, an insurance and compensation scheme and legislation on the amount of chemicals that is accepted in the air of a workplace. Reactions from resource persons are also included.

2.1 Government policies on urban solid waste management

2.1.1 National policies⁴

The Planning Commission of the government of India is a body of the National Government that defines policies for the country as a whole⁵. Regarding the future of solid waste management, the Planning Commission has elaborated a policy document on solid waste management, which includes some interesting remarks on waste collection and recycling⁶.

At the national level the Ministry of Urban Development is the responsible agency for solid waste management. It deals mostly with general issues such as training programmes. Other ministries have more specific tasks. For instance the Ministry of Forestry and Environment has established a task force to review plastic recycling industries and formulate guidelines. It has also formulated guidelines for the storage and disposal of hospital waste. The Central Pollution Control Board is another central agency, which has formulated guidelines for hazardous (industrial) waste and is also responsible for the enforcement of those guidelines.

At state level solid waste management comes under the responsibility of the Municipal Affairs Department.

Traditionally the municipality is the responsible body for solid waste management. The major cities have separate departments for solid waste management. For instance in Delhi the Conservation and Sanitation Department is responsible for street sweeping, collection, transportation and disposal of garbage and the Engineering Department is responsible for the technical and physical support such as the provision and maintenance of vehicles and dustbins. In other metros, for example Calcutta and Bangalore, the departments responsible for solid waste management are the Health Department, responsible for the safe collection and disposal of solid waste, and the Engineering Department, responsible for the physical and technical support. However, most municipalities lack a specific department responsible for solid waste management and generally the Medical Health officer looks after it.

³ It was decided to choose the municipal policy in Calcutta to write about and not the ones of New Delhi and Bangalore for two reasons. The first reason is that only in Calcutta conversations on municipal policy were held with resource persons from municipality. The second reason is because in Calcutta the policy on waste management has changed drastically over the last few years.

⁴ This paragraph is based on communication with Christine Furedy, Esha Shah and Shuchi Gupta.

⁵ The Commission is autonomous, constituted by the government of India and is not related to any ministry.

⁶ In: Planning Commission Government of India, 1995.

Waste collection

The Committee recommends that the segregation at source of inorganic recyclable materials such as plastics, glass, metals and papers should be promoted. Households should therefore be stimulated to separate their waste for which they will be provided with containers. Every day the waste materials should be collected from the households and transported to the dumpsite in which private agencies, NGOs and waste pickers or their cooperatives could be involved.

It is worth noticing that in the report of the High Power Committee the role of waste pickers is acknowledged to be an important one. It is recommended to set up cooperatives for waste pickers in the cities so that the middlemen are eliminated and the waste pickers get due financial reward for their work. According to the Committee, such a cooperative could also provide facilities for improved hygiene such as community toilets, baths, and conducts programmes for non-formal education and vocational training for the waste pickers. Furthermore, cooperatives would give waste pickers the recognition that they are an essential link in urban solid waste collection and the recycling system.

The segregation of waste at the household level, according to the Committee, is the most important solution to the problem of health hazards of waste pickers. They formulate the role of waste pickers in the system of waste collection as assisting the population by collecting all the properly segregated waste. Attempts may also be made to ensure that they wear some affordable protective gear such as plastic gloves and footwear.

Waste recycling

Industries engaged in processing the recyclable waste materials such as paper, plastics, glass and metal should be given financial assistance to upgrade their technology so that the products are of better quality, cost of production is less and marketability of the product improves. According to the Committee it is necessary to assess the state of art of the present technologies used for recycling garbage, and undertake research, development and pilot-scale studies to develop new technologies and upgrade the existing ones. A legislative framework has to be supplemented to sustain successful solid waste management.

Appropriate efforts should be directed to improve the awareness of the industrial management, health care personnel and general public of their respective roles in ensuring safe disposal of potentially hazardous waste material.

Furthermore, waste recycling is to be encouraged and strengthened because the salvaged material is free of any material cost, except for the cost of collection.

2.1.2 Municipal policy in Calcutta on solid waste management

In the last two years the municipal policy in Calcutta regarding solid waste management has drastically changed according to the two resource persons of the Calcutta municipality. Previously the garbage was piling up in the streets. The sweepers could not keep the city clean because waste was dropped on the streets irregularly by households and shops. Besides waste was not collected adequately by the municipality and many streets were not cleaned at all.

After the outburst of the plague in Surat in 1994 people became aware that waste management in urban areas had to be improved. In Calcutta the municipality decided that the

attitude of the public regarding waste disposal had to change. The public was reached by newspapers, television and pamphlets. They were told to put their waste in a plastic bag, which would be collected by a sweeper in the morning. The sweepers were trained to approach the public very politely. They were given gloves, a handcart and a whistle to announce they entered the street. In the slum areas, where the trucks cannot enter, the municipality put containers at the entrance, in which the sweepers dump the garbage. After 12 a.m. it was no longer allowed to put waste into the dustbins. Also, private companies were hired to assist the municipality in the collection of waste. Besides, garbage from restaurants, hotels and hospitals is taken to the dumpsite at night. According to the two resource persons the result is that nowadays the city is much cleaner.

Regarding the safety of the municipal garbage workers, each year gloves and shoes are handed out to them, and every fourth year they are given a raincoat. Also, municipal garbage workers live in special quarters provided to them by the municipality, schooling is offered to their children, they are ensured by group insurance and they get a fixed government salary. According to one of the resource persons of the Calcutta municipality the municipal garbage workers in general had no health complaints because 'they were immune by nature'. Furthermore, they could go on leave whenever they feel like it (in case they feel bored or want to visit family they can take unpaid days off).

The priorities of the Calcutta municipality regarding the handling of waste are:

1. There should be no open collection points of waste in the streets.
2. Solid waste should not be handled twice, so in the future waste will be transported to the dumpsite directly from the households.
3. Nobody should come in direct contact with solid waste.

To improve the cleaning of the streets the municipality is planning to introduce mechanical sweepers.

2.2 Legislation on occupational health

In India, the legislation that regulates the safety of the work environment and occupational hazards can be divided into three categories:

1. Perspective-protective acts
2. A curative act
3. A compensatory act

2.2.1 Perspective-protective acts: the factories act

The perspective-protective acts are preventive health laws, as there are: The Factories Act (1948), The Mines Act (1952), The Plantation Labour Act (1948) and The Beedi and Cigar Workers Act (1966). These acts prescribe specific standards for working conditions in factories, mines, plantations and beedi and cigar manufacturing industries. Only the Factories Act is being explained in more detail because of its possible applicability to recycling enterprises.

The Factories Act has laid down provisions for the general health of workers by prescribing details about cleanliness, disposal of waste and effluents, ventilation and temperature, dust and fumes, artificial humidification, overcrowding, lighting, drinking water, latrines, urinals

and spittoons. It provides for the safety of the employees in prescribing rules on, among others, the fencing of machinery, employment of young persons at dangerous machines, striking gear and devices for cutting power supply, lifts, chains, ropes, revolving machines and any hazardous operation. It also discusses the protection of eyes, protection against fumes, explosives and inflammable gas and precautions against fire. Also safety specifications for building and machinery are mentioned in the Act (Jaitly et al., 1996, p. 11).

The Factories Act is applicable to enterprises that fall within the following criteria:

1. A manufacturing process is being carried out.
2. The manufacturing process must be such as to employ ten persons with the use of power or twenty persons without the use of power.
3. The workmen must be employed as part of the manufacturing process.

Factories that are not covered by the act are legally exempted from any kind of safety standards, inspection or minimal working conditions (D'Souza, 1995, p. 11).

After the Bhopal tragedy in 1984, the Factories Act was amended to include an entire chapter on hazardous processes and safety issues specific to the chemical and related industries. These amendments also give certain rights to the workers and the citizens living in the vicinity of the industry (Jaitly et al., 1996, p. 12).

The Chief Inspector of Factories has the highest authority to inspect and recommend safety and health measures. Any bodily injury or accident occurring in a factory, which results in the absence from work for 48 hours of the injured worker, has to be reported to the Factory Inspector's Office.

In the Model Rules under the Factory (amendment) Act 1987 (National Safety Council, p. 62) it is mentioned that the qualification needed to become a Factory Supervisor in factories working with hazardous substances is a degree in Chemistry, Chemical Engineering or Technology. The Chief Inspector may require the supervisor to undergo training in Health and Safety. Thus a supervisor is not necessarily an occupational health specialist.

2.2.2 A Curative Act: the Employees State Insurance Act

The Employees State Insurance Act can be used by the worker in case of an occupational disease or accident.

The Employees State Insurance Act (ESI) was enacted to provide a comprehensive health insurance scheme to workers. It seeks to provide a multi-dimensional social security cover to the ensured persons. The services include:

1. Medical care
2. Sickness benefits
3. Maternity benefits
4. Disablements benefits
5. Dependents benefits
6. Funeral expenses
7. Rehabilitation allowances
8. Vocational rehabilitation training

The Employees State Insurance Act does not apply to seasonal establishments. Furthermore, the act is applicable in the first place to 'factories' as defined under the Factories Act, so workers in small factories, are not covered by any health insurance. Also workers earning more than Rs.3000 a month are not covered by this act (D'Souza, 1995, pp. 10-11).

For workers who can ensure themselves under the Employees State Insurance Act, and who pay their monthly contribution, it is still very difficult to get the required treatment. There are special ESI hospitals where workers can go in case of an occupational disease, but these hospitals lack equipment and medical supplies. Nor is there enough knowledge among the medical staff on occupational diseases. For instance in cases of respiratory diseases, these are often confused with tuberculosis and in such instances the worker cannot receive compensation because this is not a compensable disease⁷. Furthermore, workers who try to get treatment and compensation for occupational diseases are often not welcomed at the ESI hospitals.

2.2.3 A Compensatory Act: the Workmen's Compensation Act

The Workmen's Compensation Act is the basic legislation dealing with compensation to workers in cases of industrial accidents and occupational diseases.

The act excludes casual workers. Having a regular stable job becomes a precondition for payment of compensation to workers in case of industrial accidents. Taking out casual employment from the application of this act, not only excludes people from the benefits of compensation, it also encourages the informalisation of work within industry, thus creating a cycle of the informalised work and denial of compensation (D'Souza, 1995, p. 8). Furthermore, the compensation is only applicable to the 33 occupations named in the act. Since the act was designed in 1923 newly created jobs are not covered by it. Another shortcoming of the act is that for workers earning more than Rs.1000 per month, the compensation is not more than Rs.1000 a month (D'Souza, 1995, pp. 8-10).

2.3 Threshold Limit Values (TLVs)⁸

Threshold Limit Values refer to the concentration of chemicals in the air. Workers are exposed to a certain amount of chemicals every day. There is an average limit to which workers can be exposed without being affected. Three types of TLVs are being used in India. TLVs are expressed in parts per million (ppm) or milligrams per cubic metre of air (mg/cu.m)⁹.

Three types of TLVs are being used in India¹⁰:

1. The TLV-TWA is the Time Weighted Average to which a worker is allowed to be exposed in the workplace.

7 The compensable diseases are listed in the ESI Act, examples are: diseases caused by lead or its toxic compounds, diseases caused by mercury or its toxic compounds and diseases caused by chromium or its toxic compounds.

⁸ Information is based on: Pandey and Kanhere (1993), PRIA (1989) and interviews with resource persons.

⁹ PPM refers to the number of chemical parts per million parts of air. This is a limit given in terms of the volume of the chemical in the air. The mg/cu.m value is a straightforward concentration in terms of weight.

¹⁰ The permissible levels of 117 chemicals are listed in Pandey and Kanhere, 1993, pp. 89-93. They are subdivided into a Time Weighted Average (TLV-TWA), a Short Term Exposure Limit (TLV-STEL) and a Ceiling Value (TLV-C).

2. The TLV-STEL (Short Term Exposure Limit) shows the amount of chemicals one can safely breathe in a span of fifteen minutes.
3. The TLV-C (Ceiling value) gives the upper limit of exposure to a given chemical at any given point of time. This limit should never be crossed at any time. The TLV-C is not prescribed for all chemicals.

2.3.1 Shortcomings of the TLVs

Although the TLVs are relevant indicators, they are in itself a compromise. The TLVs are based on:

1. Normal conditions
2. An average healthy worker
3. Effects of a single chemical

The general shortcomings of TLVs are:

1. High temperature, humidity and noise are not uncommon and TLVs are not given for such conditions. This should be adapted because for instance heat and high noise can reduce the capability to resist chemicals.
2. Another problem is that to measure the amount of chemicals in the air the management has to install metres, which very few will do on their own account. The labourers have to put pressure on the management to install equipment, or to contact the Factory Inspector.

The TLVs are American parameters, which have not been adapted to the Indian situation. Shortcomings related to that are:

1. The effect of a chemical depends upon the body weight of the person. The average body weight of an Indian worker is less than the average weight of an American worker. So the TLVs developed by western agencies for western workers should be proportionately reduced for Indian workers. And TLVs have been based on the assumption of a normal healthy worker. In the Indian situation many workers are malnourished. Furthermore, in some instances they have already been exposed to dangerous chemicals and pollutants for years, so they cannot withstand even far less amounts of chemicals than the ones prescribed in the TLVs.
2. The TLV-TWA are based on a working week of 40 hours. In many of the Indian enterprises the working week is 48 hours. So the TLV-TWA should be adapted to the Indian situation, which means reducing it proportionally.

2.4 Reactions from resource persons

The problem with small-scale enterprises (with a maximum of 10 workers with the use of power and 20 workers without the use of power) is that they are not covered by the Factories Act. Furthermore, many of the small-scale enterprises are illegal or semi-legal. In order to get rid of the health hazards in those enterprises according to some of the resource persons the implementation of laws is very important. But because of the illegal or semi-legal character of these enterprises the enterprises are also difficult to check. In order to implement laws also more information on dangers in the workplace is needed.

To stimulate employers to improve the working conditions it is very important to make them aware and show them that by improving the working conditions the productivity will

increase. To cover these enterprises by legislation you should provide them with positive incentives, such as the exclusion from paying tax (otherwise they will continue operating illegally).

Another aspect in improving working conditions in small-scale enterprises is that labour unions have to become more interested in occupational health. One reason for the lack of interest from the part of the unions is the high level of unemployment in Indian society. Most of the struggles of the Indian trade union movement still revolve around securing employment. Labour unions should adapt their policy; they should not only be fighting for the quantity of jobs, but also for the quality of those jobs.

CHAPTER 3 CHILD LABOUR

The discussion on child labour is very much alive, both in India and in the Netherlands. It is a controversial issue on which the opinions widely differ. The reason for including the subject of child labour into the report is that in waste picking and waste recycling a lot of children are involved. The main dilemma with the involvement of children in waste activities is whether their actual working conditions should be improved or whether they should be excluded from working and sent to school.

This chapter gives an overview of the existing opinions on child labour in general, child labour policies in India and the initiatives of NGOs. The aim of this chapter is not to give a comprehensive overview of all existing opinions and strategies, but to give a summary of the most important ones that are relevant for this study.

First a summary is given of the laws developed by the UN and ILO on child labour, followed by a summary of the discussion on child labour worldwide and finally the discussion will focus on India specifically.

3.1 Child labour internationally

In developing countries alone, according to estimates of the ILO, at least 120 million children between the ages of 5 and 14 are at work, including a substantial number of children less than ten years of age. If children, for whom work is a secondary activity, are also included, the number of working children more than doubles and may be estimated at 250 million¹¹. Probably this is still a gross underestimation of the real extent of child labour, because much of it is 'invisible'.

The ILO and the UN are active at an international level in formulating regulations on child labour. They have developed several international treaties relevant to child labour. They are also protecting children from the most intolerable forms of child labour such as prostitution and bonded labour¹². In addition to this, the ILO has set up an International Programme on the Elimination of Child Labour (IPEC).

The most important treaties are:

1. The United Nations Convention on the Rights of the Child, 1989 (195 ratifications, including India). This convention is the most comprehensive treaty on the rights of children¹³. It obliges ratifying states to adopt measures that protect and promote children's rights. This includes the right to be protected from economic exploitation and from performing any work that is likely to be hazardous, to interfere with their education or to be harmful to their health or physical, mental, spiritual, moral or social development. It requires states to take legislative, administrative, social and educational measures to ensure implementation. In particular, states have to provide for:

¹¹ From: International Labour Organization. 1996. Child Labour: targeting the intolerable, In: "Sign Against Child Labour", Position Paper.

¹² Bonded labour is a form of servitude or slavery where forced or partly forced labour has to be performed in lieu of an outstanding loan or advance, agreement or custom, or with payment of only nominal wages or denial of minimum wages, or restriction on freedom of movement or employment.

¹³ Children are defined as 'persons under the age of 18 years, unless the age of majority is attained earlier'.

- A. A minimum age for admission to employment.
 - B. Appropriate regulation of hours and conditions of employment.
 - C. Appropriate penalties to ensure the effective enforcement of its provisions.
2. The Minimum Age Convention (ILO convention 138) is a major ILO instrument concerning child labour. The ratifying countries must develop a national policy to ensure the effective abolition of child labour and “to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons”. It has until now been ratified by 49 member states, excluding, among others, India¹⁴.

As with any treaty, countries cannot be forced to ratify them. Also the ILO and UN cannot interfere in the internal policy of a member country.

At the conference on Child Labour in Amsterdam (February 1997) it was urged that “all countries should launch a time-bound programme to eliminate child labour, and they should immediately put an end to its most intolerable forms like slavery and slave-like practices, forced or compulsory labour, including debt-bondage and serfdom, the use of children in prostitution, pornography and the drug trade, and their employment in any type of work that is dangerous, harmful or hazardous or that interferes with their education. Also there must be a total prohibition of work by the very young and special protection for girls”.

From the literature collected and the interviews with resource persons it is clear that three opinions are predominant:

1. The opinion that child labour should be attacked through boycotts.
2. The opinion that child labour should be regulated and that child labourers should be protected by law.
3. Child labour should be tolerated.

Ad 1. The opinion that child labour should be attacked through boycotts.

An example of boycotts is the introduction of consumer labels, such as Rugmark. Carpets produced without the use of child labour can obtain this mark. The Rugmark obliges exporters and loom owners to:

1. Prevent child labour (children below the age of 14). Loom owners may make use of family child labour involving their own children or children from their family if they can prove that all these children under the age of 14 years attend school regularly.
2. Pay personnel and loom owners at least the official minimum wage.
3. Offer a full list of carpet looms to the Rugmark foundation and regularly update this list.
4. Admit inspection at all times and make available the necessary information.

One percent of the import value on carpets carrying the Rugmark is used for ‘rehabilitation projects’. This includes help for the former child labourers. Also schools are set up for the former child labourers.

¹⁴ ILO, 1997.

In several countries research has been conducted into the consequences of boycotts. In Bangladesh where many children work in the garment industry research has been conducted by UNICEF. As a consequence of an announcement of boycotts from western countries on garments made by children, approximately 40,000 child labourers were dismissed. Researchers investigated what had happened to those children after their dismissal. Approximately 50% was at home, others had found other, worse, jobs with less payment and longer working hours. Only one of all the children had gone to school, and some of the girls had gone into prostitution.

Ad 2. The opinion that child labour should be regulated and that child labourers should be protected by law.

The banning of products made by children will not solve the problem. It will in many cases lead to worse conditions for children. It is better to improve the working conditions of children and develop laws that regulate the employment of children. Also schooling can be offered to those children after work.

Ad 3. Child labour should be tolerated.

Others trivialize the bad effects of child labour. According to them working children learn a skill, and this may facilitate them a real job in future.

3.1.1 Child labour in India

In 1986 the Child Labour (prohibition and regulation) Act was formulated. The Act forbids children under the age of 14 years to work in 17 types of enterprises and occupations. Child labour is prohibited in certain professions like carpet weaving, weaving and dying of clothes, construction, working in leather tanneries and working in the glass, matches and fire crackers industries. But child labour is allowed in these occupations and processes if they are part of family enterprises or government institutions. In all the occupations that are not prohibited child labour is regulated with a maximum of six hours work a day, which includes an hour of rest and one free day a week. Night work and working overtime is forbidden for children under this Act.

It is estimated that there are approximately 55 to 60 million working children in India, although others claim that there are a 100 million working children¹⁵. Of those working children approximately 10 million are bonded child labourers, which, under the 1979 Bonded Labour Law, is forbidden.

The South Asian Coalition on Child Servitude (SACCS) plays an important role in the fight against child labour. In this coalition NGOs from India, Pakistan, Nepal and Sri Lanka are cooperating. They put pressure on the government to take actions against the use of child labour and they have involved the media, labour unions, student organizations and religious leaders in their campaigns against child labour (Kruijtbosch, 1996). Over the years SACCS has liberated approximately 27,000 child labourers from the textile and glassware industries on request of their parents. They provide education for these children. SACCS is the co-founder of the Rugmark label and they are putting pressure on consumers and governments in western countries not to buy products made by children.

15 This is the number of children between the ages of 6 and 14 years who are not going to school, of whom it is assumed that they are working.

Another organisation in India fighting against child labour and bonded labour in particular is the M. Venkatarangaiya Foundation in Andhra Pradesh. The M.V.F program tries to withdraw children from work and enrolling them into school. Based on the belief that every child out of school is a working child, the program does not make any distinction between one form of child labour and another. Their priority is that no child should go to work and all should go to school. Parents of working children are motivated to send their children to school, who are trained by the M.V.F. programme through a bridge course to enable them to catch up in the regular schools. Younger children can enter the regular schools immediately. The initiative of the M.V. foundation is adopted by the State Government of Andhra Pradesh, which is setting up summer camps to train former working children.

A famous example of an adequate education system can be found in Kerala. In this Southern State the literacy rate is close to 95%, which is nearly double the average for India. This is the result of primary education being compulsory and available to all. Here the number of children that are working below the age of 15 is very low in comparison with other Indian States. The distribution of incomes is less unequal in Kerala than elsewhere in India. Kerala has a strong trade union movement and wages are better than in others parts of India. In general, social conditions in Kerala are better than in other parts of India, which is reflected in low child mortality and a better position of women.

3.2 Reactions of the resource persons

The majority of the resource persons share the opinion that child labour is a consequence of poverty, and they do not believe in initiatives undertaken by NGOs trying to push back the use of child labour. They agree that it is an economic compulsion to send children to work. Parents need the extra income. Also parents cannot afford their children to go to school, because although there are public schools, which are free, poor parents fail to pay for books and other necessities required for education. Furthermore, parents are often not interested in having their children educated at school. They take the rational decision to teach them a skill, so that later they will be able to find a job. They do not believe that educating children can provide them an income in the future and learning a skill at young age will.

One resource person mentioned that there is little data available on the consequences of being a child labourer. For a manufacturer a child labourer is cheap, cheaper than adult labour. But macro-economically it is more expensive in the long run to employ children because they die younger. Nor is there any data available on the benefits and losses for a family to send their child to work and not to school.

Other resource persons say that in their projects of separation at source where former waste pickers are included no children are working. They oppose to child labour and agree that children should not be employed. Parents have to be convinced that it is more profitable to send their children to school. According to them the amount of money a child earns is negligible.

The most significant thing is that all the resource persons strongly opposed the bans introduced by western countries. The resource persons agree that firstly it is very difficult to guarantee that certain products are made without the use of child labour. A lot of the products are made by subcontracting, which makes it very difficult to check whether children are involved in the production. Secondly, it will not lead to the education of children. Children will enter other jobs, which, in many cases, are even worse. One of the resource persons

compared the policy of western countries of banning and introducing consumer labels to “a blind man trying to describe an elephant”: “first he touches the trunk, then the legs and finally the tail, but he fails to understand the whole concept”.

CHAPTER 4 THE OCCUPATIONAL HEALTH RISKS OF WASTE COLLECTION AND RECYCLING

This chapter evaluates two studies dealing with the health and environmental effects of waste collection and dumping. It also gives an overview of opinions of resource persons in India on the health effects of waste collection and recycling.

4.1 Waste and health, two case-study evaluations¹⁶

Both studies were undertaken by the All India Institute of Hygiene and Public Health in Calcutta.

The first study

Socio-economic and Health Aspects of Recycling of Urban Solid Waste Through Scavenging. 1987-1991. All Indian Institute of Hygiene and Public Health Calcutta, sponsored by the World Health Organization.

Objective of the study

To collect base-line information on the status of waste picking, to evaluate the health risk regarding the working and living environment of waste pickers and to study the socio-economic aspects of waste picking.

Methodology used

- Literature review
- Interviews
- Physical examination
- Selection of the waste pickers by random sampling
- Selection of a control group

Number of respondents

For the epidemiological study 400 waste pickers were selected, from three different areas in the city, and a control group of 50. During the research the waste pickers and their control group appeared to be almost identical in malnourishment, as was their socio-economic status and living environment concerned.

Elaboration of the findings

The outcome of the study regarding the health of the waste pickers as compared to the control group was as follows:

16 The analysis of the studies presented follow the same structure as the first study (Working Document 4, Part 1). Only the format is different because these studies were much more detailed than the studies analysed in Part 1.

Table 4.1. Comparison of the findings

	Waste pickers	Control group
Respiratory diseases	71%	34%
Diarrhoea	55%	25%
Viral hepatitis	32%	2%
Protozoal and helminthic infestation	25%	25%
Skin diseases	15%	18%

Regarding most of the illnesses the condition of the waste pickers was worse compared to the control group. But, remarkably, skin diseases were more prevalent among the control group than among the waste pickers. The prevalence of protozoal and helminthic infestation was the same among waste pickers and the control group.

It was concluded that waste picking is hazardous. The epidemiological study shows that of the three open systems of the body (the respiratory tract, the gastro-intestinal system and the skin) the waste pickers are particularly vulnerable to the diseases of the respiratory tract and the gastro-intestinal tract. However, no further explanations were given in the study for the differences found between the two groups.

The second study

Health Impact of Dumping and Recycling of Solid Waste in Calcutta, Draft Report. 1995-1996. All India Institute of Hygiene and Public Health Calcutta, sponsored by Birmingham University.

Objective of the study

To study the impact of environment and occupation on the health of solid waste handlers, and to evaluate the impact of waste dumps on the environment.

Methodology used

A cross-sectional epidemiological assessment of the environmental and occupational health hazards associated with waste recycling and disposal was undertaken amongst the waste pickers living near the waste disposal sites, and street pickers working and living on the streets of Calcutta. Questionnaires were used and clinical examinations were carried out of all groups. Furthermore, water and air quality measures were taken.

Number of respondents/samples

- ◆ 25 Dump site waste pickers residing near the dumping ground
- ◆ 37 Street waste pickers
- ◆ 23 Dump site residents not involved in waste picking
- ◆ 21 Municipal garbage workers
- ◆ Water samples from drinking water wells (tube wells and open wells) (used by waste pickers and disposal ground residents not involved in waste picking) and ponds which were analysed for physical, chemical and biological Samples were taken from four ponds: two ponds within the disposal ground, the third was a fish pond and the fourth was used by a *dhobi* (laundry man).

- ◆ Control group I (N=22)
- ◆ Control group II (N=26)

Initially one control group was selected, living three kilometres away from the dumping site, but during the study it was found out that this group had a slightly better income than the study group and for that reason another control group was selected, living 25 kilometres away from the dumping ground. And although later it was found out that they had a slightly poorer economic status than the study group, the study was completed using these two control groups.

Elaboration of the findings regarding health and environmental pollution **parameters**.

Table 4.2 Results regarding health from questionnaires

	dump site waste pickers	dump site residents	Street pickers	Municipal garbage workers	control I	control II
Vaccine against tetanus	< 25%	< 25%	< 25%	< 25%	< 25%	< 25%
Chronic backache	76%	62%	51%	33%	59%	77%
General weakness	68%	70%	43%	19%	n.a.	n.a.
Cough, respiratory diseases	48%	35%	n.a.	5%	9%	42%
Chest pain	48%	39%	32%	19%	27%	54%
Pain abdomen	52%	56%	46%	24%	54%	31%
Jaundice	44%	39%	35%	0%	18%	27%
Dog and rat bites	28%	30%	16%	0%	9%	4%
Diarrhoea	72%	48%	54%	19%	55%	23%
Cuts injuries	48%	74%	46%	0%	14%	19%
Eye injuries, other eye problems	8%	13%	5%	0%	5%	0%
Skin diseases	64%	39%	16%	19%	14%	8%
Ulcers	12%	17%	16%	0%	9%	4%

What is remarkable from these figures is that the health of municipal garbage workers is better than that of the other groups. Except for ulcers, the health of the street waste pickers is better than the health of the dump site waste pickers.

Table 4.4 Results regarding health from clinical examinations

	dump site waste pickers	dump site residents	street pickers	municipal garbage workers	control I	control II
Angular stomatitis	40%	30%	40%	0%	18%	31%
Enlarged liver	16%	17%	20%	5%	9%	19%
Infective eye problems	12%	43%	4%	5%	14%	12%
Skin diseases	20%	7%	20%	0%	0%	0%
Joint problems	28%	17%	16%	5%	9%	19%
Tuberculosis	4%	0%	4%	0%	14%	8%
Bronchial asthma	0%	10%	0%	0%	5%	4%

From the clinical examinations it became also apparent that the health of municipal garbage workers is better than that of the other groups. If dump site waste pickers are compared to the street pickers the street pickers suffer more from enlarged liver and they suffer to the same extent from angular stomatitis and tuberculosis as the dump site waste pickers.

No explanations are given for the differences found between the groups.

Table 4.2 Water quality findings of the tubewells

Parameters	Results	Within the limit ¹⁷
PH	7.1-7.4	yes
TDS (Total Dissolved Solids)	800 mg/l-1070 mg/l	no
Chloride	290 mg/l-415 mg/l	no
Calcium	74 mg/l	no
Magnesium	30 mg/l	no
Nitrate	0.03 mg/l-0.10 mg/l	yes
Zinc	n.a. ¹⁸	yes
Iron	n.a.	no
Magnesia	n.a.	no
Mercury	n.a.	yes
Cadmium	n.a.	yes
Lead	n.a.	yes
Copper	n.a.	yes
Chromium	n.a.	yes
Phenolic compounds	n.a.	no
Faecal coliforms	n.a.	no

Water quality of the tubewells:

17 It is not described which guidelines are used, but most probably the guidelines of the World Health Organization are being used.

18 Not available: figures were not mentioned in the study

Water samples were taken from the tubewells and were tested for physical, chemical and bacteriological parameters.

Water quality of the open wells:

- * The quality of the water from the open wells was very poor. Heavy metal concentrations were within the permissible limit but alkalinity (among others) was high.

Water quality of the pond water:

- * The ponds were contaminated with heavy metals and all the water samples from the ponds showed very high faecal coliforms.

Explanations for the findings were not given. It is remarkable that in this study the health of the municipal garbage workers is generally better than that of the other groups.

4.2 Reactions from the resource persons

This paragraph contains the reactions of the resource persons that were interviewed in India on the subject of occupational health related to waste collection and recycling. The occupational health risks are subdivided into occupational health risks related to waste collection by waste pickers, waste collection by municipal garbage workers and the recycling of waste materials.

4.2.1 Waste collection by waste pickers

As was also concluded in the first Working Document on occupational health aspects of waste collection and recycling, some of the resource persons, in particular the ones with a background in occupational health, mention the methodological problems in relating a disease to the occupation of waste picking. The biggest problem according to the resource persons is selecting a suitable control group.

All the resource persons shared the opinion that waste collection and recycling pose dangers to health. But on the other hand they agreed that you have to look at it from the Indian context because it is a very important source of income for many of the urban poor. One resource person said that a while ago in India the opinion of the government was that waste picking should be banned. The authorities did not like the sight of people picking garbage in the streets, and in New Delhi plans were made to forbid it. The argument was used that it was too dangerous for the waste pickers and also for the general public, because the waste is taken out of the dustbins and the part that is not taken by the waste pickers is left out on the streets. Therefore street pickers were banned from the streets of New Delhi, but that did not solve the problem. Waste pickers kept on coming back and after a while the ban was stopped. Slowly the opinion towards waste pickers and waste related activities is changing. The general public is becoming aware that people are driven to waste picking out of poverty and that waste picking will only stop when there is an alternative.

Apart from the illnesses that are quite common among waste pickers (which are listed in Working Document 4, part 1), many resource persons mentioned the risks that waste pickers run by getting into contact with hospital waste. Because hospital waste is not separated from the waste stream, waste pickers as well as municipal garbage workers are exposed to it. And

although no research has been undertaken into which diseases can be transmitted, it is clear to many of the resource persons that it is dangerous.

One of the experts mentioned the risks of lung diseases caused by the smoke from dustbins that are set afire in the evening. This poses dangers to waste pickers because when they start picking waste early in the morning, the garbage is still smoking.

That the waste pickers are seen and treated as 'social outcasts' is described by a waste picker in Bangalore. When he was asked if he was ever bitten by rats or dogs he responded that he had even 'been bitten by men', animal bites were not the biggest problems he faced.

Another danger waste pickers working on waste dumps are exposed to, according to one of the resource persons, is related to the living environment. They live near (or on) the dump site, where the environment is very polluted. Another resource person has done research among waste pickers working on the dump site of Calcutta, Dhapa and has compared their health to street pickers in the streets of Calcutta. He came to the conclusion that the health of the dump site pickers was slightly better than the health of the street pickers because in Calcutta most of the pickers on Dhapa live in the nearby villages. They have a place to return to after work and they belong to a community. Most of the street pickers though sleep on the streets, do not have a place to clean themselves and cook, and many of them live a disrupted social life.

4.2.2 Waste collection by municipal garbage workers

Many resource persons mentioned that more attention should be paid to municipal garbage workers. The risks they face can be compared to waste pickers because, as one person mentioned, "waste is not collected in a scientific manner". The differences in comparison with waste pickers are that municipal garbage workers are organised, have a legal job, sometimes are provided with houses and schooling for their children and insurance schemes. On the other hand, they are equally exposed to mixed wastes like waste pickers. And although some of them are offered personal protective equipment like gloves and boots, in practice they do not use them. Like waste pickers, municipal garbage workers belong to the lower socio-economic strata of society.

4.2.3 Waste recycling

The occupational health risks in recycling enterprises depend on the material being recycled. There is also a clear need for identifying the health hazards. No studies have been undertaken yet. Some of the persons interviewed had the opinion that there are many health hazards in plastic recycling enterprises because of the outdated technology used and of the toxic fumes being released.

The major problem according to all the resource persons is the fact that the majority of the persons involved in waste collection and recycling are unaware of the occupational hazards. Many are also unaware of personal hygiene.

CHAPTER 5 STRATEGIES TO IMPROVE WORKING CONDITIONS IN WASTE COLLECTION AND RECYCLING

This chapter gives an overview of the literature and information gathered through interviewing resource persons in India on the possibilities and experiences of improving working conditions in the collection and recycling of waste materials.

5.1 Strategies to improve the working conditions of waste pickers

From government side no initiatives have been undertaken to improve the working conditions of waste pickers. Only some NGOs are involved in projects with waste pickers.

To improve the working conditions of waste pickers, NGOs are involved either in:

- A. Improving the actual working conditions
- B. Looking for alternative employment

5.1.1 Suggestions to improve the actual working conditions

To improve the actual working conditions of waste pickers, many of the resource persons mentioned that waste pickers should be made aware of the risks related to their occupation. Furthermore, they were of the opinion that waste pickers should be trained in personal hygiene. One resource person mentioned that waste pickers need washing facilities and a place to change clothes. Also, according to some resource persons, they should be offered protective devices. Resource persons with experience in the field, especially those working in NGOs with waste pickers, said that this is not a solution. According to them waste pickers will not wear protective devices. The use of gloves delays the sorting process, “waste pickers want to have direct contact with the waste they pick”, and boots are too hot, especially in the summer. Masks are also not very useful, although a lot of waste pickers at Dhapa (dump site of Calcutta) wear improvised cotton masks (shawl) in the summertime, because otherwise the smell is unbearable.

An option to improve the working conditions is that waste pickers should organise themselves in cooperatives. This would lead to more bargaining power on prices for collected recyclables with dealers and wholesalers.

A very well known cooperative is the cooperative of paper pickers, SEWA (Self Employed Women's Association), in Ahmedabad. SEWA is a registered trade union which started its work with women in the informal sector in the early 70's. Over the past 20 years it has organised self-employed women in order to help them enter the mainstream economy. Approximately 2000 female waste pickers are organised through their cooperatives. As a short measure SEWA has designed equipment for the pickers to prevent them handling waste directly. SEWA's pickers are given a license to prevent the police from harassing them; routine health check ups are done. In addition the SEWA members can make use of the cooperative bank and housing schemes. Waste paper, collected by the members is being sold to a wholesaler, who has set up a shop and sells the material to a trader. Although, according

to Ramaneshwari (1994, p. 34-37) SEWA has not managed to increase the income of the waste pickers involved, it has succeeded to develop the women's self esteem, confidence and courage to fight against the exploitative forces in society.

5.1.2 Alternative solutions

An alternative solution to improve the working condition for waste pickers is to introduce projects of separation at source. Households should be stimulated to separate their waste, which will be collected by former waste pickers. Projects are set up, among others, by SRISTHI in New Delhi (see Box 5.1). FOCUS in Calcutta, and CEE and Waste Wise in Bangalore have set up similar projects where former waste pickers are involved in a system of door-to-door collection of waste. The households separate the waste into organic and inorganic materials. The inorganic materials are sold by the former waste pickers to junk dealers. In some projects the organic materials are being used for the production of compost.

Box 5.1. Community based door-to-door collection of solid waste, initiated by SRISTHI, New Delhi.

Aimed at stopping open dumping of garbage with the ultimate goal of achieving waste reduction through processing, a programme set up by SRISTHI is based on community participation with door-to-door collection of waste, which is partially segregated. Residents are asked to segregate glass, metal and any other items that may be dangerous to those handling the waste. Residents pay a certain amount of money a month for the door to door collection.

The door-to-door collections are carried out by former waste pickers. They are paid a fixed salary, paid by the residents, and besides that they earn an extra amount of money by selling the collected recyclables. The social impact of the project is significant. The advantages for waste pickers working in the scheme is that they have obtained secure employment and an identity card. A formal job also reduces the harassment by the police. This contributes enormously to the confidence and self respect of these former waste pickers.

In order to reduce the health risks of waste collection the waste pickers are offered slippers and gloves, but they do not wear them, especially not in the summer because it is too hot. But because the waste is already partially segregated by the households, the risks of cuts and infections are reduced.

The project is self-sufficient. The households pay a certain amount of money for the collection, of which the waste pickers are paid. The initial mobilisation was carried out by one or more civilians within the colony where door to door collection was started, with the support of the SRISTHI staff. After the programme was set up, SRISTHI left the responsibility of the project to the colony.

(Venkateswaran, 1996).

5.2 Strategies to improve working conditions for municipal garbage workers

When resource persons of the municipality, responsible for municipal solid waste management, were asked about the working conditions of their employees they answered that municipal garbage workers are offered protective devices such as gloves, boots and rain

coats. "But," they said, "in practice these workers do not wear them." According to them this was beyond their responsibility.

To improve the working conditions for sweepers, one of the resource persons of the municipality in Calcutta said that there are plans to introduce mechanical sweepers. However, it is doubtful this is a solution since mechanization usually leads to unemployment.

5.3 Strategies to improve working conditions in recycling enterprises

Although there are no experiences with improving working conditions in recycling enterprises in India, there was a general consensus among the resource persons that there is a need for improvements and that there are possibilities for those improvements.

Options mentioned are:

1. The technology used in the enterprises should be upgraded.
2. Studies should be executed to identify the hazardous materials that are being recycled, for instance PVC.
3. Health hazards have to be identified more properly.
4. Zones of recycling enterprises could be developed at the border of the city. Entrepreneurs could then make use of common facilities such as infrastructure, water and sewage systems.
5. Recycling entrepreneurs could set up a fund to finance improvements in the recycling sector.

At the policy level financial incentives could be developed to give support to enterprises that work in an occupational and environmentally sound way, e.g. excluding them from the obligation to pay taxes for a certain number of years.

The opinions differ on the question who should be the initiator of those improvements. Some said that the government should take the first step in developing legislation and guidelines on working conditions in small-scale enterprises. According to others, NGOs should take the initiative and should be the driving force in improving working conditions in small-scale enterprises because there is already enough legislation, but implementation is not taken care of.

One resource person, working at government policy level, was very negative on achieving improvement through government action. According to him government is just not interested in working conditions in small-scale enterprises. But when the public opinion changes and NGO initiatives are proven to be successful the government will (have to) follow.

Pilot projects could be started in small-scale enterprises to improve working conditions. To make it attractive for employers to cooperate they have to be financially risk free and offered positive incentives such as free training in business administration for cooperating in these projects. The projects have to show that by improving working conditions productivity will increase, so that other employers will follow this example.

Some said the workers should be obliged to wear protective devices, which others, especially those working in the field of occupational health were strongly opposed to. According to

them the responsibility for the safety in a workplace should be for the management. Otherwise, if labourers are given devices, which in most cases they do not use, the employer can blame them if they get ill for not using the protective equipment.

None of the resource persons is familiar with improvements in small-scale enterprises.

CHAPTER 6 CONCLUSIONS

In the previous chapters attention has been paid to government policy in India on occupational health, child labour and case studies on occupational health risks related to waste collection and recycling have been analysed. Also attention has been paid to strategies to improve working conditions in waste collection and recycling. Literature on these topics has been analysed and the opinions of resource persons interviewed in India have been included in the report.

The central research question of the study was : **“What are the occupational health aspects of waste collection and recycling and which strategies are being used in the Indian context”**. The aim of this study was to analyse the existing knowledge and experiences in the field in India.

First attention will be paid to the occupational health risks of waste collection and recycling. Furthermore the actual strategies and activities of the different organizations active in the field of occupational health related to waste collection and recycling will be analysed and recommendations will be given.

6.1 Occupational health aspects of waste collection and recycling

The studies on occupational health effects of waste activities analysed in this report, confirm the conclusions drawn in Working Document - 4 Part 1.

Concerning the health effects of waste collection and recycling it is very difficult to link the health of people working with waste to the occupation they perform. Because of the generally poor living conditions, diseases can also be related to the living environment. Moreover, the studied group needs to be compared with an adequate control group, which is very difficult to select.

When carrying out research on health issues it is important to distinguish occupational health risks according to the type of work carried out, e.g. picking waste on a dump site may lead to other health effects than those run from picking waste on the streets, working as an itinerant waste buyer or working in a recycling enterprise. Furthermore, it is very important to differentiate the type of waste material used.

Concerning the number of studies collected both for Working Document 4 - Part 1 and Working Document 4 - Part 2 it can be concluded that only a limited number of studies focus on health aspects of waste collection and recycling. Furthermore, health effects differ for each waste material e.g. the health effects of plastic recycling differ from the health effect of picking mixed waste on a dump site. The number of studies focusing on municipal garbage workers is very limited and none of the studies collected have been undertaken in recycling enterprises.

Most of the resource persons are convinced that there are certain health risks for the people involved. They claim that more attention should be paid to possible improvements of the working conditions in this sector.

Some resource persons call for more attention for municipal garbage workers, since they are perceived to carry out a similar job as waste pickers and thus face similar health risks. However this assumption is not confirmed by one of the studies, where it was concluded that the health situation of municipal garbage workers was better than the health situation of street- and dump site waste pickers.



Photo 1: Waste Pickers at Dhapa, Calcutta

6.2 Actual strategies and activities

In general it can be concluded that in the field of occupational health related to waste collection and recycling, and improving working conditions only a few initiatives have been taken.

A subdivision follows of the different types of organizations that were visited in India: NGOs, municipalities, international organizations and medical colleges. From the literature collected, information is given on labour unions and an organization of entrepreneurs. A summary is given of their activities related to waste collection and recycling, and occupational health.

NGOs

The NGOs that operate in the field of waste related activities visited in India can be roughly subdivided into NGOs operating from a social perspective and NGOs working from an environmental perspective.

The NGOs operating from a social perspective are mostly focusing on a particular group in society: the waste pickers and street children involved in, among others, waste picking. From this perspective the NGOs provide shelter, basic education and health care. Some of them are

also setting up projects of door-to-door collection of waste materials to provide a better job for waste pickers. There are also examples of NGOs setting up cooperatives for waste pickers. Most of the NGOs working from a social perspective are location specific and are hardly involved in lobbying.



Photo 2: Separation at source in Bangalore

The NGOs that work from an environmental perspective are operating from the point of view that collection of waste should be improved to minimise the environmental damage and to re-use and recycle in order to minimise pollution and save raw materials. Although from another point of view than the NGOs operating from a social perspective, some NGOs have set up projects of separation at source, with the integration of former waste pickers. Some of them are also involved in composting. Some NGOs are involved in lobbying with the authorities to influence policy makers. Some of them are also involved in research and environmental education.

The division between the NGOs is not strict. Only a few NGOs combine an environmental and social approach. In general can be concluded that not much cooperation exists within the NGO community. This is in particular the case between NGOs working in different cities (which can be explained by the long distances between cities in India). But also within cities NGOs tend to focus on their own activities. In some cities e.g. Calcutta and Bangalore, cooperation mechanisms have been set up between various actors (in particular municipality and NGOs).

Government

Policy formulated by the Planning Commission of the Government of India (1995) includes the promotion of separation at source with the integration of waste pickers to improve their working conditions. Besides the policy acknowledges that support should be given to

recycling enterprises. But there seems to be a gap between policy formulated at the national level and implementation at the state and municipal level, which is hardly taking place.



Photo 3: Illustration of the difficulty of relating diseases to certain occupations while people live under such conditions

In India the Factories Act covers occupational health, but the problem with this Act is that it covers enterprises of 10 labourers with the use of power and 20 labourers without the use of power. It does not cover the small- scale recycling enterprises of less than 10 labourers. Besides most of these enterprises are operating illegally or semi-legally and will most probably only be interested in introducing improvements if that will benefit them financially.

In the three cities that were visited no initiatives had been taken to improve working conditions in the waste recycling sector.

In some cities the municipal garbage workers are offered protective devices like gloves and boots. Input of technology, like introducing mechanical sweepers, is the only option mentioned as a possible improvement of the waste management system.

Other stakeholders

In general it can be concluded that occupational health, in particular occupational health related to waste collection and recycling, is a subject that does not get a lot of attention from international organizations and research institutions in India yet. The ILO and WHO are not paying a lot of attention to the subject. One of the resource persons working for the WHO said that first the government should take some initiatives before others could start to focus on this sector. Medical colleges that were visited are paying attention to health aspects of working with waste to some extent. But as one of the resource persons mentioned “waste

related activities are not a priority”. Labour Unions are interested primarily in the creation of employment. They are not involved in occupational health and creating safer working conditions.

Organizations of entrepreneurs were not visited during the field visit to India. After the field visit to India information was received on the existence of the Indian Plastic Federation in Calcutta (Jordens, 1996). They provide entrepreneurs with information on new technologies and guidelines, but no information is given on occupational health.

A general conclusion may be that improving working conditions is difficult. A bottleneck is the lack of awareness both from the side of the entrepreneurs as well as from the side of the employees and other actors in the waste collection and recycling sector, on the occupational health risks related to their occupation. Also, research institutes and international organizations do not have much knowledge on the occupational health risks of recycling.

Working Document 4 - Part 1 described a 'four level strategy' to improve working conditions in waste recycling enterprises involved in used oil, household batteries and photochemicals. The most preferable option mentioned in this strategy is that measures at source should be taken, the less preferable is the introduction of protective devices.



Photo 4: Municipal garbage workers in Bangalore

The four level strategy (van der Meer, 1995):

1. Measures at source, like a change in the technical part of the production process, such as closed process instead of open processes, and a change in working methods like shifting

work more regularly, and an adjustment in the lay-out of the workplace so that dust has less chance to settle.

2. Ventilation
3. Separation of men and source
4. Personal protection

Separation at source is the most preferred option in this strategy. The most applied improvement of working conditions in waste collection and recycling activities in India is the introduction of protective devices.

6.3 Recommendations

The recommendations that are given are subdivided into guidelines for a workshop that can be organized in India, needs for capacity building and necessary policy adaptation. Furthermore recommendations are given for follow-up studies and ideas are given for the introduction of pilot projects.

A. Workshop

A recommendation that was also mentioned in Working Document 4 - Part 1 is to organise a workshop in India for resource persons working in the field of occupational health and waste related activities. As Bangalore has been chosen as a pilot project setting for the Urban Waste Expertise Programme (UWEP) which is run by WASTE, it would be advisable to organise the workshop in Bangalore.

The objective of the workshop could be:

1. To exchange expertise on occupational health aspects of waste collection and recycling.
2. To identify major issues and problems such as the dilemma of occupational health versus public health. Besides attention could also be paid to legislation on occupational health and on how to reach the recycling enterprises.
3. To formulate future policies and to discuss the possibilities for cooperation among the different participants of the workshop. Cooperation could be stimulated among the NGOs in the different cities as well as between the authorities on the one hand and international organizations on the other.
4. How to disseminate the information obtained by the workshop and the studies that are undertaken. It could be interesting to start an E-mail conference.

Within the Urban waste Expertise Programme, several researches have been carried out, which can be used as input to the workshop. In some researches, e.g. plastic recycling (UWEP 4), composting (UWEP 5) and battery recycling (UWEP 10), attention was paid to health aspects. Also conclusions on separation at source projects can be presented because of its possible contribution to the improvement of working conditions.

Suggestions for organizations and/or persons to be invited for the workshop are:

- NGOs involved in working with waste pickers.
- Occupational health experts.
- People working for municipalities in the field of solid waste management.
- Labour unions and international organizations such as the ILO and WHO.
- Federations of entrepreneurs.

- International donor organizations working in the field of occupational health and solid waste management.

B. Studies

Because of the many methodological problems in carrying out researches that try to link occupational health to a waste activity, it is not advised to continue these types of studies. It is possible to carry out research which aims at identifying possible improvements. This could be done for one group of waste workers (e.g. workers in recycling enterprises). However, it would be interesting also to include several groups in the research.

Specific research could be carried out on the role of industrial branch organizations. This research could focus on identifying relevant organizations and assessing their activities.

C. Capacity building

Since information is lacking on occupational health aspects of waste management, a manual could be developed.

The manual should comprise the following subjects:

1. A definition of occupational health.
2. The importance of paying attention to occupational health aspects.
3. What are important occupational health aspects for the different groups involved in waste collection and recycling.
4. What are possible improvements regarding occupational health and what are the strategies to be followed

Besides, a training programme could be set up for the different groups working in the field of occupational health.

- Occupational health experts could be trained on the specific aspects of waste related activities.
- The training programme should pay attention to employees, employers and managers working in the waste sector to make them aware of the occupational health risks related to their occupation.
- A training programme could be set up for waste pickers to improve their knowledge on the health risks related to their occupation and how they can protect themselves.
- Federations of entrepreneurs could be trained in occupational health.
- It should contain information on the occupational health aspects of municipal garbage workers.

D. Policy

In the long term legislation should be adapted towards the integration of small-scale enterprises of less than 10 labourers. Besides, even more important is the enforcement of legislation.

To support entrepreneurs to improve working conditions at policy level incentives could be developed, such as excluding them from paying tax for a certain period, or offering them (management) courses to increase their production.

E. Pilot projects

Pilot projects could be executed in recycling enterprises to test small-scale improvements that fall within the financial possibilities of the enterprises.

As a measure at source, technical improvements in the production process of plastic recycling enterprises could be introduced like the regulation of the temperature, so that plastic is melted on a constant temperature which will lessen the production of dioxins (if pvc is used).

Another measure at source is introducing improvements in the safety of the machines used in recycling enterprises. Special attention should be paid to ventilation and the availability of washing facilities for workers.

ANNEX 1 DESCRIPTION OF THE ORGANIZATIONS THAT WERE VISITED IN NEW DELHI, CALCUTTA AND BANGALORE

NEW DELHI

1. Centre for Science and Environment (CSE)

Mrs S. Narain, Deputy Director of CSE, member of the Programme Policy Committee of the Urban Waste Expertise Programme of WASTE

Mrs P. Kumar, Coordinator Health and Environment Unit

41, Institutional Area
Tughlakabad
New Delhi 110 062
Fax: +91-11-6985879
E-mail: csedel@cse.unv.ernet.in

The Centre for Science and Environment is a public interest research and advocacy organisation which promotes environmentally sound and equitable development strategies. The Centre supports and organises the information flow in a way that the better organised sections of the world get to hear the problems and perspectives of the less organised. CSE publishes the magazines "Down to Earth" and the "Green File". A list of publications can be obtained from CSE.

2. Society for Participatory Research in Asia (PRIA)

Mr H. Jaitli

42, Institutional Area Tughlakabad
New Delhi 110 062
Fax: +91-11-6980183
E-mail: pria@da.tool.nl

PRIA is an NGO that promotes people centred development initiatives using the perspective of participatory research. The focal aim of PRIA's Centre for Occupational and Environmental Health is to promote and contribute towards making work and living place healthier and safer. On one hand the centre collects information from networks, organizations and individuals through research studies, documentation and data bases. On the other hand it publishes and disseminates information to students, workers, entrepreneurs, occupational health specialists and doctors.

PRIA publishes the magazine "Occupational and Environmental Health".

Other publications by PRIA are:

Jaitly, H., and A. Kumar. 1996. "Dusty Dawn, Dust at Workplace and Workers Nightmares." PRIA, New Delhi.

Alkazi, F., M. Farrell and S. Kalyanwala. 1995. "The Danger Within, an Activity Book for Students on Occupational Health Hazards." PRIA, New Delhi.

3. Srishti

Mr R. Agarwal
Mrs. B.Chaturvedi

1001 Antariksh Bhawan, 10th floor
22 Kasturba Gandhi marg
New Delhi 110001
Fax: +91-11-4632727
E-mail: ravig@unv.ernet.in
Mailing address:
111, Golf Links
New Delhi 110003

Srishti is an NGO working on conservation and ecological issues. In the field of waste management they are involved in community based solid waste management, appropriate technology for waste disposal, toxic waste imports and they are designing and implementing a cooperative for waste pickers.

Some publications are:

Chaturvedi, B. 1994. "A Tale of Trash, a Survey of the Materials, People and Economics Involved in the Recycling Trade in Delhi." Srishti, New Delhi.

Chaturvedi, B., R. Agarwal. 1996. "Be Careful With That Cure, a Critical Look at Incineration as a Medical Waste Disposal Method." Srishti, New Delhi.

4. Voluntary Health Association India (VHAI)

Dr. Mrs M. Shiva
Head of Division

40, Institutional Area
South of ITT
New Mehrauli Road
New Delhi 110 016
Fax: +91-11-6853708
E-mail: vhai@unv.ernet.in

VHAI is an NGO that promotes community health, social justice and human rights related to the provision and distribution of health services in India. They fulfil these objectives through

campaigning, policy research, and press and parliament advocacy. They are also involved in training and they provide information and documentation services.

They have a long list of publications on different subjects, as there are: Child development, Community Health, Environmental Health, Health Management, Diseases Control. These publications are summarized in a catalogue, which can be obtained at the VHAI office.

5. World Health Organization (WHO)

Mr J. Pospisilik

World Health House
Indraprastha Estate
Mahatma Ghandi Marg
New Delhi 110 002
Fax: +91-11-3318607, 3327972
E-mail: posjohn@who.ernet.in

The objective of the WHO is the attainment by all peoples of the highest possible level of health, as defined in the WHO constitution, is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. In support of its main objective, the Organization has a wide range of functions, including the following:

1. To act as the directing and coordinating authority on international health work.
2. To promote technical cooperation.
3. To assist Governments, upon request, in strengthening health services.
4. To furnish appropriate technical assistance and, in emergencies, necessary aid, upon the request or acceptance of Governments.
5. To stimulate and advance work on the prevention and control of epidemic and other diseases.
6. To promote, in cooperation with other specialized agencies where necessary, the improvements of nutrition, housing, sanitation, recreation, economic or working conditions and other aspects of environmental hygiene.
7. To promote and coordinate biomedical and health services research.
8. To promote improved standards of teaching and training in health, medical and related professions.
9. To establish and stimulate the establishment of international standards for biological, pharmaceutical and similar products, and to standardize diagnostic procedures.
10. To foster activities in the field of mental health, especially those activities affecting the harmony of human relations.

The WHO has a long list of publications, listed in directories, which can be obtained from the WHO.

6. International Labour Organization

Mrs L.Tegmo Reddy.
Dept. Director ILO Office for India and Bhutan
Indian Habitat Centre
Lodi Road
New Delhi
Fax: +91-11-4647973, 4602111

The International Labour Organization is one of the specialized agencies of the United Nations system. It is a tripartite organization with workers' and employers' representatives participating on an equal status with governments.

The ILO engages in:

1. The formulation of international policies and programmes to promote basic human rights, improve working and living conditions and enhance employment opportunities.
2. The creation of international labour standards.
3. An extensive programme of international technical cooperation formulated and implemented in an active partnership with constituents, to help countries in making these policies effective in practice.
4. Training, education, research and publishing activities to help advance all these efforts.

In the “Workers Education Project” in India they have developed (among others) training manuals for mining, textiles and plantations for the use of workers and Labour Unions. They are also involved in the abolition of child labour.

They have a long list of publications, action manuals and training manuals on many different subjects, listed in directories which can be obtained from the ILO.

7. Development Alternatives

Mrs Vijayalakshmi

B-32 Tara Crescent
Qutab Institutional Area
New Delhi 110 016
Fax: +91-11-6866031
E-mail: people@sdalt.ernet.in

Development Alternatives is a non-profit research and consultancy organization. They focus among others on designing and developing environmentally sound and appropriate technologies. Also they design environment and development management strategies at various geographic scales and levels of detail.

They have a long list of publications and reports, summed up in the brochure “Publications and Research Reports”.

8. Mrs S. Venkateswaran
30, Ferozeshah Road
Apartment B-3
New Delhi 110 001

Mrs.Venkateswaran is a consultant, working part-time for international donor agencies.

Publications from her hand are:

Venkateswaran, S. 1994. "The Wealth of Waste, Waste Pickers, Solid Wastes and Urban Development." Friedrich Ebert Stiftung, New Delhi.

Venkateswaran, S. 1996. "Community Sanitation. Communities in Action Series 1", National Institute of Urban Affairs, Ministry of Urban Affairs and Employment, UNICEF, New Delhi.

9. Friedrich Ebert Stiftung

Mrs Damyanty Sridharan

D-9 South Extension
New Delhi 110 049
Fax: +91-11-6221700
E-mail: 101473.3361@compuserve.com

The Friedrich Ebert Stiftung is involved in credit programmes in Bihar and developing networks of NGOs, legal rights for tribals and political participation of women in Haryana. In Andra Pradesh they are involved in integrated resource management.

10. Centre for Environmental Education (CEE)

Mrs S. Krishna

No.219 Pocket C
Sarita Vihar
Mathura Road
Indraprastha
New Delhi 110 044
Fax: +91-11-6472317

For information on CEE, see CEE South in Bangalore.

CALCUTTA

11. Mr D.K. Nandi
The Calcutta Municipal Corporation
Chief Municipal Corporation
M.V. & Conservancy Directorate
Entally market, 1st Floor
156, A.J.C. Bose Road
Calcutta 700 014

Mr. Nandi is as Chief Municipal Corporation of the Calcutta municipal corporation responsible for solid waste management in Calcutta.

12. Mr Shri Kanti Ganguly
Member, Mayor in Council (CON & EWS)
Calcutta Municipal Corporation
5, S.N. Banerjee Road
Calcutta 700-013

As a member of the Council of Calcutta, Mr Ganguly is responsible for Solid Waste Management.

13. All India Institute of Hygiene and Public Health (AIIHPH)

Prof. K.J. Nath
Dr. R.N. Chauduri

110, Chittaranjan Avenue
Calcutta 700 073
Fax: +91-33-2412539

The All India Institute is involved in research in public and occupational health issues. They are also involved in the education of doctors into occupational health specialists.

Some publications:

“Socio-economic and health aspects of recycling urban solid waste through scavenging.”
1987-1991.

“Health impact of dumping and recycling of solid waste in Calcutta.” 1995-1996.

14. Forum of Communities United in Service (FOCUS)

Mr. Md. Alamgir
Dr. S. Mukherjee

6, Tiljala Road, 3rd Floor
Calcutta 700 046
Fax: +91-33-406643

FOCUS is an NGO working in particular in the slum areas of Calcutta. An area of special attention is waste picking children.

15. Calcutta Municipal Corporation

Dr. D. Gosh

CMW SA
32, BBD Bag (South)
Calcutta 700001
Fax: +91-33-2473761

Dr. Gosh has a degree in Civil Engineering and a PhD in Ecology, both from the University of Calcutta. He is a teacher and a research supervisor. He wrote a baseline document about the present status of Calcutta's environment for the Government of West-Bengal. He is head of the department of the Calcutta Municipal Corporation.

16. The Times Research Foundation (TRF)

Mr. R.M. Kapoor

Chief Urban Studies Centre
8, Camac Street
Calcutta 700 017
Fax: +91-33-2423747

The TRF aims to undertake, promote and coordinate research in all aspects of urban affairs including economic structures of cities, local government, municipal finance, urban legislation, urban planning, infrastructure development, housing, transport and urban environment management.

17. Housing & Urban Development Corporation (HUDCO)

Mr. P.R. Das
Regional Chief

15 N, Lindsay Street
Calcutta 700 087
Fax: +91-33-2448615

HUDCO is owned by the Government of India and its main concern is to improve the housing conditions of the low-income and economically weaker sections of society. Today HUDCO has emerged as a leading national techno-financing institute, with the major objective of financing and encouraging the housing activity in the country and alleviating housing shortage of all groups in rural and urban areas with an emphasis on catering for the needs of the low-income groups and also on the development of infrastructure in human settlements.

18. Calcutta Environmental Management Strategy and Action Plan (CEMSAP)

Mrs. M.Gupta
Social Development Consultant

17A Everest House
46C Chowringhee Road
Calcutta 700 071
Fax: +91-33-2427021

CEMSAP's goal is to improve the environment of Calcutta in order for it to become a better place to live, work and invest in. CEMSAP aims to enable the disadvantaged and vulnerable groups in the Calcutta Metropolitan Area to benefit from a greater involvement in the management of their living environment. This will be achieved through targeting the disadvantaged groups and ensuring that individuals, communities, NGOs and CBOs are able to participate in the planning, implementation, and provision of environmental service improvements.

19. Direct Initiative for Social and Health Action (DISHA)

Dr. D. Sengupta

B-23/2 Kalandi Housing Estate
Lake Town
Calcutta 700 089

This organization is environmental and occupational health oriented. They have done research into the health status of waste pickers. They are also collecting information on hospital waste and they work together with SRISHTI and Greenpeace International against the incineration of hospital waste. They have undertaken a study into the flow of waste from dustbins to dump sites and recycling enterprises.

Publication:

Direct Initiative for Social and Health Action. 1996. "A Rapid Assessment Survey of the Health and Environmental Impacts of Recycling." Calcutta.

BANGALORE

20. Institute for Social and Economic Change (ISEC)

Prof. A. Aziz

Economics Unit
9/3, I.S.E.C. Campus
Nagarbhavi Post
Bangalore 560 072
Fax: +91-80-3387008
E-mail: dgp@isec.kar.nic.in

Professor Aziz is head of the Economics Unit of ISEC. He has carried out a number of research studies and guided doctoral students. At the economics unit they recently started to collect information on solid waste management.

A publication by prof.Aziz:

Aziz, A., 1994. "Urban poor and urban informal sector." Ashish Publishing House, New Delhi.

21. Waste Wise

Mr A. Rosario
Mr V. Rajaram

373, Hundred Feet Road
Hal 2nd Stage, Indiranagar
Bangalore 560 008
Fax: +91-80-2272258
E-mail: raja@indiatap.tool.nl

Waste Wise evolved out of the ecological need to educate people to reduce waste generation and to avoid dumping by facilitating community based treatment of garbage near the source. Waste Wise's focus also combines a social concern to recognise the jobs of waste pickers, to improve their working conditions and to enable them to gain public recognition for their role in recycling and protecting the environment. Waste Wise is involved in community participation in solid waste management. Former waste pickers are integrated in door-to-door collection of waste. Waste Wise is also involved in composting in several areas in Bangalore.

Some publications by Waste Wise:

Rajaram, V., G. Anumita. 1995. "Impact Assessment-Packaging Materials, a Study of Packaging and the Environment." Waste Wise, Bangalore.

"Study to Provide Direction for Evolving a Marketing and Sales Strategy for Vermicomposting." 1995. Waste Wise, Bangalore.

22. Bangalore Mahanagara Palike

Dr. Rao

N.R. Square
Bangalore 560 002
Fax: +91-80-22117670

Dr. Rao is the former additional health officer of the Bangalore City Corporation.

23. Bangalore Medical College

Dr. D.P. Nag
Officer in Charge

Regional Occupational Health Centre
Bangalore Medical College
Library Information Centre Block
Bangalore 560 002
Fax: +91-80-6613359

The Occupational Health Centre is involved in research on the effects of burning of dust bins on the respiratory system of waste pickers.

24. Bosco Yuvodaya

Fr. V. Pallipuram

91, B Street
6th Cross Gandhinagar
Bangalore 560 009

BOSCO is an NGO involved in the care for approximately 2000 street children in Bangalore. They organise health camps, provide shelter for street children, provide education and set up rehabilitation programmes. An example of such a rehabilitation programme is the waste paper project. Offices, hospitals and institutions are integrated in the project to separate the waste paper they generate and waste picking children collect the waste paper from those addresses.

25. M.S. Ramaiah Medical College

Dr. Shivaram
Principal

Gokula Extension
Bangalore 560 054

The Department of Community Medicine has undertaken a study into Hospital Waste Disposal:

“Health Care Waste Disposal, An Exploration.” 1997. MS Ramaiah Medical College, Bangalore.

26. Bangalore Urban Art Commission

Mr. Partha Sarathy
Chairman

V Floor, Tower Block
Vishweswaraiah Centre
Bangalore 560 001
Fax: +91-80-3341674

The Urban Art Commissions is part of the State Government involved in aesthetics, architecture, environment and quality of life. They are involved in planning within the Bangalore Metropolitan Area.

27. Reds

Mr. J. Paul

15, Curley Street
Bangalore

Reds is involved in projects of door-to-door collection of solid waste by former waste pickers. They are also involved in projects in six slums where they try to reach out to the women. They organise health care camps, training in nutrition and hygiene and social activities.

28. Action Aid

Dr. S. Prutavish, Programme Manager
Dr. Daniel

3, Rest House Road
P.B. 5406
Bangalore 560 001
Fax: +91-80-5586284
E-mail: co.blr@actionaid.sprintrpg.ems.vsnl.net.in

Action Aid is an international development organization dedicated to help children, families and communities to overcome poverty and secure lasting improvements in the quality of their lives. The work of Action Aid is spread across 20 developing countries in Asia, Africa and Latin America. Action Aid has its headquarters in London and is an organization with no religious or political affiliations, working at the grassroot level with specific poor communities through poverty alleviation programmes. Further, to tackle the broader causes of poverty, Action Aid uses its micro-level experiences to influence public policy at the national and international levels.

29. Centre for Environment Education (CEE-South)
Southern Regional Cell

Mrs. M. Sowmya

Kamala Mansion
143, Infantry Road
Bangalore 560 001
Fax: +91-80-2868209

The Centre for Environment Education is supported by the Ministry of Environment and Forests of the Government of India. The main objectives of CEE is to create environmental awareness among children, youth and the general community. To achieve this they develop programmes and educational materials. Specific programmes are developed for selected target groups which include school children, visitors to national parks, heritage sites and the rural poor. In Bangalore CEE is involved, among others, in composting and door-to-door collection of garbage.

A publication by CEE:

Modak, P. 1995. "Waste Minimization." Centre for Environment Education, Ahmedabad.

ANNEX 2 CHECKLIST

This checklist was used to interview resource persons in India.

REACTIONS FROM THE RESOURCE PERSONS ON PART I OF THE WORKING DOCUMENT

1. What is your reaction on the report on occupational health aspects of waste collection and recycling and do you have any suggestions/recommendations?

OPINIONS ON OCCUPATIONAL HEALTH, IMPROVING WORKING CONDITIONS

2. What is your point of view on working conditions and occupational health aspects of waste collection and recycling?
 1. The dangers of the work are relative and waste picking is an income providing occupation that is essential to many of the urban poor in economically less developed countries.
 2. Working with waste is inhuman and it should be abolished as soon as possible.
 3. Before valuing the work more research on the occupational health aspects of working with waste should be undertaken.
 4. Waste forms a source of income, which is essential for many urban poor people, and low-cost measures to improve the working conditions are necessary and possible.
 5. Other opinion:
3. What do you consider as necessary measures to improve the working conditions and control the occupational exposures in small-scale enterprises in general?
4. What do you consider as necessary methods to improve working conditions in waste related activities, and can you specify the different waste related activities (waste pickers working at dump sites, itinerant waste buyers, recycling enterprises, and specify the different materials being collected and recycled):
 1. Measures at source, like changing production methods:
 - * A change in the technical part of the production process: closed processes instead of open processes
 - * A change in working methods, no longer work at one particular task at a very long stretch, or more breaks
 - * An adjustment in the lay-out of the working place, so that dust gets less chance to settle
 2. Ventilation
 3. Separation of men and source
 4. Personal protection
 5. Awareness raising

5.
 1. Are you familiar with improvements of working conditions in small-scale enterprises in general and in waste related activities specifically?
 2. What is improved in those activities, and how?
 3. What were the bottlenecks in implementing those improvements?
 4. Do you have more information on those projects?

QUESTIONS ON MEASUREMENT METHODS AND LEGISLATION

6.
 1. Is there in India legislation on working conditions/occupational health (exposure limits, ergonomics)?
 2. If so, which laws?
 3. How are they checked?
 4. What are the consequences of these laws (do they work in practice)?
7. What kind of methods are used in India to measure the occupational health hazards in the working place?
8. Is there in India legislation on maximum permissible inside and outside levels of:
 1. Dust
 2. Fungi (moulds)
 3. Bacteria and toxic substances (produced by bacteria) like endotoxins and exotoxins
 4. Protozoa.
 5. Allergens.
9. To what extent is it possible to improve working conditions when the average living conditions are very low (dilemma occupational health/public health)?
10. What is your opinion on child labour, waste picking by children for instance?
 - A. It should be forbidden:
 1. If you agree to forbid it, how should that be achieved?
 2. What is your opinion on bans from western countries on products that are produced by children?
 - B. It should not be forbidden:
 3. Why not?
 4. What do you suggest should happen in the future?

GENERAL QUESTIONS

11. General recommendations on the topic.
12. Do you know other resource persons/organisations active in the field of occupational health?
13. Do you yourself (or the library) have publications on the subject of occupational health, waste and health and improving working conditions?
14. Are you interested to be kept informed on this topic?

15. Are you interested in the publications of WASTE?

REFERENCES

- Action Aid. Kala-Azar in India. 1995. *Themes in Development Series* no. 2, Action Aid, Bangalore.
- Action Aid. Community Participation in Drinking Water and Sanitation Projects. 1995. *Themes in Development Series* no. 3, Action Aid, Bangalore.
- Agarwal, A. Who Will Help Her? *Down to Earth*, November 15, 1992, pp. 22-33.
- Ajello, R. and A. Ranawana. Death in Slow Motion. *Asiaweek*, September 20, 1996, pp. 28-29.
- Baud, I. and H. Schenk. 1994, (eds.). *Solid Waste Management, Modes, Assessments, Appraisals and Linkages in Bangalore*. Manohar Publishers, New Delhi.
- Bellamy, C. 1996. *The State of the World's Children*. UNICEF.
- Boleij, J., E. Buringh, D. Heederik and H. Kromhout. 1995. *Occupational Hygiene of Chemical and Biological Agents*. Elseviers, Amsterdam.
- Broere, K. Kerala, een Schoolvoorbeeld. *Onze Wereld*, Januari 1996, pp. 8-12.
- Boon, H. Geen Doorbraak, Wel Stap Vooruit. *India Nu*, Maart-April 1997, pp. 3-6.
- BOSCO. 1995. *Buddhivantha, a Holistic Educational Programme for the Children on the Street*. BOSCO, Bangalore.
- Bosma, M. Leve de Kinderarbeid. *Onze Wereld*, November 1996, pp. 14-17.
- Carter, D.E., C. Peña, R. Varady and W.A. Suk. Environmental Health and Hazardous Waste Issues Related to the U.S-Mexico Border. *Environmental Health Perspectives*, vol. 104, no. 6, June 1996, pp. 590-594.
- Chakraborty, A.K. and S. Choudhury. 1997. *National TB Programme, Stopping the Killer*. Action Aid, Bangalore.
- Chakraborty, A.K., T.D. Daniel and G. Chaturvedi. 1996. Tuberculosis Control in India, Developing Role of NGOs. *Themes in Development Series* no. 4, Action Aid, Bangalore.
- CII. *Economic Implications of Abolition of Child Labour India*. Confederation of Indian Industry. (Year not given).
- Cointreau-Levine, S. 1997. Occupational and Environmental Health Issues of Solid Waste Management. Draft Report, to be published in: *International Occupational and Environmental Medicine*. Mosby St. Louis, MO, USA, 1997.
- Conradi, P. Verplicht Onderwijs Tegen Kinderarbeid. *Viceversa*, 1e kwartaal 1997.

Coppée, G.H. Occupational Health Services: an ILO Perspective. *Asian-Pacific Newsletter on Occupational Health and Safety*, no. 3, 1996, pp. 4-7.

Edwards, B. 1996. *The Stranger*. Greenpeace International, Amsterdam.

Eerd, M. van. 1996. *The Occupational Health Aspects of Waste Collection and Recycling*. *UWEP Working Document 4, Part 1*, WASTE, Gouda

Finlay, H., G. Crowther, B. Thomas and T. Wheeler. 1993. *India, a Travel Survival Kit*. Lonely Planet, Australia.

Furedy, C. Junking Reality. *Down to Earth*, August 15, 1996, p. 53.

Galloway, N.L. 1993. *Recycling: a Natural Response to India's Solid Waste Problems*. Development Alternatives, New Delhi.

The Gazette of India, 25 April 1995.

Health Care Waste Disposal, An Exploration, Executive Summary. 1997. M.S. Ramaiah Medical College Bangalore, Department of Community Medicine.

How to Stop Garbage Plagueing You. *Anubhav*, April 1996, pp. 28-29.

ILO. Thurman, J.E., A.E. Louzine and K. Kogi. 1988. *Higher Productivity and a Better Place to Work, Practical Ideas for Owners and Managers of Small and Medium-Sized Industrial Enterprises*. International Labour Office, Geneva.

ILO. 1994. *Textiles, Occupational Safety and Health, Factories Checklist Pack*. International Labour Organization, New Delhi.

ILO. 1994. *Textiles, Occupational Safety and Health, a Workbook for Trade Union Courses*. International Labour Organization, New Delhi.

ILO. 1994. *Mining, Occupational Safety and Health. Mines Safety Checklist Pack*. International Labour Organization, New Delhi.

ILO. *ILO Instruments on the Most Intolerable Forms of Child Labour*. Amsterdam Child Labour Conference, February 1997.

Indian Standard. *Solid Wastes, Hospital Guidelines for Management*. (Year not given).

ISSA. 1990. *Storage of Dangerous Substances, a Practical Guide*. ISSA, Heidelberg.

Jordens, S. 1996. *Plastic Recycling Enterprises in Bangalore, India*. M.A. Thesis, University of Amsterdam.

Kharas, P.P. *Plastics and the Environment*. (Year not given).

- Kokate, K. Happy Colony in Pune. *Anubhav*, April 1996, pp. 30-31.
- Kooiman, D. 1994. *India*. Koninklijk Instituut voor de Tropen, Amsterdam.
- Kruitbosch, M. 1996. *Child and Adult Labour in the Export-Oriented Garment and Gem Polishing Industry of India*. India Committee of the Netherlands, Utrecht.
- Kumar, A., R. Joshi and S.P. Sharma. Effects of Long-Term Exposure of Cotton Dust on Psychological and Anthropometric Profiles of Cotton Mill Workers in Phagwara, Punjab. *Journal of Human Ecology*, 1996, no. 7, pp. 187-190.
- Lappalainen, J., P. Oksa and A. Kaukiainen. Ergonomics in Construction Work: Physical Load and Means of Affecting it. *Asia-Pacific Newsletter on Occupational Health and Safety*, no. 2, 1995, pp. 9-11.
- Lardinois, I. and A. van de Klundert (eds.). 1993. *Organic Waste - Options for Small-scale Resource Recovery. Urban Solid Waste Series 1*. WASTE/TOOL, Amsterdam.
- Lardinois, I. and A. van de Klundert (eds.). 1995. *Plastic Waste - Options for Small-scale Resource Recovery. Urban Solid Waste Series 2*. WASTE/TOOL, Amsterdam.
- Maharatna, A. Children's Work Activities, Surplus Labour and Fertility, a Case-Study of Six Villages in Birhum. *Economic and Political Weekly*, February 15, 1997, pp. 363-369.
- Meer, van der R. 1994. *Environment and Safety in the Processing of Hazardous Waste*. WASTE, Gouda.
- Menon, S. Hospital Waste, a Deadly Menace to Public Health. *India Today*, April 30, 1996, pp. 133-135.
- Mia, F.U.A. (Year not given). *A Case-Study of Community Participation in Solid Waste Management, Kalabagan, Dhaka*. World Health Organization.
- Mikheev, M.I. Occupational Health Services: a WHO Perspective. *Asia-Pacific Newsletter on Occupational Health and Safety*, no. 3, 1996, pp. 8-12.
- Mishra, V.S. Environmental Education and Awareness: the Indian Environment Law Perspective. *Scavenger*, Jan-April 1993, pp. 3-10.
- Nath, K.J. 1995-1996. *Health Impact of Dumping and Recycling of Solid Waste in Calcutta*, draft report. All Indian Institute of Hygiene and Public Health Calcutta.
- Nath, K.J., I. Chakrabarty and D. Kahali. 1987-1991. *Socio-Economic and Health Aspects of Urban Solid Waste Through Scavenging*. All Indian Institute of Hygiene and Public Health Calcutta, Department of Sanitary Engineering.
- National Labour Institute. *Working Children in India*. (Year not given).
- National Safety Council. *Model Rules Under The Factories (Amendment) Act 1987*.

Pain, G.C. *A Manual of Occupational Health in Small Scale Industries of India*. All Indian Institute of Hygiene and Public Health Calcutta and the Ministry of Health and Family Welfare, Government of India. (Year not given).

Planning Commission Government of India. 1995. Urban Solid Waste Management in India. Report of High Power Committee.

PRIA. 1996. *Children at Work, the Bhavnagar Scenario*. PRIA and SHAISHAV, New Delhi.

PRIA. *Occupational and Environmental Health*. PRIA, vol. 2, no. 2, August 1995.

PRIA. Jaitli H. and A. Kumar (eds). 1996. *Dusty Dawn, Dust at Workplace and Workers' Nightmares*. PRIA, New Delhi.

PRIA. Alkazi, F., M. Farrell and S. Kalyanwala. 1995. *The Danger Within, an Activity Book for Students on Occupational Hazards*. PRIA, New Delhi.

PRIA. 1996. *Employees State Insurance Scheme*. PRIA, New Delhi.

PRIA. Pandey, R., and V. Kanhere (eds.). 1993. *Activists' Handbook of Occupational Health and Safety*. PRIA, New Delhi.

PRIA. 1989. *Diseases Due to Work and Compensation*. PRIA, New Delhi.

Psychosocial and Organizational Hazards at Work, Control and Monitoring. *European Occupational Health Series* no. 5, 1993, pp. 29-45.

Ramaneshwari, B. 1994. *Approaches to Urban Solid Waste Management by NGOs and CBOs in Indian Cities*.

Rao, M.J. *Environment and Solid Waste Management*, a paper presented at the conference of ISHA, Bangalore, 8-9 september 1989.

Ravindra, A. 1993. *Bangalore, an Environmental Profile in Managing Urban Environment in India, Towards an Agenda for Action*, Vol. II. Times Research Foundation India.

Salian, P. Recycling for Development. *Anubhav*, April 1996, pp. 13-16.

Sign Against Child Labour Position Paper. 1997.

D'Souza, R. Occupational Health and Safety Legislation in India. *F.I.L Working Papers*, no. 9, 1995.

Srinivas Chary, V. The Role of the Informal Sector in Urban Waste Management, Some Issues. *Ecology* vol. 11, no. 7, 1996, pp. 15-20.

SRISHTI. 1996. *Using Bio Reactor Technology for Kitchen Waste, a Community Level Pilot Project*. SRISHTI and WWF and TATA Research Institute, New Delhi.

SRISTHI. Chaturvedi, B., and R. Agarwal. 1996. *The Waste Situation in India, an Outline*. SRISHTI, New Delhi.

SRISTHI. Chaturvedi, B., and R. Agarwal. 1996. *Be Careful With That Cure, a Critical Look at Incineration as a Medical Waste Disposal Method*. SRISHTI, New Delhi.

Venkateswaran, S. 1994. *The Wealth of Waste, Waste Pickers, Solid Wastes and Urban Development*. Friedrich Ebert Stiftung, New Delhi.

Venkateswaran, S. 1996. Community Sanitation. *Communities in Action Series I*, National Institute of Urban Affairs, Ministry of Urban Affairs and Employment, UNICEF.

Weiner, M. 1991. *The Child and the State in India*. Oxford University Press, New Delhi.

Yoganand Jha. Child labour and Poverty in India. *Anubhav* no. 9, pp. 31-33, 1995.

Zuiderhoek, O., H van Beers and M. Vreeburg. *Street Children, NGOs and Social Welfare*. 1993. Paper for the Joint Seminar of the Open University and Development Studies Institute, London School of Economics.