

REVIEW

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Trending research topics on carbon footprint and supply chains: a bibliometric analysis based on the Scopus data (2019–2023)

Ismail Abdi Changalima^{1*}, Prisca Pascrates Rutatola² and Goodluck Goldian Ntangeki³

Abstract

This study analyzes the publication trend, most active contributors, most influential publications and trending research topics on the current context of carbon footprint and supply chains. The study conducted a bibliometric analysis of 809 documents retrieved from Scopus, published between 2019 and 2023, to identify trends, contributors, top publications, and trending topics. With the help of Harzing's Publish or Perish and VOSviewer, the study employed performance analysis and keyword co-occurrence analysis. The study reveals an upward trajectory in the number of publications in this research domain. Additionally, the study identifies several themes through keyword co-occurrence analysis, including 'the application of regulatory mechanisms and game theory in carbon emission reductions,' 'strategies and mechanisms for enhancing low-carbon initiatives within supply chains,' 'the development and optimization of sustainable supply chain systems to reduce carbon emissions,' 'the use of simulation and optimization models for CO₂ emission reduction in supply chain and logistics operations,' 'financial legislation and mechanisms for improving carbon emission reductions,' 'the impact of logistics and supply chain operations on carbon emissions and climate change,' and 'the carbon footprint in supply chains and cold chain logistics operations.' This review emphasizes the need of adopting low-carbon technologies to enhance sustainable practices within supply chains. The study highlights the role of advanced technologies in efforts linked to carbon reduction. The study also advocates for a multifaceted policy approach, including encouraging innovation, and implementing financial mechanisms to reduce carbon emissions, especially in logistics and supply chain operations.

Keywords Carbon footprint, Carbon emission, Supply chains, Sustainable supply chain, Low-carbon supply chain, Bibliometrics

Introduction

Over the past years, environmentalists, academics, and various stakeholders have increasingly focused on environmental impacts and climate change concerns. This is intriguing as the negative impact on the environment

affect biodiversity and human operations on Earth. It has been reported that carbon emissions account for the largest portion of global emissions [1, 2]. Despite efforts being made to address this issue, academics continue to express concerns. Their concerns show that environmental aspects need to be more focused on with efforts from the government, customers, and businesses [3–10]. This triggers aspect related to carbon footprint, which refers to the overall quantity of greenhouse gases, mainly carbon dioxide, released directly or indirectly through human activities [11]. Measuring and managing carbon emission is crucial for reducing environmental impacts and addressing climate change [12–15].

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Carbon Footprint Trending

R Bogdan

A red circular graphic with a gradient, appearing as a stylized arrow or a partial circle, located to the right of the author's name.

Carbon Footprint Trending:

Ecological Economics Research Trends Carolyn C. Pertsova, 2007 This new book presents important research in the field of ecological economics which is a trans disciplinary field of academic research that addresses the dynamic and spatial interdependence between human economies and natural ecosystems Ecological economics brings together and connects different disciplines within the natural and social sciences but especially between these broad areas Ecological economics presents a more pluralistic approach to the study of environmental problems and policy solutions characterised by systems perspectives adequate physical and biological contexts and a focus on long term environmental sustainability *Future Trends in Modern Plastics* Johannes Karl Fink, 2024-04-02 *Future Trends in MODERN PLASTICS* The prolific author and polymer scientist discusses the current topics in the plastics industry and recommends future research in sustainable polymers and the recycling routes of plastic waste The book opens with a chapter discussing newly developed monomers such as alkylene based monomers epoxide monomers diol based monomers bio based monomers and several other types Modern polymerization methods are then explained such as ionic polymerization plasma polymerization and ring opening polymerization The book moves on to special issues and some future trends in the plastics industry with recommendations for future research Plastics have given society enormous benefits because of their versatility light weight durability and low costs However these properties have come with negative impacts because these persistent materials are leaked into the environment during their entire life cycle Therefore critical chapters report on the future directions for sustainable polymers the valorization of plastic waste and the recovery treatment and recycling routes of plastic waste The book concludes with chapters on the usage of plastics in medical devices as well as the use of plastics in restoration food applications additive classes and manufacturing Audience The book will be used by plastics engineers chemists polymer and materials scientists in both academia and the plastics industry **15 Entrepreneurship Trends for 2025** Jon S. Wilson, Dhruvesh Panchal, Khalid Wani, Sumit Varma, Aman Nayak, Madhuvan Singh Panwar, Shiven Varma, 2025-04-26 The book *Entrepreneurship Trends for 2025* is a comprehensive guide for aspiring business leaders and innovators seeking to thrive in the fast evolving landscape of modern entrepreneurship Drawing from cutting edge trends this book explores the latest advancements in technology business strategy and consumer behavior offering invaluable insights on how to navigate and capitalize on the opportunities of the future Written by an expert in the field it provides actionable advice real world examples and practical frameworks to help entrepreneurs launch and scale successful ventures Whether you are starting your first business or scaling an existing one this book equips you with the knowledge and tools necessary to stay ahead in a rapidly changing world **RECENT TRENDS IN CHEMICAL SCIENCES AND ENVIRONMENTAL SCIENCE** Dr. Azad Kumar, Dr. Rajesh Kumar Singh, Dr. Yashvant Rao, 2021-11-18 Our intention in publishing this book was to discuss and interpret all of the major issues in the chemical and environmental science disciplines because this book covers such a broad range of chemical and environmental

science research area Rather we have selected the themes and challenges briefly defined them and demonstrated how they connect clarified the terminology and indicated where further research may be accessed We hope that the result is an excellent introduction to chemical and environmental science It is primarily aimed towards researchers in chemical science and related fields but it should be accessible to new researchers as well We have explored into more depth on issues that have received little attention elsewhere There are several useful sources for topics such as chemical science environmental science nanotechnology ionic liquids solid waste management photodegradation Nanomaterial adsorption of hazardous metals and conducting polymers However we attempted to provide up to current knowledge we are well aware that books may soon go out of date if they seek to provide too much detail so we concentrated on basic concepts that should not go out of fashion too quickly Our book differs somewhat from other texts in the chemical and environmental sciences in its concentration We have focused on ideas and theories because we feel that a solid grasp of them will be more useful in the long run than specifics of present systems services and approaches We ve also highlighted the dimension since we feel it s critical to understand where the discipline and its components originated from and why some things are the way they are This approach is based on the research with several references provided at the end of each chapter for convenience Our intention is that the content of this book will be sufficient to provide a fundamental knowledge of the entire field and that readers will refer to the references for more information and examples of the parts of which they are most interested The conclusion words and captions as well as the important references at the conclusion of each chapter are intended to present the main points in a factual way

AI Future Fortunes: AI-Powered Trends for Long-Term Investors Jeffery Long,2024-08-15
AI Future Fortunes AI Powered Trends for Long Term Investors In the world of investing staying ahead of the curve is crucial for long term success This is where AI powered trend analysis comes into play By harnessing the power of artificial intelligence investors can gain valuable insights into market trends and make informed decisions that can lead to future fortunes This subchapter will serve as an introduction to AI investing exploring the benefits and potential pitfalls of utilizing AI technology in the world of finance

Recent Trends in Civil Engineering K. K. Pathak,J. M. S. J. Bandara,Ramakant Agrawal,2020-09-27 This book presents the selected peer reviewed proceedings of the International Conference on Recent Trends and Innovations in Civil Engineering ICRTICE 2019 The volume focuses on latest research and advances in the field of civil engineering and materials science such as design and development of new environmental materials performance testing and verification of smart materials performance analysis and simulation of steel structures design and performance optimization of concrete structures and building materials analysis The book also covers studies in geotechnical engineering hydraulic engineering road and bridge engineering building services design engineering management water resource engineering and renewable energy The contents of this book will be useful for students researchers and professionals working in civil engineering

Innovations and Trends in Environmental and Agricultural Informatics Papajorgji,

Petra, Pinet, Francois, 2018-05-09 In recent years the role of information and communications technologies in the development of agriculture and environmental issues has received significant attention in different types of international forums. With new technologies constantly developing, there is a need for research dedicated to technological progress. *Innovations and Trends in Environmental and Agricultural Informatics* provides emerging research on the design, development, and implementation of complex agricultural and environmental information systems addressing the integration of several scientific domains including agronomy, mathematics, economics, and computer science. While highlighting topics such as image quality assessment, environmental policy, and supervised classification, this publication explores the applications and progress of various technologies within agricultural and environmental professions. This book is an important resource for researchers, professionals, academics, students, and scientists seeking current research on the rapidly evolving field of technology integration in agricultural production and environmental issues. *Current Trends in Environmental Psychology, volume I, 2nd edition* Giuseppe Carrus, Eugenio De Gregorio, Frederica Caffaro, Sabine Pirchio, Lorenza Tiberio, 2023-07-18 This Research Topic is linked to the 3rd International Conference of Environmental Psychology ICEP 2021 to be held in Siracusa, Italy, 4-9 October 2021. The ICEP is one of the most important scientific events in the global community for experienced scholars, junior researchers, and professionals working in the field of Environmental Psychology across the world. Submissions to this Research Topic welcome but are not limited to works that have been presented on site and virtually at the ICEP 2021. Research Topic articles will be published immediately once accepted in the journal. This Research Topic aims to promote the scientific debate over the most recent empirical findings and theoretical advances in Environmental Psychological science and to build evidence-based knowledge and innovative approaches to understand the relationship between humans and their socio-physical environments. It aims at hosting empirical and theoretical works that contribute to advancing our scientific knowledge on some of the most urgent challenges of contemporary human society. *Emerging Trends in Computer Science and Its Application* Anurag Tiwari, Manuj Darbari, 2025-04-08 The conference brought together a diverse group of scholars, researchers, and industry professionals to engage in meaningful discussions and share insights on cutting-edge trends in artificial intelligence, machine learning, data science, and their multifaceted applications. This collaboration and knowledge exchange fostered an environment of innovation, making the conference a successful and impactful event for all participants. It aimed to highlight these significant advancements and serve as a valuable resource for researchers, academicians, and practitioners who wish to stay informed about the recent innovations and methodologies shaping the landscape of computational intelligence. By showcasing a wide range of research topics and practical implementations, it not only addressed the current challenges but also inspired new ideas and approaches for future research. *The New Trend of Global Industrial Division of Labor and China's Responses* Bei Jin, Qizi Zhang, 2022-11-02 This book explores the dynamic process of International Division of Labor with constant

development and changes The process reflects not only the development level of productivity but also relations between countries What would be the evolution path for the International Division of Labor How to improve China s and emerging economies competitiveness to meet the new industrial revolution The book aims to answer the questions under the global context China would explore the innovation in new economic forms to strengthen international cooperation and avoid the intensified trade frictions brought about by its industrial upgrading

Carbon Footprint Trending Book Review: Unveiling the Power of Words

In a global driven by information and connectivity, the energy of words has be more evident than ever. They have the capability to inspire, provoke, and ignite change. Such may be the essence of the book **Carbon Footprint Trending**, a literary masterpiece that delves deep to the significance of words and their affect our lives. Compiled by a renowned author, this captivating work takes readers on a transformative journey, unraveling the secrets and potential behind every word. In this review, we shall explore the book is key themes, examine its writing style, and analyze its overall impact on readers.

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web mar 24 2020 in this session participants will use a simple procedure to extract dna from wheat germ what does dna look like is wheat dna structurally different than human dna join us to answer these questions and more in this session participants will learn about the structure of dna explore some important chemical principles

dna extraction experiment mit department of biology - Nov 06 2022

web if you want to keep the dna for further experiments 13 dunk several time the spooled dna into a small tube containing clean alcohol and let air dry 14 at this point you can store the dna in sterile water in the freezer notes if you do not open the lid while the wheat germ is settling carbon dioxide will build up in the tube

wheat germ wheat cell nucleus outreach - Jan 08 2023

web today we are going to extract dna from wheat germ this exploration station highlights some of the areas that can be focused on with a degree in genetics or molecular biology how is wheat germ dna extraction directly related to genetics on the large scale view of things such as a career in genetics and projects such as the human genome project

dna extraction from wheat germ salk institute for biological - Feb 09 2023

web from wheat germ protocol salk institute mobile lab step 1 obtain a numbered 50 ml conical vial with 10 ml of water write your number here step 2 to the tube with 10 ml water add 1g 1 pinch of raw wheat germ the wheat germ should settle to fill 1 2 the cone step 3 cap the tube and vigorously shake to mix for about 30 seconds

dna extraction from wheat germ lab studylib net - Feb 26 2022

web purpose the purpose of this lab is to extract dna from wheat germ iii hypothesis if you add wheat germ water soap and alcohol then the dna should appear iv materials 1 gram raw wheat germ 50 ml test tube 20 ml hot 50 60 deg c tap water frac14 teaspoon detergent soap paper towel 14 ml 91 alcohol v procedure 1

year of amoris laetitia family usccb - Mar 31 2022

web jun 26 2022 pope francis announced the year of amoris laetitia family during his angelus message on the feast of the

holy family on december 27 2020 he ended his address by invoking the blessed mother may the virgin mary grant that families throughout the world be increasingly fascinated by the evangelical ideal of the holy family so as to

vatican declares popes john paul ii and john xxiii saints - Mar 11 2023

web apr 27 2014 pope francis has declared popes john paul ii and john xxiii saints in front of a crowd of hundreds of thousands he praised his two predecessors as men of courage at the vatican service the

pope francis in turkey arrival in istanbul 2014 11 29 - Sep 05 2022

web starts at 9 30 am arrival at atatürk international airport of istanbul

pope francis declares jubilee year for the first pope who quit - Jul 15 2023

web jul 8 2014 on july 5 2014 pope francis declared a year of jubilee this concept originated in the hebrew bible s book of leviticus and offers a special occasion for the remission of sins and divine pardon it is a kind of gift from god to humankind which in a catholic context may be instituted by the pope

pope francis proclaims year of st joseph catholic news agency - Dec 28 2021

web dec 8 2020 pope francis announced a year of st joseph tuesday in honor of the 150th anniversary of the saint s proclamation as patron of the universal church the year begins dec 8 2020 and concludes on

pope francis jubilee year 2025 can restore hope after years of - Jan 29 2022

web feb 11 2022 pope francis has set in motion the preparations for the jubilee year 2025 which he believes can contribute greatly to restoring a climate of hope and trust as a prelude to the renewal and

pope francis arrival in turkey 2014 11 28 youtube - Nov 07 2022

web starts at 12 00pm pope francis apostolic journey to turkey begins the papal plane lands at ankara s esemboga airport

pope francis wikipedia - Feb 10 2023

web the pope along with the government of canada was a behind the scenes broker of the agreement taking the role following president obama s request during his visit to the pope in march 2014

pope eugene iv wikipedia - Jul 03 2022

web pope eugene iv latin eugenius iv italian eugenio iv 1383 23 february 1447 born gabriele condulmer was head of the catholic church and ruler of the papal states from 11 march 1431 to his death in february 1447 condulmer was a venetian and a nephew of pope gregory xii in 1431 he was elected pope his tenure was marked by conflict first

what will pope francis proclaim the year of 2014 to be - Aug 16 2023

web oct 30 2013 the liturgical year of faith 2013 is winding down and one can t help speculating what pope francis will proclaim the year 2014 to be let s first start with the secular fantasy wish list 1 transformation of the church of course not society 2 non judgment of morality of course not the holy church 3

pope francis launches consultation on church reform bbc news - Jun 02 2022

web oct 10 2021 pope francis has launched what some describe as the most ambitious attempt at catholic reform for 60 years a two year process to consult every catholic parish around the world on the future

pope francis names 2014 year of terror eott llc - Jun 14 2023

web nov 24 2013 vatican in his general audience today pope francis announced that he would be naming 2014 the year of terror since it is difficult to balance the various challenges of the papacy while finding time to decide what to call this upcoming year i have decided that the year of terror best represents what we ought to be focusing on

pope francis proclaims year of st joseph vatican news - Oct 06 2022

web dec 8 2020 with the apostolic letter patris corde with a father s heart pope francis recalls the 150th anniversary of the declaration of saint joseph as patron of the universal church to mark the occasion the holy father has proclaimed a year of saint joseph from today 8 december 2020 to 8 december 2021

2014 was a banner year for pope francis - May 13 2023

web jan 1 2015 in 2014 pope francis inserted himself as a peacemaker into the israeli palestinian conflict during a landmark trip to the middle east he also played a key role in mending us cuba relations the pope has taken multiple actions to make catholic churches much more gay friendly

pope wikipedia - Aug 04 2022

web the pope latin papa from greek πάππας romanized páppas lit father 2 3 also known as the supreme pontiff pontifex maximus or summus pontifex roman pontiff romanus pontifex or sovereign pontiff is the bishop of rome or historically the patriarch of rome 4 head of the worldwide catholic church and has also

general audience of 15 january 2014 francis vatican - Jan 09 2023

web jan 15 2014 pope francis general audience saint peter s square wednesday 15 january 2014 video dear brothers and sisters good morning last wednesday we started a brief cycle of catecheses on the sacraments beginning with baptism

jubilee in the catholic church wikipedia - May 01 2022

web the pope speaks rather of a celebration which is to occur every 100 years but writers both roman and foreign described this year as annus jubileus and the name jubilee though others such as the holy year or the golden year have been used as well has been applied to such celebrations ever since 1

francis announces new global jubilee the holy year of mercy - Dec 08 2022

web mar 13 2015 the last extraordinary jubilee year was held in 1983 to celebrate 1 950 years since the death and resurrection of jesus francis on friday said the new jubilee would begin on this year s catholic

homilies 2014 francis vatican - Apr 12 2023

web homilies 2014 celebration of vespers and te deum of thanksgiving for the end of the year 31 december 2014 english
french german italian polish portuguese spanish

pope paul iv wikipedia - Feb 27 2022

web he was crowned as pope on 26 may 1555 by the protodeacon he formally took possession of the basilica of saint john
lateran on 28 october 1555 papacy as pope paul iv s nationalism was a driving force he used the office to preserve some
liberties in the face of fourfold foreign occupation