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SUSTAINABLE E-WASTE MANAGEMENT: PRINCIPLES AND PRACTICES

SUSTAINABLE E-WASTE MANAGEMENT

PRINCIPLES AND PRACTICES



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Sustainable E-Waste Management: Principles and Practices

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PREFACE

In an era defined by rapid technological advancement, e-waste has emerged as one of the most pressing environmental and socio-economic challenges of our time. The relentless pace of innovation brings with it a growing mountain of discarded electronics, posing significant threats to ecosystems, human health, and sustainable development, particularly in developing nations where informal recycling practices exacerbate the crisis.

This book, “*Sustainable E-Waste Management: Principles and Practices*”, seeks to explore the multifaceted dimensions of e-waste, offering a comprehensive examination of its environmental repercussions, socio-economic implications, and the evolving legal and policy responses aimed at mitigating its impact.

The chapters within this volume delve into critical aspects of e-waste management, beginning with foundational strategies for Successful E-Waste Management and Best Practices for Sustainable E-Waste Management, which highlight innovative and efficient approaches to recycling and disposal. The discussion then shifts to the Socio-Economic Impact of E-Waste in Third World Countries, where informal sectors often bear the brunt of hazardous waste handling, perpetuating cycles of poverty and environmental degradation.

An Environmental Impact Analysis further underscores the urgent need for systemic change, examining how toxic components from improperly processed e-waste contaminate soil, water, and air, with far-reaching consequences for biodiversity and public health.

A significant portion of this book is dedicated to the Role of the Indian Judiciary and Pollution Control Boards in Waste Management, analyzing landmark judgments and regulatory mechanisms that have shaped India’s approach to e-waste. The chapter on the Indian Judiciary as a Catalyst for Sustainable E-Waste Solutions explores how judicial interventions have spurred

policy reforms, corporate accountability, and public awareness, setting precedents for other nations grappling with similar challenges.

This book is intended for policymakers, environmentalists, legal scholars, waste management professionals, and concerned citizens who seek a deeper understanding of e-waste dynamics and the collaborative efforts required to forge a sustainable future. By combining research, case studies, and legal insights, we aim to contribute to the global dialogue on responsible e-waste management and inspire actionable solutions.

We extend our gratitude to the academicians, experts, researchers, and institutions whose work has informed this compilation. It is our hope that this book will serve as both a resource and a call to action, promoting awareness, innovation, and justice in the pursuit of a cleaner, greener planet.

Dr. Aijaz Husain

Dr. Seema Siddique

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CHAPTER 11

The Hidden Danger and E-Waste Impact on Health and Environment

Dr. Manzoor Khan & Huma Ausaf***

INTRODUCTION

The invention of various electronic gadgets has contributed to the improvement of people's living status, which is a result of increasing development and industrialization. "The widespread use of EEE is a direct result of the tremendous progress in information technology, which has simplified our lives significantly. But it is concerning that we are producing so much e-waste because of how quickly technology is improving and how quickly we upgrade to newer models with better specs and designs, as well as problems with compatibility. The need for ever-more-advanced technological devices is the primary driver of e-waste production. Its growth has been consistent and is likely to continue at a high rate. There will be more than 74.7 million metric tons (Mt) of electronic waste produced worldwide by 2030, up from 53.6 Mt in 2019 and 9.2 Mt in 2014. For example, in 1997, computers had an average lifespan of four to six years; by 2005, that number had dropped to about two years. Modern society's ever-increasing reliance on EEE has increased the strain on waste stream disposal facilities. Computers, mobile phones, screens, and other electronic devices, as well as industrial and domestic appliances, contribute significantly to the problem of solid waste. In the wrong hands, the waste's many dangerous chemicals and toxic metals could cause serious harm to both humans and the environment. Human ignorance and lax law enforcement are to blame for the poor management of e-waste in most regions of the globe. A number of factors upstream influence purchasing and disposal choices; for example, consumer preference for low-quality, newly-manufactured equipment has a

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