Recycling Research Paper

Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions begins with an introduction to the different types of plastic materials, their uses, and the concepts of reduce, reuse and recycle before examining plastic types, chemistry and degradation patterns that are organized by non-degradable plastic, degradable and biodegradable plastics, biopolymers and bioplastics. Other sections cover current challenges relating to plastic waste, explain the sources of waste and their routes into the environment, and provide systematic coverage of plastic waste treatment methods, including mechanical processing, monomerization, blast furnace feedstocks, gasification, thermal recycling, and conversion to fuel. This is an essential guide for anyone involved in plastic waste or recycling, including researchers and advanced students across plastics engineering, polymer science, polymer chemistry, environmental science, and sustainable materials. Presents actionable solutions for reducing plastic waste, with a focus on the concepts of collection, re-use, recycling and replacement Considers major societal and environmental issues, providing the reader with a broader understanding and supporting effective implementation Includes detailed case studies from across the globe, offering unique insights into different solutions and approaches

Reducing the amount of solid wastes in landfills is one of the main targets in nowadays wastes treatment. To this direction, there is a great need in finding of smart recycling techniques which should, as is possible, to be environmentally friendly. The intention of this book is to present some recent methods for the recycling of several materials, including plastics and wood, as well as to show the importance of composting of polymers. It targets professionals, recycling companies, researchers, academics and graduate students in the fields of waste management and polymer recycling in addition to chemical engineering, mechanical engineering, chemistry and physics. This book comprises 5 chapters covering areas such as, recycling of polystyrene, polyesters, PC, WEEE and wood waste, together with compostable polymers and nanocomposites.

This book provides insights into waste management practices in developing countries, and the application of research and innovation in finding appropriate solutions to improved waste management. The chapters have been selected with a focus on organic waste beneficiation, a significant waste stream in developing countries; the role of government and associated policy interventions; citizen behaviour in support of greater waste recycling; and the safe management of hazardous waste, particularly healthcare risk waste.

Research Ethics for Scientists is about best practices in all the major areas of research management and practice that are common to scientific researchers, especially those in academia. Aimed towards the younger scientist, the book critically examines the key areas that continue to plague even experienced and well-meaning science professionals. For ease of use, the book is arranged in functional themes and units that every scientist recognizes as crucial for sustained success in science; ideas, people, data, publications and funding. These key themes will help to highlight the elements of successful and ethical research as well as challenging the reader to develop their own ideas of how to conduct themselves within their work. Tackles the ethical issues of being a scientist rather than the ethical questions raised by science itself Case studies used for a practical approach Written by an experienced researcher and PhD mentor Accessible, user-friendly advice Indispensible companion for students and young scientists

This is an examination of the history and the state of the art of the quest for visualizing scientific knowledge and the dynamics of its development. Through an interdisciplinary perspective this book presents profound visions, pivotal advances, and insightful contributions made by generations of researchers and professionals, which portrays a holistic view of the underlying principles and mechanisms of the development of science. This updated and extended second edition: highlights the latest advances in mapping scientific frontiers examines the foundations of strategies, principles, and design patterns provides an integrated and holistic account of major developments across disciplinary boundaries “Anyone who tries to follow the exponential growth of the literature on citation analysis and scientometrics knows how difficult it is to keep pace. Chaomei Chen has identified the significant methods and applications in visual graphics and made them clear to the uninitiated. Derek Price would have loved this book which not only pays homage to him but also to the key players in information science and a wide variety of others in the sociology and history of science.” – Eugene Garfield “This is a wide ranging book on information visualization, with a specific focus on science mapping. Science mapping is still in its infancy and many intellectual challenges remain to be investigated and many of which are outlined in the final chapter. In this new edition Chaomei Chen has provided an essential text, useful both as a primer for new entrants and as a comprehensive overview of recent developments for the seasoned practitioner.” – Henry Small Chaomei Chen is a Professor in the College of Information Science and Technology at Drexel University, Philadelphia, USA, and a ChangJiang Scholar at Dalian University of Technology, Dalian, China. He is the Editor-in-Chief of Information Visualization and the author of Turning Points: The Nature of Creativity (Springer, 2012) and Information Visualization: Beyond the Horizon (Springer, 2004, 2006).

Paper recycling in an increasingly environmentally conscious world is gaining importance. Increased recycling activities are being driven by robust overseas markets as well as domestic demand. Recycled fibers play a very important role today in the global paper industry as a substitute for virgin pulps. Paper recovery rates continue to increase year after year Recycling technologies have been improved in recent years by advances in pulping, flotation deinking and cleaning/screening, resulting in the quality of paper made from secondary fibres approaching that of virgin paper. The process is a lot more eco-friendly than the virgin-papermaking process, using less energy and natural resources, produce less solid waste and fewer atmospheric emissions, and helps to preserve natural resources and landfill space. Currently more than half of the paper is produced from recovered papers. Most of them are used to produce brown grades paper and board but for the last two decades, there is a substantial increase in the use of recovered papers to produce, through deinking, white grades such as newsprint, tissue, market pulp. By using recycled paper, companies can take a significant step toward reducing their overall environmental impacts. This study deals with the scientific and technical advances in recycling and deinking including new developments. Covers in great depth all the aspects of recycling technologies Covers the latest science and technology in recycling Provides up-to-date, authoritative information and cites many mills experiences and pertinent research Includes the use of biotech methods for deinking, refining. and improving drainage

Volume 3: Managing the Ecosystem focuses on those ecosystems in which human intervention has been or continues to be predominant, specifically within cities and rural areas.

Winner of the International Solid Waste Association's 2014 Publication Award, Handbook of Recycling is an authoritative review of the current state-of-the-art of recycling, reuse and reclamation processes commonly implemented today and how they interact with one another. The book addresses several material flows, including iron, steel, aluminum and other metals, pulp and paper, plastics, glass, construction materials, industrial by-products, and more. It also details various recycling technologies as well as recovery and collection techniques. To completely round out the picture of recycling, the book considers policy and economic implications, including the impact of recycling on energy use, sustainable development, and the environment. With contemporary recycling literature scattered across disparate, unconnected articles, this book is a crucial aid to students and researchers in a range of disciplines, from materials and environmental science to public policy studies. Portrays recent and emerging technologies in metal recycling, by-product

utilization and management of post-consumer waste Uses life cycle analysis to show how to reclaim valuable resources from mineral and metallurgical wastes Uses examples from current professional and industrial practice, with policy and economic implications

“Guides readers toward the road less consumptive, offering practical advice and moral support while making a convincing case that individual actions . . . do matter.” —Elizabeth Royte, author, Garbage Land and Bottlemania Like many people, Beth Terry didn’t think an individual could have much impact on the environment. But while laid up after surgery, she read an article about the staggering amount of plastic polluting the oceans, and decided then and there to kick her plastic habit. In Plastic-Free, she shows you how you can too, providing personal anecdotes, stats about the environmental and health problems related to plastic, and individual solutions and tips on how to limit your plastic footprint. Presenting both beginner and advanced steps, Terry includes handy checklists and tables for easy reference, ways to get involved in larger community actions, and profiles of individuals—Plastic-Free Heroes—who have gone beyond personal solutions to create change on a larger scale. Fully updated for the paperback edition, Plastic-Free also includes sections on letting go of eco-guilt, strategies for coping with overwhelming problems, and ways to relate to other people who aren’t as far along on the plastic-free path. Both a practical guide and the story of a personal journey from helplessness to empowerment, Plastic-Free is a must-read for those concerned about the ongoing health and happiness of themselves, their children, and the planet.

Advances in Construction and Demolition Waste Recycling: Management, Processing and Environmental Assessment is divided over three parts. Part One focuses on the management of construction and demolition waste, including estimation of quantities and the use of BIM and GIS tools. Part Two reviews the processing of recycled aggregates, along with the performance of concrete mixtures using different types of recycled aggregates. Part Three looks at the environmental assessment of non-hazardous waste. This book will be a standard reference for civil engineers, structural engineers, architects and academic researchers working in the field of construction and demolition waste. Summarizes key recent research in recycling and reusing concrete and demolition waste to reduce environmental impacts Considers techniques for managing construction and demolition waste, including waste management plans, ways of estimating levels of waste, and the types and optimal location of waste recycling plants Reviews key steps in handling construction and demolition waste

Sustainable Industrial Design and Waste Management was inspired by the need to have a text that enveloped awareness and solutions to the ongoing issues and concerns of waste generated from industry. The development of science and technology has increased human capacity to extract resources from nature and it is only recently that industries are being held accountable for the detrimental effects the waste they produce has on the environment. Increased governmental research, regulation and corporate accountability are digging up issues pertaining to pollution control and waste treatment and environmental protection. The traditional approach for clinical waste, agricultural waste, industrial waste, and municipal waste are depleting our natural resources. The main objective of this book is to conserve the natural resources by approaching 100 % full utilization of all types of wastes by cradle – to - cradle concepts, using Industrial Ecology methodology documented with case studies. Sustainable development and environmental protection cannot be achieved without establishing the concept of industrial ecology. The main tools necessary for establishing Industrial Ecology and sustainable development will be covered in the book. The concept of “industrial ecology will help the industrial system to be managed and operated more or less like a natural ecosystem hence causing as less damage as possible to the surrounding environment. Numerous case studies allow the reader to adapt concepts according to personal interest/field Reveals innovative technologies for the conservation of natural resources The only book which provides an integrated approach for sustainable development including tools, methodology, and indicators for sustainable development

The presently common practice of wastes' land-filling is undesirable due to legislation pressures, rising costs and the poor biodegradability of commonly used materials. Therefore, recycling seems to be the best solution. The purpose of this book is to present the state-of-the-art for the recycling methods of several materials, as well as to propose potential uses of the recycled products. It targets professionals, recycling companies, researchers, academics and graduate students in the fields of waste management and polymer recycling in addition to chemical engineering, mechanical engineering, chemistry and physics. This book comprises 16 chapters covering areas such as, polymer recycling using chemical, thermo-chemical (pyrolysis) or mechanical methods, recycling of waste tires, pharmaceutical packaging and hardwood kraft pulp and potential uses of recycled wastes.

This book covers the technology of the recovery of secondary fibre for its use in paper and board manufacture. The editor, who has had substantial practical experience of designing and commissioning paper recycling plants all over the world, leads a team of experts who discuss subjects including sourcing, characterisation, mechanical handling and preparation and de-inking.

This report provides analysis of long-range trends in paper recycling and impacts on the timber outlook for the 1993 RPA Assessment Update. Paper recycling is projected to increase substantially in the next decade, followed by more gradual increases in subsequent decades. Increased recycling will extend timber resources and fiber supply.

How the success and popularity of recycling has diverted attention from the steep environmental costs of manufacturing the goods we consume and discard. Recycling is widely celebrated as an environmental success story. The accomplishments of the recycling movement can be seen in municipal practice, a thriving private recycling industry, and widespread public support and participation. In the United States, more people recycle than vote. But, as Samantha MacBride points out in this book, the goals of recycling—saving the earth (and trees), conserving

resources, and greening the economy—are still far from being realized. The vast majority of solid wastes are still burned or buried. MacBride argues that, since the emergence of the recycling movement in 1970, manufacturers of products that end up in waste have successfully prevented the implementation of more onerous, yet far more effective, forms of sustainable waste policy. Recycling as we know it today generates the illusion of progress while allowing industry to maintain the status quo and place responsibility on consumers and local government. MacBride offers a series of case studies in recycling that pose provocative questions about whether the current ways we deal with waste are really the best ways to bring about real sustainability and environmental justice. She does not aim to debunk or discourage recycling but to help us think beyond recycling as it is today.

Readers discover the important steps in the process of recycling paper in order to help the environment. Age-appropriate language, vivid imagery, and a relatable narrative will grab students' attention, keeping them engaged while also equipping them with the skills they need to become thoughtful readers. This book provides additional learning opportunities through a graphic organizer, glossary, and index.

Public concern for the conservation of natural resources and a general awareness of the environmental consequences of waste disposal is reflected in current legislation aimed at reducing waste. Recycling is commonly cited as one of the preferred methods of waste reduction and this book summarizes a recent study of paper recycling in Europe, which investigated the entire production and disposal process using a life-cycle methodology. The results of the study underline the economic and environmental advantages of paper recycling, but more controversially, they also show how, under certain conditions, the renewable character and the high energy content of paper seem to make energy recovery more attractive than recycling.

Recycling of Polyethylene Terephthalate Bottles provides an overview of PET chemistry, highlighting the main degradation, depolymerization processes and pathways of PET, along with the applications of recycled monomers derived from PET waste. The latest methodologies of recycling and feedstock recovery are covered, providing critical foundational information. In addition, the book discusses a range of established methods of polymer recycling, with an emphasis on real world industrial case studies and the latest academic research. Users will find in-depth lifecycle and cost analysis of each waste management method, comparing the suitability and feasibility of each to support the decision -making process. Polyethylene Terephthalate (PET) is the most recycled plastic in the world, but still represents a significant amount of landfill waste. This book presents an update on new regulations, providing recommendations for new opportunities in this area, including new processing methods and applications for recycled PET. Features a comprehensive introduction to the waste management of PET bottles, from regulatory concerns, to the range of different methods of materials recovery Enables practitioners to choose the most efficient and effective waste management process Includes detailed lifecycle and cost analysis information Compares traditional thermal recycling methods with more recently developed monomer recovery and chemical recycling methods

#1 Bestseller in waste management Stop Garbage sheds some light on the world of waste and recycling, topics often filled with questions for most readers. Do we really know why it's important to recycle and the consequences of not doing it? What environmental impact does our behavior have? What trends will prevail in waste management during the next decade? Far from being a technical book, Stop Garbage introduces us to the field of waste and recycling in a clear and enjoyable way. It deals with garbage or waste, whatever you want to call it, but in it you will also find a kidnapping, a destroyer, successes, food waste, the biggest dump in the world, the first incinerator, questions about money and employment or riddles: how many times can you fill the Camp Nou Stadium with one year's waste? How many trees do we save from felling if we recycle paper? What's the best waste in the world? Added to this, multimedia content, articles and videos make up a didactic book of reading which is, without a shadow of a doubt, entertaining. After years of experience in the sector, Alex Pascual (Barcelona, 1976) brings us closer to the key concepts that can help us to formulate our own opinion on the subject. A book full of vital data as well as funny anecdotes that will trigger successive reflections on waste management, undoubtedly one of the pillars of the contemporary and future commitment to the environment. About the author Industrial Engineer specialist in waste management, street cleaning and public services. He has been working in the private sector for many years and now, after more than nine years works as a public services chief for a city council. He also writes on a blog about the same subject www.stopgarbage.com, Twitter profile @stopbasura1 and on Instagram as @stopbasura. Readers reviews " It is a very affordable book for anyone who wants to know how the recycling system works in Spain. With a simple language and away from the technicalities, step by step the writer introduces you to why it is important to recycle, the main magnitudes in our country and the recycling process of each container ." Nicolás "This is a good book to understand the garbage and what represents in our society. It is impressive to read the data and interpretation that the author gives us ..."Luis "Very good book, practical, with a surprising data that reveals and the clarity of the explanation. Despite containing a large amount of information, its reading is enjoyable and facilitated by numerous graphics, links to websites, etc. The book really opens your eyes to the world of recycling! Highly recommended. "Dani

An overview of recycling as an activity and a process, following different materials through the waste stream. Is there a point to recycling? Is recycling even good for the environment? In this volume in the MIT Press Essential Knowledge series, Finn Arne Jørgensen answers (drumroll, please): it depends. From a technical point of view, recycling is a series of processes—collecting, sorting, processing, manufacturing. Recycling also has a cultural component; at its core, recycling is about transformation and value, turning material waste into something useful—plastic bags into patio furniture, plastic bottles into T-shirts. Jørgensen offers an accessible and engaging overview of recycling as an activity and as a process at the intersection of the material and the ideological. Jørgensen follows a series of materials as they move back and forth between producer and consumer, continually transforming in form and value, in a never-ceasing journey toward becoming waste. He considers organic waste and cultural contamination; the history of recyclable writing surfaces from papyrus to newsprint; discarded clothing as it moves from the the Global North to the Global South; the shifting fate of glass bottles; the efficiency of aluminum recycling; the many types of plastic and the difficulties of informed consumer choice; e-waste and technological obsolescence; and industrial waste. Finally, re-asking the question posed by John Tierney in an infamous 1996 New York Times article, “is recycling garbage?” Jørgensen argues that recycling is necessary—as both symbolic action and physical activity that has a tangible effect on the real world.

The book points out that rural regions need proper attention at the global level concerning solid waste management sector where bad practices and public health threats could be avoided through traditional and integrated waste management routes. Solid waste management in rural areas is a key issue in developing and transitioning countries due to the lack of proper waste management facilities and services. The book further examines, on the one hand, the main challenges in the development of reliable waste management practices across rural regions and, on

the other hand, the concrete solutions and the new opportunities across the world in dealing with municipal and agricultural wastes. The book provides useful information for academics, various professionals, the members of civil society, and national and local authorities.

WEEE Recycling: Research, Development, and Policies covers policies, research, development, and challenges in recycling of waste electrical and electronic equipment (WEEE). The book introduces WEEE management and then covers the environmental, economic, and societal applications of e-waste recycling, focusing on the technical challenges to designing efficient and sustainable recycling processes—including physical separation, pyrometallurgical, and hydrometallurgical processes. The development of processes for recovering strategic and critical metals from urban mining is a priority for many countries, especially those having few available ores mining. Describes the two metallurgical processes—hydro- and pyro-metallurgy—and their application in recycling of metals Provides a life cycle analysis in the WEEE recycling of metals Outlines how to determine economic parameters in the recycling of waste metals Discusses the socio economic and environmental implication of metal recycling

The theory of social capital cannot be universally applied unless it is contextualised according to the local conditions of a given society. Based on extensive field research in Dhaka and Chittagong this book shows that collective action works well when the public has confidence in the prevailing law and order situation.

The International Year of Fruits and Vegetables 2021 (IYFV), as declared by the UN General Assembly in Resolution A/RES/74/244, aims at raising awareness of, directing policy attention to, and sharing good practices on the nutritional and health benefits of fruit and vegetable consumption, the contribution of fruit and vegetable consumption to the promotion of diversified, balanced and healthy diets and lifestyles, and reducing loss and waste of fruits and vegetables. This background paper outlines the benefits of fruit and vegetable consumption, but also examines the various aspects of the fruit and vegetable sector from a food systems approach: from sustainable production and trade to loss and waste management. This paper provides an overview of the sector and a framework and a starting point for discussion for the Year, highlighting the interlinkages of stakeholders and key issues to be considered for action during the IYFV.

This important book is an overall analysis of different innovative methods and ways of recycling in connection with various types of materials. It aims to provide a basic understanding about polymer recycling and its reuse as well as presents an in-depth look at various recycling methods. It provides a thorough knowledge about the work being done in recycling in different parts of the world and throws light on areas that need to be further explored. Emphasizing eco-friendly methods and recovery of useful materials The book covers a wide variety of innovative recycling methods and research, including • Green methods of recycling • Effective conversion of biomass and municipal wastes to energy-generating systems • A catalyst for the reuse of glycerol byproduct • Methods of adsorption to treat wastewater and make it suitable for irrigation and other purposes • Disposal of sludge • The use of calcined clay to replace both fine and coarse aggregates • Recycling of rubbers • The production of a sorbent material for paper mill sludge • Replacing polypropylene absorbent in oil spill sanitations • The use of natural fibers for various industrial applications • Cashew nut shell liquid as a source of surface active reagents • Integrated power and cooling systems based on biomass • Recycling water from household laundering • much more

Tire Waste and Recycling takes a methodical approach to the recycling of tires, providing a detailed understanding on how to manage, process, and turn waste tires into valuable materials and industrial applications. Sections cover fundamental aspects such as tire use, composition, trends, legislation, the current global situation, the possibilities for moving towards a circular economy, lifecycle options, treatment methods, and opportunities for re-use, recycling and recovery. Subsequent sections of the book focus on specific technologies that enable the utilization of waste tires in the development of high value materials and advanced applications. Finally, the future of tire recycling is considered. This is an essential resource for scientists, R&D professionals, engineers and manufacturers working in the tire, rubber, waste, recycling, automotive and aerospace industries. In academia, the book will be of interest to researchers and advanced scientists across rubber science, polymer science, materials engineering, environmental science, chemistry and chemical engineering. Offers systematic coverage of tire recycling, covering composition, lifecycle, processing options, material developments and latest technologies Explains end-of-life-options in detail, considering approaches and methods for reduction, re-use, recycling and recovery Explores key application and product areas for recycled tire materials, from civil engineering, sports and leisure, to roads and transport, construction, automotive, and many more

Recycling and Deinking of Recovered PaperElsevier

The purpose of this project is to compare emissions of greenhouse gases from material recycling with those from virgin material production, both from a material supply perspective and from a recycling system perspective. The method for estimating emissions and climate benefits is based on a review, followed by a selection, of the most relevant publications on life cycle assessment (LCA) of materials for use in Denmark, Norway and Sweden. The proposed averages show that emissions from material recycling are lower in both perspectives, comparing either material supply or complete recycling systems. The results can be used by companies and industry associations in Denmark, Norway and Sweden to communicate the current climate benefits of material recycling in general. They may also contribute to discussions on a societal level, as long as their average and historic nature is recognised.

Economic, marketing, and legislative considerations are increasingly leading companies to take back and recover their products after use. From a logistics perspective, these initiatives give rise to new goods flows from the user back to the producer. The management of these goods flows opposite to the traditional supply chain flows is addressed in the recently emerged field of Reverse Logistics. This monograph considers quantitative models that support decision making in Reverse Logistics. To this end, several recent case studies are reviewed. Moreover, first

hand insight from a study on used electronic equipment is reported on. On this basis, logistics issues arising in the management of "reverse" goods flows are identified. Moreover, differences between Reverse Logistics and more traditional logistics contexts are highlighted. Finally, attention is paid to capturing the characteristics of Reverse Logistics in appropriate quantitative models.

Solid Waste Recycling and Processing, Second Edition, provides best-practice guidance to solid waste managers and recycling coordinators. The book covers all aspects of solid waste processing, volume reduction, and recycling, encompassing typical recyclable materials (paper, plastics, cans, and organics), construction and demolition debris, electronics, and more. It includes techniques, technologies, and programs to help maximize customer participation rates and revenues, as well as to minimize operating costs. The book is packed with lessons learned by the author during the implementation of the most successful programs worldwide, and includes numerous case studies showing how different systems work in different settings. This book also takes on industry debates such as the merits of curbside-sort versus single-stream recycling and the use of advanced technology in materials recovery facilities. It provides key facts and figures, and brief summaries of legislation in the United States, Europe, and Asia. An extensive glossary demystifies the terminology and acronyms used in different sectors and geographies. The author also explains emerging concepts in recycling such as zero waste, sustainability, LEED certification, and pay-as-you-throw, and places waste management and recycling in wider economic, environmental (sustainability), political, and societal contexts. Covers single- and mixed-waste streams Evaluates the technologies and tradeoffs of recycling of materials vs. integrated solutions, including combustion and other transformational options Covers recycling as part of the bigger picture of solid waste management, processing and disposal

Polymers, main components of plastics and rubbers, are being discarded in increasing quantities. But this waste can also be considered as `plastic gold'. Public concern, coupled with the inherent value of the material, means that recycling is imperative. The present book presents a survey of current knowledge in the form of case studies, including current legal and educational issues. Topics covered also include regulation and practice in NATO countries, the economics of recycling, the reprocessing of single polymers and mixtures, and future prospects and strategies. Audience: Vital reading for all polymer scientists, technicians and engineers.

Nanomaterial Recycling provides an update on the many benefits nanomaterials can provide on both environmental and economic issues. Sections cover the appropriate recycling strategies of nanowastes, nanowaste regulations (including nanowaste disposal and recycling standards), promising applications (reuses) of these recycled nanomaterials, and various methods used for the separation of nanoparticles, including (i) centrifugation, (ii)solvent evaporation, (iii) magnetic separation, (iv) using pH/thermal responsive materials, (v) molecular antisolvents, (vi) nanostructured colloidal solvents, and more. This book is an important reference source for materials scientists and engineers who are seeking to increase their understanding of nanomaterials, recycling processes and techniques. As nanomaterials can be recycled from both new/pure products (from nano manufacturing) and used products (nano waste: waste from nano integrated products), this book is a welcomed addition to many disciplines. Provides information on how nanoscale recycling techniques can mitigate the most hazardous effects of nanomaterials Explains the major recycling processes and techniques used for nanoscale materials Assesses the major challenges of implementing nanoscale recycling approaches in a scalable and cost-effective manner