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**UNITED NATIONS ENVIRONMENT PROGRAMME**  
**REGIONAL OFFICE FOR ASIA AND THE PACIFIC**



**REPORT OF THE FIRST  
NETTLAP RESOURCES DEVELOPMENT WORKSHOP FOR  
EDUCATION AND TRAINING AT TERTIARY LEVEL  
IN THE MANAGEMENT OF TOXIC CHEMICALS AND HAZARDOUS WASTES**

**Hyderabad, India**

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AT TERTIARY LEVEL IN ASIA AND THE PACIFIC  
(NETTLAP)**

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## PREFACE

Sound management of toxic chemicals and hazardous wastes (TCHW) requires, amongst other actions, and investment in training and education. A factor which is hindering the introduction *and* maintenance of appropriate management practices in all developing countries of the Asia-Pacific region is a shortage of trained, experienced and qualified personnel.

Training programmes targeting staff in appropriate universities and technical institutes can do much to address this shortcoming, especially if the training activities are coordinated with the many important initiatives being taken by UNEP's Environmental Education and Training Unit (EETU), the Industry and Environment Office (IE/PAC), IRPTC, the Secretariat for the Basel Convention (SBC) and the International Programme on Chemical Safety (IPCS), and by other organizations including the United Nations Institute for Training and Research (UNITAR), the Economic and Social Commission for Asia and the Pacific (ESCAP), the Asian Development Bank (ADB), the United Nations Industrial Development Organization (UNIDO), the International Labour Organization (ILO) and the World Health Organization (WHO).

Chemicals arise naturally and are a normal part of the environment, having been used by people since the beginning of civilization. Other chemicals are synthesized by humans. Again, many of these are used, to the benefit of modern life. However, some of these chemicals do exhibit toxic and other hazardous properties. Such materials require identification, reduced use, adoption of less hazardous alternatives and a "cradle to grave" approach to the management of the quantities in continuing use.

Based on recent estimates, the Asia-Pacific region produces approximately 50 million tons of hazardous waste each year. This is a significant proportion of the 300 to 400 million tons generated world wide, especially when the region's comparatively limited capacity to manage this waste is taken into account.

According to the International Register of Potentially Toxic Chemicals (IRPTC) there are more than 8 million known chemicals, with about 70,000 in common use. Each year between 1,000 and 2,000 new chemicals are released onto the market (UNEP, 1992).

Consequent priority areas for human resource development that impinge on the teaching and educational activities of tertiary institutions include the following themes, many of which are identified in Agenda 21:

- enhance capacity to contribute to and make use of national and international assessments of chemical risks;
- develop and use mechanisms for the risk management of chemicals;
- increased understanding and use of a new harmonized classification and compatible labelling system for chemicals;
- develop greater understanding and use of databases and other information systems on toxic chemicals;
- develop and use mechanisms for the safe production, management and use of dangerous

- materials, formulating programmes to substitute them with safer alternatives;
- promote and adopt interdisciplinary approaches to chemical safety problems;
  - encourage investigations into and promote the use of cost-effective alternatives for processes and substances that currently result in the generation of hazardous wastes;
  - seek and adopt economically attractive mechanisms leading to the ultimate phase out of those substances that present an unmanageable risk and are toxic, persistent and bio-accumulative;
  - explore and implement strategies that lead industry to adopt cleaner production methods, to invest in preventative and/or recycling technologies and to pursue hazardous waste minimization and management programmes which are environmentally sound;
  - promote the development and implementation of environmentally sound technologies;
  - develop methods for tracking the generation, movement, storage and disposal of hazardous wastes and for the identification of contaminated sites;
  - assist in the identification and application of methods for the environmentally sound disposal of hazardous wastes and for the rehabilitation of contaminated sites; and
  - encourage the development and implementation of procedures and programmes for hazardous waste audits and for regulation of hazardous processes, activities and materials generation.

Through research, tertiary institutions have already contributed extensively to the ability to manage toxic chemicals and hazardous wastes in ways which are environmentally sound and to the development of alternative approaches that avoid the use of toxic chemicals or the generation of hazardous wastes. Technology transfer and training and educational programmes for both students and members of the public and private sectors have led to these environmentally sound approaches achieving widespread use and acceptance. But the process is far from complete, and tertiary institutions still have a critical role to play.

On behalf of the Executive Director of the United Nations Environment Programme, Ms Elizabeth Dowdeswell, I invite you to consider this report on the Second Training and Resources Development Workshop Toxic Chemicals and Hazardous Waste Management and to use the contents to enhance the quality and relevance of related training programmes in the region. The workshop was convened by the Network for Environmental Training at Tertiary Level in Asia and the Pacific (NETTLAP), a project which receives considerable technical, administrative and financial support from UNEP's Regional Office for Asia and the Pacific. My office expresses its appreciation to the Government of India and to the Environmental Protection, Research and Training Institute for hosting the workshop. We are also indebted to the NETTLAP staff and the TCHW Thematic Network Coordinator and Nodes for their contribution to the workshop planning and implementation.

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