Training Resource Pack
for hazardous waste management in developing economies

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for

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The Training Resource Pack
at a glance

■ Purpose
  ➞ to fill a gap in training materials
  ➞ supplement technical manuals with teaching aids
  ➞ provide useful presentation material for developing countries
  ➞ encourage further capacity building initiatives
  while recognising the diversity of technical and management capacity in countries

■ Target audience
  Trainers and communicators:
  ➞ regional and national centres
  ➞ university teachers
  ➞ professional trainers
  ➞ policy makers and regulators
  ➞ industrial waste generators
  ➞ waste management industry
  ➞ consultants
  ➞ development assistance bodies
  Not targeted at operators of hazardous waste facilities
  Not an operational or design manual

■ Partners
  Collaborating organisations:
  ➞ International Solid Waste Association
  ➞ United Nations Environment Programme
  ➞ Secretariat of the Basel Convention
  With contributions from:
  ➞ World Health Organisation
  ➞ Pacific Basin Consortium on Hazardous Waste Research & Management

■ Sponsors
  ➞ AVR
  ➞ ERM
  ➞ Imperial College (UK)
  ➞ Indaver
  ➞ SITA
  ➞ Trienekens
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Acknowledgements

This Training Resource Pack has been compiled using contributions and input from a wide range of individuals and organisations.

The project was conceived nearly 10 years ago as a collaborative activity of the ISWA Working Group on Hazardous Waste (WGHW), the Pacific Basin Consortium on Hazardous Waste (PBCHW), UNEP, the Secretariat of the Basel Convention and the Nancy project office of WHO. Contributions from individual authors were subsequently reviewed by the WGHW and other specialists, before being compiled into a ‘prototype’ TRP by a volunteer editor working in Paris.

Unfortunately, the effort required to turn this prototype into a final product proved beyond the capacity of the then collaborating bodies, and the work was put aside for some time. Subsequently the new Chair of the WGHW found commercial sponsors to support the completion of the TRP through the engagement of a professional editor. The earlier drafts were updated by the principal authors (ie the two project leaders and the professional editor), with the help also of staff and postgraduate students from the Centre of Waste Management and Environmental Control (CECWM) at the Imperial College of Science, Technology and Medicine of the University of London. Two further drafts were reviewed by members of the WGHW and other specialists. While the individual chapters inevitably reflect the viewpoint and expertise of a variety of specialists in hazardous waste, responsibility for the final content rests with the principal authors.

Three main Collaborating Organisations have worked together throughout the project, namely ISWA and in particular its Working Group on Hazardous Waste; UNEP and in particular its Division of Technology, Industry and Economics; and the Secretariat of the Basel Convention.

Two other Contributing Organisations have made a valuable initial input to the publication, namely the Pacific Basin Consortium on Hazardous Waste (PBCHW) and the Nancy project office of the World Health Organisation (WHO).

We are grateful for the invaluable assistance and input of the following organisations and individuals:

The authors of the initial draft chapters, including:

- Philip Rushbrook, then of the Nancy project office of the WHO (Chapter 2.3)
- Jennifer McQuaid-Cook, Centre for Environmental and Waste Management, University of Paisley (Chapter 2.4)
- Asa Granados and Pierre Portas, Secretariat of the Basel Convention (Chapter 3.2)
- C M Lim and Raymond Y Leung, Hong Kong Productivity Council (Chapter 4.1)
- C M Lim and Clement P Li, Hong Kong Productivity Council (Chapters 4.2 and 4.3)
- Shen-yann Chiu, Argonne National Laboratory (Chapters 5.1 and 5.2)
- Michael J Stokoe, Hong Kong Environmental Protection Department (Chapter 5.4)
- Jean-Bernard Leroy, SYPRED (Chapters 6.2, 6.3 and 6.5)
- S T Chou and L T Fan, Department of Chemical Engineering, Kansas State University (Chapter 6.4)
- Thierry Vincent who commenced the compilation of material from various sources and prepared the first consultation (prototype) version in 1996.
- Vincent Jugault of the Secretariat of the Basel Convention for input and support from the Basel Convention.

Members of the ISWA Working Group on Hazardous Waste (WGHW), who compiled, contributed to and reviewed various chapters, in particular:

- Leo Pasch, Trienekens, Germany (who as Chair of the WGHW reactivated the project)
- Michael J Stokoe, Environmental Protection Department, Hong Kong (WGHW Chair from 2002)
- Alfred W. Lindsay, USEPA, Chair when the project first commenced
- Aarno Kavonius, Ekokem, Finland
- Claus Reinhardt Hansen, Denmark
- Damir Subasic, APO, Croatia
- Edward Kempa, Poland
- Eirik Wormstrand, NORSAS, Norway
- Gerhard Vogel, Vienna University of Economics, Austria
- Ian H Miller, NOAH, Norway
- Isabelle Conche, TERIS, France
- Janos Egerszegi, ERM, Hungary
- Jean-Bernard Leroy, SYPRED, France
- Leslie Baker, UK
- Paul de Bruycker, Indaver, Belgium
• Soren Andersen, ROVESTA Miljo, Denmark
• Stig Edner, Sysav Kemi, Sweden
• Ton Goverde, AVR, Netherlands
• Gunay Kocasoy, Turkey
• Kenneth Anderson, Sweden
• John Skinner, USA
• William S Forester, USA (WGHW Secretary when the project commenced)

Staff and students of the Centre for Waste Management and Environmental Control (CECWM) at Imperial College, London, in particular:
• Dr Chris Cheeseman, who supervised the student work and also contributed to Chapter 6.4.
• Carolina Sanchez Vargas who prepared materials for Chapters 2.1, 2.2, 2.3, 4.3, 5.1, 5.2 and 5.3
• Joy Woo (Joyce) Tsoi who prepared materials for Chapters 6.1, 6.6 and 6.8.
• Dr Stephen Smith, the Director of CECWM.

Other reviewers included:
• Adam Read, ERM
• Adrian Ross, Manfred Nauke, and Rene Coenen, IMO
• Arend Hoogervorst, Eagle International, South Africa
• Brenda van Eeden, Secretariat of the Basel Convention
• Chandak Surya, UNEP DTIE, especially on Chapters 4.1 and 4.2
• Frieda Wyns,
• Jon Ward, Eco-Recycle, Melbourne, Australia
• Prof C. Visvanathan, AIT, Bangkok, Thailand
• Prof John Hay, Auckland, New Zealand
• Anthony Chiu, Philippines

We want especially to acknowledge all those who provided graphics and images from their private collection for this publication. Many generic illustrations were copied or adapted from other published material. We have acknowledged the source wherever possible, but regrettably have not been able to do this in every case where author’s details were missing. We are grateful to Wiley Publishing for permission to reproduce several diagrams in the presentation slides. Other material was graciously provided by Victoria Environment Protection Authority and Hong Kong Environmental Protection Department.

Technical assistance with publication and information was also provided by Marie-Christine Guedon, Barbara Huber, Eleanor Solomon, Toshisuke Ozawa and Benyucef Megherbi from UNEP; Brenda van Eeden from the Secretariat of the Basel Convention; Trudi Gasser, Isabella Grogan and Ania Karzek from ERM; Annette Mejía and Helena Bergman from the ISWA Secretariat; and Mimamsa Pant and Birgit Krause from UTG Control.

Maggie Thurgood undertook the daunting task of the final compilation of the material, including the rewriting and formatting of numerous chapters, and managed to remain cheerful throughout.....

Publication of this Resource Pack would not have been possible without the financial support of the sponsors who are listed on a separate page.

David C Wilson,
ERM Group Principal for International Waste Management,
Visiting Professor in Waste Management at CECWM,
Imperial College, and UK representative on the ISWA WGHW

Fritz Balkau,
Head, Production and Consumption Branch,
United Nations Environment Programme, Division of Technology, Industry and Economics
Preface

Much has been written about hazardous waste management. Many countries have progressively put in place comprehensive management systems since the 1970s or 1980s. Numerous conferences present technical descriptions of waste treatment technology and updates of regulatory developments at national and international level.

It remains to spread this extensive knowledge to countries that are at an early stage in the development of their own hazardous waste management system. Surprisingly, there is still an absence of good teaching aids to allow trainers to present the management information in a simple and coherent way to managers and students in their home institution or country.

Some years ago, UNEP and ISWA prepared training manuals for hazardous waste management to allow trainers to create effective courses and curricula in this field. The Secretariat of the Basel Convention has produced numerous technical guidelines on key issues and waste streams.

The purpose of this Training Resource Pack is to supplement these manuals and guidelines with visual aids and explanatory notes that bring the message across in a structured, convincing and exciting way. This will assist teachers and trainers in various institutions to present an overview of the many issues and challenges faced by those in government, industry and civil society who are responsible for hazardous waste management.

Statement by Christoph Scharff, President of ISWA

ISWA has been representing professional waste managers around the world for more than 30 years. Our origins coincided with the international recognition of the potentially severe public health and environmental consequences if hazardous wastes are not managed properly. The first Working Group set up by ISWA, the Working Group on Hazardous Wastes established in 1984, has been at the forefront of contributing to modern systems for environmentally sound management of hazardous waste which are now adopted throughout the developed world. Extending these management systems to developing economies is a major priority of the international community. ISWA firmly believes that it is the responsibility of the waste industry to help developing economies in building the necessary capacity.

I am delighted that the ISWA Working Group on Hazardous Wastes has produced this Training Resource Pack, which I believe will be a significant contribution to national capacity building. I know that this project has taken nearly 10 years to complete, and I would like to thank UNEP, the SBC, the principal authors and all of the other individuals and organisations who have contributed to this mammoth effort.

Statement By Klaus Töpfer, Executive Director of UNEP

The recent review of the environmental health of our planet given by the Global Environment Outlook report shows that much effort is still needed before the world masters the hazardous waste agenda. Skilled and knowledgeable persons are needed in all countries to take effective action to prevent waste being generated, and to deal safely with those that cannot be avoided. The professional training of managers and administrators in government, industry and civil society must now also include greater awareness of and competencies in the important area of cleaner production and waste management. Our teaching institutions have the responsibility to carry this message to all those who are or will be concerned with waste generation, treatment and control. This publication will be a valuable resource for them in this function, and I recommend its full application in countries around the world.

Statement by Philip Roch, Chairman of the Conference of the Parties, Basel Convention

Managing hazardous wastes is a growing concern for all regions of the world. The long term impacts and costs of improper disposal can be very high, and the emphasis must be put on prevention and the minimization of the generation of hazardous wastes. That is in essence the message expressed by the Parties to the Basel Convention in the Ministerial Declaration made in Basel, Switzerland, at the occasion of the 5th Meeting of the Conference of the Parties to the Basel Convention (1999).

A comprehensive management system should include (a) policies, institutions and effective regulations and (b) adequate and acceptable disposal facilities, either public or private. This Training Resource Package aims at providing the general knowledge that is necessary to get to grips with the consolidating of hazardous waste management systems in the developing world. In addition, the ISWA-UNEP jointly developed Training Resource Package addresses in the field of capacity-building the need identified by the Parties for more active public-private partnerships. The contribution of ISWA on this occasion has been critical to reflect the realities and intricacies of hazardous waste management.
How to use this document

Note from the authors

This document provides educators and trainers with a basic package of visual aids and footnotes to assist in formal courses and training programmes on hazardous waste. It supplements other training material and technical literature by summarising in a visual fashion the essential points of the subject.

This publication is not, and should not be used as, a technical manual for managing waste problems. Other documents shown in the references are better designed to do this. In this Resource Pack some subjects have not been comprehensively described, and others such as soil contamination have not been included at all because they are covered by other manuals. Some chapters reflect a point of view that may not be equally valid in all countries and all situations. The material is designed to stimulate thinking, not to set fixed management procedures.

It is very much a basic resource package that the trainer adapts, augments and adjusts to his or her circumstances. For each training application or presentation some slides may need to be omitted, some new ones added, the content edited and adjusted. The footnotes to each slide also can be further edited, and new examples and case studies cited introduced. The material does not consist of absolute truths, rather it is intended to illustrate principles and stimulate thinking and analysis.

We acknowledge that much of the material has a developed-country flavour – that is after all where the experience with hazardous wastes (both problems and the solutions) is the greatest and it makes sense to build on this experience. We have tried to include wherever possible also recent experience from developed countries. By adding further knowledge and experience as it becomes available, the trainer can make this package remain relevant as the waste management industry itself evolves.

Much of the material in this package was originally compiled by the authors in the 1990s during earlier UNEP and ISWA programmes on waste management. Considerable effort has been made to update the material. However, we would argue that, while the long ‘gestation’ period for the TRP might be a handicap for a guidance manual, it is not a serious constraint for training, where it is more important to illustrate principles and management elements. Trainers can even use this as an opportunity to provide research projects for students to undertake review exercises in workshops.

In order to keep this package to a manageable length, each major aspect has been restricted to a set of around 20 slides, annotated by footnotes, with a short introduction of key issues. This is enough for an introduction, but will not lead to an in-depth knowledge of the subject. For this further references are given. While some footnotes contain suggestions for class or individual exercise, this package is not attempting to repeat what has already been published in earlier manuals by UNEP and ISWA. Users are encouraged to refer to these manuals in order to develop classroom exercises and group discussions. Many of these manuals contain useful case studies and scenarios that can be used for training exercises. Some of the manuals are included on the CD ROM for this package.

We have attempted to structure the package to give the trainer an overview of the key areas that a management strategy for waste has to address. A few salient points should be noted:

→ avoidance of waste generation through cleaner production and similar approaches is the first and most important element in a comprehensive approach to waste management, yet we can only give it two chapters here. We strongly recommend that trainers familiarise themselves with the extensive training material available in this area, and link with appropriate avoidance programmes in their country. Some material is available on the CD-ROM of this package.
→ regulatory approaches, much more so than technologies, vary greatly between countries. The relevant chapters here should always be supplemented by local information and experience.
→ this Resource Pack inevitably draws on the extensive experience in industrialised countries which have had over 30 years to try to come to grips with their situation. We caution against a blind copying of the path taken by developed countries, rather we recommend an analysis of this path to see what would function elsewhere under different political, cultural and economic circumstances. The slides should be used to encourage this analysis, not to present a role model to be followed.
→ technologies are the easiest of the management elements to locate or to purchase. They are not necessarily the appropriate starting point for the waste manager. In the end, success will depend more on the effectiveness of the management and organisational arrangements than on the details of the technologies installed.
→ as stressed in Chapter 1, waste management is more a path than a destination. The various technical chapters do not represent a single point on this path, but will be relevant again and again, in different manifestations, as the journey continues. The technical chapters should thus not be presented as models or blueprints, but as concepts to be revisited periodically.
→ we have not included the important issue of soil decontamination because it is a vast new subject in its own right. Training material on this subject is included on the CD ROM that accompanies this Package.
→ similarly the package does not discuss in detail the management options for specific wastes or groups of wastes. There is already much information on this topic available in the literature, and the CD ROM includes guidance documents produced by the Basel Convention on selected waste streams.
Suggestions for how to use this package

1. Familiarise yourself with the contents of the package, and also with the contents of the CD-ROM which contains additional training resource material, including images and photographs.
2. Study the table of contents from the point of view of the management areas that constitute ‘hazardous waste management’.
3. Examine some of the powerpoint slides, and see how the footnotes complement the slides.
4. Use the material as a starting point for teaching and discussion. Do NOT regard the slides and the information they contain as the absolute truth. They are a viewpoint from experienced professionals, to be sure, but in many countries other viewpoints may also be valid.
5. Adapt the slides by using your own material, and by including local case studies and examples.
6. Where the content does not reflect the situation in your country, adapt the slides, but also consider using the slides here as the start of a group discussion on the lines “this is the practice in the West, how should we consider this issue here...?”
7. Visual slides come to life when you use examples to illustrate the principles. Look for work exercises and group discussion topics in the other manuals and support materials, or develop your own.
8. Read the hints for effective presentations to ensure your slides come to life for the audience. Just repeating to the audience the exact text of your slides is not effective - they are quite capable of reading the text for themselves on the screen.
9. If you do not have powerpoint equipment, simply copy the slides onto transparencies for use with an overhead projector.
10. Consider giving students and trainees a paper set of the slides you will use to allow them to annotate with their own comments while you speak. Three slides per page is often enough.
11. Collect also slides and visual material from your own country and from invited guest speakers.

Feedback helps everyone

Do provide us with feedback on how you find this Resource Pack, any ideas you have for improving it, and any modifications you might propose to the slides, and any supplementary material you can offer to others.

If you would like to join a future review group, please indicate this in your response to:

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Effective use of visual aids

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Use visual aids when you need to:

- Capture and focus the attention of your audience;
- Reinforce your verbal message, but not repeat it;
- Stimulate interest in the content of your presentation; and
- Illustrate points that are hard to make in “word pictures”.

Thus the visual aids provided with this training package should be used to complement a presentation, rather than being the main form of presentation. The visual aids can also be used as a basis for large and small group discussions, question/answer sessions and participatory activities such as role plays.

Some common practices to avoid when using visual aids:

- Don’t try and impress your audience with complex tables and diagrams;
- Don’t use visual aids as a way to avoid interacting verbally with your audience;
- Don’t make more than one key point on a slide or transparency; and
- Don’t use visual aids to present simple ideas that are best stated verbally.

Guiding principles for the use of visual aids are:

- Adapt the visual aids in the packages to your purpose, audience and available time;
- Make your presentation people-centred, not media-centred; while the media can help, it is the presenter’s interaction and rapport with the audience that will make the difference between an effective and ineffective presentation;
- Use visual aids sparingly – no more than one for every two minutes of presentation time; if something can be stated simply and verbally, do not use a visual aid;
- Use visual aids pictorially – graphs and images can often replace many columns of numbers and a large number of words;
- Present one key point per visual;
- Make sure your visuals are big enough to be clear to the person sitting in the back row;
- Make visuals attractive – avoid the “data dump”; if colour is used, it must have high contrast (e.g. yellow on dark blue); avoid clutter and adopt the KISS principle – keep it short and simple;
- Preferably place the screen, flipchart or whiteboard at a 45 degree angle and slightly to one side of the centre of the room, allowing the presenter to occupy the central position;
- The presenter should try and keep shoulder orientation towards the audience at all times; the presenter should avoid speaking until they have eye contact with the audience – do not talk while writing on a flip chart or whiteboard;
- Pointers should be used to make a quick visual reference; use the pointer at the screen, not on the overhead projector; keep the shoulder oriented towards the audience, holding the pointer in the hand closest to the screen; don’t play with the pointer when not using it;
- Avoid revelation – the process of covering part of the overhead transparency and revealing the contents by sliding the cover down; rather, use overlays to build the information slowly;
- Be selective in preparing handouts based on the visual aids – if all visuals are in the handout participants tend to focus on it rather than on the presenter and the images on the screen.

Further training resources in hazardous waste management

Trainers in hazardous waste management have access to a vast library of information through published literature and conference proceedings. However this is not always easy to convert into a training format. Some assistance with developing training courses and teaching material is available from the following:

Organisations and networks

1. Regional Centres for the Basel Convention undertake training and technical assistance on issues related to the Basel Convention. Details are available on: www.basel.int/centers/regional.html

2. National Cleaner Production Centres (NCPC) have been established by UNEP and UNIDO in 23 countries around the world. Other Centres have been established by national organisations. The NCPCs undertake information and training on procedures and policies concerning cleaner production (waste avoidance). Locations of NCPCs are available on: www.unep.org/pccp/home.htm and also www.unido.org/doc/331390.html.

3. Regional Roundtables on Cleaner Production are now established in all regions around the world. Normally held every two years, these Roundtables bring together all professionals and administrators concerned with waste avoidance. Many participants are from universities or training institutions. Further information can be found from the UNEP publication Guide to Cleaner Production Information Sources from UNEP in hardcopy or on www.unep.org/pccp/home.htm.

4. The Pacific Basin Consortium for Hazardous Waste is a group of scientists and engineers involved in both research and development, and the management of, hazardous waste in Pacific Basin countries. The objectives of the Pacific Basin Consortium (PBC) are to:
   - Promote technology and information exchange on health and environmental issues in the Pacific Basin.
   - Develop a network of individuals and organizations experts in research and policies relating to the management of the environment, health and hazardous substances.
   - Serve as an objective source of analysis, review and critique on hazardous wastes.
   - Stimulate, coordinate and conduct research on and promote sustainable policy for the management of environmental and health issues. www.pbchw.com.ph.

5. The regional programme on Environmental Education, Awareness and Training in Asia and the Pacific (EEATAP) has replaced the earlier programme on Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTAP) to undertake capacity building in the region. There is an active regional network of educators and trainers who include hazardous waste teaching in their curricula – contact Mahesh Pradhan, UNEP Regional Office for Asia and the Pacific on pradhan@un.org.

6. International Solid Waste Association (ISWA) and national member associations periodically conduct training seminars and conferences. Ref www.iswa.org

7. National or regional conferences are held in all regions concerning hazardous waste, soil contamination, pollution control and hazardous chemicals management. National associations affiliated with ISWA or environmental management organisations will be able to provide further details.

Training Manuals

Although written some years ago the manuals below are still a good source of material and inspiration for trainers. Several of these are included in the CD-ROM of this package.

1. Cleaner Production - a trainers manual, UNEP, 1996
4. Environmental and Technological Issues related to Lead-Acid Battery Recycling - a workbook for trainers, UNEP, 1996

Material relating to the environmentally sound management of hazardous waste can be found at SBC’s web-site: http://www.basel.int/
About UNEP, About ISWA, About SBC

■ About UNEP DTIE

The UNEP Division of Technology, Industry and Economics (DTIE) based in Paris, France, helps decision-makers in government, local authorities and industry to develop and adopt policies and practices that are cleaner and safer, make more efficient use of natural resources and reduce pollution and risks to humans and the environment. DTIE is composed of one Centre in Osaka, Japan, and four Branches in Paris and Geneva.

UNEP DTIE focuses activities on awareness raising, improving the transfer of information, capacity-building, and promoting the integration of environmental considerations into industrial development policies and strategies.

A major activity of UNEP DTIE is the prevention of pollution through adoption of cleaner production practices and policies and encouraging more sustainable patterns of consumption in industry and civil society. Environmentally sound management of those residues which cannot be avoided or recycled is an integral part of this approach.

More information from www.uneptie.org

■ About ISWA

The International Solid Waste Association is a global non-political and non-governmental association, whose mission is to promote and develop professional waste management worldwide as a contribution to sustainable development.

ISWA's objective is the worldwide exchange of information and experience on all aspects of waste management. ISWA promotes the adoption of acceptable systems of professional waste management through technological development and improvement of practices for the protection of human life and health and of the environment, as well as the conservation of materials and energy resources.

The association is active in a variety of areas, including conferences, meetings, training programmes, information development and dissemination, and technical assistance on a global scale.

ISWA has a total of more than 1,200 members in 93 countries. ISWA has three membership categories: national members, organisation members and individual members. At present, there are 32 national members or incoming national members that represent their country on solid waste issues. ISWA's members represent all aspects of our field and most regions worldwide: from practitioners and industry to communities, from associations, research institutes and academics to regulatory authorities. The association is the global forum for waste management, with 12 technical Working Groups covering all relevant aspects of sustainable waste management and with special interest in developing countries issues.

More information from www.iswa.org

■ About the Basel Convention and its secretariat (SBC)

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in 1989 and entered into force on 5 May 1992. The Convention is the response of the international community to the problems caused by the annual worldwide production of hundreds of millions of tonnes of wastes. These wastes are hazardous to people or the environment because they are toxic, poisonous, explosive, corrosive, flammable, eco-toxic, or infectious.

This global environmental treaty strictly regulates the transboundary movements of hazardous wastes and provides obligations to its Parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.

In order to achieve its principles, the Convention aims to control the transboundary movement of hazardous wastes, monitor and prevent illegal traffic, provide assistance for the environmentally sound management of hazardous wastes, promote cooperation between Parties in this field, and develop Technical Guidelines for the management of hazardous wastes.

The secretariat of the Basel Convention is based in Geneva and is administered by UNEP.

More information from www.basel.int