GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

OCTOBER 15-16, 2025 / KAYSERI, TÜRKİYE

ABSTRACT BOOK

EDITORS

Prof. Dr. Oktay ÖZKAN

Assoc. Prof. Dr. Şükrü Taner AZGIN

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CONGRESS ID

CONGRESS TITLE
INTERNATIONAI GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

DATE and PLACE
October 15-16, 2025 / Erciyes University, Kayseri, Türkiye

PARTICIPATION
Invited & Oral & Poster

ORGANIZATION
Sustainability Coordinatorship, Erciyes University
IKSAD-Institute of Economic Development and Social Research, Türkiye

PARTICIPANTS COUNTRY
Albania, Algeria, Argentina, Australia, Azerbaijan, Bangladesh, Bulgaria, China, Czechia, Egypt, Georgia, Hong Kong, Hungary, India, Indonesia, Iran, Kazakhstan, Kosovo, Lithuania, Malaysia, Morocco, Niger, Nigeria, Oman, Pakistan, Portugal, Romania, Russia, Saudi Arabia, Tunisia, Türkiye, TRNC, UAE, UK, Ukraine, USA, Vietnam

Number Of Accepted Papers-**274**
Number Of Rejected Papers-**47**
The number of abstracts from foreign countries-**141**
The number of abstracts from Türkiye-**133**

EVALUATION PROCESS
All applications have undergone a double-blind peer review process

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GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

OCTOBER 15-16, 2025 / KAYSERI, TÜRKİYE

CONGRESS PROGRAM

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GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

OPENING CEREMONY

Erciyes University Faculty of Engineering
Date: 15.10.2025

09:30-10:30	Registration
10:30-11:00	Opening Speeches
	Assoc. Prof. Dr. Şükrü Taner AZGIN Sustainability Coordinator of Erciyes University HEAD OF ORGANIZING BOARD
	Dr. Atabek MOVLYANOV General Coordinator of IKSAD Institute CONGRESS COORDINATOR
	Prof. Dr. Fatih ALTUN Rector of Erciyes University HONORARY HEAD OF CONGRESS
11:00-11:40	**Yunus Emre ŞEKER** Secretary General of the Central Anatolia Development Agency INVITED SPEAKER
11:40-11:50	Plaque Ceremony
12:00-13:30	Lunch

Participants Country: Albania, Algeria, Argentina, Australia, Azerbaijan, Bangladesh, Bulgaria, China, Czechia, Egypt, Georgia, Hong Kong, Hungary, India, Indonesia, Iran, Kazakhstan, Kosovo, Lithuania, Malaysia, Morocco, Niger, Nigeria, Oman, Pakistan, Portugal, Romania, Russia, Saudi Arabia, Tunisia, Türkiye, TRNC, UAE, UK, Ukraine, USA, Vietnam

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-1 / SESSION-1 / TSI Time-13^{30}:15^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assist. Prof. Dr. Erhan MUĞALOĞLU**

Theme: Sustainable Economy and Governance

Authors	Affiliation	Presentation title
Assoc. Prof. Dr. Veysel KARAGÖL **Res. Assist. Dr. Ayşegül ŞAHİN**	Van Yüzüncü Yıl University, Türkiye Anadolu University, Türkiye	FROM SUSTAINABILITY RISKS TO FOOD PRICE SHOCKS: THE ROLE OF ESG-BASED SUSTAINABILITY UNCERTAINTY
Assoc. Prof. Dr. Ahmet AYSU **Mehmet Ali ASLAN**	Erciyes University, Türkiye	THE PLACE AND IMPORTANCE OF COMPETITIVE PRODUCTION WITHIN THE TWELFTH DEVELOPMENT PLAN AND SUSTAINABLE DEVELOPMENT GOALS
Assoc. Prof. Dr. Öznur Begüm GÖKÇEK **Arife Gözde AKAN** **Prof. Dr. Sevgi DEMİREL**	Niğde Ömer Halisdemir University, Türkiye Ayakizi Akademi San. ve Tic. Ltd. Şti., Türkiye	INTEGRATED SUSTAINABILITY STRATEGIES IN INDUSTRY
Dr. Seçil YILDIZ	Independent Researcher, Türkiye	THE IMPACT OF CBAM ON GLOBAL GREEN TRANSITION: A SUSTAINABILITY ANALYSIS OF THE AGRICULTURAL SECTOR THROUGH THE GTAP-E MODEL
Prof. Dr. Sadettin PAKSOY	Gaziantep University, Türkiye	THE EFFECTS OF THE CLIMATE BULLWHIP ON THE AGRICULTURAL SECTOR
Elif ÖZKOÇ	Dokuz Eylül University, Türkiye	RESILIENCE, EU ENLARGEMENT PROCESS AND UKRAINE: THE EFFECT OF GEOPOLITICAL SHIFT IN EU EXTERNAL POLICY
Betül İÇELLİOĞLU **Prof. Dr. Şaban UZAY**	Erciyes University, Türkiye	THE ROLE OF INTERNAL AUDIT IN SUSTAINABILITY REPORTING AND ASSURANCE AUDITING

ERCİYES ÜNİVERSİTESİ SÜRDÜRÜLEBİLİRLİK KOORDİNATÖRLÜĞÜ

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-2 / SESSION-1 / TSI Time-13^{30}:15^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assoc. Prof. Dr. Şükrü Taner AZGIN**

Theme: Clean Energy, Climate and Water Systems

Authors	Affiliation	Presentation title
Lect. Dr. Serap BOLAYIR **Assoc. Prof. Dr. Hayriye Hilal BAĞLITAŞ**	Cumhuriyet University, Türkiye Erciyes University, Türkiye	AFFORDABLE and CLEAN ENERGY within the SCOPE of SUSTAINABLE DEVELOPMENT GOALS and TURKIYE'S CURRENT SITUATION
Assist. Prof. Dr. İbrahim UYANIK **Assoc. Prof. Dr. Alper SOLMAZ**	Erciyes University, Türkiye	SUSTAINABLE WASTEWATER FILTRATION: GRAVITY-DRIVEN DYNAMIC MEMBRANE FOR THE EFFLUENTS OF WASTEWATER TREATMENT PLANTS
Assist. Prof. Dr. Şeyma AKKURT	Adıyaman University, Türkiye	CARBON NEUTRAL WASTEWATER TREATMENT PLANTS AND THEIR ROLE IN ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS
Mehmet Can ŞENEL **Prof. Dr. Nesrin KAYATAŞ DEMİR**	Erciyes University, Türkiye	ALBEDO EFFECT OF DIFFERENT GROUND CONDITIONS AND PERFORMANCE ANALYSIS IN PHOTOVOLTAIC SYSTEMS
Ennur Rabia YAMAÇ **Prof. Dr. Aysel Çağlan GÜNAL** **Assoc. Prof. Dr. Şükrü Taner AZGIN**	Gazi University, Türkiye Erciyes University, Türkiye	DEVELOPING A CALCULATION TOOL WITH CURRENT GLOBAL DATA FOR HOTEL CARBON FOOTPRINT WITHIN THE SCOPE OF SUSTAINABLE TOURISM
Lect. Dr. Serap BOLAYIR **Assoc. Prof. Dr. Nevzat BALIKÇIOĞLU**	Cumhuriyet University, Türkiye Erciyes University, Türkiye	LIFE BELOW WATER GOAL and the CONCEPT of BLUE ECONOMY
Assoc. Prof. Dr. Öznur Begüm GÖKÇEK **Arife Gözde AKAN** **Prof. Dr. Sevgi DEMİREL**	Niğde Ömer Halisdemir University, Türkiye Ayakizi Akademi San. ve Tic. Ltd. Şti., Türkiye	CARBON FOOTPRINT MANAGEMENT IN CLIMATE CHANGE ADAPTATION STRATEGIES

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-3 / SESSION-1 / TSI Time-13^{30}:15^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assist. Prof. Dr. Saltuk Buğra SELÇUKLU**

Theme: Smart and Digital Sustainability

Authors	Affiliation	Presentation title
Res. Assist. Berra Nur TUNÇ Res. Assist. Selver GÜNGÖR Prof. Dr. Erkan BEŞDOK Assoc. Prof. Dr. Ümit Haluk ATASEVER	Erciyes University, Türkiye	ERCNET: A NEW SHALLOW NETWORK FOR WATER BODY SEGMENTATION FROM SATELLITE IMAGERY
Res. Assist. Esma KARAKOYUN YAŞAR Prof. Dr. Z. Özlem PARLAK BİÇER	Niğde Ömer Halisdemir University, Türkiye Erciyes University, Türkiye	THE USE OF ARTIFICIAL INTELLIGENCE TOOLS IN BIBLIOMETRIC META-ANALYSIS IN THE FIELD OF SUSTAINABLE CONSTRUCTION MANAGEMENT: QWEN3- MAX
Dr. Çağlar TABAK Nehir YILDIRIM Zehra Bahar ÇİÇEK	Ministry of Transport and Infrastructure, Türkiye Middle East Technical University, Türkiye	RISK MAPPING, TECHNOLOGY, AND ARTIFICIAL INTELLIGENCE APPLICATIONS IN WILDFIRE MANAGEMENT: CASES FROM TÜRKİYE AND THE WORLD
Res. Assist. Dr. Fikriye Ceren BOSTANCI Prof. Dr. Selçuk KOÇ	Kocaeli University, Türkiye	AN ECONOMETRIC ANALYSIS OF THE IMPACT OF RENEWABLE ENERGY USE AND ENVIRONMENTAL TECHNOLOGY DEVELOPMENT ON CO2 EMISSIONS
Prof. Dr. Selçuk KOÇ Res. Assist. Dr. Fikriye Ceren BOSTANCI	Kocaeli University, Türkiye	ANALYSIS OF THE RELATIONSHIP BETWEEN CO_2 EMISSIONS AND HUMAN DEVELOPMENT USING NON-LINEAR METHODS

SÜRDÜRÜLEBİLİRLİK KOORDİNATÖRLÜĞÜ

15.10.2025 / HALL-4 / SESSION-1 / TSI Time-13^{30}:15^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assoc. Prof. Dr. Burcu SALGIN**

Theme: Urban Systems and Resilient Societies

Authors	Affiliation	Presentation title
Ece BOZ **Assist. Prof. Dr. Mazlum AR**	Kırşehir Ahi Evran University, Türkiye	THE IMPACT OF VERTICAL URBANIZATION ON SOCIO-SPATIAL LIFE IN TURKEY
Lect. Dr. Sümeyra AYIK **Assist. Prof. Dr. Sinan AKYÜZ**	Abdullah Gül University, Türkiye	EQUITABLE CITY DESIGN THROUGH PARTICIPATORY EDUCATION: A MODEL FOR ARCHITECTURE AND URBAN PLANNING STUDENTS
Dr. Çağlar TABAK **Zehra Bahar ÇİÇEK** **Nehir YILDIRIM**	Ministry of Transport and Infrastructure, Türkiye Middle East Technical University, Türkiye	THE EFFECTS OF INTERNAL MIGRATION DYNAMICS ON URBANIZATION AND SOCIO- ECONOMIC DEVELOPMENT IN TURKEY
Assist. Prof. Dr. Elif ÜZEL **Lect. Seda ÇOLAK**	Kayseri University, Türkiye	A BIBLIOMETRIC STUDY ON GREEN AIRPORT PRACTICES WITHIN THE SCOPE OF SUSTAINABILITY

Theme: Sustainable Agriculture: From Ecological Impact to Human Behavior

Authors	Affiliation	Presentation title
Assist. Prof. Dr. Hatice BEKCİ	Kayseri University, Türkiye	THE EFFECTS OF SUSTAINABLE AGRICULTURE ON BIOLOGICAL ACTIVITY
Nurcan VARİYENLİ **Prof. Dr. Mustafa METİN**	Erciyes University, Türkiye	A SYSTEMATIC ANALYSIS OF PERMACULTURE AND SUSTAINABLE AGRICULTURE PRACTICES
Nurcan VARİYENLİ **Prof. Dr. Mustafa METİN**	Erciyes University, Türkiye	CONTENT ANALYSIS OF ATTITUDE AND AWARENESS STUDIES TOWARDS SUSTAINABLE DEVELOPMENT

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-1 / SESSION-2 / TSI Time-15^{30}:17^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assist. Prof. Dr. Selman SEVİNDİK**

Theme: Sustainable Design, Architecture and Materials

Authors	Affiliation	Presentation title
İsmet ZARARSIZ **Lect. Dr. Merve GÜLER**	Bozok University, Türkiye	A SUSTAINABLE RESTORATION APPROACH FOR REFUNCTIONING CULTURAL HERITAGE: THE YOZGAT HOUSING EXAMPLE
Berkan KAHVECİOĞLU **Prof. Dr. Semra ARSLAN SELÇUK**	Gazi University, Türkiye	"BARRIER-FREE CAMPUS" APPROACH FOR SUSTAINABLE AND ACCESSIBLE UNIVERSITY CAMPUSES: THE CASE OF ERCİYES UNIVERSITY
Ayla KARAKAYA **Assist. Prof. Dr. Güzin Yeliz KAHYA**	Erciyes University, Türkiye	THE ADAPTIVE REUSE OF INDUSTRIAL HERITAGE AND COLLECTIVE MEMORY: THE CASE OF THE KAYSERI SÜMERBANK FACTORY
Dilara KALLİ **Assist. Prof. Dr. Selman SEVİNDİK**	Erciyes University, Türkiye	COMPARATIVE ANALYSIS OF ADOBE AND REINFORCED CONCRETE IN THE CONTEXT OF SUSTAINABLE BUILDING MATERIALS
Mehmet Umut KUTLU **Altay Şamil KUTLU** **Dr. Bora AKİNCE** **İpek KUTLU AKYÜZ**	GCM Group, Türkiye Abdullah Gül University, Türkiye	MixPack INFRARED SHIRINK
Dr. Bora AKİNCE	Abdullah Gül University, Türkiye	THE PHOENIX PROJECT: YOUTH RISING ABOVE POLARIZATION

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-2 / SESSION-2 / TSI Time-15^{30}:17^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assoc. Prof. Dr. Esra KIZILAY**

Theme: Education, Communication and Behavioral Change

Authors	Affiliation	Presentation title
Lect. Dr. Sümeyra AYIK **Assist. Prof. Dr. Sinan AKYÜZ**	Abdullah Gül University, Türkiye	WORKSHOP PROGRAM on SUSTAINABLE DEVELOPMENT GOALS TROUGH GAMES for CHILDREN
Assoc. Prof. Dr. Meltem ŞAHİN HASSAN	Erciyes University, Türkiye	SUSTAINABILITY COMMUNICATION IN THE POST-TRUTH AGE
Res. Assist. Meltem ULU **Res. Assist. Sevde GÜNER**	Erciyes University, Türkiye	ENHANCING SUSTAINABILITY AWARENESS THROUGH GAMIFICATION ON THE ERCİYES UNIVERSITY CAMPUS: A CONCEPTUAL APPROACH BASED ON UI GREENMETRİC CRITERIA
Dr. Tülin FİLİK **Prof. Dr. Demet ÜNALAN**	Erciyes University, Türkiye	FACTORS AFFECTING THE DISASTER RISK PERCEPTION OF THE DENTISTRY PRACTICE AND RESEARCH CENTER EMPLOYEES
Beyzanur OLÜÇ **Lect. Berna AKIN**	Erciyes University, Türkiye	IMPACT OF SUSTAINABILITY-FOCUSED RANKING SYSTEMS ON UNIVERSITIES: THE CASE OF THE IMPACT RANKING
Assist. Prof. Dr. Sümeyra AYIK **Assoc. Prof. Dr. Kemal KOCA**	Abdullah Gül University, Türkiye	CAN ARTIFICIAL INTELLIGENCE SHAPE LIFELONG LEARNING AT MODERN EDUCATION FOR THE FUTURE WORLD?
Assist. Prof. Dr. Sümeyra AYIK **Assoc. Prof. Dr. Kemal KOCA**	Abdullah Gül University, Türkiye	ROLE OF ARTIFICIAL INTELLIGENCE ON SUSTAINABILITY OF EDUCATION SYSTEM

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-3 / SESSION-2 / TSI Time-15^{30}:17^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assist. Prof. Dr. İbrahim UYANIK**

Theme: Circular Production and Waste Management

Authors	Affiliation	Presentation title
Assist. Prof. Dr. Esra AKGÜL	Erciyes University, Türkiye	VALORIZATION OF FURNITURE INDUSTRY WASTE IN THE TEXTILE SECTOR WITHIN THE FRAMEWORK OF INDUSTRIAL SYMBIOSIS
Fatih TORUNOĞLU Mert Can YALÇIN Hamdi YAPICI Fatma OĞUZ	Turkuaz Seramik A.Ş., Türkiye	USABILITY OF WASTE IN CERAMIC SANITARYWARE PROCESSES
Fatih TAT Fatih TORUNOĞLU Mehmet GÖKALP	Turkuaz Seramik A.Ş., Türkiye	INVESTIGATION OF THE USABILITY OF CERAMIC WASTES AS ALTERNATIVE RAW MATERIALS IN SSG PRODUCTION: CHARACTERIZATION TECHNIQUES
Dr. Fatma Seda CUNDUBEY Assoc. Prof. Dr. Şükrü Taner AZGIN	Erciyes University, Türkiye	THE BENEFITS OF SUSTAINABLE COTTON-TO-ENERGY PRODUCTION FOR DENIM FABRIC
Murat Yahya GAZİOĞLU Ali ÇİFTÇİ	Orta Anadolu T.A.Ş., Türkiye	A SUSTAINABLE APPROACH FOR THE RECOVERY OF CAUSTIC SOLUTION IN THE MERCERIZATION PROCESS
Assist. Prof. Dr. Duygu AGHAZADEH	University of Turkish Aeronautical Association, Türkiye	TOWARDS SUSTAINABLE REVERSE LOGISTICS: A TSP-INSPIRED OPTIMIZATION FRAMEWORK FOR MEDICAL WASTE WITH EXACT AND LEARNING-BASED METHODS
Hatice BERAT ORHAN Assoc. Prof. Dr. Nadide Sevil TÜLÜCE	Kayseri University, Türkiye	THE IMPACT OF FAST FASHION ON ECOLOGICAL BALANCE AND HEALTH
Res. Assist. Dr. Merve ÇAPAŞ Ayşe Nur ÇENET	Erciyes University, Türkiye	LIFE CYCLE ASSESMENT BASED WASTE STRATEGIES FOR VEGETABLE OIL INDUSTRY AND SUSTAINABLE DEVELOPMENT GOALS
Res. Assist. Mustafa ÖZDEMİR Assoc. Prof. Dr. Selma BÜYÜKKILIÇ BEYZİ Prof. Dr. Mehmet Ulaş ÇINAR	Erciyes University, Türkiye	INTEGRATING GENOMIC INSIGHTS, NUTRITIONAL STRATEGIES, AND ANIMAL HEALTH FOR SUSTAINABLE LIVESTOCK PRODUCTION

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-4 / SESSION-2 / TSI Time-15^{30}:17^{30}

Erciyes University, Faculty of Engineering

HEAD OF SESSION: **Assoc. Prof. Dr. Orhan KEKLİKCİOĞLU**

Theme: Industrial Design and Product Innovation

Authors	Affiliation	Presentation title
Ayşe Nur DAYDAŞ BAŞKAN **Ahmet Semih KIŞLA**	Konya Technical University, Türkiye Yenar Döküm Sanayi ve Ticaret Anonim Şirketi, Türkiye	THE CARBON FOOTPRINT ASSESSMENT OF ROLLING MILL ROLLS MANUFACTURED BY CASTING METHOD
Tuğçe NEBİOĞLU	Femaş Metal Industry Kayseri, Türkiye	SILENT AND ENERGY-EFFICIENT RANGE HOOD DESIGN DEVELOPED WITH BLDC MOTOR TECHNOLOGY
Zulfiqar ALI **Assoc. Prof. Dr. Gözde TANTEKİN-ÇELİK**	Cukurova University, Türkiye	HOW GREEN CEMENT REDUCES THE BURDEN of NATURE: A SUSTAINABLE SOLUTION
Lect. Dr. Onur TOPRAK	Erciyes University, Türkiye	SUSTAINABLE GRAPHIC DESIGN SOLUTIONS, ECO-FRIENDLY PRACTICES AND MATERALS
Gözde AYKUT ÖZBİLGİN	Femaş Metal Industry Kayseri, Türkiye	CARDBOARD-BASED PACKAGING DESIGN FROM A CIRCULAR ECONOMY PERSPECTIVE: THE CASE OF THE RANGE HOOD
Ağustos GERÇE	Erciyes University, Türkiye	REFLECTION OF ENVIRONMENTAL SUSTAINABILITY-THEMED ADVERTISEMENTS ON CONSUMER DECISION-MAKING PROCESSES

ERCİYES ÜNİVERSİTESİ SÜRDÜRÜLEBİLİRLİK KOORDİNATÖRLÜĞÜ

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

OCTOBER 15-16, 2025 / KAYSERI, TÜRKİYE

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GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-1 / SESSION-1 / TSI Time-10^{00}:12^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Prof. Dr. Arzu AL

Authors	Affiliation	Presentation title
Prof. Dr. Arzu AL **Hatice Vildan KABASAKAL**	Marmara University, Türkiye	THE DISCUSSION OF THE CONCEPT OF TECHNOPOLITICS IN ARTIFICIAL INTELLIGENCE: THE CASE OF CHINA–USA
Dr. Mehmet Kaan ÖNEM	Independent Researcher, Türkiye	NATO'S ENVIRONMENTAL SECURITY APPROACH
Assoc. Prof. Dr. Çiğdem TUĞAÇ	Ankara Hacı Bayram Veli University, Türkiye	AN ASSESSMENT OF THE CONTRIBUTIONS OF SMART CITY APPLICATIONS TO THE SUSTAINABLE DEVELOPMENT GOALS
Assoc. Prof. Dr. Tuna BATUHAN	Atatürk University, Türkiye	SUSTAINABILITY REPORTING IN UNIVERSITIES: A GOVERNANCE-ORIENTED EVALUATION
Assoc. Prof. Dr. Tuna BATUHAN	Atatürk University, Türkiye	WHAT SHOULD SUSTAINABILITY MEAN FOR UNIVERSITIES? RETHINKING BEYOND GLOBAL INDICATORS
Res. Assist. Pınar KARAMAN YALÇIN	Marmara University, Türkiye	SUSTAINABLE DEVELOPMENT GOALS AND FOOD SOVEREIGNTY: A COMMON ROADMAP AGAINST CLIMATE CHANGE
Res. Assist. Cemre Edip YALÇIN	Sakarya University, Türkiye	THE RIGHT TO A HEALTHY ENVIRONMENT AND SUSTAINABLE DEVELOPMENT: A COMPLEMENTARY RELATIONSHIP BETWEEN LAW AND POLICY
Şükrü ÇİFTÇİ	Erciyes University, Türkiye	ECOLOGICAL CITIZENSHIP BEYOND LIBERAL AND REPUBLICAN MODELS

ERCİYES ÜNİVERSİTESİ SÜRDÜRÜLEBİLİRLİK KOORDİNATÖRLÜĞÜ

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-2 / SESSION-1 / TSI Time-10^{00}:12^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assoc. Prof. Dr. Huriye Simten SÜTÜNÇ

Authors	Affiliation	Presentation title
Assoc. Prof. Dr. Huriye Simten SÜTÜNÇ	Siirt University, Türkiye	AI AND SMART TECHNOLOGIES FOR SUSTAINABLE CAMPUS TRANSFORMATION: A ROADMAP FOR SIIRT UNIVERSITY
Tuğba HAŞAL **Prof. Dr. Nilüfer TAŞ** **Prof. Dr. Murat TAŞ**	Bursa Uludağ University, Türkiye	THE IMPACTS OF GLOBAL CLIMATE CHANGE ON WATER RESOURCES AND INNOVATIVE WATER MANAGEMENT SOLUTIONS IN BUILDINGS FOR SUSTAINABLE DEVELOPMENT: APPLICATION EXAMPLES FROM TURKEY AND AROUND THE WORLD
Assist. Prof. Dr. İlayda SOYUPAK **Assist. Prof. Dr. Ozan SOYUPAK**	Marmara University, Türkiye	CITY-SPECIFIC PATHWAYS: LOCALIZED SUSTAINABILITY PRACTICES ACROSS TURKISH MUNICIPALITIES
Gökçen Ay KARADENİZ **Assist. Prof. Dr. Selman SEVİNDİK**	Erciyes University, Türkiye	THE ROLE OF PUBLIC BUILDINGS IN COMBATING CLIMATE CHANGE: ENERGY-EFFICIENT TRANSFORMATION APPROACHES
Gökçen Ay KARADENİZ **Assist. Prof. Dr. Selman SEVİNDİK**	Erciyes University, Türkiye	ENERGY AND WATER EFFICIENCY IN RECREATIONAL AREAS: BIOCLIMATIC COMFORT PARK AREA
Semra SÜTÇÜ **Assoc. Prof. Dr. Erhan KURTARIR**	Yıldız Technical University, Türkiye	ASSESSING URBAN TRANSFORMATION IN LINE WITH SUSTAINABILITY PRINCIPLES: A SKA-11 FOCUSED APPROACH
Assoc. Prof. Dr. Merve TUNA KAYILI	Karabuk University, Türkiye	THE IMPACT OF THE EU's DIGITAL PRODUCT PASSPORT ON CONSTRUCTION MATERIALS: TRANSPARENCY, TRACEABILITY, AND COMPETITIVE ADVANTAGES
Assoc. Prof. Dr. Merve TUNA KAYILI	Karabuk University, Türkiye	POLICY APPROACHES IN CITIES AND THE CONSTRUCTION SECTOR WITHIN THE FRAMEWORK OF CIRCULARITY INDICATORS: LESSONS FROM THE EU FOR TURKEY
Res. Assist. Dr. Gözde KESTELLİOĞLU **Assoc. Prof. Dr. Gamze DOĞDU YÜCETÜRK**	Erciyes University, Türkiye Bolu Abant İzzet Baysal University, Türkiye	FROM ASHES TO LIFE: SUSTAINABLE APPROACHES IN POST-FIRE URBAN RECONSTRUCTION

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-3 / SESSION-1 / TSI Time-10^{00}:12^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assist. Prof. AMRITHA LJ

Authors	Affiliation	Presentation title
Assist. Prof. AMRITHA LJ **Sreejith J**	Sri Ramachandra Institute of Higher Education and Research, India	GREEN ECONOMY: A CATALYST FOR SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES – AN EMPIRICAL ANALYSIS
Lect. Dr. Chukwuemeka G. Eme	National Open University of Nigeria, Nigeria	KNOWLEDGE MANAGEMENT AND ITS IMPORTANCE IN NIGERIA'S PUBLIC AND PRIVATE BUSINESS ENTERPRISES
Lect. Dr. Chukwuemeka G. Eme	National Open University of Nigeria, Nigeria	GLOBALIZATION OF ECONOMIES AND THE SUSTAINABLE DEVELOPMENT OF THREE SELECTED EURO-DOLLAR COUNTRIES
Assoc. Prof. Dr. Muhammad Umer Quddoos **Tahira Kanwal** **Munawwar Hussain** **Kazim Abbas** **Muhammad Tayyeb Hafeez**	Bahauddin Zakariya University Multan, Pakistan	BIBLIOMETRIC ANALYSIS OF LITERATURE ON SUSTAINABILITY REPORTING THROUGH SOCIAL MEDIA
Sani Abdullahi Sule	Saadatu Rimi College of Education, Nigeria	THE ROLE OF AI IN SHAPING DECENTRALIZED FINANCIAL PRODUCTS: IMPLICATIONS FOR GLOBAL ECONOMIC INEQUALITY
Neny Desriani **Aryan Danil Mirza** **Resha Moniyana Putri** **Sartini**	Universitas Lampung, Indonesia	BALANCING REWARDS FOR SUSTAINABLE PERFORMANCE: A LITERATURE REVIEW ON FINANCIAL AND NON-FINANCIAL COMPENSATION
Neny Desriani **Aryan Danil Mirza** **Joni Putra** **Reza Arliantari**	Universitas Lampung, Indonesia	SUSTAINABLE RESEARCH CULTURE THROUGH DIGITAL LITERACY: EMPOWERING STUDENTS WITH PUBLISH OR PERISH AND VOSVIEWER
Dr. Sobia Naseem	Hunan University of Arts and Science, China	THE NEXUS BETWEEN RENEWABLE ENERGY, REFORESTATION, AND ECONOMIC GROWTH: PATHWAYS TOWARD SUSTAINABLE DEVELOPMENT

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-4 / SESSION-1 / TSI Time-10^{00}:12^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Prof. Dr. Marwa Tamim A. Abdel-Wareth

Authors	Affiliation	Presentation title
Assoc. Prof. Dr. Rajeev Kumar	Manav Rachna International Institute of Research and Studies, India	SUSTAINABLE MATERIALS FOR THE REMOVAL OF HEAVY METALS AND OTHER CONTAMINANTS FROM WASTEWATER
Lect. Nguyen Thi Huynh Phuong **Nguyen Thi Be Ba** **Ly My Tien** **Le Thi To Quyen** **Nguyen Thi Hong Ngan**	Can Tho University, Vietnam	DRIVERS OF ECOTOURISM DEVELOPMENT IN TAY NINH PROVINCE, VIETNAM
Sikiru IBRAHIM-OLESIN **Lateef Lawal ADEFALU** **Sidiqat Adeyemi ADERINOYE-ABDULWAHAB** **Chibuzo Uzoma IZUOGU** **Sanni Bashir MOHAMMED**	Alex Ekwueme Federal University, Nigeria University of Ilorin, Nigeria Kwara State Polytechnic, Nigeria	SUSTAINABLE LIVELIHOOD INDEX AND DETERMINANTS OF LIVELIHOOD STATUS OF MAIZE FARMERS IN KWARA STATE, NIGERIA: AN IN-DEPTH ANALYSIS
Prof. Dr. Marwa Tamim A. Abdel-Wareth	Theodor Bilharz Research Institute, Egypt	CLIMATE CHANGE AND THE SUSTAINABILITY OF FRESHWATER ECOSYSTEMS
Jayathilaka H.B.T.P.	Henan University, China	A REVIEW OF GLOBAL PERSPECTIVES ON SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE: A BIBLIOMETRIC ANALYSIS
Diajeng Fitri WULAN	University of Lampung, Indonesia	DO BOARD CHARACTERISTICS EFFECT THE CLIMATE CHANGE REPORTING IN INDONESIA?
Ganesh Kumar **R.Y Hiranmai** **Harshita Marwal** **Ajay Neeraj**	Central University of Gujarat, India	NANO-VERMICOMPOST FROM AGRICULTURAL WASTE AS A SUSTAINABLE ALTERNATIVE TO SYNTHETIC FERTILIZERS

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-5 / SESSION-1 / TSI Time-10^{00}:12^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assist. Prof. Dr. Manjeet Yadav

Authors	Affiliation	Presentation title
Oyewole Oluwaseun	Sikiru Adetona College of Education, Nigeria	INTEGRATING SUSTAINABILITY INTO ECONOMICS EDUCATION: PREPARING LEARNERS FOR INCLUSIVE GROWTH AND SUSTAINABLE DEVELOPMENT
Assist. Prof. Dr. Manjeet Yadav	R.L.S. College of Education, India	SUSTAINABILITY EDUCATION
Bandana Chowdhury **Deepjyoti Nath**	Gauhati University, India Girijananda Chowdhury University, India	EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) IN INDIA: THE ROLE OF THE NATIONAL EDUCATION POLICY (NEP) 2020
Farid Uddin Khan	Nohor Foundation, Bangladesh	INCLUSIVE AI WORKFORCE DEVELOPMENT: A MIXED-METHODS ANALYSIS OF DISABILITY-CENTERED TECHNOLOGY EDUCATION IN BANGLADESH
Dr. Le Tran Thanh LIEM **Bui Thi Bich LIEN** **Dr. Pham Ngoc NHAN** **Nguyen Thi Kim PHUOC**	Can Tho University, Vietnam Tra Vinh University, Vietnam Kien Giang University, Vietnam	TRENDS IN SUSTAINABLE DEVELOPMENT EDUCATION IN ASIAN UNIVERSITIES: A COMPARATIVE PERSPECTIVE AND RECOMMENDATIONS FOR VIETNAM
Sidra Bnao **Assoc. Prof. Dr. Irfan Bashir**	University of Management and Technology, Pakistan	EFFECT OF SUSTAINABLE LEADERSHIP PRACTICES ON ORGANIZATIONAL COMMITMENT OF HIGHER EDUCATION FACULTY IN PAKISTAN
Yusthina Hardiyati Ndolu	Christian University of Indonesia, Indonesia	SUSTAINABLE EDUCATION AS A TRANSFORMATIVE PLATFORM: BUILDING AWARENESS AND CAPABILITIES FOR A SUSTAINABLE WORLD

15.10.2025 / HALL-1 / SESSION-2 / TSI Time-12^{30}:14^{30}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assist. Prof. Dr. Sahin AYDIN

Authors	Affiliation	Presentation title
Assist. Prof. Dr. Sahin AYDIN	Işık University, Türkiye	SPATIAL DISTRIBUTION OF TÜRKIYE'S LIVESTOCK PRODUCTS ECONOMY (1995–2020): SUSTAINABILITY- ORIENTED VISUALIZATION ANALYSIS
Assoc. Prof. Dr. Suna MUĞAN ERTUĞRAL **Prof. Dr. Metin TOPRAK** **Dr. Reza BEHJATI** **Assoc. Prof. Dr. İhsan KURAN**	Istanbul University, Türkiye İstanbul Sabahattin Zaim University, Türkiye Harran University, Türkiye	ENVIRONMENTAL IMPACTS OF SEASONAL POPULATION GROWTH AND TOURISM INVESTMENTS ON THE COASTS OF THE SEA OF MARMARA: AN ASSESSMENT OF WASTEWATER MANAGEMENT AND WATER QUALITY
Assoc. Prof. Dr. Suna MUĞAN ERTUĞRAL **Prof. Dr. Metin TOPRAK** **Dr. Reza BEHJATI** **Assoc. Prof. Dr. İhsan KURAN**	Istanbul University, Türkiye İstanbul Sabahattin Zaim University, Türkiye Harran University, Türkiye	THE ROLE OF AGGLOMERATION PARTNERSHIPS IN PROMOTING SUSTAINABLE LOCAL ECONOMIES: THE CASE OF ARDAHAN
Dr. Emine Kokaçya DUVAN **Assoc. Prof. Dr. Semin TOPALOĞLU PAKSOY**	Scientific Researcher, Türkiye Çukurova University, Türkiye	GLOBAL COMPETITION IN THE TROPICAL FRUIT SECTOR AND STRATEGIC OPPORTUNITIES FOR TÜRKİYE
Assoc. Prof. Dr. Semin TOPALOĞLU PAKSOY **Dr. Emine Kokaçya DUVAN**	Çukurova University, Türkiye Scientific Researcher, Türkiye	SUSTAINABLE AGRICULTURAL POLICIES AND FOOD SECURITY: TÜRKİYE'S HARMONIZATION PROCESS WITH THE EU GREEN DEAL
Assist. Prof. Dr. Hilal KUVVETLİ YAVAŞ	İstanbul Arel University, Türkiye	FROM DISCLOSURE TO DECEPTION: THE ROLE OF GREENWASHING IN UNDERMINING SUSTAINABLE DEVELOPMENT

15.10.2025 / HALL-2 / SESSION-2 / TSI Time-12^{30}:14^{30}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Prof. Dr. Afaq AHMAD

Authors	Affiliation	Presentation title
Emre ALAN Muharrem GÜRGEN Talha AYTAR Emre MERT İ. İrfan AYHAN	ÇEMTAŞ R&D Center, Türkiye	INNOVATIVE MOLD DESIGN AND PROCESS STRATEGIES FOR SUSTAINABLE LABORATORY-SCALE STEEL CASTING
Melike DEMİRCİ DOĞAN Assist. Prof. Dr. Cansu BOZKURT Prof. Dr. Mahmut FIRAT	Inonu University, Türkiye Ardahan University, Türkiye	ASSESSMENT OF ALTERNATIVE WATER RESOURCES IN MALATYA PROVINCE USING THE ENTROPY-BASED VIKOR APPROACH
Furkan GÜNGÖR Assist. Prof. Dr. Cansu BOZKURT Prof. Dr. Mahmut FIRAT	Inonu University, Türkiye Ardahan University, Türkiye	EVALUATION OF WATER CONSUMPTION ANALYSIS AND MONITORING INDEX FOR SUSTAINABLE WATER MANAGEMENT IN SCHOOLS WITH FUCOM WEIGHTING METHOD
Ömer Faruk KURANLI Aygül Zara KEBİR Prof. Dr. Mücteba UYSAL	Yildiz Technical University, Türkiye	OPTIMIZING ACTIVATOR RATIO THROUGH FRESH STATE, BUILDABILITY AND STRENGTH TESTS IN GEOPOLYMER MIXTURES FOR 3D PRINTING
Prof. Dr. Alexander V. LAGEREV	Russian University of Transport, Russia	SUBSTANTIATION OF THE PRINCIPLE OF ENSURING THE UNIVERSALITY OF THE OVERALL DIMENSIONS OF AIRMOBILE ROPE UNITS
Prof. Dr. Afaq AHMAD Assoc. Prof. Dr. M. Mohammed Sabir HUSSAIN Lect. Dr. Naga Venkata RAMAKRIHNA G Alex SAVARIYAR Lect. Dr. Karimulla Syed MOHAMMAD Lect. Rajeev RAJENDRAN	Modern College of Business and Science, Oman Muffakham Jah College of Engineering & Technology, India University of Science and Technology (UTAS), Oman	ROBOTICS AND EMERGING INNOVATIONS FOR SUSTAINABILITY
Prof. Dr. Afaq AHMAD Assist. Prof. Dr. Mohammad Sultan Ahmad ANSARI Assoc. Prof. Dr. Umar AHMED Assist. Prof. Dr. Basant KUMAR Assist. Prof. Dr. Nassor Suleiman Nasser AL JAHWARI Lect.Reena ABRAHAM	Modern College of Business and Science, Oman Muffakham Jah College of Engineering & Technology, India	REDESIGNING ECONOMIC GROWTH MODEL: THE CIRCULAR ECONOMY GROWTH MODEL – A FRAMEWORK TO COPE WITH CHALLENGES IN MEETING SUSTAINABLE DEVELOPMENT GOALS (SDGs)
Dr. Donatas Bagočius Dr. Aleksas Narščius	Klaipėda Higher Education Institution, Lithuania	DEVELOPMENT OF THE TECHNOLOGIES FOR THE MONITORING OF THE MARINE UNDERWATER ACOUSTIC POLLUTION

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-3 / SESSION-2 / TSI Time-12^{30}:14^{30}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Dr. Sándor FÖLDVÁRI

Authors	Affiliation	Presentation title
Dr. Sándor FÖLDVÁRI	Debrecen University, Hungary	GAS UNDER THE BLACK SEA IN UKRAINIAN MARITIME TERRITORIES AND ITS SIGNIFICANCE IN THE ASPECT OF TÜRKIYE'S ROLE IN PEACEBUILDING
Voroneanu-Popa Rareș-Vasile Richard Constantinescu	Grigore T. Popa University of Medicine and Pharmacy of Iași, Romania	THE ROLE OF THE EUROPEAN UNION IN THE DEVELOPMENT OF NATION STATES
Assoc. Prof. Dr. Sorina Corman	Lucian Blaga University of Sibiu, Romania	SUSTAINABILITY AND GLOBAL DEVELOPMENT: INTEGRATING SOCIAL, ECONOMIC, AND ENVIRONMENTAL DIMENSIONS THROUGH PUBLIC POLICIES. PERSPECTIVES FROM ROMANIA
Assist. Prof. Maske M. M. Dr. Patil N. K.	Rajarambapu Institute of Technology, India SGU, India	BAYESIAN NEURAL NETWORKS IN SUSTAINABLE INFRASTRUCTURE: AN INTEGRATED FRAMEWORK FOR CORROSION ASSESSMENT AND CLIMATE RESILIENCE
Assoc. Prof. Dr. Rrezarta Gashi Assist. Prof. Dr. Blerta Haliti Baruti	AAB College, Kosovo	FROM CHALLENGES TO OPPORTUNITIES: THE RISE OF WOMEN ENTREPRENEURS IN KOSOVO
Manoj Chauhan Udbhavna	Himachal Pradesh University, India	EMPOWERING RURAL WOMEN THROUGH SKILL DEVELOPMENT PROGRAMS: PATHWAYS TO INCLUSIVE SUSTAINABLE DEVELOPMENT IN HIMALAYAN REGIONS
Nega Ejigu Tefera Sarbjeet Singh	Bahir Dar University, Ethiopia Punjabi University Patiala (PUP), India	THE INTERPLAY OF EXTERNAL DEBT, INEQUALITY, AND SUSTAINABLE DEVELOPMENT: A BIBLIOMETRIC ANALYSIS (SINCE 2016)
Selvije Lajqi Soreja Adzajlic Kushtrim Agaj	University "Haxhi Zeka Pejë, Kosovo	GREEN TRAVEL – SUSTAINABLE TRANSPORT IN TOURISM

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-4 / SESSION-2 / TSI Time-12^{30}:14^{30}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Prof. Dr. Andrea OVIEDO

Authors	Affiliation	Presentation title
Prof. Dr. Andrea OVIEDO	Universidad Nacional de Tucumán, Argentina	PRELIMINARY FIELD TRIAL OF A MICROBIAL BIO-ANTICIDE FOR THE CONTROL OF DEFOLIATING ANTS
Udoye, Charles Ekene	University of Nigeria, Nigeria	SUSTAINABLE ODOUR CONTROL MEASURES AMONG POULTRY FARMERS IN ENUGU EAST SENATORIAL ZONE, ENUGU STATE, NIGERIA
Bashir, M.B **Mukhtar, Y.** **Garba M.S** **Lukman, A** **Isah, S.**	Ahmadu Bello University, Nigeria	AGRICULTURAL EXTENSION AND SUSTAINABLE LAND MANAGEMENT: A REVIEW OF CONSERVATION PRACTICES AMONG SMALLHOLDER MAIZE FARMERS IN NIGERIA
Assist. Prof. Dr. Sara S.M. Sayed	Theodor Bilharz Research Institute, Egypt	SUSTAINABLE APPLICATIONS OF ALGAL EXTRACTS: IMMUNITY, PARASITE CONTROL, AND INNOVATION
Archisman KUNDU	Haldia Institute of Technology, India	A PROTOCOL-AWARE MULTI-ROBOTIC SYSTEM FOR ANOMALY DETECTION AND CROP YIELD OPTIMIZATION IN SUSTAINABLE AGRICULTURE
Samim BISWAS	Bidhan Chandra Krishi Viswavidyalaya, India	ADOPTION BARRIERS OF EFFICIENT IRRIGATION SYSTEMS IN PURULIA DISTRICT, WEST BENGAL, INDIA: PATHWAYS TO SUSTAINABLE AGRICULTURE
Aliu O H **Olasina J R**	Federal Polytechnic Ilaro, Nigeria Covenant University, Nigeria	LEVERAGING AI IN SMART FARMING AND GREENHOUSE MONITORING FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN NIGERIA

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-5 / SESSION-2 / TSI Time-12^{30}:14^{30}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Dr. Atabek Movlyanov

Authors	Affiliation	Presentation title
Muslim Yusuf **Sulaiman Sani Yusuf**	Umaru Musa Yar'adua University, Nigeria	BIOACTIVE COMPOUNDS FROM MEDICINAL PLANTS AS A PATHWAY TO ATTAINING SUSTAINABLE DEVELOPMENT GOAL 3: GOOD HEALTH AND WELL-BEING
Mouheb Sboui **Assoc. Prof. Dr. Youssef O. Al-Ghamdi**	University of Sfax, Tunisia Majmaah University, Saudi Arabia	ECO-FRIENDLY Ag-Ag_2 O/TiO_2 /Cellulose BIOCOMPOSITE FILM FOR ENVIRONMENTAL AND BIOLOGICAL APPLICATIONS
Ahmed Attahiru	Kebbi State University of Science and Technology, Nigeria	SUSTAINABLE FOOD SYSTEMS AND NUTRITION SECURITY
Ahmed Attahiru **Abubakar Umar Birnin-Yauri**	Kebbi State University of Science and Technology, Nigeria	CLIMATE CHANGE MITIGATION AND ADAPTATION STRATEGIES
Prof. Dr. Mir-Hassan MOOSAVY	University of Tabriz, Iran	PRACTICAL PATHWAYS TO SUSTAINABILITY IN THE FOOD INDUSTRY: WASTE VALORIZATION, SMART TECHNOLOGIES, AND NOVEL PROTEIN SOURCES
Andrey POPATANASOV **Wendy De SHONG-NEUHALFEN**	Bulgarian Academy of Sciences, Bulgaria NDS - NEW DIRECTION SERVICES, New York, USA	ON THE CHRONIC POVERTY AND FOOD INSECURITY IN MALAWI AND THE POSSIBILITIES FOR DEVELOPMENT AND SUSTAINABILITY WITH THE ADVANCE OF THE CLIMATE CHANGES
Mohamed EL MORSY **Prof. Dr. Laila AFIA** **Prof. Dr. Mohamed EZ-ZAHERY**	Ibnou Zohr University, Morocco	TREATMENT OF WASTE AND EFFLUENTS FROM THE AGRI-FOOD INDUSTRY: THE CASE OF THE DAIRY INDUSTRY
Albina BASHOLLI **Erika KACI**	Polytechnic University of Tirana, Albania	TRAFFIC SIGNAL OPTIMIZATION IN URBAN INTERSECTIONS: A MATHEMATICAL PROGRAMMING MODEL
Asst. Prof. Elza Bitsadze	Akaki Tsereteli State University, Georgia	ADVANCING SUSTAINABLE DEVELOPMENT THROUGH MATHEMATICAL MODELING, COMPUTATIONAL ANALYTICS, AND CLOUD-ENABLED BUSINESS INTELLIGENCE

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-1 / SESSION-3 / TSI Time-15^{00}:17^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Prof. Dr. Deniz ÖZYAKIŞIR

Authors	Affiliation	Presentation title
Assoc. Prof. Dr. Yasemin TAŞKIN **Prof. Dr. Salim Ateş OKTAR**	Istanbul University, Türkiye	EVALUATION OF RESEARCH AND DEVELOPMENT PROJECTS IN TERMS OF PUBLIC INCENTIVES
Ahmet GÜNEŞ **Assoc. Prof. Dr. Gönül DİNÇER**	Republic of Turkey Ministry of Internal Affairs, Ankara Governorship Provincial Planning and Coordination Directorate, Türkiye Ankara Hacı Bayram Veli University, Türkiye	ANALYSIS OF THE MACROECONOMIC EFFECTS OF EARTHQUAKES IN THE CONTEXT OF SUSTAINABILITY AND NATURAL DISASTER MANAGEMENT
Assist. Prof. Dr. Murat DOĞAN	Manisa Celal Bayar University, Türkiye	STEEL PRODUCTION AND CONSUMPTION BALANCES IN THE EUROPEAN UNION: THE ROLE OF IMPORT DEPENDENCY IN THE CBAM FRAMEWORK
Assoc. Prof. Dr. Demet ÖZMEN YILMAZ **Prof. Dr. R.Koray YILMAZ**	Samsun Ondokuz Mayıs University, Türkiye	THE BANKRUPTCY OF GLOBAL DEVELOPMENTALISM?
Assist. Prof. Dr. Bilal EZİLMEZ **Assist. Prof. Dr. Adnan ÇALIŞKAN**	Bandırma Onyedi Eylül University, Türkiye Bandırma Onyedi Eylül University, Türkiye	RETHINKING THE GREEN ECONOMY WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT
Prof. Dr. Deniz ÖZYAKIŞIR	Kafkas University, Türkiye	THE RELATIONSHIP BETWEEN MIGRATION AND REGIONAL DEVELOPMENT: A THEORETICAL ASSESSMENT IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT GOALS
Dr. Erol YÜCEL **Gülhan TURAN EGE**	HAVELSAN INC, Türkiye	EXAMINING THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND ENVIRONMENTAL SUSTAINABILITY ON THE AXIS OF SUSTAINABLE DEVELOPMENT GOALS: A COMPARATIVE STUDY ON DEVELOPED AND DEVELOPING COUNTRIES

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-2 / SESSION-3 / TSI Time-15^{00}:17^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assoc. Prof. Dr. Gamze PEKBEY

Authors	Affiliation	Presentation title
Res. Assist. Dr. Demet Ülkü GÜLPINAR SEKBAN Assist. Prof. Dr. Makbulenur ONUR	Karadeniz Technical University, Türkiye	KARADENIZ TECHNICAL UNIVERSITY WITHIN THE FRAMEWORK OF SUSTAINABLE GREEN CAMPUSES
Res. Assist. Dr. Demet Ülkü GÜLPINAR SEKBAN Assist. Prof. Dr. Makbulenur ONUR	Karadeniz Technical University, Türkiye	DESIGNING CHILDREN'S PLAYGROUND WITH SUSTAINABLE MATERIALS
Ali EFE Assist. Prof. Dr. Ayşe ÖZTÜRK PULATOĞLU	Kastamonu University, Türkiye	WOODY FLORA OF KASTAMONU UNIVERSITY: INSIGHTS FOR SUSTAINABLE AND CLIMATE-RESPONSIVE GREEN SPACES
Res. Assist. Dr. Aybüke Özge BOZ DEMİR Res. Assist. Dr. İdil DAL	Bartın University, Türkiye	THE RELATIONSHIP BETWEEN ACCESSIBILITY TO URBAN GREEN SPACES AND SUSTAINABLE DEVELOPMENT GOALS: THE CASE OF BARTIN CITY CENTER
Assoc. Prof. Dr. Gamze PEKBEY	Yozgat Bozok University, Türkiye	WASTE MANAGEMENT AND BIOECONOMY: THE EXAMPLE OF THE BLACK SOLDIER FLY (HERMETIA ILLUCENS L.)
Assoc. Prof. Dr. Gamze PEKBEY	Yozgat Bozok University, Türkiye	DIPTERA (INSECTA) RESEARCH AND ITS CONTRIBUTIONS TO SUSTAINABLE DEVELOPMENT GOALS
Assoc. Prof. Dr. Hikmet YAZICI Dr. Serkan Deniz KOŞOÇAYDAN	Zonguldak Bülent Ecevit University, Türkiye	SUSTAINABILITY PRINCIPLES IN THE SUPPLY OF WOOD RAW MATERIALS FOR THE TIMBER PROCESSING FOREST PRODUCTS SECTOR IN ZONGULDAK PROVINCE IN THE CONTEXT OF RICH FOREST RESOURCES AND BIODIVERSITY IN THE FILYOS VALLEY
Assist. Prof. Dr. İlknur ESKİMEZ Prof. Dr. Mehmet POLAT Assist. Prof. Dr. Kerem MERTOĞLU	Isparta University of Applied Sciences, Türkiye Usak University, Türkiye	BIOCHEMICAL CHANGES IN FRUITS DURING THE DEVELOPMENTAL PERIOD
Assist. Prof. Dr. İlknur ESKİMEZ Assist. Prof. Dr. Kerem MERTOĞLU Prof. Dr. Mehmet POLAT	Isparta University of Applied Sciences, Türkiye Usak University, Türkiye	MECHANISMS OF COLOR CHANGE IN FRUITS

15.10.2025 / HALL-3 / SESSION-3 / TSI Time-15^{00}:17^{00}

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HEAD OF SESSION: Dr. Alina Amanzhol

Authors	Affiliation	Presentation title
Lect. Shirin Akter	University of Liberal Arts Bangladesh (ULAB), Bangladesh	SUSTAINABLE MATERIALS FOR FUTURE: BELIEF IN BENGALI FOLKLORISTICS (KHONA'S SPEECH)
Assoc. Prof. Dr. Muhammad Umer Quddoos **Tahira Kanwal** **Munawwar Hussain** **Kazim Abbas** **Muhammad Tayyeb Hafeez**	Bahauddin Zakariya University Multan, Pakistan	BIBLIOMETRIC ANALYSIS OF LITERATURE ON SUSTAINABILITY REPORTING THROUGH SOCIAL MEDIA
Lamyae Nachit **Nada MOUFDI**	Sidi Mohamed Ben Abdellah University, Morocco	ENTREPRENEURIAL RESILIENCE AND GLOBAL MARKET EXPANSION: MANAGERIAL STRATEGIES FOR INTERNATIONAL GROWTH
Shiv Kumar	Institute – GSBV, India	ECONOMIC IMPACT OF MAJOR SPORTING EVENTS ON HOST CITIES: EVIDENCE FROM GLOBAL CASE STUDIES (2000–2024)
Nicoleta Țicu **Onofrei Mihaela**	Alexandru Ioan Cuza University of Iași, Romania	ECONOMIC AND POLICY DETERMINANTS OF RENEWABLE ENERGY CONSUMPTION. THE CASE OF EU COUNTRIES
Ebenezer Akinniyi AKINYEMI **Dolapo Peace ABIOLA** **Abdulwasiu Adeniyi ADEWOLE**	Ladoke Akintola University of Technology, Nigeria	THE IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC DEVELOPMENT IN NIGERIA: 1995-2024.
QASSID Ayoub **Touhami Fatima** **BAKKALI Salma** **Maroua MENGADE** **Youssef REHALI**	Sultan Moulay Slimane University, Morocco Sultan Moulay Slimane University, Morocco Multidisciplinary Research Laboratory in Economics and Management (LARPEG), Morocco	MARKETING AND SOCIAL INNOVATION: A STRATEGIC DRIVER FOR SUSTAINABLE AND INCLUSIVE DEVELOPMENT

GLOBAL SUSTAINABILITY AND DEVELOPMENT CONGRESS

15.10.2025 / HALL-4 / SESSION-3 / TSI Time-15^{00}:17^{00}

ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Virág Zábó

Authors	Affiliation	Presentation title
Virág Zábó Andrea Lehoczki Mónika Fekete	Semmelweis University, Hungary	THE IMPACT OF THE MIND DIET ON MORTALITY, CHRONIC DISEASES, AND MENTAL HEALTH: COMPREHENSIVE EVIDENCE FROM DIVERSE POPULATIONS
Ajsel Budlla	Turgut Ozal Durrës, Albania	THE USE OF MACHINE LEARNING FOR GENDER EQUALITY IN HEALTHCARE
Dr.W.Helen S.Rubin Thara R.SriArasuvasan K.Vaishnavi	Bharath Institute of Higher Education and Research, India	SUSTAINABLE PHARMACEUTICAL SUPPLY CHAIN
Deepak. S Palanisamy. A David. G Ravi. C	Bharath Institute of Higher Education and Research, India	SUSTAINABLE DRUG MANUFACTURING: A GREEN CHEMISTRY APPROACH
Nworah Florence N Eje Ozoemena E Igwebuike Nancy C	University of Nigeria, Nigeria	THE ROLE OF BIOTECHNOLOGY IN SUSTAINABLE DRUG DEVELOPMENT
Dr. Saloni Sharma Suhani Sharma	Manav Rachna International Institute of Research Studies, India Jamia Hamdard University, India	SUSTAINABLE HEALTHCARE SYSTEMS: BALANCING COST, QUALITY, AND ACCESSIBILITY
Palanisamy.A Deepak. S David. G Ravi. C	Bharath Institute of Higher Education and Research, India	SUSTAINABLE PHARMACY: INTEGRATING HEALTH, ETHICS, AND ENVIRONMENTAL RESPONSIBILITY
Dr. Rovena ELMAZI Assoc. Prof. Dr. Elton SPAHIU Dr. Anduela LILE Dr. Entela KUSHTA Dr. Surven METOLLI	Sports University of Tirana, Albania	ANALYSIS OF INCLUSION AND SUSTAINABILITY POLICIES IN SPORT FOR PEOPLE WITH DISABILITIES IN ALBANIA
Hicham EL-BOUKHARY Hamza ELKISSANY Adil LAAZIZ Abdelouahed HAJJAJI	Sultan Moulay Slimane University, Morocco Sidi Mohamed Ben Abdellah University, Morocco	ENVIRONMENTAL POLLUTION AND REMEDIATION STRATEGIES: A REVIEW

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HEAD OF SESSION: Assoc. Prof. Dr. Tolga ERKAN

Authors	Affiliation	Presentation title
Shafiul Muznobin	Pabna University of Science and Technology (PUST), Bangladesh	APPLICATION OF SUSTAINABLE BUILDING MATERIALS FOR GREEN CONSTRUCTION IN BANGLADESH
Assist. Prof. Payam Tarighi **Ali Akbary**	Ahlul Bayt International University, Iran	REVOLUTIONIZING CONSTRUCTION: EMERGING MATERIALS AND THEIR ROLE IN SUSTAINABLE DEVELOPMENT
Mehreen Ashfaq **Assist. Prof. Farhana Naz** **Assist. Prof. Maryam Usman**	Interior Designer, Lahore Pakistan Lahore College for Women University, Pakistan	FROM WASTE TO VALUE: CONCEPTUALIZING A FASHION HUB FOR SUSTAINABLE FUTURES
Akhi Akther **Saikot Hasan**	University of Rajshahi, Bangladesh Bangladesh Agricultural University, Bangladesh	SUSTAINABLE DEVELOPMENT THROUGH CULTURAL HERITAGE: A LITERATURE REVIEW OF THE NABANNA FESTIVAL IN RURAL BANGLADESH
Aref Nouri **Prof. Dr. Mehrdad Karimimoshaver**	Bu-Ali Sina University, Iran	THE EVOLUTION OF RESIDENTIAL ARCHITECTURE: TOWARDS SUSTAINABLE AND BIOPHILIC DESIGN IN THE POST-PANDEMIC ERA
Lect. Pooja Shukla	Hong Kong Metropolitan University, Hong Kong	CARBON NEUTRALITY TARGETS AND FIDUCIARY DUTIES IN HONG KONG
Assoc. Prof. Dr. Tolga ERKAN	OSTIM Technical University, Türkiye	IMPLEMENTING BIODIVERSITY IN URBAN PROJECTS
Assoc. Prof. Dr. Tolga ERKAN	OSTIM Technical University, Türkiye	SPATIAL AND TEMPORAL PERSPECTIVES ON URBAN BIODIVERSITY

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16.10.2025 / HALL-1 / SESSION-1 / TSI Time-10^{00}:12^{00}

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HEAD OF SESSION: Dr. Sakine SİNCER

Authors	Affiliation	Presentation title
Elif YILMAZ **Prof. Dr. Ebru ÖZGEN**	Marmara University, Türkiye	THE NECESSITY OF PUBLIC RELATIONS IN THE SUSTAINABILITY COMMUNICATION PROCESS AND SOCIAL IMPACT ANALYSIS
Prof. Dr. Ebru ÖZGEN **Assist. Prof. Dr. Özgenur Reyhan GÜLER**	Marmara University, Türkiye İstinye University, Türkiye	SUSTAINABILITY DISCOURSES FROM AN ECOFEMINIST PERSPECTIVE: A CRITICAL ANALYSIS OF COMMUNICATION STRATEGIES
Assoc. Prof. Dr. Gonul BODUR **Assist. Prof. Dr. Polat GOKTAS** **Aycan KUCUKKAYA** **Zehra TURHAN** **Yunus Emre ALTUN**	Istanbul University-Cerrahpasa, Türkiye Sabancı University, Türkiye Gazi University, Türkiye	EXPLORING NURSING STUDENTS' AWARENESS OF THE SUSTAINABLE DEVELOPMENT GOALS AND PERCEPTIONS OF THE GLOBAL FUTURE: A DESCRIPTIVE CROSS- SECTIONAL STUDY
Res. Assist. Dr. Kadir ÇALIŞKAN	Bitlis Eren University, Türkiye	WEB-BASED SUSTAINABILITY COMMUNICATION OF REGIONAL DEVELOPMENT-ORIENTED UNIVERSITIES: A CONTENT ANALYSIS OF UI GREENMETRIC PARTICIPANTS FROM TÜRKİYE
Dr. Sakine SİNCER	Hacettepe University, Türkiye	SUSTAINABLE DIGITALIZATION IN EDUCATIONAL INSTITUTIONS: OPPORTUNITIES, CHALLENGES AND POLICY DIRECTIONS
Assoc. Prof. Dr. Liubov BOIKO	Kherson Educational-Scientific Institute of Admiral Makarov National University of Shipbuilding, Ukraine	INTEGRATING SUSTAINABLE DEVELOPMENT GOALS INTO LANGUAGE LEARNING AS A BRIDGE TO GLOBAL RESPONSIBILITY

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ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assoc. Prof. Dr. Pınar ÖZTÜRK DEMİRTAŞ

Authors	Affiliation	Presentation title
Res. Assist. Ebru KILIÇ BAKIRHAN	Karabuk University, Türkiye	WASTE-BASED BUILDING MATERIALS AND INDOOR AIR QUALITY: RISKS, POTENTIALS AND GAPS
Res. Assist. Ebru KILIÇ BAKIRHAN	Karabuk University, Türkiye	A SYSTEMATIC REVIEW ON INDOOR AIR QUALITY IN PASSIVE BUILDINGS
Res. Assist. Bilgehan BAKIRHAN	Karabük University, Türkiye	COMMUNITY-CENTRED FIRE RISK MANAGEMENT APPROACH FROM A SOCIAL SUSTAINABILITY PERSPECTIVE
Merve SARIGÖK **Prof. Dr. Nilay COŞGUN**	Gebze Technical University, Türkiye	AN ANALYSIS OF LEAN PRODUCTION PRINCIPLES IN THE HOUSING SECTOR: THE CASE OF TOKİ HOUSING
Assoc. Prof. Dr. Pınar ÖZTÜRK DEMİRTAŞ **Assoc. Prof. Dr. Çınar NARTER**	İstanbul Ticaret University, Türkiye	METHODOLOGICAL APPROACHES TO THE USE OF BIOMATERIALS IN PRODUCT DESIGN FROM A SUSTAINABILITY PERSPECTIVE
Assist. Prof. Dr. Gözde TEKİN	Ankara Hacı Bayram Veli University, Türkiye	INTANGIBLE CULTURAL HERITAGE FOR SUSTAINABLE CITIES AND COMMUNITIES IN THE RELATIONSHIP BETWEEN CULTURE AND DEVELOPMENT
Lect. Dr. Burcu SOYKÖK EDE **Prof. Dr. Murat TAŞ**	Bursa Uludag University, Türkiye	RURAL ARCHITECTURAL HERITAGE AND RURAL TOURISM FOR SUSTAINABLE RURAL DEVELOPMENT: BURSA IZNIK EXAMPLE

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16.10.2025 / HALL-3 / SESSION-1 / TSI Time-10^{00}:12^{00}

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HEAD OF SESSION: Amer Nasr A. Elghaffar

Authors	Affiliation	Presentation title
Assist. Prof. Dr. Sushovan KHATUA **Dr. Atabek MOVLYANOV**	SRM University -AP, India IKSAD Institute, Türkiye	INTEGRATING RENEWABLE ENERGY WITH INTELLIGENT TRANSPORTATION SYSTEMS FOR SUSTAINABLE DEVELOPMENT: AN ENHANCED FRAMEWORK WITH STATISTICAL VALIDATION
Opeyemi A. Olusola **Olusegun A. Olaiju** **Ephesus O. Fatunmbi**	Federal Polytechnic, Nigeria	PERFORMANCE AND BENEFITS OF HYBRID SYSTEMS COMBINING SOLAR ENERGY WITH RENEWABLE AND CONVENTIONAL SOURCES
Jihane ZNAKI **Fatima Zahra ZNAKI** **Khalid SAID** **Mohamed ADADI** **Hassane MOUSTABCHIR** **Souad ELKHATTABI**	Sidi Mohamed Ben Abdallah University, Morocco	DFT STUDIES ON PEROVSKITE SOLAR CELLS: BRIDGING INNOVATION AND SUSTAINABILITY GOALS
Amadi Oko Amadi **ifeanyi Moses Iwueze** **Okwa Eyare Nola** **Ahmed Enesi Abdulrahman** **Idiong Ubong Asuquo** **Osita Ngozika Ann**	Akanu Ibiam Federal Polytechnic, Nigeria	SMART GRIDS WITH EDGE–AI FOR SUSTAINABLE ENERGY MANAGEMENT
Prof. Dr. Ali M. Eltamaly **Amer Nasr A. Elghaffar**	Mansoura University, Egypt Alfanar Training Institute, Saudi Arabia	SMART METERING FOR ENHANCING ENERGY EFFICIENCY AND CONSUMER AWARENESS
Yassamine Hadjer FODIL	BELHADJ BOUCHAIB -AIN TEMOUCHENT University, Algeria	SOLAR ENERGY REVOLUTION: ALGERIA'S PATH TO SUSTAINABLE RENEWABLE ENERGY
Somnath BERA **Prof. Dr. Debashis DE** **Assist. Prof. Dr. Anwesha MUKHERJEE**	Maulana Abul Kalam Azad University of Technology, India Mahishadal Raj College Mahishadal, India	SECURE GOSSIP LEARNING-BASED SUSTAINABLE IRRIGATION MANAGEMENT
Tanushree DEY **Prof. Dr. Debashis DE** **Assist. Prof. Dr. Anwesha MUKHERJEE**	Maulana Abul Kalam Azad University of Technology, India Mahishadal Raj College Mahishadal, India	SECURE DECENTRALIZED FEDERATED LEARNING-BASED SUSTAINABLE CROP YIELD PREDICTION
Amina Yahia	Oum el Bouaghi University, Algeria	TOWARDS ENERGY SUSTAINABILITY IN ALGERIA: OPTIMIZING HYBRID SYSTEMS COMBINING RENEWABLE ENERGIES AND SMART TECHNOLOGIES

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HEAD OF SESSION: Dr. RAHMOUNI Hanane

Authors	Affiliation	Presentation title
Joni Putra Rohani Aryan Danil Mirza. Br Reza Arliantari	Universitas Lampung, Indonesia	ISLAMIC CHARACTER EDUCATION FOR SUSTAINABLE YOUTH DEVELOPMENT: A MODEL TO COUNTER STUDENTS' MORAL DECADENCE
Aryan Danil Mirza. Br Laili Fadhila Banuwa Ghea Laili Putri Garien	Universitas Lampung, Indonesia	SUSTAINABLE DEVELOPMENT THROUGH PARTICIPATIVE BUDGETING: A GLOBAL BIBLIOMETRIC PERSPECTIVE
Pedro Miguel Domingos Duarte de Oliveira	Santarém Polytechnic University, Portugal	SOCIAL AND SOLIDARITY ECONOMY IN THE DIGITAL AGE: ECONOMIC COMPETITIVENESS AND KNOWLEDGE-BASED DEVELOPMENT
S A Marathaka Rani Dr. Murugesan Kamaraj	SRM Institute of Science and Technology, India	MARINE BIOTECHNOLOGY AND THE BLUE ECONOMY: A PATHWAY TO SUSTAINABILITY
Prof. Dr. Anjali Ganesh Assist. Prof. Dr. Acharya Chitralekha J. Assist. Prof. Dr. Roopesh	St. Joseph Engineering College, India	SUSTAINABLE DEVELOPMENT GOAL 5-GENDER EQUALITY THROUGH WOMEN ENTREPRENEURSHIP
Iva SULAJ	"Aleksandër Moisiu" University, Albania Logos University College, Albania	GREEN FINANCE AND SUSTAINABLE INVESTMENT IN ALBANIA. OPPORTUNITIES FOR ECONOMIC GROWTH AND ENVIRONMENTAL IMPACT
Dr. RAHMOUNI Hanane	University of Oran 2 Mohamed Ben Ahmed, Algeria	THE INVESTMENT SPECIFICATIONS DOCUMENTS FOR SUSTAINABLE DEVELOPMENT

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HEAD OF SESSION: Frida Gjermeni

Authors	Affiliation	Presentation title
Bamiro, Tolulope Oluwatosin	The Federal Polytechnic, Nigeria	AN ASSESSMENT OF THE AFFORDABILITY OF PUBLIC WATER SUPPLY IN OGUN STATE
Renuka Gautam **Dr. Dheeraj Rathore**	Central University of Gujarat, India	MICROALGAE UTILIZATION AS A RENEWABLE FEEDSTOCK FOR SUSTAINABLE BIOPLASTIC PRODUCTION
Ibrahim WAGANI **Diane Lydie HOUNKPE LAURENT**	Dan Dicko Dan Koulodo University, Niger	INVESTIGATING THE ENVIRONMENTAL IMPACT OF URANIUM ORE EXTRACTION IN NIGER
Mamta Chhabra Sharma **Sandeep Kumar Sharma 2**	University of Delhi, India	SUSTAINABLE DEVELOPMENT GOALS: INITIATIVES TAKEN TO FIGHT ENVIRONMENTAL POLLUTION BY REDUCING CARBON FOOTPRINTS
Lai Van Tai **Monica Raileanu Szeles**	HCMC University of Technology, Vietnam National University, Vietnam Transilvania University of Brașov and Institute for Economic Forecasting, Romania	ROLES OF GREEN ENERGY, CAPITAL FORMATION, AND DEVELOPMENT ON EVIRONMENTAL DEGRADATION IN ASIA PACIFIC
Humayra Kabir **Rubina Akter** **Masum billah**	University of Rajshahi, Bangladesh	FROM DEBT CYCLES TO SUSTAINABLE LIVELIHOODS: A PARADIGM SHIFT MODEL OF MICRO-INDUSTRIES THROUGH WASTE UTILIZATION IN BANGLADESH
Narimene Krai **Sonia Cherif** **Yasmine Chabaane** **Mounia Lakrout** **Hynda Rezzaz-Yazid** **Zahra Sadaoui**	Laboratory of Reaction Engineering, Algeria	SUSTAINABLE VALORIZATION OF PETROLEUM RESIDUES INTO ACTIVATED CARBON FOR THE TREATMENT OF REFINERY WASTEWATER
Humaira Rashid **Akib Javed** **Assist. Prof. Dr. Iffat Ara**	Islamic University, Bangladesh Institute of Water Modelling (IWM), Bangladesh	A REMOTE SENSING ASSESSMENT OF AIR POLLUTION IN FIVE BANGLADESHI INDUSTRIAL CITIES
Frida Gjermeni	"Aleksander Moisiu" University of Durres, Albania	DESIGN OF IOT-ENABLED SMART CLASSROOMS FOR NEXT-GENERATION LEARNING ENVIRONMENTS

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HEAD OF SESSION: Assist. Prof. Dr. İpek METE

Authors	Affiliation	Presentation title
Prof. Dr. Mehmet DEMİRAL **Res. Assist. Emine Dilara AKTEKİN GÖK**	Niğde Ömer Halisdemir University, Türkiye	ENERGY TRANSITION AND ENVIRONMENTAL PERFORMANCE: A COMPARATIVE ANALYSIS
Res. Assist. Rumeysa GEVHER TOKDEMİR **Assist. Prof. Dr. Ömer AKKAYA**	Selcuk University, Türkiye	SUSTAINABLE DEVELOPMENT TO CIRCULAR ECONOMY: A BIBLIOMETRIC ANALYSIS OF RESEARCH EVOLUTION, TRENDS AND FUTURE DIRECTIONS
Lect. Özdemir YAVAŞ	Trakya University, Türkiye	THE IMPACT OF COUNTRIES' TECHNOLOGICAL READINESS ON THEIR GREEN ECONOMY PERFORMANCE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT: A GLOBAL ANALYSIS
Assist. Prof. Dr. İpek METE	Ankara Yıldırım Beyazıt University, Türkiye	NATIONAL SUSTAINABILITY AND EMPLOYEE ENGAGEMENT: EVIDENCE FROM CROSS-COUNTRY DATA
Lect. Nur ÖZDELİBAŞ **Assist. Prof. Dr. Barış KULEYİN**	Canakkale Onsekiz Mart University, Türkiye Dokuz Eylul University, Türkiye	MANAGERS' PERCEPTIONS OF SUSTAINABILITY: A STUDY ON PORT PRACTICES
Assist. Prof. Dr. Cansu GÖKMEN KÖKSAL	İstanbul Topkapi University, Türkiye	THE UTILIZATION OF SOCIAL MARKETING IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT GOALS
Assist. Prof. Dr. Burhan KAYIRAN **Assoc. Prof. Dr. Abdullah AÇIK**	Karadeniz Technical University, Türkiye Dokuz Eylül University, Türkiye	MARITIME CONNECTIVITY AND ENVIRONMENTAL EFFICIENCY: AN ARDL ANALYSIS FOR TÜRKIYE
Assist. Prof. Dr. Nuran Halise Belet **Shehzada Ghulam Abbas** **Shahzada Rahim Abbas**	Ankara Haci Bayram Veli University, Türkiye CERGE-EI, Prague, Czechia Ibn Haldun University, Türkiye	CAN EUROPE STAY PRODUCTIVE? MACROECONOMIC AND DEMOGRAPHIC PRESSURES ON LABOR PRODUCTIVITY

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HEAD OF SESSION: Assist. Prof. Dr. Merve SİPAHİ

Authors	Affiliation	Presentation title
Hatice ATAY **Dr. Gülhan ŞEN**	Burdur Mehmet Akif Ersoy University, Türkiye	EVALUATION OF THE RELATIONSHIP BETWEEN CLIMATE CHANGE AWARENESS AND CARBON FOOTPRINT
Dr. Sertan AVCI **Prof. Dr. Belgin ÇAKMAK**	Ankara University, Türkiye	A REVIEW OF WATER QUALITY MONITORING IN TURKEY HISTORICAL TRENDS, CURRENT PRACTICES, AND FUTURE PERSPECTIVES
Prof. Dr. Belgin ÇAKMAK **Dr. Sertan AVCI**	Ankara University, Türkiye	A NEW APPROACH TO INCREASE WATER EFFICIENCY IN AGRICULTURE
Assist. Prof. Dr. Gülçin DEMİREL BAYIK	Zonguldak Bulent Ecevit University, Türkiye	SUSTAINABILITY IN HIGHER EDUCATION: CARBON FOOTPRINT REPORTING AND MANAGEMENT ON UNIVERSITY CAMPUSES
Prof. Dr. Suat ÇETİNER **Dr. Şeyma KANARA**	Kahramanmaraş Sütçü İmam University, Türkiye	GREEN TRANSFORMATION IN WEARABLE TECHNOLOGIES: SUSTAINABLE SMART TEXTILES
Assist. Prof. Dr. Merve SİPAHİ	Osmaniye Korkut Ata University, Türkiye	SUSTAINABLE DEVELOPMENT GOALS AND CLIMATE POLICIES IN LOCAL GOVERNMENTS: A PARTICIPATORY APPROACH
Assist. Prof. Dr. Mustafa Teoman TEKKÖKOĞLU **Assist. Prof. Dr. Ahmetcan ALPAN**	Mimar Sinan Fine Arts University, Türkiye	THE TRANSFORMATION OF CLIMATE POLICIES IN TURKEY: GLOBAL INFLUENCES AND NATIONAL STRATEGIES

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ZOOM ID: 860 5266 6988 / PASSCODE: 123456

HEAD OF SESSION: Assist. Prof. Dr. Ahmet SEKEROGLU

Authors	Affiliation	Presentation title
Res. Assist. Zeynep Nur KÖSTEPEN Prof. Dr. Deniz TÜRSEL ELİİYİ Assoc. Prof. Dr. Uğur ELİİYİ Sıla UZUN İsmail ÖZEN	Izmir Bakircay University, Türkiye	PARATRANSIT SYSTEM DESIGN FOR TRANSPORTATION REQUESTS OF DISABLED PASSENGERS IN CENTRAL İZMİR
Lect. Dr. Fatmira PRODANI	Aleksandër Moisiu University, Albania	ARTIFICIAL INTELLIGENCE FOR SMARTER LOGISTICS IN ALBANIA: A QUALITATIVE EXPLORATION
Assist. Prof. Dr. Ahmet SEKEROGLU Harun CEYLAN	Amasya University, Türkiye	SPATIAL OPTIMIZATION OF HYBRID SOLAR–WIND RENEWABLE ENERGY FACILITIES: A DECISION-MAKING APPROACH BASED ON BOOLEAN LOGIC
Zeynep Nur KÖSTEPEN Prof. Dr. Hasan SELİM	Dokuz Eylul University, Türkiye	RISK IDENTIFICATION AND INTERACTION ANALYSIS IN HUMANITARIAN LOGISTICS PROCESSES
Şükrü BEŞTAŞ Assist. Prof. Dr. Fatih BAYRAK Prof. Dr. Fevzi HANSU	Siirt University, Türkiye	BIBLIOMETRIC MAPPING OF ELECTRIC VEHICLE BATTERY THERMAL MANAGEMENT AND COOLING TECHNOLOGIES: TRENDS AND FUTURE DIRECTIONS
Mikail KURNAZ Assoc. Prof. Dr. Ebru KOCA AKKAYA	Yıldız Tecnhical University, Türkiye	IMPLEMENTATION OF DIGITAL PRODUCT PASSPORT IN LOW-TECH ELECTRICAL PRODUCTS: A CASE STUDY ON AN ELECTRICAL SOCKET
Metin YILMAZ Assist. Prof. Dr. Derya Betul UNSAL	Sivas Cumhuriyet University, Türkiye	OPTIMIZING SOLAR ENERGY FORECASTING THROUGH MACHINE LEARNING WITH REAL-TIME DATA FOR SUSTAINABLE ENERGY USAGE

SÜRDÜRÜLEBİLİRLİK KOORDİNATÖRLÜĞÜ

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HEAD OF SESSION: Dr. Chems Eddine BOUKHEDIMI

Authors	Affiliation	Presentation title
Constantin-Daniel VĂDUVA	University of Bucharest, Romania	CONCEPTUALIZING SUSTAINABLE SOCIAL ENTREPRENEURSHIP: INTEGRATING COMMUNITY VALUES AND SUSTAINABILITY PRINCIPLES IN SOCIAL ECONOMY MODELS
Assist. Prof. Dr. Tuhina Sinha **Assist. Prof. Dr. Priya Chaudhuri**	Amity University Jharkhand, India	NAVIGATING THE COMPLEXITIES OF DIGITAL TAXATION IN GLOBAL ECONOMIC GOVERNANCE: EVALUATING THE IMPACT OF OECD'S TWO-PILLAR FRAMEWORK AND EMERGING NATIONAL DIGITAL SERVICE TAXES ON DEVELOPING ECONOMIES
Joseph Chinedu Ofobuike	Nnamdi Azikiwe University, Nigeria	THE POLITICAL ECONOMY OF ENVIRONMENTAL SUSTAINABILITY AND ITS IMPLICATIONS FOR AFRICAN DEVELOPMENT: A REFLECTION ON A JUST TRANSITION TO A CIRCULAR ECONOMY
Dr. Chems Eddine BOUKHEDIMI	University of Tizi-Ouzou, Algeria	ENERGY TRANSITION IN ALGERIA: CHALLENGES, OPPORTUNITIES, AND PATHWAYS TO SUSTAINABILITY
Kajal Antil **Assoc. Prof. Dr. Rekha Goel** **Mohit Kumar**	Maharshi Dayanand University, India KL Mehta Dayanand College For Women, India	SUSTAINABLE PACKAGING AS A CATALYST FOR GREEN TRANSFORMATION IN THE CIRCULAR ECONOMY
Idris Shamsuddeen	Umaru Musa Yar'adua University, Nigeria	ECONOMIC FRONTIERS OF THE HERBAL-PRODUCTS MARKET: HEALTH, TRADE, AND SUSTAINABILITY
Nuno BAPTISTA **Anna BOECHAT**	Polytechnic University of Leiria, Portugal European University, Portugal	TURNING CRISIS-INDUCED CHALLENGES INTO OPPORTUNITIES FOR BUILDING SUSTAINABLE SHORT FOOD SUPPLY CHAINS: THE CASE OF THE COVID PANDEMIC
Firmino ALMEIDA **Nuno BAPTISTA** **Anna BOECHAT**	Polytechnic University of Leiria, Portugal European University, Portugal	UNCERTAINTY MANAGEMENT IN BUSINESS STRATEGY
Khanak **Assoc. Prof. Dr. Seema Rathee Naiya**	Maharshi Dayanand University, India	DIGITAL CHANGE AGENTS: SOCIAL MEDIA INFLUENCERS AND THE SHIFT TOWARD SUSTAINABLE CONSUMPTION

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16.10.2025 / HALL-4 / SESSION-2 / TSI Time-12^{30}:14^{30}

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HEAD OF SESSION: Dr. ODU Adejare Samuel

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Dr. Nimota Jibola Kadir ABDULLAHI **Dr. Ifeoma P. OKAFOR**	University of Ilorin, Nigeria	MANAGING INNOVATION FOR SUSTAINABLE DEVELOPMENT IN NIGERIAN UNIVERSITIES: A TRIPLE HELIX PERSPECTIVE
Dr. ODU Adejare Samuel	The Federal Polytechnic Ilaro, Nigeria	POSSIBILITY OF ACTUALISATION OF THE SUSTAINABLE DEVELOPMENT GOALS: IMPLICATION FOR INDIGENOUS LANGUAGE MEDIA
Huzaifa Ahmad	Universiti Tunku Abdul Rahman, Malaysia	EMBEDDING ESG IN SMES: PATHWAYS TO SUSTAINABLE INNOVATION AND CLEAN ENERGY ADOPTION
Adnan Maqbool **Zahid Hameed**	Khwaja Fareed University of Engineering & Information Technology, Pakistan Ajman University, UAE	HOW DOES GREEN HUMAN RESOURCE MANAGEMENT PRACTICES ENHANCE SUSTAINABLE PERFORMANCE? THE ROLE OF GREEN AWARENESS AND GREEN KNOWLEDGE
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Purbasa Mondal **Assist. Prof. Dr. Raf Raf Shakil Ansari**	Sharda University, India	SUSTAINABILITY THROUGH STORYTELLING: ECO-LITERACY IN BIJAL VACHHARAJANI's A Cloud Called Bhura

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James Essien Akpan	Nigeria Police Academy, Nigeria	EXCHANGE RATE VOLATILITY, THE BANE OF NIGERIA INDUSTRIAL PRODUCTIVITY
Rufai Abdulmajid	Isa Kaita College of Education, Nigeria	ESG INTEGRATION AND CORPORATE SUSTAINABILITY REPORTING IN NIGERIA: CHALLENGES AND PROSPECTS
K Sandhiya **R Swathi**	Bharath Institute of Higher Education and Research, India	SUSTAINABILITY AND DEVELOPMENT: BUILDING A BALANCED FUTURE
E.Praveena **R.Swathi** **S.Rubin Thara**	Bharath Institute of Higher Education and Research, India	TECHNOLOGY INOVATION AND DIGITAL SUSTAINABILITY
Dr. Maldynova Aizhana **Dr. Mussabalina Dinara** **Dr. Nazgul AIDARGALIYEVA** **Nuraly Akniyet**	Kenzhegali Sagadiyev University of International Business, Kazakhstan Abai Kazakh National Pedagogical University, Kazakhstan L.N. Gumilyov Eurasian National University, Kazakhstan	ECONOMICS OF SUSTAINABLE RISK MANAGEMENT IN MINING COMPANIES IN KAZAKHSTAN
Saimon Islam **Most. Mokarroma**	University of Rajshahi, Bangladesh	THE RISE AND FALL OF JUTE: ECONOMIC CHALLENGES AND FUTURE PROSPECTS OF BANGLADESH'S GOLDEN FIBER
R. Swathi **G. David**	Bharath Institute of Higher Education and Research, India	RENEWABLE ENERGY AS A CATALYST FOR SUSTAINABLE ECONOMIC GROWTH

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Lect. Rindy Dwi LADISTA **Lect. Maya Aulia SAPUTRI**	University of Lampung, Indonesia Polytechnic of STMI Jakarta, Indonesia	FACTORS INFLUENCING CARBON EMISSION DISCLOSURE IN INDONESIAN SHARIA BANKS
Dr. Jasvinder Kaur **Dr. Kamaljit Singh** **Assist. Prof. Dr. Saransh Royal** **Dr. Pawan Kumar**	Kurukshetra University, India SRM University, India National Institute of Technology Kurukshetra, India	SUSTAINABLE INVESTMENT AND MARKET STABILITY: PERFORMANCE AND VOLATILITY DYNAMICS OF SUSTAINABLE STOCK INDICES AMID MARKET TURBULENCE
Res. Assist. PAROSHA JAHA SHATUL	Rajshahi University, Bangladesh	ROLE OF RAJSHAHI UNIVERSITY IN LOCAL AND REGIONAL DEVELOPMENT
Malfaliya Nabila	State Islamic University of K.H. Abdurrahman Wahid, Indonesia	FINANCIAL INCLUSION AND ECONOMIC EMPOWERMENT: THE ROLE OF YOUTH ENTREPRENEURSHIP IN DEVELOPING ECONOMIES
Sheza Aura NAFASYA **Alifa Rahma OKTANTIA**	State Islamic University K.H. Abdurrahman Wahid Pekalongan, Indonesia	GREEN SHARIA BANKING AS A CRITIQUE OF THE ILLUSION OF SUSTAINABILITY IN THE GLOBAL ECONOMY
Laroaena Nadia Ayu FATHMASARI **Alfi Anita SASIA** **Takawa MAFAZA**	State Islamic University K.H. Abdurrahaman Wahid Pekalongan, Indonesia	ENHANCING ACADEMIC ENGAGEMENT IN THE ERA OF DIGITAL SUSTAINABILITY: A CROSS-DISCIPLINARY APPROACH
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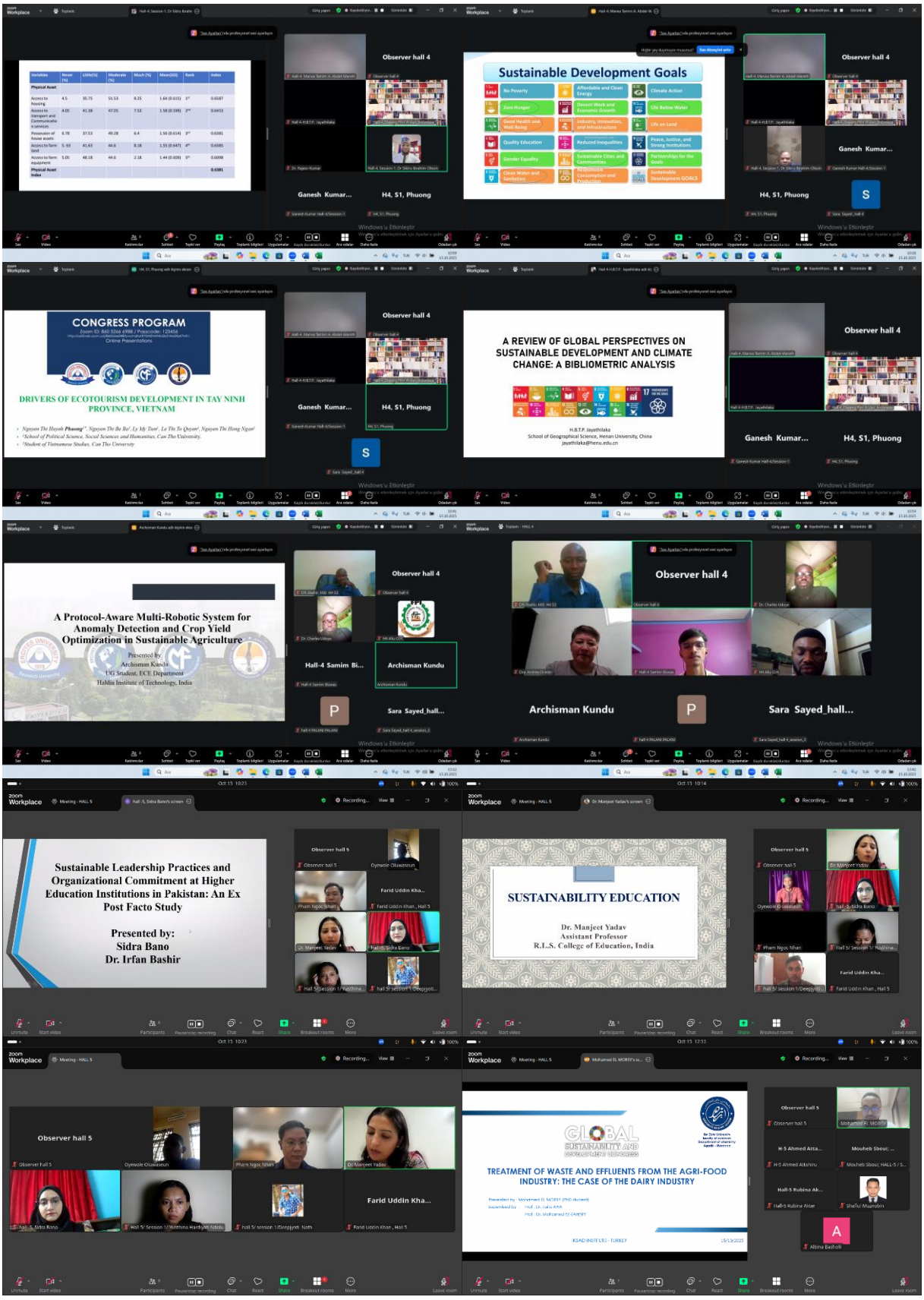
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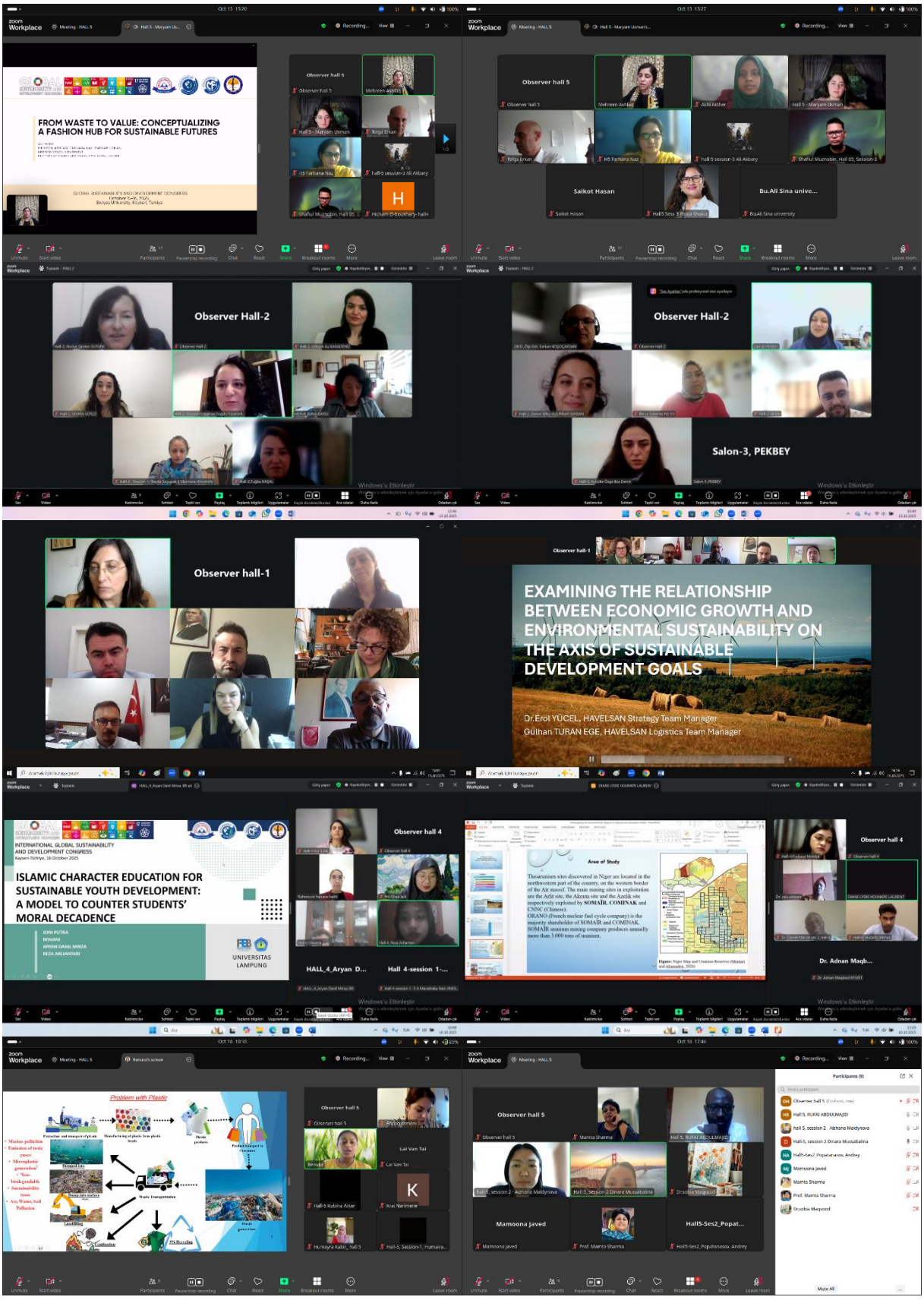
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SÜRDÜRÜLEBİLİRLİK RİSKLERİNDEN GIDA FİYATI ŞOKLARINA: ESG TABANLI SÜRDÜRÜLEBİLİRLİK BELİRSİZLİĞİNİN ROLÜ

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ÖZET

Bu çalışma, ESG (çevresel, sosyal, yönetişim) tabanlı sürdürülebilirlik belirsizliğinin küresel gıda fiyatları üzerinde nasıl bir etkisi olduğunu 2009:01-2025:05 dönemi için araştırmayı amaçlamaktadır. Bu amaçla, küresel gıda fiyatlarının artış ve azalış dönemlerini farklı rejimler altında inceleyebilmek adına Markov Rejim Değişim modelinden yararlanılmıştır. Rejim (0), küresel gıda fiyatlarının ani artış göstermesine neden olan 2008 küresel finansal krizini, 2010-2011 küresel piyasalardaki spekülatif hareketlerini ve COVID-19 pandemisini temsil etmektedir. Rejim (1) ise küresel gıda fiyatlarının nispeten daha istikrarlı olduğu uzun süreli dönemlerle örtüşmektedir. Çalışmada kullanılan temel modelin sonuçlarına göre, petrol fiyatları, gıda fiyatlarının en güçlü belirleyicisi konumundadır. Ayrıca Rejim (0)'dayken, ekonomik politika belirsizliğinin küresel gıda fiyatları üzerinde anlamlı pozitif bir etkisi bulunmaktadır. Burada yeni ve en dikkat çekici bulgu, sürdürülebilirlik belirsizliğinin Rejim (1)'deki pozitif ve anlamlı etkisidir. Bu bulgular, farklı dönemlerde farklı belirsizliklerin küresel gıda fiyatlarını artırabileceğine işaret etmektedir. Politika yapıcıların, küresel gıda fiyatlarındaki dalgalanmaları kontrol edebilmeleri için, ekonomik politika belirsizliklerinin yanında sürdürülebilirlik belirsizliklerini de dikkate almaları önerilir.

Anahtar kelimeler: Küresel gıda fiyatları, ekonomik politika belirsizliği, sürdürülebilirlik belirsizlik endeksi, Markov rejim değişim modeli.

FROM SUSTAINABILITY RISKS TO FOOD PRICE SHOCKS: THE ROLE OF ESG-BASED SUSTAINABILITY UNCERTAINTY

ABSTRACT

This study aims to investigate the impact of ESG (environmental, social, governance)-based sustainability uncertainty on global food prices for the period 2009:01-2025:05. To this end, the Markov Regime Switching model is used to examine the periods of increase and decrease in global food prices under different regimes. Regime (0) represents the 2008 global financial crisis, the 2010-2011 speculative movements in global markets, and the COVID-19 pandemic, which caused a sudden increase in global food prices. Regime (1) coincides with long periods of relatively stable global food prices. According to the results of the basic model in the study, oil prices are the strongest determinant of food prices. Furthermore, economic policy uncertainty has a significant positive effect on global food prices in Regime (0). The new and most striking finding here is the positive and significant effect of sustainability uncertainty in Regime (1). These findings indicate that different uncertainties may increase global food prices in different periods. It is recommended that policy makers consider sustainability uncertainties alongside economic policy uncertainties to control fluctuations in global food prices.

Keywords: Global food prices, economic policy uncertainty, sustainability uncertainty index, Markov regime-switching model.

THE PLACE AND IMPORTANCE OF COMPETITIVE PRODUCTION WITHIN THE TWELFTH DEVELOPMENT PLAN AND SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

Development Plans are among Turkey's most important planning and strategy documents, prepared every five years and carrying comprehensive goals for everyone. Among the development plans that aim to achieve sustainable development by keeping pace with the globalizing and modern world in every field, the 12th Development Plan, covering the period 2024-2028, is currently in effect. The 12th Development Plan appears to embrace the United Nations' "Sustainable Development Goals (SDG)" vision, which offers a development approach that considers the balance between economic growth, social justice, and environmental sustainability, and includes global goals. Within this framework, the "productivity-based and export-oriented growth model," highlighted in the 12th Development Plan and one of the cornerstones of competitive production in the context of increasing international competitiveness, is directly aligned with SDG 8 (Decent Work and Economic Growth).

As another example, the "green transformation and circular economy practices" included in the 12th Development Plan are directly linked to SDG 12 (Responsible Consumption and Production). The efficient use of existing resources and environmentally friendly production processes demonstrate that competitiveness today is based not only on cost advantage but also on sustainability criteria. Based on all the parameters related to "Competitive Production" in the 12th Development Plan's Sustainable Development Goals (SDG) vision, competitive production stands out as a fundamental tool for strengthening Turkey's position in global markets and achieving sustainable development goals. This study will first explain some of the fundamental parameters of competitive production within the scope of enhancing international competitiveness. Subsequently, the relevant sections of the 12th Development Plan and the Sustainable Development Goals (SDGs) related to competitive production and aimed at achieving this goal will be explained. In the conclusion section, evaluations regarding the sustainable development vision will be made.

Keywords: Sustainable Development, Competitive Production, Sustainable Development Goals (SDG), Development Plans

ÖZET

Kalkınma Planları, Türkiye'nin en mühim plan ve strateji belgelerinden biri olup, 5 yılda bir hazırlanmakta, herkes için kapsayıcı hedefler taşımaktadır. Küreselleşen ve çağdaş Dünyayı her alanda yakalayarak sürdürülebilir kalkınmayı gerçekleştirmeyi hedefleyen kalkınma planları içerisinde, halihazırda 2024-2028 yılları arasını düzenleyen 12. Kalkınma Planı yürürlüktedir. 12.Kalkınma Planının; Birleşmiş Milletlerin ekonomik büyüme, sosyal adalet ve çevresel sürdürülebilirlik arasındaki dengeyi gözeten bir kalkınma anlayışı sunduğu, küresel hedefleri içeren "Sürdürülebilir Kalkınma Amaçları(SKA)" vizyonunu benimsediği görünmektedir. Bu çerçevede 12.Kalkınma Planı'nda öne çıkan ve uluslararası rekabet gücünün artırılması bağlamında rekabetçi üretimin temel yapı taşlarından biri olan "verimliliğe dayalı ve ihracat odaklı büyüme modeli", SKA 8 (İnsana Yakışır İş ve Ekonomik Büyüme) ile doğrudan uyumludur.

Yine buna başka bir örnek olarak, 12. Kalkınma Planı'nda yer alan "yeşil dönüşüm ve döngüsel ekonomi uygulamaları", SKA 12 (Sorumlu Tüketim ve Üretim) ile doğrudan bağlantılıdır. Mevcut kaynakların etkin

kullanımı, çevre dostu üretim süreçleri, rekabetçiliğin günümüzde sadece maliyet avantajına değil, bunun yanında sürdürülebilirlik kriterlerine dayandığını göstermektedir. Sürdürülebilir Kalkınma Amaçları(SKA) vizyonundaki 12.Kalkınma Planının, "Rekabetçi Üretim" le ilişkili bütün parametrelerden yola çıkarak rekabetçi üretim, Türkiye'nin küresel pazarlardaki konumunu güçlendirmenin yanı sıra sürdürülebilir kalkınma hedeflerine ulaşmada da temel bir araç olarak öne çıkmaktadır. Çalışmada ilk olarak uluslararası rekabet gücünün artırılması kapsamındaki rekabetçi üretim temel bazı parametreleriyle açıklanacak olup; akabinde 12. Kalkınma Planı ve Sürdürülebilir Kalkınma Amaçları(SKA)'nın, rekabetçi üretimi ilgilendiren, bu hedefi gerçekleştirmeye yönelik ilişkili kısımları açıklanacaktır. Sonuç bölümünde ise sürdürülebilir kalkınma vizyonuna yönelik değerlendirmeler yapılacaktır.

Anahtar kelimeler: Sürdürülebilir Kalkınma, Rekabetçi Üretim, Sürdürülebilir Kalkınma Amaçları(SKA), Kalkınma Planları

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ÖZET

Sanayi sektöründe faaliyet gösteren birçok firma, sürdürülebilirlik kavramının önemini fark etse de bu yolculuğa nereden başlayacağını bilememektedir. Oysa iklim değişikliği, karbon emisyonlarının azaltımı, su kaynaklarının etkin kullanımı ve döngüsel ekonomi uygulamaları yalnızca çevresel sorumluluk değil, aynı zamanda rekabet gücü ve uzun vadeli varoluş için kritik unsurlardır. Sürdürülebilirlik çalışmalarına başlarken su, enerji ve karbon hesaplamaları için envanter oluşturularak mevcut durumun tespit edilmesi büyük önem taşımaktadır. Bu süreçte ISO 14064-1:2018 ve ISO 14046 standartları, ölçüm ve raporlama için uluslararası kabul gören çerçeveler sunmaktadır. Yaşam döngüsü analizi (LCA), ürün ve süreçlerin çevresel etkilerini bütüncül olarak değerlendirme imkânı verirken; GRI raporlama standartları ve Bilim Temelli Hedefler (SBTi), sürdürülebilirlik performansının şeffaf bir biçimde aktarılmasına katkı sağlamaktadır.

Bu teknik araçların yanında firmaların organizasyonel düzeyde de bir yapılanmaya gitmeleri gereklidir. Sürdürülebilirlik komitelerinin kurulması, veri toplama sistemlerinin oluşturulması, enerji verimliliği ve atık yönetimi projelerinin hayata geçirilmesi bu sürecin temel yapı taşlarını oluşturmaktadır. Ayrıca AB Yeşil Mutabakatı ve SKDM gibi düzenlemelerle uyumlu yol haritalarının hazırlanması, firmaların yalnızca yasal zorunluluklarını yerine getirmesine değil, aynı zamanda küresel pazarlara erişimine de katkı sunmaktadır. Sürdürülebilirlik çalışmalarına paralel olarak yürütülen mevzuat takibi ise firmaların yasal yükümlülüklerini zamanında karşılamasına ve proaktif çözümler geliştirmesine yardımcı olmaktadır. Sonuç olarak, sürdürülebilirlik yolculuğuna başlayan bir firmanın atması gereken adımlar teknik ölçümlerden kurumsal yapılanmaya, raporlamadan stratejik uyuma kadar çok boyutlu bir yaklaşım gerektirir. Bu bildiri, sanayi kuruluşlarına bu süreci sistematik ve uygulanabilir bir çerçevede kurgulamaları için rehberlik etmeyi amaçlamaktadır.

Anahtar kelimeler: İklim Değişikliği, Entegre Sürdürülebilirlik, Sanayi, Karbon ve Su Envanteri, Yeşil Mutabakat

INTEGRATED SUSTAINABILITY STRATEGIES IN INDUSTRY

ABSTRACT

Many companies operating in the industrial sector recognize the importance of sustainability but are unsure where to begin this journey. However, climate change, carbon emission reduction, efficient use of water resources, and circular economy practices are critical elements not only for environmental responsibility but also for competitiveness and long-term survival. When embarking on sustainability efforts, it is crucial to identify the current situation by creating an inventory for water, energy, and carbon calculations. In this process, ISO 14064-1:2018 and ISO 14046 standards provide internationally accepted frameworks for measurement and reporting. Life cycle assessment (LCA) allows for a holistic assessment of the environmental

impacts of products and processes, while GRI reporting standards and Science-Based Targets (SBTi) contribute to the transparent communication of sustainability performance.

In addition to these technical tools, companies also need to establish organizational structures. The establishment of sustainability committees, the establishment of data collection systems, and the implementation of energy efficiency and waste management projects constitute the cornerstones of this process. Furthermore, developing roadmaps aligned with regulations such as the EU Green Deal and the SKDM not only helps companies fulfill their legal obligations but also contributes to their access to global markets. Monitoring legislation conducted in parallel with sustainability efforts helps companies meet their legal obligations in a timely manner and develop proactive solutions. Ultimately, the steps a company embarking on its sustainability journey requires a multifaceted approach, from technical measurements and institutional structuring to reporting and strategic alignment. This study aims to guide industrial organizations in building their integrated sustainability efforts in a systematic and applicable framework.

Keywords: Climate Change, Integrated Sustainability, Industry, Carbon and Water Inventory, Green Deal

THE IMPACT OF CBAM ON GLOBAL GREEN TRANSITION: A SUSTAINABILITY ANALYSIS OF THE AGRICULTURAL SECTOR THROUGH THE GTAP-E MODEL

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ABSTRACT

This study investigates the implications of the European Union's Carbon Border Adjustment Mechanism (CBAM), developed in line with climate neutral go, on the global green transition with a specific focus on the agricultural sector. The EU's carbon pricing policy is simulated using the GTAP-E (Global Trade Analysis Project – Energy) model under various scenarios. The simulations cover both unilateral implementation of CBAM by the EU and its simultaneous global adoption. The findings reveal that beyond reducing carbon leakage, CBAM encourages sustainable production models and facilitates the adoption of low-carbon technologies in agriculture. However, the shifts in the competitiveness of agricultural products in developing countries may lead to trade diversions. CBAM can thus be evaluated not only as a carbon regulation tool but also as a mechanism contributing to the integration of global sustainable agricultural policies.

Keywords: CBAM, GTAP-E, Carbon Pricing, Agricultural Sector, Sustainability

İKLİM KIRBACININ TARIM SEKTÖRÜ ÜZERİNE ETKİLERİ

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ÖZET

İklim Kırbacı, 21. yüzyılın en kritik çevresel sorunlarından biri olarak karşımıza çıkmaktadır. İklim Kırbacı kısaca *"ani sert hava değişimleri"* olarak tanımlanmaktadır. Zaman zaman dünyada ve Türkiye'de ani sert hava değişimleri yaşanmakta ve bunun sonucu bazı tarımsal ürünlerde üretim ve verim düşmektedir. Türkiye Akdeniz Havzası'nda yer almaktadır. Bu nedenle Türkiye, küresel ısınmanın etkilerini ortalamanın çok daha üstünde yaşamaktadır. Küresel ısınma sonucu bazen aşırı kuraklık, bazen ortalığı yıkıp geçen seller, bazen bahar ve yaz aylarında yaşanan kış, bazen de kış aylarında yaşanan bahar özellikle tarım sektörünü olumsuz etkilemektedir. Bu durum tarım sektöründe görülen risk ve belirsizlikleri daha da artırmaktadır.

2025 yılı Şubat, Mart ve Nisan aylarında Türkiye'de görülen *İklim Kırbacı* çeşitli meyve ve sebzeleri olumsuz etkilemiştir. 2025 yılı içinde yaşanan iklim kıracının Türkiye'de 16 meyve üzerinde olumsuz etkisi tespit edilmiştir. Bu olumsuz etki, sebze ve meyve fiyatlarına yükselmesine neden olmuştur. Bu çalışmada iklim kırbacının tarım sektörüne etkileri ele alınmıştır. Çalışma ikincil verilere dayalı olarak yapılmıştır. Çalışmanın sonunda iklim kırbacının etkilerini azaltmak için bazı öneriler getirilmiştir.

Anahtar Kelimeler: İklim kırbacı, Tarım sektörü, Türkiye.

THE EFFECTS OF THE CLIMATE BULLWHIP ON THE AGRICULTURAL SECTOR

ABSTRACT

The Climate bullwhip is one of the most critical environmental problems of the 21st century. Climate Wreck is simply defined as "sudden, severe weather changes." Sudden, severe weather changes occasionally occur worldwide and in Turkey, resulting in decreased production and yields for some agricultural products. Turkey is located in the Mediterranean Basin. Therefore, Türkiye is experiencing the effects of global warming much more than average. Global warming can sometimes cause extreme droughts, sometimes devastating floods, and sometimes winters during spring and summer, while sometimes springs during winter, negatively impacting the agricultural sector. This situation further increases the risks and uncertainties in the agricultural sector.

The Climate bullwhip, which occurred in Türkiye in February, March, and April 2025, negatively impacted various fruits and vegetables. The climate wreak havoc experienced in 2025 was identified as having a negative impact on 16 fruits in Turkey. This negative impact led to increased fruit and vegetable prices. This study examines the effects of climate wreak havoc on the agricultural sector. The study was conducted based on secondary data. At the end of the study, some recommendations were made to mitigate the effects of climate bullwhip.

Keywords: Climate bullwhip, Agricultural sector, Türkiye.

RESILIENCE, EU ENLARGEMENT PROCESS AND UKRAINE: THE EFFECT OF GEOPOLITICAL SHIFT IN EU EXTERNAL POLICY

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ABSTRACT

The concept of resilience is a vague concept because it includes various such as sectoral resilience including energy and climate fields. The EU has integrated this concept in its programs and policies and made it one of the main principles in its external affairs explicitly with the 2016 Global Strategy[1]. The new strategy has been viewed as a shift from the democratic transformation ambition to pragmatic action in external relations[2] and resilience principle provided an opportunity for the creation and maintainance of stability through eliminating political contradictions.

As a part of the external policy, the concept is also accomodated within the enlargement process. With the 2003 enlargement process and following crisis within the EU have caused the slow down of enlargement process and it was explicitly announced.[3] Since then, the aim is to navigate relations with candidate countries based on a common ground rather than membership.

However, the geopolitical shifts have potential to change the direction of resilience as it happened with the start of the Russia-Ukraine war in 2022. Since the war with Russia, the resilience concept has been alligned with a security-oriented features more than sustainable development. This study will focus on the pragmatic rational behind EU's policy for Ukraine's resilience in enlargement process. How the EU supports Ukraine with an ambition for security-oriented resilience first in Ukraine and second for whole Europe will be analyzed and explained through making comparisions in the pre-and post-2022 periods' documents and financial assistance.

Keywords: Resilience, the EU, Ukraine, Enlargement, War

[1] European Commission. June 2016. "European Union Global Strategy, Shared Vision, Common Action: A Stronger Europe", 27.09.2025. https://www.eeas.europa.eu/sites/default/files/eugs_review_web_0.pdf
[2] Ana E. Juncos. 2017. "Resilience as the New EU Foreign Policy Paradigm: A pragmatist turn?, *European Security, Vol. 26, No. 1,* pp. 1-18.
[3] Frank Schimmelfenning. 12 November 2015. "Juncker's Enlargement Standstill Threathens the EU's Credibility", *Friends of Europe*. 26.09.2025. https://www.friendsofeurope.org/insights/junckers-enlargement-standstill-threatens-the-eus-credibility/

SÜRDÜRÜLEBİLİRLİK RAPORLAMASI VE GÜVENCE DENETİMİNDE İÇ DENETİMİN ROLÜ

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ÖZET

Şirketlerin performansını etkileyen geleneksel finansal raporlamalar önemini korurken, dünya koşullarının değişimi finansal olmayan raporlamaların da şirket performanslarını etkilediği sonucunu ortaya koymaktadır. Finansal olmayan raporlama ile şirketlerin çevresel, sosyal ve ekonomik performansları, hedeflerine ulaşma çabaları ve bu süreçte elde ettikleri başarıların yatırımcı ve paydaşlara sunulması için sürdürülebilirlik raporlaması değerli bir kaynak haline gelmiştir. Dünya da yaşanan küresel ısınma, çevre kirliliği, su kaynaklarının kirletilmesi ve doğal kaynakların azalması gibi yaşanan olumsuzluklar geleceğe dair kaygıları artırmakta ve geleceğe yaşanabilir bir dünya bırakmak için sürdürülebilir üretim anlayışı, sürdürülebilirlik raporlaması hazırlamanın önemini göz önüne sermektedir. Sürdürülebilirlik raporlamasının önem kazanmasıyla bu raporlarda kaliteyi, güvenilirliği, şeffaflığı ve hesap verebilirliği sağlamak amacıyla güvence denetimine de ihtiyaç duyulmaktadır. Söz konusu güvence denetimi bağımsız denetçiler tarafından gerçekleştirilmekle birlikte, bu konuda iç denetçilere de önemli görevler düşmektedir. Şirketlerin çevresel, sosyal ve ekonomik hedeflerini tanımlamaları ve bu hedeflerin etkin bir şekilde uygulanmasında iç denetim önemli bir bileşen olarak varlığını göstermektedir. Ayrıca sürdürülebilirlik raporlaması ve güvence denetiminde iç denetim birimlerinin, yönetime makul güvence sağlamak amacıyla oluşturacağı politika ve prosedürler ile raporun hazırlanmasında oynayacağı rol de söz konusudur.

Bu çalışmada, işletmelerde iç denetim birimlerinin sürdürülebilirlik raporlaması ve güvence denetiminde aktif bir şekilde rol almasının etkileri kuramsal çerçevede incelenmiştir. Bu bağlamda çalışmada, sürdürülebilirlik raporlaması ve güvence denetimi ile sürdürülebilirlik raporlamasında iç denetim konularıyla ilgili ulusal ve uluslararası alanda yapılmış akademik araştırmalar incelenmiştir. Bu araştırma sonucunda; iç denetimin şirket içinde etkin bir şekilde var olması, sürdürülebilirlik raporlamasına ilişkin kaygıları azaltmakta ve raporların güvenilirliğini artırmaktadır. Ayrıca, etkin bir iç denetim mekanizması şirketlerin sürdürülebilirlik hedeflerine ulaşmalarına katkı sağlamakta ve kurumsal yönetim anlayışının güçlenmesine yol açmaktadır. Sadece sürdürülebilirlik raporlaması hazırlaması zorunlu olan şirketler için değil bunu her şirketin gönüllü bir şekilde yapmayı istemesi ve geleceğe yaşanabilir bir dünya bırakılması açısından önemlidir.

Anahtar Kelimeler: Sürdürülebilirlik Raporlaması, Güvence Denetimi, İç Denetim.

THE ROLE OF INTERNAL AUDIT IN SUSTAINABILITY REPORTING AND ASSURANCE AUDITING

ABSTRACT

While traditional financial reporting continues to be important in influencing company performance, changing global conditions have revealed that non-financial reporting also affects company performance. Non-financial reporting has become a valuable resource for sustainability reporting, presenting companies' environmental, social, and economic performance, their efforts to achieve their goals, and their successes in this process to investors and stakeholders. Global issues such as global warming, environmental pollution, contamination of water resources, and depletion of natural resources are increasing concerns about the future and highlighting the importance of preparing sustainability reports based on a sustainable production approach in order to leave

a livable world for future generations. With the growing importance of sustainability reporting, assurance audits are also needed to ensure the quality, reliability, transparency, and accountability of these reports. While such assurance audits are conducted by independent auditors, internal auditors also have important roles to play in this regard. Internal audit plays an important role in companies defining their environmental, social, and economic goals and effectively implementing these goals. Furthermore, internal audit units play a role in sustainability reporting and assurance audits by establishing policies and procedures to provide reasonable assurance to management and in the preparation of reports.

This study examines the effects of internal audit units actively participating in sustainability reporting and assurance audits in businesses within a theoretical framework. In this context, the study reviews academic research conducted nationally and internationally on sustainability reporting and assurance audits, as well as internal audit issues in sustainability reporting. The results of this research show that the effective presence of internal audit within a company reduces concerns about sustainability reporting and increases the reliability of reports. Furthermore, an effective internal audit mechanism contributes to companies achieving their sustainability goals and leads to the strengthening of corporate governance. This is important not only for companies that are required to prepare sustainability reports, but also for every company that wishes to do so voluntarily and to leave a livable world for the future.

Keywords: Sustainability Reporting, Assurance Audit, Internal Audit.

SÜRDÜRÜLEBİLİR KALKINMA AMAÇLARI KAPSAMINDA ERİŞİLEBİLİR ve TEMİZ ENERJİ ve TÜRKİYE'NİN MEVCUT DURUMU

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ÖZET

Sürdürülebilir kalkınma amaçları ya da diğer adıyla küresel amaçlar; dünyamızı korumak, yoksulluğa son vermek ve tüm insanlığın barış ve refah içinde yaşamasını sağlamak için; Birleşmiş Milletler üyesi ülkelerin 2030 yılı sonuna kadar ulaşması planlanan hedefleri içeren, evrensel bir eylem çağrısı niteliğindedir. Küresel amaçların 7.si, herkes için karşılanabilir, güvenilir, sürdürülebilir ve modern enerjiye erişimi sağlamaktır. Erişilebilir ve temiz enerji; temel olarak uygun fiyatlı, sürdürülebilir bir sistemle dağıtımı sağlanan ve çevreyi kirletmeyen enerjidir. İklim değişikliği ile mücadele etmenin en etkin yollarından biri olan temiz enerji, enerji üretimi sırasında çok az sera gazı salınımı yapan veya hiç yapmayan kaynakları içermektedir. Sera gazları; yeryüzünden yansıyan güneş ışınlarının yol açtığı ısının, atmosfer dışına çıkmasını engelleyen tabakayı oluşturan ve ısının tekrar yeryüzüne dönmesine neden olan gazlardır. Yenilenebilir enerji ise, ortalama bir insan ömrü boyunca doğa tarafından devamlı olarak yenilenen ve doğal süreçlerdeki mevcut enerji akışından elde edilen enerjidir. Bu tür enerjiyi; termal gibi doğrudan güneşten, rüzgâr ve hidroelektrik gibi dolaylı olarak güneşten ya da jeotermal ve gelgit enerjisi gibi çevrenin diğer doğal hareketlerinden ve mekanizmalarından elde etmek mümkündür. Bu çalışmanın amacı; Türkiye'nin yenilenebilir enerji potansiyelini ve mevcut durumunu 7. küresel amaç dâhilinde analiz etmektir. Olası fırsatlar ve alınması gereken tedbirler noktasında kamuoyuna ve yetkililere fikir verebilmek, çalışmanın bir diğer amacıdır.

Anahtar Kelimeler: sürdürülebilir kalkınma amaçları (SKA), temiz enerji, yenilenebilir enerji

AFFORDABLE and CLEAN ENERGY within the SCOPE of SUSTAINABLE DEVELOPMENT GOALS and TURKIYE'S CURRENT SITUATION

ABSTRACT

Sustainable development goals, also known as global goals, are a universal call to action that includes targets for United Nations member countries to be achieved by the end of 2030 in order to protect our world, end poverty and ensure that all of humanity lives in peace and prosperity. The 7th global goal is to ensure access to affordable, reliable, sustainable and modern energy for all. Affordable and clean energy is fundamentally, energy that is affordable, distributed through a sustainable system and does not pollute the environment. Clean energy, one of the most effective ways to combat climate change, includes resources that emit very little or no greenhouse gases during energy production. Greenhouse gases are gases that form a layer that prevents the heat caused by sunlight reflected from the earth from leaving the atmosphere and cause the heat to return to the earth. Renewable energy is energy that is continuously renewed by nature over the course of an average human lifetime and obtained from the existing energy flow in natural processes. It's possible to obtain this type of energy directly from the sun, such as thermal energy, indirectly from the sun, such as wind and hydroelectric energy or from other natural movements and mechanisms of the environment, such as geothermal and tidal energy. The purpose of this study is to analyze Turkiye's renewable energy potential and current

situation within the scope of the 7th global goal. Another aim of the study is to provide the public and authorities with ideas about possible opportunities and necessary measures.

Keywords: sustainable development goals (SDG), clean energy, renewable energy

SUSTAINABLE WASTEWATER FILTRATION: GRAVITY-DRIVEN DYNAMIC MEMBRANE FOR THE EFFLUENTS OF WASTEWATER TREATMENT PLANTS

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ABSTRACT

The effluent from municipal and industrial wastewater treatment plants (WWTPs) generally ends in a final sedimentation tank after the biologically activated sludge process. Although existing WWTPs meet Turkish discharge standards (Water Pollution Control Regulation), they are less efficient than membrane systems in terms of parameters such as suspended solids (SS), microplastics (MPs), and micropollutants. Therefore, low-cost and easy-to-operate filtration systems are needed. In this study, a pilot-scale gravity-driven dynamic membrane (GD-DM) filtration system was designed for Kayseri industrial WWTP effluent, Türkiye. A dynamic membrane module with eight cylindrical stainless steel support material of 150 µm pore diameter (total filtration area of 0.3136 m^2) was integrated into a 270 L volume and 70 cm high reactor which is operated by gravity. WWTP effluent was continuously fed to the reactor after adding 9 L of activated sludge taken from the secondary clarifier to form a dynamic layer. Previous laboratory-scale studies have shown that effluent turbidity values are below <0.01 NTU and MP removal efficiencies exceed 99%. Batch experiments were conducted on this pilot-scale system to investigate the flux profile. An average flux of 568 LMH was achieved at about 3 hours of operation. Preliminary studies suggest that sustainable results can be achieved about the integration of the pilot-scale GD-DM system into WWTPs in terms of energy saving and high efficiency.

Keywords: Sustainable, energy saving, wastewater, filtration, dynamic membrane.

CARBON NEUTRAL WASTEWATER TREATMENT PLANTS AND THEIR ROLE IN ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

The rapid increase in urban population and the effects of climate change necessitate the reconsideration of wastewater treatment plants from an environmental and climatic sustainability perspective. Conventional wastewater treatment plants consume high energy while also producing greenhouse gas emissions such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). This study examines the existing literature on carbon-neutral approaches and discusses gaps in research. The findings show that process optimization, recovery of biogas as an energy source, and renewable energy integration are effective in reducing greenhouse gas emissions. In recent years, artificial intelligence-based process management and circular economy approaches have come to the fore in carbon-neutral wastewater treatment plants. In addition, the recovery of nutrients such as phosphorus and nitrogen and the reuse of treated water directly contribute to the protection of natural resources. This study demonstrates that carbon-neutral wastewater treatment plants improve water quality, reduce fossil fuel dependence, ensure sustainable energy use and efficiency, and significantly contribute to achieving the sustainable development goals. The results show that carbon-neutral wastewater treatment facilities are essential to achieving global sustainability objectives, but multidisciplinary approaches, policy integration, and pilot-scale implementations should be the main focus of future studies.

Keywords: Carbon neutral wastewater treatment plants, energy positive plants, sustainable development goals.

ALBEDO EFFECT OF DIFFERENT GROUND CONDITIONS AND PERFORMANCE ANALYSIS IN PHOTOVOLTAIC SYSTEMS

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ABSTRACT

The energy generation performance of photovoltaic (PV) systems is directly linked to panel and inverter efficiency, as well as the environmental conditions of the installation site. The albedo value, which expresses the reflectivity of the ground surface, makes a significant contribution to production, especially in bifacial modules, via rear-side irradiation gains. In this study, based on a PV power plant installed in Van, Turkey, a model was created in the PVsyst software that was fully identical to the on-site configuration, and the simulation outputs were compared with the actual production data. For the grass (soil surface) ground condition, the simulation predicted an annual production of 5,217,138 kWh, while the measured production in the same period was recorded as 5,095,962 kWh, with a difference calculated at 2.3%.

Since the PVsyst model was configured in full compliance with the site parameters, it was demonstrated in this section that the difference between the simulated and measured values stems from irradiation variability and seasonality over the year. To eliminate the effect of this difference, monthly uncertainty coefficients for irradiation and seasonality were defined and applied to the PVsyst outputs, thereby adapting the simulation results to real-year conditions. Given that the site data used in the study belonged to the grass (soil surface) condition, the grass surface was accepted as the reference scenario for the corrected values. According to the corrected results, the grass surface produced 5,095,962 kWh. Other ground types achieved different production levels compared to this reference: dry asphalt 5,026,242 kWh (–1.4%), concrete 5,159,544 kWh (+1.25%), white gravel 5,268,864 kWh (+3.4%), and aluminum surface 5,402,782 kWh (+6.0%).

High-albedo ground surfaces are quantitatively shown to increase PV energy yield; ground selection is emphasized as a strategic variable in design and feasibility, providing a scientific framework for albedo-focused assessments.

Keywords: Photovoltaic (PV) systems, Ground albedo, Bifacial PV, PVsyst modeling, Energy yield

DEVELOPING A CALCULATION TOOL WITH CURRENT GLOBAL DATA FOR HOTEL CARBON FOOTPRINT WITHIN THE SCOPE OF SUSTAINABLE TOURISM

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ABSTRACT

Tourism is recognized as a rapidly expanding global industry that significantly contributes to greenhouse gas (GHG) emissions. However, sector-specific and methodologically robust tools for accurate measurement and reporting remain underdeveloped. This study proposes the design of an innovative carbon footprint calculation tool specifically tailored to the hotel industry, grounded in internationally acknowledged methodologies such as the Greenhouse Gas Protocol and the Intergovernmental Panel on Climate Change (IPCC) guidelines.

The tool integrates hotel-specific operational data to calculate emissions while incorporating uncertainty analysis, transparent reporting mechanisms, and mitigation strategy development. In alignment with the Global Sustainable Tourism Council (GSTC) criteria, the framework seeks to establish a robust carbon management infrastructure for the tourism sector, thus supporting its transition toward sustainable and low-carbon pathways.

Moreover, by pooling and standardizing data across time and geographies, the system enables longitudinal monitoring of emission trends, offering critical insights into the evolving carbon intensity of the tourism industry at both national and global scales. The study contributes to the literature by bridging methodological gaps and providing an applied framework that strengthens the intersection of academic research, industry practices, and policy frameworks.

Keywords: Sustainability, Carbon Foot Print, Carbon Reporting, Corporate Sustainability, Tourism

SÜRDÜRÜLEBİLİR TURİZM KAPSAMINDA OTEL KARBON AYAK İZİ İÇİN GÜNCEL KÜRESEL VERİLER İLE HESAPLAMA ARACI GELİŞTİRİLMESİ

ÖZET

Turizm, hızla büyüyen küresel bir sektör olarak sera gazı (GHG) emisyonlarına önemli ölçüde katkıda bulunmaktadır. Ancak, sektörün ihtiyaçlarına özgü, metodolojik olarak sağlam ölçüm ve raporlama araçları halen yetersizdir. Bu çalışma, otelcilik sektörüne özgü yenilikçi bir karbon ayak izi hesaplama aracının tasarlanmasını önermekte olup, Sera Gazı Protokolü (GHG Protocol) ve Hükümetlerarası İklim Değişikliği Paneli (IPCC) kılavuzları gibi uluslararası kabul görmüş metodolojilere dayanmaktadır.

Geliştirilen araç, otellere özgü operasyonel verilerle emisyon hesaplaması yaparken belirsizlik analizi, şeffaf raporlama ve azaltım stratejisi geliştirme modüllerini de içermektedir. Küresel Sürdürülebilir Turizm Konseyi (GSTC) kriterleri ile uyumlu olarak tasarlanan bu çerçeve, turizm sektörünün düşük karbonlu ve sürdürülebilir bir dönüşüme yönelmesini destekleyecek güçlü bir karbon yönetim altyapısı oluşturmayı hedeflemektedir.

Ayrıca, sistem farklı zaman dilimlerinde ve coğrafyalarda veri havuzu oluşturarak emisyon eğilimlerinin uzunlamasına izlenmesini sağlamaktadır. Böylece, turizm sektörünün karbon yoğunluğunun ulusal ve küresel ölçekte nasıl evrildiğine dair kritik içgörüler sunmaktadır. Çalışma, metodolojik boşlukları doldurmanın yanı sıra akademik araştırma, sektör uygulamaları ve politika çerçevelerini birbirine bağlayan uygulanabilir bir yaklaşım ortaya koyarak literatüre katkı sağlamaktadır.

Anahtar Kelimeler: Sürdürülebilirlik, Karbon Ayak İzi, Karbon Raporlama, Kurumsal Sürdürülebilirlik, Turizm

SUDAKİ YAŞAM HEDEFİ ve MAVİ EKONOMİ KAVRAMI

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ÖZET

Sürdürülebilir kalkınma amaçları ya da diğer adıyla küresel amaçlar; dünyamızı korumak, yoksulluğa son vermek ve tüm insanlığın barış ve refah içinde yaşamasını sağlamak için; Birleşmiş Milletler üyesi ülkelerin 2030 yılı sonuna kadar ulaşması planlanan hedefleri içeren, evrensel bir eylem çağrısı niteliğindedir. Küresel amaçların 14.sü, sürdürülebilir kalkınma için okyanusları, denizleri ve deniz kaynaklarını korumak ve sürdürülebilir kullanmaktır. Sudaki yaşam hedefi; deniz ve kıyı ekosistemlerini sürdürülebilir bir şekilde yönetmeyi ve kirlilikten korumayı ve de okyanus asitlenmesinin etkilerini ele almayı amaçlamaktadır. İşte bu hedef, mavi ekonomi kapsamına girmektedir. Mavi ekonomi kavramı; deniz ve okyanusların korunması ve sürdürülebilir kullanımını, petrol ve önemli deniz minerallerinin temini ve biyolojik olarak zenginleştirilmesini, sürdürülebilir enerji üretimini ve deniz taşımacılığını kapsamakta ve amaçlamaktadır. Mavi ekonominin temelinin yeşil ekonomiye dayandığını ve mavi ekonominin, yeşil ekonominin denizlere ve okyanuslara uyarlanmış versiyonu olduğunu söylemek mümkündür. Yeşil ekonomi kavramı; ekonomi ve ekoloji, büyüme ve kaynakların korunması, refah ve çevrenin korunması arasındaki çelişkiye çözüm niteliğindedir. Yeşil ekonomi; çevresel riskleri ve maliyetleri azaltırken, doğal kaynakların geri dönüşümünü içeren sürdürülebilir kalkınmaya dayanmaktadır. Bu çalışmanın amacı, 14. küresel amacı da kapsayan mavi ekonomi kavramını ele almaktır. Çalışma dâhilinde yeşil ekonomi kavramından da bahsedilecek; sonuç ve öneriler bölümünde ise, mavi ekonomi bağlamında gerek dünya çapında gerekse Türkiye özelinde alınabilecek önlemlere yer verilecektir.

Anahtar Kelimeler: sürdürülebilir kalkınma amaçları (SKA), yeşil ekonomi, mavi ekonomi

LIFE BELOW WATER GOAL and the CONCEPT of BLUE ECONOMY

ABSTRACT

Sustainable development goals, also known as global goals, are a universal call to action that includes targets for United Nations member countries to be achieved by the end of 2030 in order to protect our world, end poverty and ensure that all of humanity lives in peace and prosperity. The 14th global goal is to protect and sustainably use the oceans, seas and marine resources for sustainable development. Life below water goal aims to manage marine and coastal ecosystems sustainably, protect them from pollution and address the effects of ocean acidification. This goal falls within the scope of blue economy. The concept of blue economy contains and aims the protection and sustainable use of seas and oceans, the supply and biological enrichment of oil and important marine minerals, sustainable energy production and maritime transportation. It is possible to say that blue economy is based on green economy and blue economy is a version of green economy adapted to the seas and oceans. The concept of green economy offers a solution to the conflict between economy and ecology, growth and resource conservation, prosperity and environmental protection. Green economy is based on sustainable development that includes recycling of natural resources while reducing environmental risks and costs. The aim of this study is to address the concept of blue economy, which also includes the 14th global goal. The concept of green economy will also be discussed within the study and in the conclusions and

recommendations section, measures that can be taken both globally and specifically in Turkiye within the context of blue economy will be addressed.

Keywords: sustainable development goals (SDG), green economy, blue economy

İKLİM DEĞİŞİKLİĞİNE UYUM STRATEJİLERİNDE KARBON AYAK İZİ YÖNETİMİ

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ÖZET

İklim değişikliğiyle mücadelede azaltım ve uyum stratejileri, sürdürülebilir kalkınma hedeflerinin gerçekleşmesinde birbirini tamamlayan iki temel süreç olarak öne çıkmaktadır. Karbon ayak izi, azaltım politikalarının en önemli göstergelerinden biri olmakla birlikte, uyum stratejileriyle bütünleştiğinde iklim risklerinin azaltılmasına ve daha dirençli ekonomik-sosyal sistemlerin kurulmasına katkı sağlamaktadır. Bu bildiri, iklim değişikliğine uyum kapsamında geliştirilen stratejilerin karbon ayak izi yönetimi üzerindeki etkilerini ele almaktadır.

Su verimliliği uygulamaları, enerji tasarrufunu artıran teknolojiler, yenilenebilir enerji yatırımları, yeşil altyapı çözümleri ve sürdürülebilir tarım pratikleri hem sera gazı emisyonlarını azaltmakta hem de uyum kapasitesini güçlendirmektedir. Özellikle su kaynaklarının kısıtlı olduğu bölgelerde yürütülen verimlilik projeleri, bir yandan kuraklık riskine karşı uyumu desteklerken, diğer yandan enerji tüketimini ve sera gazı salımlarını düşürerek karbon nötrlük hedeflerine katkı sağlamaktadır.

Bu çalışmada, uyum stratejilerinin karbon ayak izi üzerindeki etkileri uluslararası standartlar (ISO 14064, ISO 14067, GHG Protocol) çerçevesinde değerlendirilecek; farklı sektörlerden uygulama örnekleri incelenerek, politika yapıcılar ve sanayi kuruluşları için bütüncül öneriler geliştirilecektir.

Anahtar kelimeler: Karbon Ayak İzi, İklim Değişikliği, Uyum Stratejileri, Sürdürülebilir Kalkınma, Enerji Verimliliği

CARBON FOOTPRINT MANAGEMENT IN CLIMATE CHANGE ADAPTATION STRATEGIES

ABSTRACT

Mitigation and adaptation strategies are recognized as two complementary processes in addressing climate change and achieving sustainable development goals. While the carbon footprint has traditionally been considered a core indicator for mitigation policies, its integration with adaptation strategies also contributes to reducing climate risks and building more resilient socio-economic systems. This paper examines the impacts of adaptation strategies on carbon footprint management.

Water efficiency measures, energy-saving technologies, renewable energy investments, green infrastructure, and sustainable agricultural practices not only lower greenhouse gas emissions but also strengthen adaptation capacity. Efficiency projects implemented in water-scarce regions simultaneously support adaptation to drought risks while reducing energy use and related emissions, thereby contributing directly to carbon neutrality targets.

This study evaluates the role of adaptation strategies in carbon footprint reduction within the framework of international standards (ISO 14064, ISO 14067, GHG Protocol). By analyzing case studies from different

sectors, the paper aims to provide integrated recommendations for both policymakers and industrial stakeholders, highlighting the strategic role of carbon footprint management in strengthening climate resilience.

Keywords: Carbon Footprint, Climate Change, Adaptation Strategies, Sustainable Development, Energy Efficiency

ERCNET: A NEW SHALLOW NETWORK FOR WATER BODY SEGMENTATION FROM SATELLITE IMAGERY

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ABSTRACT

Remote sensing is an important tool that provides large-scale, continuous, and objective data to ensure the sustainable use of natural resources on Earth. The integration of remote sensing and deep learning-based models has been frequently used in recent years, particularly in the field of water body extraction. This process, which allows for the temporal monitoring of changes in the quantity and quality of water resources, forms an important data infrastructure for the sustainable management of water, combating drought, and protecting ecosystems. In this study, the ERCNET network model was developed for semantic segmentation of water bodies using the WaterNet dataset. ERCNet was designed as a simpler and "shallower" version of the U-Net architecture, which has been used in many fields in recent years. The model has fewer layers and fewer filters compared to complex deep learning models such as Standard U-Net, Dilated U-Net, Fractal U-Net, and FC-DenseNet, which are widely used in image segmentation.This shallow structure of the model makes it easily applicable to small-scale datasets and requires less computational power. This way, it consumes less energy and offers a solution compatible with sustainable artificial intelligence applications.

According to the results obtained, the model's accuracy was calculated 99.77%, recall 99.41%, F1 score 99.52%, precision 99.63%, and IOU 99.06%. The results show that ERCNET can achieve high accuracy despite having a low number of parameters. It also turns out to be a more efficient solution compared to other methods.

Keywords: Sustainability, ERCNET, Deep learning, U-Net

THE USE OF ARTIFICIAL INTELLIGENCE TOOLS IN BIBLIOMETRIC META-ANALYSIS IN THE FIELD OF SUSTAINABLE CONSTRUCTION MANAGEMENT: QWEN3- MAX

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ABSTRACT

This study examines the potential use of artificial intelligence-based models in bibliometric meta-analysis studies conducted on sustainable construction management. The Qwen3-Max tool stands out in analysis studies in academic work. The literature reveals the systematic use of meta-analysis and literature reviews in sustainable construction management. Publications based on Web of Science and Scopus were included in the datasets used in the studies. In this study, clusters were attempted to be obtained through Vosviewer. In the second phase of the study, the clustering results obtained through VOSviewer were compared with the analysis outputs produced by Qwen3-Max on the same dataset in terms of accuracy, consistency, analytical depth, and usability. In conclusion, the reliability and applicability of AI-supported bibliometric analyses were evaluated in light of the advantages and limitations offered by Qwen3-Max compared to the clusters obtained with VOSviewer. The aim of the study, which will help determine tool selection in future academic studies, is to determine the variability according to limitations and priorities. It is believed that AI-supported models will offer a distinct advantage with their rapid data processing power in bibliometric meta-analysis. It is hoped that this study will contribute to the field by providing a methodological framework and usability recommendations for planned future studies.

Keywords: Sustainable construction management, bibliometric analysis, meta-analysis, artificial intelligence, Qwen3-Max.

RISK MAPPING, TECHNOLOGY, AND ARTIFICIAL INTELLIGENCE APPLICATIONS IN WILDFIRE MANAGEMENT: CASES FROM TÜRKİYE AND THE WORLD

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ABSTRACT

In recent years, there has been a marked increase in both the frequency and severity of wildfires in Türkiye and worldwide. While the causes of these fires include natural factors such as climate change, drought, and high temperatures, as well as human-induced activities, their impacts result in severe and often irreversible damage to ecosystems. This study focuses on identifying high-risk areas to prevent wildfires and to minimize potential damage in the event of a fire. Risk maps were created at the provincial level, and both natural factors (climate, topography, vegetation cover) and anthropogenic factors (human activities, settlement density, infrastructure) contributing to fire occurrence were analyzed. Furthermore, wildfire early warning systems, response plans, and strategies developed in Türkiye and globally were reviewed, and applicable action plans under different scenarios were discussed. Particular emphasis was placed on the integration of emerging technologies and artificial intelligence tools in fire detection and management processes. The findings indicate that widespread adoption of such technologies plays a critical role in reducing potential loss of life and property. This research demonstrates that combining risk mapping, technological infrastructure, and artificial intelligence integration can provide an effective roadmap for wildfire prevention and mitigation efforts.

Keywords: Wildfires, Risk Mapping, Climate Change, Artificial Intelligence.

ORMAN YANGINLARIYLA MÜCADELEDE RİSK HARİTALAMASI, TEKNOLOJİ VE YAPAY ZEKÂ UYGULAMALARI: TÜRKİYE VE DÜNYA ÖRNEKLERİ

ÖZET

Son yıllarda gerek Türkiye'de gerekse dünya genelinde orman yangınlarının sayısında ve şiddetinde belirgin bir artış gözlemlenmektedir. Yangınların nedenleri arasında iklim değişikliği, kuraklık, yüksek sıcaklıklar gibi doğal etkenlerin yanı sıra insan kaynaklı faktörler de önemli bir rol oynamaktadır. Her ne sebeple olursa olsun orman yangınları ekosistem üzerinde ciddi ve çoğu zaman kalıcı tahribatlara yol açmaktadır. Bu çalışma, orman yangınlarının önlenmesi ve olası yangın durumlarında meydana gelebilecek zararların en aza indirilmesi amacıyla riskli bölgelerin tespit edilmesine odaklanmaktadır. Bu kapsamda, il bazında risk haritaları oluşturulmuş; yangınlara sebep olan doğal (iklim, topografya, bitki örtüsü) ve yapay (insan faaliyetleri, yerleşim yoğunluğu, altyapı) faktörler analiz edilmiştir. Çalışmada ayrıca Türkiye ve dünya genelinde orman yangınlarına karşı geliştirilen erken uyarı sistemleri, müdahale planları ve stratejiler incelenmiş; farklı senaryolar çerçevesinde uygulanabilir aksiyon planları tartışılmıştır. Son yıllarda gelişen teknoloji ve yapay zekâ temelli sistemlerin, yangın tespitinde ve yangın yönetimi süreçlerinde nasıl kullanıldığına vurgu yapılmış; bu teknolojilerin yaygınlaşmasının, can ve mal kayıplarını önlemede kritik rol oynayacağı sonucuna varılmıştır. Bu araştırma, risk haritalaması, teknolojik altyapı ve yapay zekâ entegrasyonunun birlikte ele

alınmasının, orman yangınlarının önlenmesi ve etkilerinin azaltılması için etkin bir yol haritası sunabileceğini ortaya koymaktadır.

Anahtar Kelimeler: Orman Yangınları, Risk Haritalaması, İklim Değişikliği, Yapay Zekâ.

YENİLENEBİLİR ENERJİ KULLANIMI VE ÇEVRE TEKNOLOJİLERİNİN GELİŞİMİNİN CO_2 EMİSYONU ÜZERİNDEKİ ETKİSİNİN EKONOMETRİK İNCELENMESİ

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ÖZET

Bu çalışma, en çok yeşil ve en az yeşil ülkelerde yenilebilir enerji kullanımı ve çevresel teknoloji gelişiminin CO_2 emisyonu üzerindeki etkisini panel veri analizi yöntemleriyle incelemektedir. 2002-2021 dönemi için en çok yeşil ülkelere ait 8 ülke ve en az yeşil ülkelere ait 5 ülke sırasıyla iki yönlü panel veri analiz yöntemleri ve tek yönlü panel veri analizi yöntemleriyle analiz edilmiştir. Analiz sonucuna göre literature uygun bir şekilde en çok yeşil ülkeler grubunda yenilenebilir enerji kullanımı ve çevresel teknolojilerin gelişiminin CO_2 emisyonunu azalttığı gözlemlenmiştir. En az yeşil ülkeler grubunda ise yenilenebilir enerji kullanımının %10 anlamlılık seviyesinde CO_2 emisyonunu azalttığı gözlemlenirken çevresel teknoloji gelişiminin CO_2 emisyonu üzerinde anlamlı bir ilişkisi istatistiksel olarak bulunamamıştır. Çalışma sonucunda en çok yeşil ülkelerin ekonomilerinin yenilebilir enerji kullanımının teşvikleri ve çevresel teknolojilerinin gelişimindeki olumlu katkılar ile çevresel sürdürülebilirliğe katkı sağladıkları bu çalışmada da ispatlanmıştır. Bununla birlikte en az yeşil ülkelerde, yenilenebilir enerji kullanımın daha fazla yaygınlaşması teşvik edilmeli ve üniversitelerde ve çeşitli bilimsel kurumlarda çevresel teknolojilerin gelişmesi projelerler teşvik edilmesi en az yeşil ülkelerin sürdürülebilir ekonomiye geçmesinde önem arz etmektedir. Bu çalışma, panel veri analizinde iki yönlü etkiler modelinin ve tek yönlü panel veri modellerinin kuruluş mantıklarını karşılaştırmalı olarak vermesi bakımından ve ülkeleri çevre literatürene uygun gruplanması bakımından literatüre katkı sağladığı düşünülmektedir.

Anahtar Kelimeler: Panel Veri Analizi, Ekonometri, Sürdürülebilirlik, CO2 Emisyonu, Çevre Teknolojileri, Yenilenebilir Enerji Kullanımı.

AN ECONOMETRIC ANALYSIS OF THE IMPACT OF RENEWABLE ENERGY USE AND ENVIRONMENTAL TECHNOLOGY DEVELOPMENT ON CO_2 EMISSIONS

ABSTRACT

This study examines the impact of renewable energy use and environmental technology development on CO_2 emissions in the top greenest and bottom greenest countries using panel data analysis methods. For the period 2002-2021, eight countries belonging to the most top greenest group and five countries belonging to bottom greenest group were analysed using two-way panel data analysis methods and one-way panel data analysis methods, respectively. According to the analysis results, consistent with the literature, it was observed that renewable energy use and environmental technology development reduced CO_2 emissions in the group of the top greenest countries. In the group of the bottom greenest friendly countries, it was observed that renewable energy use reduced CO_2 emissions at a 10% significance level, while no statistically significant relationship was found between environmental technology development and CO_2 emissions. The study also demonstrated that the economies of the top greenest countries contribute to environmental sustainability through incentives for renewable energy use and the positive contributions of environmental technology development. However, in the bottom greenest countries, the wider adoption of renewable energy should be encouraged, and the development of environmental technologies in universities and various scientific institutions should be promoted, as this is crucial for the least green countries to transition to a sustainable economy. This study is considered to contribute to the literature in terms of comparatively presenting the underlying logic of two-way

effects models and one-way panel data models in panel data analysis and grouping countries according to environmental literature.

Keywords: Panel Data Analysis, Econometrics, Sustainability, CO_2 Emissions, Environmental Technologies, Renewable Energy Use.

CO_2 EMİSYONU VE İNSANİ GELİŞMİŞLİK ARASINDAKİ İLİŞKİNİN DOĞRUSAL OLMAYAN YÖNTEMLERLE İNCELENMESİ

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ÖZET

Bu çalışmada; seçili gelişmiş ve gelişmekte olan G20 ülkelerinde, CO_2 emisyonu ve insani gelişmişlik arasındaki uzun dönemli ilişki incelenmektedir. 1990-2023 dönemini kapsayan bu çalışmada; gelişmiş Almanya, Amerika Birleişk Devletleri, Birleşik Krallık, Güney Kore, İtalya ve Kanada, gelişmekte olan Arjantin, Brezilya, Endonezya, Güney Afrika, Meksika, Rusya Fedarasyonu, Suudi Arabistan ve Türkiye ülkeleri için CO_2 emisyonu ve insani gelişmişlik endeksi verileri doğrusal olmayan eşbütünleşme testleri ile incelenmiş ve sonuçları karşılaştırılmıştır. Çalışma sonucunda Almanya ve Meksika'da CO_2 emisyonu ve insani gelişmişlik endeksi arasında uzun dönemli sabit bir ilişki tespit edilirken, çalışmaya konu olan diğer ülkelerde uzun dönem sabit ilişki elde edilememiştir. Eşbütünleşme analizinden sonra, Almanya ve Meksika özelinde CO_2 emisyonu ve insani gelişmişlik arasındaki uzun dönem ilişkinin davranışı araştırılmış ve ters U şeklinde karesel bir ilişki tespit edilmiştir. Gelişmiş ülkelerde, insani gelişmişlik seviyesinin analiz başından itibaren yüksek olması ve zamanla az değişirken zaman içinde başarılı CO_2 emisyonunu azaltma politikalarının uygulanması ile bu iki değişken arasındaki uzun dönem denge ilişkisinin bozulduğu sonucu çıkarılmaktadır. Gelişmekte olan ülkeler grubunda ise, bu ülkelerin insanı gelişmişlik seviyelerindeki artışın daha çok sağlık, eğitim ve sosyal programlar kanalıyla olması ve CO_2 emisyonu seviyesini artıran sanayi kanalıyla ilişkinin daha zayıf olması nedeniyle iki değişken arasında uzun dönem denge ilişkisinin olmadığı söylenebilmektedir.

Anahtar Kelimeler: Doğrusal Olmayan Zaman Serileri Analizi, Eşbütünleşme Testleri, CO_2 Emisyonu, İnsani Gelişmişlik Endeksi

ANALYSIS OF THE RELATIONSHIP BETWEEN CO_2 EMISSIONS AND HUMAN DEVELOPMENT USING NON-LINEAR METHODS

ABSTRACT

This study examines the long-term relationship between CO_2 emissions and human development in selected developed and developing G20 countries. Covering the period 1990-2023, this study includes developed countries such as Germany, the United States, the United Kingdom, South Korea, Italy, and Canada, and the developing countries of Argentina, Brazil, Indonesia, South Africa, Mexico, the Russian Federation, Saudi Arabia, and Turkey. The study found a long-term constant relationship between CO_2 emissions and the human development index in Germany and Mexico, while no long-term constant relationship was found in the other countries covered by the study. Following the cointegration analysis, the behaviour of the long-term relationship between CO_2 emissions and human development in Italy was investigated, and an inverse U-shaped quadratic relationship was identified. In developed countries, it is concluded that the long-term equilibrium relationship between these two variables is disrupted by the implementation of successful CO_2 emission reduction policies over time, given that the level of human development is high from the outset of the analysis and changes little over time. In the group of developing countries, it can be said that there is no long-term equilibrium relationship between the two variables, as the increase in human development levels in

these countries is mainly through health, education and social programmes, and the relationship through industry, which increases CO_2 emission levels, is weaker.

Keywords: Nonlinear Time Series Analysis, Cointegration Tests, CO_2 Emissions, Human Development Index

TÜRKİYE'DE DİKEY ŞEHİRLEŞMENİN SOSYO-MEKANSAL YAŞAMA ETKİSİ

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ÖZET

İnsanoğlu yaradılışının temel aksiyomu olarak iki temel olgunun gerçekliği üzerinden ontolojik gerekçesini tamamlamaktadır: "Zaman ve mekân". Gündelik yaşamın hareketliliğini, hızını, planlamasını ve başta kültürel yapı olmak üzere beşerî her türlü birikimin bağlamını şekillendiren zaman faktörü bunu mekânın somut gerçekliği üzerinden inşa etmektedir. Mekânın zamanda meydana gelen konteksin hafızası olmasının yanında birey ve toplumların bu bütünsellik üzerinden sosyal yaşamı kurgulamaları, aidiyet hissetmeleri ve anlamlandırmaları da zamanın öznel, özgül ve ilişkisel sürekliliği üzerinden gerçekleşmektedir. Mekân ve zamanın bu karşılıklı inşasına yönelik gerçekleş(tiril)en her türlü etki ise iki temel olgu üzerinden şekillenen gündelik yaşamın doğal bağlamının çözülmesine ve toplumsal yaşamda farklı ölçeklerde "krizlerin" yaşanmasına neden olmaktadır. Bu durumun en çarpıcı örneği şehirsel formun dönüşümü üzerinden gerçekleşmiştir. Başta farklı medeniyet kodları üzerinden şekillenen "Nom, Polis ve Medine" şehir devletleri olmak üzeri geçmişten günümüze zaman-mekân düalizmi üzerinden insanlığın sosyal birikimini oluşturan tüm şehirler, özellikle sanayileşme süreciyle yeni bir boyuta evrilerek bu krizlerin varsıl coğrafyalarına dönüşmüştür. Modernitenin getirmiş olduğu enformasyonel araçlar, dijitalizm ve siyasal müdahalelerin meşruiyetine dayalı planlamaların da etkisiyle zaman-mekan düalizminin kopuşu, bireyin mekânsal bağlamdan daha hızlı bir şekilde soyutlanmasına ve coğrafi brikimi olmayan kentsel inşaların ve dönüşümlerin ortaya çıkmasına neden olmuştur. Soylulaştırma pratiklerinin de sürece dahil olmasıyla sürdürülebilir sosyal formun ortadan kalkmasına, toplumsal bağların ve hafızanın çözülmesine ve kapitalist rasyonel tasarıma uyum sağlayacak sosyo-mekansal coğrafyaların küresel bir boyut kazanmasına olanak tanımıştır. Bu nokta bu araştırmanın temel amacı, bin yıllık tarihsel birikimiyle Anadolu coğrafyasında önemli şehirler inşa ederek aynı zamanda kültürel ve inançsal doğal bütünselliği koruyan bir mirası devralan Türkiye'nin özellikle 1950 sonrası süreçte yaşadığı şehirleşme ve dikey mimarileşme ile birlikte meydana gelen dönüşümünün sosyo-mekansal yapıya etkisini analiz etmektir. Nitel araştırma yönteminin kullanıldığı bu çalışmanın veri seti amaçlı örneklem kapsamında yarı yapılandırılmış mülakat üzerinden elde edilmiş olup eleştirel tematik ve yorumlayıcı fenomenoloji analiz tekniğiyle incelenmiştir. Araştırma sonucunda Türkiye'de dikey şehirleşmeye hızlı geçişin tarihsel birikimin ve toplumsal bağlamın göz ardı edilerek planlı bir şekilde gerçekleştirilmediği, toplumun yüzyıllardır biriken kültürel ediminin kısa bir süreçte çözüldüğü ve bunun neticesinde zaman-mekân aidiyetine dayalı peyzaj semiyolojini yansıtmayan ve sosyal hafızası olmayan kentsel dokuların ortaya çıktığı anlaşılmıştır.

Keywords: Bireyselleşme, dikey şehirleşme, kolektif çözülme, kültürel dönüşüm, mekansal dönüşüm, toplumsal dönüşüm.

ABSTRACT

Humanity completes its ontological justification based on the reality of two fundamental phenomena as the basic axiom of its creation: "Time and Space." The factor of time, which shapes the dynamism, pace, and planning of daily life, as well as the context of all human accumulation—primarily cultural structure—constructs this upon the concrete reality of space. While space acts as the memory of the context that unfolds in time, the construction of social life, the sense of belonging, and the processes of meaning-making for individuals and societies also occur through the subjective, specific, and relational continuity of time. Any impact on this mutual construction of space and time leads to the dissolution of the natural context of daily

life, shaped by these two fundamental phenomena, and results in the experience of "crises" at various scales within societal life. The most striking example of this is observed through the transformation of the urban form. All cities, from the city-states of "Nome, Polis, and Medina" shaped by distinct civilizational codes to the present, which constitute humanity's social accumulation through the duality of time-space, have evolved into a new dimension, particularly with the industrialization process, becoming affluent geographies of these crises. Driven by informational tools brought by modernity, digitalism, and planning based on the legitimacy of political interventions, the rupture of the time-space duality has led to the rapid abstraction of the individual from spatial context and the emergence of urban constructions and transformations devoid of geographical accumulation. The inclusion of gentrification practices has further enabled the disappearance of sustainable social forms, the dissolution of social bonds and memory, and the global proliferation of socio-spatial geographies conforming to capitalist rational design. At this point, the primary aim of this research is to analyze the impact of the transformation resulting from urbanization and verticalization, especially in the post-1950 period, on the socio-spatial structure in Turkey, which inherited a legacy of constructing significant cities in the Anatolian geography with its millennia-old historical accumulation while also preserving a natural integrity of culture and faith. The data set of this study, which employs a qualitative research method, was obtained through semi-structured interviews within the scope of purposive sampling and analyzed using critical thematic and interpretive phenomenological analysis techniques. The research concludes that the rapid transition to vertical urbanization in Turkey was not planned in a manner that considered historical accumulation and social context; that the cultural practices accumulated by society over centuries dissolved within a short period; and that, as a result, urban fabrics emerged that do not reflect the landscape semiotics based on time-space belonging and lack social memory.

Keywords: Individualization, vertical urbanization, collective dissolution, cultural transformation, spatial transformation, social transformation.

EQUITABLE CITY DESIGN THROUGH PARTICIPATORY EDUCATION: A MODEL FOR ARCHITECTURE AND URBAN PLANNING STUDENTS

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ABSTRACT

This study presents an innovative participatory education model structured around the concept of the egalitarian city, implemented with undergraduate and graduate students from architecture and urban planning disciplines. Supported by the TÜBİTAK 2237-A Scientist Training Program (BİDEB), the project specifically focused on Sustainable Development Goal 11 (Sustainable Cities and Communities), aiming to enhance students' awareness of urban inequalities and to strengthen their capacity to generate solutions.

The six-day program combined theoretical inputs with practical applications through workshops, field observations, group discussions, and student presentations. Designed as a participatory action research process, the program addressed themes such as spatial justice, gender equality, inclusive design, and the use of public spaces. Data collected during these activities were analyzed collaboratively with participants and translated into solution-oriented proposals for more equitable urban environments.

The findings of this study demonstrate that participatory education can serve as a powerful tool to develop critical perspectives among future urban professionals and to foster innovative, locally applicable strategies that also have relevance in the global debate on equitable city design. By linking academic knowledge with practical engagement, this model not only empowers students but also contributes to sustainable and inclusive urban policy and design practices.

Keywords: Egalitarian City, Participatory Education, SDG 11, Spatial Justice, Gender, Public Space

THE EFFECTS OF INTERNAL MIGRATION DYNAMICS ON URBANIZATION AND SOCIO-ECONOMIC DEVELOPMENT IN TURKEY

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ABSTRACT

This study examines the impact of internal migration dynamics on the urbanization process and socio-economic development in Türkiye. The spatial distribution of the population directly influences a wide range of areas, from settlement planning and industry to transportation and infrastructure. In the Turkish context, rural-to-urban migration is a critical process that produces multidimensional consequences in education, infrastructure, sociology, and psychology. The study investigates the historical development of Türkiye's population and future population projections, discussing uncertainties arising from fertility rates, migration trends, and socio-economic conditions. Using official institutional data, statistics and maps were generated to analyze the causes and distribution of internal migration. Issues such as unplanned urbanization in metropolitan areas, insufficient transportation infrastructure, and cultural integration challenges were also addressed. Within the scope of the methodology, service activities, employment indicators, the distribution of university students by province, and socio-economic development indices were examined to identify the reasons behind inter-provincial differences in livability. Furthermore, Turkish provinces were assessed through the lens of the Global Liveability Index (EIU), and a survey conducted with 50 participants was used to determine the expectations and priorities of migrants. As a result, a roadmap considering the economic, infrastructural, and cultural dimensions of the rural-urban balance was proposed.

Keywords: Population Distribution, Internal Migration, Causes of Migration.

TÜRKİYE'DE İÇ GÖÇ DİNAMİKLERİNİN ŞEHİRLEŞME VE SOSYO-EKONOMİK GELİŞMİŞLİK ÜZERİNDEKİ ETKİLERİ

ÖZET

Bu çalışma, Türkiye'de iç göç dinamiklerinin şehirleşme süreci ve sosyo-ekonomik gelişmişlik üzerindeki etkilerini incelemektedir. Nüfusun mekânsal dağılımı; yerleşim planlamasından sanayiye, ulaşımdan altyapıya kadar pek çok alanı doğrudan etkilemektedir. Türkiye özelinde, kırsaldan kentlere gerçekleşen göç hareketleri, eğitim, altyapı, sosyoloji ve psikoloji gibi çok boyutlu sonuçlar doğuran kritik bir süreçtir. Araştırmada, Türkiye nüfusunun tarihsel gelişimi ve nüfus projeksiyonları incelenmiş; doğurganlık oranları, göç eğilimleri ve sosyo-ekonomik koşulların yarattığı belirsizlikler tartışılmıştır. Mevcut kurumsal veriler kullanılarak hazırlanan istatistikler ve haritalar üzerinden iç göçün nedenleri ve dağılımları analiz edilmiş; büyükşehirlerdeki plansız kentleşme, ulaşım altyapısındaki yetersizlikler ve kültürel uyumsuzluklar gibi sorunlar değerlendirilmiştir. Metodoloji kapsamında; hizmet faaliyetleri, istihdam göstergeleri, üniversite öğrencilerinin illere göre dağılımı ve sosyo-ekonomik gelişmişlik endeksleri incelenmiş; iller arası yaşanabilirlik farklarının nedenleri ortaya konmuştur. Türkiye illeri Küresel Yaşanabilirlik Endeksi (EIU) perspektifinden değerlendirilmiş ve 50 katılımcı ile yürütülen anket çalışması ile göçmenlerin beklenti ve

öncelikleri belirlenmiştir. Sonuç olarak kır-kent dengesinin ekonomik, altyapısal ve kültürel boyutlarını dikkate alan bir yol haritası önerilmiştir.

Anahtar Kelimeler: Nüfus Projeksiyonları, İç Göç, Göç Nedenleri.

A BIBLIOMETRIC STUDY ON GREEN AIRPORT PRACTICES WITHIN THE SCOPE OF SUSTAINABILITY

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ABSTRACT

Sustainability, a holistic approach that aims for balanced development across environmental, economic, and social dimensions, is of utmost importance for the aviation sector. Sustainability within the aviation sector aims to both reduce environmental impacts and increase economic and social benefits. Therefore, this study aims to reveal the dynamics of recent trends in sustainability and green airport studies at airports by examining them through bibliometric analysis. Studies on green airports between 2000 and 2025, located in the Scopus database, were obtained and analyzed using Vosviewer 1.6.16. The results of the study revealed a steady increase in the number of studies conducted each year, with the journal with the highest number of publications being "Sustainability Switzerland." Furthermore, the authors L. Mantecchini and M. N. Postorino have the most publications on the subject, while the most frequently used keywords are "sustainability," "airport," and "sustainable development," respectively. The country with the most publications was the United States, while the United Kingdom was the country with the most citations. An examination of the inter-institutional citation network for co-authorship reveals that Loughborough University in the United Kingdom leads the way. Consequently, the increase in research conducted on green airports can be attributed to their importance in terms of environmental, economic, global competitiveness, and social responsibility. However, the analysis concludes that the number of publications published in Turkey is low by world standards.

Keywords: Green Airport, sustainability, bibliometric analysis

THE EFFECTS OF SUSTAINABLE AGRICULTURE ON BIOLOGICAL ACTIVITY

SÜRDÜRÜLEBİLİR TARIM UYGULAMALARININ BİYOLOJİK AKTİVİTELERE ETKİSİ

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ABSTRACT

Sustainable agriculture is recognized as an essential approach in modern farming systems, ensuring the conservation of environmental resources, the continuity of biodiversity, and the long-term security of food supplies. Unlike conventional farming practices, which often lead to soil degradation, biodiversity loss, and the disruption of ecosystem services due to intensive chemical inputs, sustainable agriculture offers an integrated system that considers ecological balance, economic feasibility, and social acceptance. Within this context, biological activity emerges as a key determinant of agricultural sustainability. The diversity of soil biota, the biochemical responses of plants, and the continuity of ecosystem services are all directly influenced by sustainable agricultural practices.

Organic fertilization plays a crucial role in enriching soil microbial diversity, enhancing enzymatic activity, and sustaining biochemical cycles. Crop rotation reduces the negative impacts of monoculture farming, while simultaneously increasing both the diversity of soil microorganisms and the resistance of plants to biotic and abiotic stress factors. Minimum tillage contributes to the preservation of soil structure, reduces carbon loss, and enhances water retention capacity, thereby supporting overall biological activity. Furthermore, biological control practices—utilizing natural enemies of pests—reduce dependency on chemical pesticides and promote ecosystem health.

Current literature emphasizes that these sustainable agricultural practices not only maintain ecological balance but also stimulate secondary metabolite production in plants, strengthen stress responses, and enhance the functional diversity of microbial communities. Consequently, sustainable agriculture contributes to the regulation of the carbon cycle, the maintenance of soil fertility, and the improvement of agroecosystem resilience.

The findings collectively indicate that sustainable agriculture should not be viewed solely as an environmental strategy but also as an approach that enhances biological activity, improves crop quality, and ensures long-term food security. Therefore, sustainable agricultural practices represent a critical pathway toward ecologically sound and economically viable food production systems in the future.

Keywords: Sustainable agriculture, biological activity, organic fertilization, microbial diversity, ecosystem services, secondary metabolites

A SYSTEMATIC ANALYSIS OF PERMACULTURE AND SUSTAINABLE AGRICULTURE PRACTICES*

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ABSTRACT

This study is a systematic analysis conducted with the aim of presenting a holistic perspective on sustainable agricultural practices and permaculture. To collect data, the Google Scholar database was searched using the keywords "permaculture" and "education," and 11 national and international studies conducted between 2010 and 2023 were found. The criteria for selecting studies were their contribution to the field of education and their relevance to sustainable development principles. Data were collected through document analysis and analyzed using content analysis. The studies revealed that permaculture is addressed in various applications in education. These practices were identified as closely related to school garden design, the development of science process skills, extracurricular learning environments, forest schools, and collaborative learning approaches. Garden-based learning contributes to the holistic development of cognitive, affective, and psychomotor skills in students by interacting with nature. Furthermore, the observation, classification, prediction, and modeling stages of the permaculture design process are considered an inherent part of science process skills. Learning environments where permaculture is implemented support students in developing environmentally conscious behaviors by increasing their environmental awareness. Consequently, permaculture education is considered an effective pedagogical tool for raising awareness of sustainable development.

Keywords: Permaculture, sustainable development, sustainable agriculture, education, systematic analysis, garden-based learning.

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CONTENT ANALYSIS OF ATTITUDE AND AWARENESS STUDIES TOWARDS SUSTAINABLE DEVELOPMENT*

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ABSTRACT

This study aims to reveal trends in the field by examining research on attitudes and awareness towards sustainable development in education. To this end, 54 national and international studies conducted between 2010 and 2023 were analysed using content analysis methods. Using the Google Scholar database, studies were retrieved by searching for the concepts ‘sustainable development’ AND ‘education’ AND “attitude” AND “awareness”. With the help of Excel, codes were created under categories such as the year of the study, type, purpose, research approach/methods, data collection tools, and results. The content analysis revealed that most studies were qualitative research-based articles focused on the field of science. The review of the studies showed that awareness of sustainable development is related to individuals developing conscious perceptions in environmental, economic and social dimensions, approaching events within a cause-and-effect relationship, and their capacity to generate solutions. It is emphasised that cognitive and affective awareness increases in direct proportion to individuals' interest in the subject and that awareness must be supported by curricula and applied education. When examining the theme of attitudes, it is seen that the cognitive, emotional, and behavioural components that guide individuals' behaviour towards the environment, society, and economy in achieving sustainable development goals gain importance. Most studies have found that attitudes towards sustainable development are addressed within the scope of environmental attitudes and that positive environmental attitudes pave the way for sustainable behaviour. In general, it has been concluded that awareness and attitudes towards sustainable development can be developed through education, and that inclusive programmes and applied learning processes are decisive in supporting individuals' sustainable living skills. The findings indicate that the components of attitude and awareness must be addressed holistically within the scope of sustainable development education.

Keywords: Sustainable development, awareness, attitude, content analysis, education.

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KÜLTÜREL MİRASIN YENİDEN İŞLEVLENDİRİLMESİ İÇİN SÜRDÜRÜLEBİLİR RESTORASYON YAKLAŞIMI: YOZGAT KONUT ÖRNEĞİ[1]

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ÖZET

Mimari miras, yalnızca kültürel kimliğin korunması açısından değil, aynı zamanda sürdürülebilir kentleşme politikalarının geliştirilmesi bakımından da stratejik bir önem taşımaktadır. Geleneksel konutlar, yerel malzeme kullanımı, iklime duyarlı tasarım yaklaşımları, enerji etkin çözümler ve uzun ömürlü yapım teknikleriyle günümüz sürdürülebilir mimarlık anlayışına doğrudan katkı sunabilecek nitelikler taşımaktadır. Ancak, modernleşme süreci, hızlı kentleşme ve değişen yaşam alışkanlıkları nedeniyle bu yapıların işlevselliğini kaybetmesi hem kültürel değerlerin hem de potansiyel sürdürülebilirlik avantajlarının kaybolmasına neden olmaktadır. Bu bağlamda, geleneksel konutların korunarak yeniden işlevlendirilmesi; enerji verimliliği, karbon ayak izinin azaltılması, çevresel uyum ve döngüsel ekonomi ilkeleri çerçevesinde ele alınmalıdır.

Çalışmanın temel amacı, Yozgat'ın Boğazlıyan ilçesinde bulunan geleneksel konut örneklerini sürdürülebilir tasarım ilkeleri doğrultusunda incelemek ve restorasyon önerileri geliştirmektir. Araştırma kapsamında literatür taraması, saha gözlemleri, yapı ön keşifleri, rölöve çizimleri, analiz paftaları ve metraj hesapları gerçekleştirilmiş; yapıların mevcut durumları hem kültürel miras değerleri hem de sürdürülebilirlik potansiyelleri açısından değerlendirilmiştir. Restorasyon önerileri geliştirilirken enerji etkin tasarım, pasif iklimlendirme çözümleri, malzeme geri dönüşümü ve çevresel yükün azaltılması gibi sürdürülebilirlik kriterleri dikkate alınmıştır. Böylelikle, yapıların özgün kimliğini koruyarak çağdaş kent yaşamına entegre edilebilmesi için uygulanabilir stratejiler ortaya konulmuştur.

Elde edilen bulgular, geleneksel konutların iklime uyumlu tasarım anlayışları, düşük karbonlu inşa teknikleri ve yerel malzeme kullanımıyla sürdürülebilir mimarlık için model teşkil ettiğini göstermektedir. Çalışma kapsamında önerilen restorasyon yaklaşımları, yapıların çevresel performanslarını iyileştirmeyi, enerji tüketimini azaltmayı ve döngüsel ekonomi anlayışı doğrultusunda kaynak kullanımını optimize etmeyi hedeflemektedir.

Sonuç olarak, Yozgat Boğazlıyan bölgesinde ele alınan geleneksel konutlar, kültürel mirasın korunmasının yanı sıra, sürdürülebilir kentleşme ve iklim değişikliği ile mücadele bağlamında da önemli bir potansiyel taşımaktadır. Bu çalışma, sürdürülebilir restorasyon yaklaşımlarının akademik ve uygulamalı düzeyde geliştirilmesi için örnek bir model sunmakta; aynı zamanda gelecekteki kentsel dönüşüm projelerine çevresel, toplumsal ve ekonomik sürdürülebilirlik ilkeleri doğrultusunda katkı sağlamaktadır.

Keywords: geleneksel konut, sürdürülebilir mimari, restorasyon, mimarlık.

[1] Bu çalışma 'Geleneksel Konut Mirası ve Sürdürülebilirlik Üzerine Bir Arastırma; Bogazlıyan Geleneksel Konut Örnegi' başlıklı TÜBİTAK 2209-A projesinden üretilmiştir. Desteklerinden dolayı TÜBİTAK'a teşekkür ederiz.

A SUSTAINABLE RESTORATION APPROACH FOR REFUNCTIONING CULTURAL HERITAGE: THE YOZGAT HOUSING EXAMPLE

ABSTRACT

Architectural heritage is of strategic importance not only for the preservation of cultural identity but also for the formulation of sustainable urbanization policies. Traditional dwellings—characterized by the use of local materials, climate-responsive design strategies, energy-efficient solutions, and durable construction techniques—embody qualities that can directly inform contemporary approaches to sustainable architecture. Yet, processes of modernization, rapid urban growth, and shifting lifestyles have diminished their functionality, resulting in the loss of both cultural values and potential sustainability benefits. In this regard, the conservation and adaptive reuse of traditional housing should be framed around principles of energy efficiency, carbon footprint reduction, environmental integration, and circular economy.

The study focuses on traditional dwellings in the Boğazlıyan district of Yozgat, with the dual aim of assessing them through sustainable design principles and developing context-sensitive restoration proposals. Methods included literature review, field observation, preliminary architectural surveys, measured drawings, analytical documentation, and quantity assessments. These were employed to evaluate the current conditions of the dwellings with respect to both their cultural heritage significance and sustainability potential. Restoration proposals were developed with attention to energy-conscious design, passive climate control, material reuse, and the mitigation of environmental impacts. Through this approach, strategies were formulated to facilitate the integration of traditional houses into contemporary urban life while maintaining their authenticity.

The findings reveal that traditional dwellings, through climate-adapted design approaches, low-carbon construction techniques, and reliance on local resources, can serve as models for sustainable architecture. The restoration strategies proposed in this study aim to enhance environmental performance, reduce energy consumption, and optimize resource use in alignment with circular economy principles.

In conclusion, the traditional houses of Boğazlıyan represent not only a valuable component of cultural heritage but also a significant resource for sustainable urbanization and climate change mitigation. This study offers a model for advancing sustainable restoration practices at both academic and applied levels, while contributing to future urban transformation projects grounded in environmental, social, and economic sustainability.

Keywords: traditional housing, sustainable architecture, restoration, architecture.

SÜRDÜRÜLEBİLİR VE ERİŞİLEBİLİR ÜNİVERSİTE YERLEŞKELERİ İÇİN "ENGELSİZ KAMPÜS" YAKLAŞIMI: ERCİYES ÜNİVERSİTESİ ÖRNEĞİ

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ÖZET

Üniversite yerleşkeleri, yeşil alanları ve yapılarıyla toplumun geniş kesimlerine açık olan ve en yoğun şekilde deneyimlenen kentsel laboratuvarlardan biridir. Üniversitelerin kurumsal kimliklerinin oluşumunda önemli bir role sahip bu yerleşkelerin geleceğe sürdürülebilir biçimde aktarılması büyük önem taşımaktadır. Aynı zamanda kentlerin en dinamik odaklarından biri olmaları, mevcut mekânsal koşulların iyileştirilmesini ve sürdürülebilir yenilemelere açık tutulmasını zorunlu hale getirmektedir. Bu bütüncül yaklaşım, günümüzde herkes için erişilebilir ve engelli dostu kampüs modellerini gündeme taşımaktadır. Bu modellerden biri olan "Engelsiz Kampüs" yaklaşımı, yerleşkelerin fiziksel, dijital ve sosyal erişilebilirlik uygulamalarını öne çıkarmaktadır. Bu çalışmada, Erciyes Üniversitesi kampüsü örnek alan olarak seçilmiştir. Çalışmanın yöntemi üç aşamalı bir inceleme süreci üzerine kurgulanmıştır. İlk olarak kampüsün açık alanları (yaya yolları, rampalar, yönlendirme sistemleri) ile örnek seçilen fakülte binaları (girişler, koridorlar, asansörler, tuvaletler, sesli ve yazılı bilgilendirme sistemleri) yerinde gözlemlerle incelenmiştir. İkinci aşamada, resmi belgeler ile yatırım planları ve son beş yıla ait bütçe verileri analiz edilerek erişilebilirlik çalışmalarının yıllara göre gelişimi sayısal olarak ortaya konmuştur. Üçüncü aşamada ise tespit edilen uygulamalar, ulusal mevzuat ve uluslararası erişilebilirlik standartları (TS 9111, ISO 21542 vb.) ile karşılaştırılmış, güçlü ve zayıf yönler değerlendirilmiştir. Bulgular; açık ve kapalı mekânlarda uygulanan engelli dostu düzenlemelerin kapsamını, fakültelerin ve üniversitenin yıllara göre gelişim eğilimlerini ortaya koymaktadır. Elde edilen veriler, Erciyes Üniversitesi'nin engelsiz kampüs yaklaşımında kaydettiği ilerlemeyi ve eksiklikleri çok boyutlu olarak değerlendirmektedir. Sonuç olarak, Erciyes Üniversitesi örneği üzerinden geliştirilen değerlendirmelerin ve önerilerin, diğer yükseköğretim kurumlarında yapılacak çalışmalara model oluşturması beklenmektedir. Çalışma, Sürdürülebilir Kalkınma Amaçları'ndan SKH 4 (Nitelikli Eğitim), SKH 10 (Eşitsizliklerin Azaltılması) ve SKH 11 (Sürdürülebilir Şehirler ve Topluluklar) ile doğrudan ilişkilidir. Bu doğrultuda, araştırmacıların, uygulayıcıların ve yöneticilerin teorik ve pratik girişimleriyle engelsiz kampüs perspektifinin geliştirilmesi amaçlanmaktadır.

Anahtar Kelimeler: Sürdürülebilirlik, Erişilebilirlik, Engelsiz Kampüs, Erciyes Üniversitesi.

"BARRIER-FREE CAMPUS" APPROACH FOR SUSTAINABLE AND ACCESSIBLE UNIVERSITY CAMPUSES: THE CASE OF ERCİYES UNIVERSITY

ABSTRACT

University campuses, with their green spaces and buildings, are one of the most intensely experienced urban laboratories open to broad segments of society. These campuses, which play a significant role in shaping the institutional identity of universities, must be transferred to the future in a sustainable manner. At the same time, being one of the most dynamic focal points of cities makes it imperative to improve existing spatial conditions and keep them open to sustainable renovations. This holistic approach brings accessible and disability-friendly campus models to the forefront today. One such model, the "Barrier-Free Campus" approach, highlights the physical, digital, and social accessibility practices of campuses. In this study, the

Erciyes University campus was selected as a case study. The study's methodology is based on a three-stage examination process. First, the campus's open areas (sidewalks, ramps, signage systems) and selected faculty buildings (entrances, corridors, elevators, restrooms, audio and written information systems) were examined through on-site observations. In the second stage, accessibility studies were quantitatively presented by analyzing official documents, investment plans, and budget data for the last five years. In the third stage, the identified practices were compared with national legislation and international accessibility standards (TS 9111, ISO 21542, etc.), and their strengths and weaknesses were evaluated. The findings reveal the scope of disability-friendly arrangements implemented in open and closed spaces, as well as the development trends of the faculties and the university over the years. The data obtained provides a multidimensional assessment of the progress and shortcomings of Erciyes University's "Barrier-Free Campus" approach. Ultimately, it is expected that the assessments and recommendations developed based on the example of Erciyes University will serve as a model for studies to be conducted at other higher education institutions. The study is directly related to Sustainable Development Goals SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities). In this regard, the aim is to develop the "Barrier-Free Campus" perspective through the theoretical and practical initiatives of researchers, practitioners, and administrators.

Keywords: Sustainability, Accessibility, Barrier-Free Campus, Erciyes University.

ENDÜSTRİ MİRASININ YENİDEN İŞLEVLENDİRİLMESİ VE KOLEKTİF BELLEK: KAYSERİ SÜMERBANK FABRİKASI ÖRNEĞİ

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ÖZET

Kentler yalnızca fiziksel mekânlardan ibaret olmayıp, toplumsal ilişkiler, tarihsel süreklilik ve kültürel belleğin iç içe geçtiği çok katmanlı yapılardır. Bu nedenle kentsel dönüşüm süreçleri, yalnızca yapısal değişimi değil, aynı zamanda kente dair hatıraların, sembollerin ve kimliklerin yeniden üretimini de içerir. Endüstri mirası alanları, geçmişin üretim faaliyetlerinin izlerini taşımalarının ötesinde, toplumların kolektif belleğinde yer etmiş sosyo-kültürel değerlerin taşıyıcılarıdır. Dolayısıyla bu alanların dönüşümü, mekân, hafıza ve aidiyet ilişkilerinde köklü değişimleri beraberinde getirir ve sosyal sürdürülebilirlik açısından önemli bir potansiyel sunar.

Türkiye'nin erken Cumhuriyet döneminde sanayileşmenin simgelerinden biri olan Kayseri Sümerbank Bez Fabrikası, 1935 yılında üretime başlamış; ekonomik katkısının yanı sıra işçi-işveren ilişkilerinden kent kimliğine kadar geniş bir alanda belirleyici rol oynamıştır. Uzun yıllar kent belleğinde güçlü bir simge olarak varlık gösteren fabrika, 2000'li yıllarda üretimin sona ermesi ve üniversite kampüsüne dönüşmesiyle, kolektif hafızanın sürekliliği ve yeniden inşası açısından yeni tartışmalara yol açmıştır.

Bu çalışma, Sümerbank'ın kampüse dönüştürülme sürecinin kolektif bellek üzerindeki etkilerini nitel yöntemlerle incelemiştir. Sözlü tarih görüşmeleri, arşiv belgeleri ve mekânsal analizler, farklı kuşakların mekânla kurduğu ilişki, hatırlama pratikleri ve mekânsal-duygusal süreklilikleri analiz etmiştir. Bulgular, alanın hâlen simgesel bir değere sahip olduğunu; ancak kampüsleşme sürecinin belleği hem dönüştürdüğünü hem de parçalı bir yapıya büründürdüğünü göstermektedir. Bazı kullanıcılar mekânsal sürekliliği deneyimlerken, bazıları alanı tarihsel bağlamından kopuk olarak yalnızca güncel işlevleri üzerinden deneyimlemektedir.

Sosyal sürdürülebilirlik perspektifiyle değerlendirildiğinde, endüstri mirasının yeniden işlevlendirilmesi, toplumsal aidiyet duygusunu güçlendirerek kültürel deneyimlerin kuşaktan kuşağa aktarılmasına olanak tanır. Bu da, enerji, malzeme ve karbon ayak izi açısından yeni yapı inşa etme gerekliliğini azaltarak çevresel sürdürülebilirlik hedeflerine dolaylı katkı sağlar.

Sonuç olarak, Sümerbank örneği, endüstri mirasının dönüşümünde fiziksel korumanın yanı sıra kolektif belleği ve sosyal sürdürülebilirliği güçlendirecek kültürel ve katılımcı stratejilerin geliştirilmesi gerekliliğini vurgulamaktadır. Hafızayı merkeze alan eleştirel bir yaklaşım, kent kimliği, toplumsal süreklilik ve sürdürülebilir kent politikaları açısından kritik öneme sahiptir.

Anahtar Kelimeler: Endüstri Mirası, Kolektif Bellek, Kent Hafızası, Sosyal Sürdürülebilirlik, Sümerbank, Yeniden İşlevlendirme

THE ADAPTIVE REUSE OF INDUSTRIAL HERITAGE AND COLLECTIVE MEMORY: THE CASE OF THE KAYSERI SÜMERBANK FACTORY

ABSTRACT

Cities are not merely physical spaces but complex, multi-layered structures where social relations, historical continuity, and cultural memory are deeply intertwined. Therefore, urban transformation processes involve not only structural change but also the reproduction of urban memories, symbols, and identities. Industrial heritage sites, beyond bearing traces of past production activities, are carriers of socio-cultural values embedded in the collective memory of societies. Consequently, the transformation of these sites brings about profound changes in the relationships between space, memory, and belonging, offering significant potential from a social sustainability perspective.

The Kayseri Sümerbank Cloth Factory, one of the symbols of industrialization in the early Republican period of Turkey, started production in 1935. Alongside its economic contributions, it played a decisive role in a wide range of areas, from labor-employer relations to urban identity. Having existed as a powerful symbol in the city's memory for many years, the factory ceased production in the 2000s and was converted into a university campus, sparking new debates regarding the continuity and reconstruction of collective memory.

This study examined the effects of Sümerbank's transformation into a campus on collective memory using qualitative methods. Oral history interviews, archival documents, and spatial analyses were used to analyze the relationship different generations establish with the space, their memory practices, and spatial-emotional continuities. The findings indicate that the site still holds symbolic value; however, the campus conversion process has both transformed the memory and rendered it fragmented. While some users experience spatial continuity, others experience the site primarily through its current functions, disconnected from its historical context.

When evaluated from a social sustainability perspective, the adaptive reuse of industrial heritage allows for the intergenerational transmission of cultural experiences by strengthening the sense of social belonging. This, in turn, contributes indirectly to environmental sustainability goals by reducing the necessity of constructing new buildings, thereby lessening the impact in terms of energy, materials, and carbon footprint.

In conclusion, the Sümerbank case emphasizes the necessity of developing cultural and participatory strategies that strengthen collective memory and social sustainability, in addition to physical conservation, in the transformation of industrial heritage. A critical approach that centers memory is of crucial importance for urban identity, social continuity, and sustainable urban policies.

Keywords: Industrial Heritage, Collective Memory, Urban Memory, Social Sustainability, Sümerbank, Adaptive Reuse

COMPARATIVE ANALYSIS OF ADOBE AND REINFORCED CONCRETE IN THE CONTEXT OF SUSTAINABLE BUILDING MATERIALS

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Abstract

Climate change, manifested by globally shifting climatic conditions such as rising temperatures and extreme weather events, is among the foremost global challenges of our time. One of the primary drivers of this process is the rapid increase in greenhouse gas emissions, which must be curbed and minimized. Structures that directly and indirectly influence carbon emissions play a pivotal role in reducing greenhouse gas emissions. Throughout their life cycle (construction–operation–demolition), buildings not only consume significant amounts of energy but also account for approximately 40% of total greenhouse gas emissions, thereby highlighting their detrimental impact on the environment. To mitigate this impact and reduce the greenhouse effect, it is essential to employ environmentally friendly, energy-efficient building materials that utilize renewable energy sources. Although reinforced concrete is presently the most widely used construction material, findings in the literature emphasize the strong potential of adobe as a sustainable alternative in terms of sustainability and energy efficiency.The aim of this study is to examine adobe, as a sustainable construction alternative, in terms of energy consumption, thermal comfort, and environmental sustainability, and to highlight its potential advantages over reinforced concrete—the most common building material today—based on findings reported in the literature. Evidence from the literature indicates that adobe buildings consume less energy during their construction, operation, and demolition phases, and, due to their high thermal mass, are capable of moderating fluctuations in temperature. In contrast, reinforced concrete buildings tend to exhibit higher energy consumption levels and fail to buffer temperature variations, thereby necessitating additional cooling and heating systems, which in turn increases overall energy demand. Consequently, adobe structures are underscored as being more advantageous with respect to energy consumption, thermal comfort, and sustainability.

Keywords: Adobe, reinforced concrete, sustainability, energy efficiency, thermal comfort.

MIXPACK INFRARED SHIRINK

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ABSTRACT

Tekstil sektöründe ambalajlama yapmak için shrinkleme fırınları kullanılmaktadır. Bu fırınların fiyat dezavantajı başta olmak üzere, fazla naylon kullanımı, fırınların bakım maliyetinin yüksek olması noktasında dezavantajları bulunmaktadır. GCM Makine tarafından geliştirilen shrinkleme makinesinde shrinkleme fırınları yerine infrared ısıtıcılar yerleştirilmektedir. Böylece makine ile fiyat tasarrufu sağlanmakta, makinenin küçülmesi ile firmaların alan sorunu çözülmektedir. Ayrıca paketleme sürecinde naylon kullanımının azaltılması soncunda firmaların karbon salınımları azaltılmakta ve Sürdürülebilir Kalkınma 13 İklim Eylemi amacının ulaşılmasına katkı sağlanmaktadır. Makinenin geliştirilmesi, patentlenmesi, sanayiye uygulanması sürecinde üniversite sanayi iş birliği sağlanmış bu çerçevede Dr. Bora Akince tarafından teknoloji ve inovasyon yönetimi kapsamında danışmanlık sağlanmıştır. Bu çerçevede GCM Group tarafından geliştirilen makine hem yenilikçi hem sanayiye uygulanabilir hem de buluş basamağı içerdiği için Türk Patent'ten incelemeli patent almıştır.

Keywords: Infrared, Shrink, İklim Eylemi, Patent

ABSTRACT

In the textile industry, shrink tunnels are commonly used for packaging. These systems have several drawbacks, notably their purchase cost, the excessive use of plastic (nylon) film, and high maintenance expenses. In the shrink-packaging machine developed by GCM Makine, conventional shrink tunnels are replaced with infrared heaters. This substitution delivers cost savings and, by reducing the machine's footprint, alleviates space constraints within factories. Moreover, decreasing plastic consumption during the packaging process lowers companies' carbon emissions, thereby contributing to the achievement of the Sustainable Development Goal on Climate Action (SDG 13).

Throughout the development, patenting, and industrial deployment of the machine, university–industry collaboration was established; in this context, Dr. Bora Akince provided consultancy on technology and innovation management. Consequently, as the machine is innovative, industrially applicable, and embodies an inventive step, it has been granted a substantively examined patent by the Turkish Patent Office.

Keywords: Infrared, Shrink, Climate Action, Patent

THE PHOENIX PROJECT: YOUTH RISING ABOVE POLARIZATION

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ÖZET

Kutuplaşma bireylerin birbirinden farklı fikirler çerçevesinde uzaklaşması anlamına gelmektedir. Kutuplaşma Dünya Ekonomik Forumu tarafından dünyadaki en önemli küresel risklerden bir tanesi olarak tanımlanmaktadır. Kutuplaşmaya karşı Sürdürülebilir Kalkınma Amacı 17 kapsamında bir iş birliği geliştirmek ve gençlerin kutuplaşmasını önlemek için yaygın eğitim temelli bir eğitim programı oluşturmak amacı ile 2023 – 2025 yılları arasında Phoenix: Youth Rising Above Polarization projesi Erasmus+ programı kapsamında Türkiye, Norveç, Danimarka ve İspanya'dan sivil toplum kuruluşlarının katılımı ile gerçekleştirilmiştir.

Proje kapsamında Danimarka ve İspanya'da kutuplaşma ile ilgili bir eğitim kursu organize edilmiş, sonrasında Türkiye, Noveç, Danimarka ve İspanya'dan oluşan proje ekibi tarafından bir yaygın eğitim formatlarının kullanıldığı eğitim programı oluşturulmuş ve bu eğitim programı Türkiye'de gerçekleştirilen faaliyette uygulanmıştır. Ayrıca proje kapsamında kutuplaşma ile ilgili bir belgesel çekilmiştir.

Keywords: Kutuplaşma, Eğitim Programı, Erasmus+, Gençlik Çalışmaları, Yaygın Eğitim

ABSTRACT

The World Economic Forum defines polarization as one of the most significant global risks. In line with Sustainable Development Goal 17, which emphasizes partnerships for achieving the goals, the *Phoenix: Youth Rising Above Polarization* project was implemented between 2023 and 2025 under the Erasmus+ program with the participation of non governmental organizations from Turkey, Norway, Denmark, and Spain. The aim of the project was to develop cooperation to counter polarization and to design a non formal based educational program to prevent polarization among youth via supporting youth workers.

Within the scope of the project, a training course on polarization was organized in Denmark and Spain. Subsequently, the project team, consisting of representatives from Turkey, Norway, Denmark, and Spain, designed an educational program that was later implemented during an activity in Turkey. In addition, a documentary film was produced as part of the project.

Keywords: Phoenix, Training Program, Erasmus+, Youth Work, Non Formal Education

WORKSHOP PROGRAM on SUSTAINABLE DEVELOPMENT GOALS TROUGH GAMES for CHILDREN

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ABSTRACT

This study presents an innovative educational model that aims to raise awareness of the Sustainable Development Goals (SDGs) among children through game-based workshops. Between 2021 and 2025, a total of 31 workshops were conducted, reaching approximately 1,200 students from preschool to high school levels, fostering sustainability awareness across a wide age range. The workshops employed innovative methods such as gamification, design thinking, philosophy for children, drama, empathy mapping, and problem-solving activities, addressing themes such as climate change, water conservation, food waste reduction, clean energy, sustainable cities, and zero-waste practices.

Designed in line with children's cognitive, social, emotional, linguistic, and physical development, these programs not only enhanced awareness of the SDGs but also contributed to the development of 21st-century skills including critical thinking, collaboration, empathy, creativity, and social responsibility. Some workshops were aligned with international days such as World Water Day, World Forest Week, and World Cities Day, thereby reinforcing global awareness.

As the first and only comprehensive program in Turkey focusing on children and the SDGs, this initiative stands out with its multi-stakeholder approach, involving NGOs, local authorities, university student clubs, and international institutions, thus generating broad social impact. In the long term, this approach is expected to contribute to integrating sustainability culture into educational curricula and to the cultivation of future generations who are solution-oriented, environmentally conscious, and socially responsible.

Keywords: Sustainable Development Goals, Game-Based Learning, Children's Workshops, Sustainability Education, Participatory Learning

POST-TRUTH ÇAĞINDA SÜRDÜRÜLEBİLİRLİK İLETİŞİMİ

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Özet

Nesnel gerçeklerin kamuoyunu şekillendirmede duygulara ve kişisel inançlara hitap etmekten daha az etkili olduğu durumlarla ilgili veya bu durumları ifade eden bir sıfat olarak tanımlanan post-truth, sahtenin, yalanın gerçeğin yerini aldığı günümüz çağını anlatan en güçlü kavramlardan biridir. İçinde yaşanılan dijital çağda, enformasyonun yoğunluğu ve artan hızı, bir yandan aşırı bir bilgilenme sağlarken diğer yandan bir kaos da yaratmaktadır. Günümüzde bilginin üretim, dolaşım ve tüketim süreçlerinin hızla dönüşmesi, hakikatin doğasına dair köklü bir tartışmayı gündeme getirmektedir. Gerçeklik, giderek spekülasyon, yanlış bilgi ve sahte içerikler karşısında zayıflamakta; bu olgu "post-truth" kavramıyla açıklanmaktadır. Post-truth çağında hakikat, önemini ve işlevini yitirirken; dijital teknolojilerin güçlendirdiği iletişim ortamı, kamuoyunun duygu ve inançlar etrafında şekillenmesine zemin hazırlamaktadır. Böylelikle, tekil bir hakikat yerine öznel, parçalı ve çoğu zaman birbirine zıt "hakikatler" ortaya çıkmakta; gerçek, görünürlük mücadelesinde geri plana itilmektedir.

Bir kalkınma planı olarak sürdürülebilirlik, 'Brundtland Raporu'nda yer aldığı gibi, en açık ifadeyle; "gelecek nesillerin kendi ihtiyaçlarını karşılama olanaklarını tehlikeye atmadan bugünün ihtiyaçlarını karşılama" olarak tanımlanmaktadır. Sürdürülebilirlik iletişimi ise sürdürülebilirliğin 3 temel boyutu olan çevresel, sosyal ve ekonomik alanlarla ilgili olarak toplumda bilinç yaratılması ve davranış değişikliği oluşturulması amacıyla yapılan paydaşlar arası ilişkilerin yönetilmesi için yararlanılan bir iletişim yaklaşımı olarak tanımlanmaktadır. Post-truth ortamında kitlelerin bilinçlendirilmesi sürecinde, kanıtlardan çok duygusal ya da ideolojik bağlarla yönlendirilmesi, bilim dili yerine özellikle medya ortamlarında üretilen bilgi otoritesini parçalayan enformasyon akışı, komplo teorilerinin üretimi ve yayımı; dezenformasyonla birlikte çarpıtılmış bilgilerin yayılımı ve sahte sürdürülebilirlik söylemleri dikkat çekmektedir.

Bu çalışmada, post-truth çağında sürdürülebilirlik iletişiminin karşı karşıya kaldığı riskler ve dönüşümler incelenmektedir. Özellikle medyadan topluma aktarılan dezenformasyon, yanlış bilgilendirme ve komplo teorilerinin kamuoyunun sürdürülebilirlik algılarını nasıl etkilediği, toplumsal farkındalığın oluşması sürecini nasıl şekillendirdiği literatür taraması ve kuramsal çerçeveler üzerinden tartışılacak ve medyanın bu ortamda üstlenebileceği roller üzerine öneriler sunulmaya çalışılacaktır.

Anahtar Kelimeler: Post-truth, sürdürülebilirlik iletişimi, medya.

SUSTAINABILITY COMMUNICATION IN THE POST-TRUTH AGE

ABSTRACT

Post-truth, defined as an adjective referring to or describing situations where objective facts are less effective in shaping public opinion than appealing to emotions and personal beliefs, is one of the most powerful concepts describing our current era, where falsehood and lies have replaced truth. In the digital age, the density and increasing speed of information both provide an overload of information and create chaos. The rapid transformation of today's information production, circulation, and consumption processes has brought to the fore a fundamental debate about the nature of truth. Truth is increasingly weakened by speculation, misinformation, and fake content; this phenomenon is explained by the concept of "post-truth." In the post-truth era, truth is losing its significance and function, while the communication environment empowered by digital technologies paves the way for public opinion to be shaped by emotions and beliefs. Thus, instead of a

single truth, subjective, fragmented, and often contradictory "truths" emerge, and truth is relegated to the background in the struggle for visibility.

Sustainability as a development plan, as stated in the Brundtland Report, is most clearly defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." Sustainability communication, on the other hand, is defined as a communication approach used to manage relationships among stakeholders aimed at raising public awareness and fostering behavioral change regarding the three fundamental dimensions of sustainability: environmental, social, and economic. In the post-truth environment, the process of raising public awareness is characterized by emotional or ideological ties rather than evidence; the flow of information produced, particularly in the media, instead of scientific language, undermines the authority of knowledge; the production and dissemination of conspiracy theories; the dissemination of distorted information and false sustainability narratives.

This study examines the risks and transformations facing sustainability communication in the post-truth era. We will discuss how disinformation, misinformation, and conspiracy theories, particularly those transmitted from the media to the public, influence public perceptions of sustainability and shape the process of raising public awareness, drawing on literature review and theoretical frameworks. We will also offer suggestions for the media's potential roles in this environment.

Keywords: Post-truth, sustainability communication, media.

ENHANCING SUSTAINABILITY AWARENESS THROUGH GAMIFICATION ON THE ERCIYES UNIVERSITY CAMPUS: A CONCEPTUAL APPROACH BASED ON UI GREENMETRIC CRITERIA

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ABSTRACT

In addition to being centers of knowledge production, higher education institutions play a critical role as spaces for education and awareness-building. University campuses, where young individuals spend a significant portion of their daily lives, offer important opportunities for fostering environmental sensitivity. In this context, sustainable campus policies should not be limited to physical arrangements and infrastructural investments, but should also be supported by pedagogical approaches that strengthen student and staff engagement. The gamification approach stands out for its potential to enhance active participation in learning processes, increase motivation, and support behavioral change. In recent years, gamification has emerged as a promising tool for raising environmental awareness and promoting sustainability consciousness.

This study explores, within the context of Erciyes University's campus, the innovative possibilities that gamification can offer in expanding the participatory base of existing practices aligned with the Sustainable Development Goals (SDGs). Motivated by this goal, a conceptual gamification model is proposed to contribute to the development of a community-based sustainability culture. The model suggests that Erciyes University's current success in the UI GreenMetric ranking can be further strengthened through gamification scenarios that foster behavioral changes in areas such as waste management, energy efficiency, and transportation by ensuring active participation of students and staff. Thus, gamification—when not limited to administrative policies but embedded in everyday practices and supported by collective goals—can transform individual efforts into community-scale change and institutionalize a culture of sustainability.

The proposed model is emphasized as an example that could serve similar campus settings, highlighting the need to perceive campuses as spaces for pedagogical and behavioral transformation. Gamification emerges as a cost-effective, participatory, and motivational tool in this transformation. It is asserted that the conceptual model presented will offer a practical framework to deepen the sustainability vision of campuses. In this way, sustainability goals will not remain confined to reports and rankings, but will be integrated into the daily life practices of campus communities.

Keywords: Sustainability; Gamification; Green Campus; UI GreenMetric; Environmental Awareness; Higher Education

FACTORS AFFECTING THE DISASTER RISK PERCEPTION OF THE DENTISTRY PRACTICE AND RESEARCH CENTER EMPLOYEES

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ABSTRACT

Objective: It is aimed to search the factors affecting the disaster risk perception of the Dentistry Practice and Research Center Employees

Method: The universe of this cross-sectional study includes 408 personnel working at Erciyes University Dentistry Practice and Research Center. The sample of the research was calculated as 199 people with 95% confidence interval and 5% margin of error. The study was conducted with 231 people accepting to participate in the research between the dates of July-August 2025. The data were collected through the personal information form for the qualitative characteristics of the healthcare employees, psychological well-being scale and disaster risk perception scale. The data of the research were analyzed through Levene test, t-test, one-way analysis of variance (ANOVA), Tukey test and Pearson correlation analysis. The significance level was accepted as $p<0.05$.

Findings: The psychological well-being scale total score average of the healthcare professionals (38,056±11,572) and disaster risk perception scale total score average (98,974±15,143) were found high. Disaster risk perception scale probability sub-scale scores were found significantly different in terms of age groups. In terms of gender, it was found that impact, worry/fear and vulnerability sub-scale scores were significantly different ($p<0.05$). In addition, psychological well-being scale scores and the scores of the uncontrollable and vulnerability sub-scales of the disaster risk perception scale were significantly different ($p<0.05$). According to Pearson correlation analysis result, it was determined that psychological well-being scale was not related to disaster risk perception scale and its sub-scales. The variable of age had a positive and weak significant relation with the probability and vulnerability sub-scales of the disaster risk perception scale. It was determined that there was a positive and moderate significant relation between the sub-scales of the risk perception scale.

Conclusion: A significant difference was found in the disaster risk perception of healthcare employees in terms of age, educational level and gender. A significant relation was not determined between disaster risk perception and psychological well-being.

Key Words: Disaster risk perception, psychological well-being, healthcare employee

DİŞ HEKİMLİĞİ UYGULAMA VE ARAŞTIRMA MERKEZİ ÇALIŞANLARININ AFET RİSK ALGISINA ETKİ EDEN FAKTÖRLER

ÖZET

Amaç: Diş hekimliği uygulama ve araştırma merkezi çalışanlarının afet risk algisina etki eden faktörlerin araştirilmasi amaçlanmıştır.

Yöntem: Kesitsel tipdeki bu çalışmanın evrenini Erciyes Üniversitesi Diş Hekimliği Uygulama ve Araştırma Merkezi'nde çalışan 408 personel oluşturmaktadır. Araştırmanın örneklemi %95 güven aralığında %5 hata payıyla 199 kişi olarak hesaplanmıştır. Çalışma Temmuz - Ağustos 2025 tarihleri arasında, çalışmaya

katılmaya kabul eden 231 kişi ile gerçekleştirilmiştir. Çalışmada veriler sağlık çalışanlarının tanımlayıcı özelliklerini belirmeye yönelik kişisel bilgi formu, psikolojik iyi oluş ölçeği ve afet risk algısı ölçeği ile toplanmıştır. Araştırma verileri Levene testi, t testi, tek yönlü varyans analizi (ANOVA), Tukey testi ve Pearson korelasyon analizi ile değerlendirildi. Anlamlılık düzeyi $p<0.05$ olarak kabul edildi.

Bulgular: Sağlık çalışanlarının psikolojik iyi oluş ölçeği toplam puan ortalaması (38,056±11,572) ve afet risk algısı ölçeği toplam puan ortalaması (98,974±15,143) yüksek bulunmuştur. Çalışanların yaş gruplarına göre Afet risk algısı ölçeği, olasılık alt boyut puanı anlamlı düzeyde farklı bulunmuştur. Cinsiyete göre afet risk algısı ölçeği; etki, endişe ve savunmasızlık alt boyut puanlarının anlamlı düzeyde farklı olduğu görülmüştür ($p<0.05$). Ayrıca eğitim düzeyine göre, pisikolojik iyi oluş ve afet risk algısı ölçeği yönetilemezlik ile savunmasızlık alt boyut puanlarının anlamlı düzeyde farklı olduğu görülmüştür ($p<0.05$). Pearson korelasyon analizi sonucuna göre, psikolojik iyi oluş ölçeğinin, afet risk algısı ölçeği ve alt boyutları ile ilişkisi olmadığı tespit edilmiştir. Yaş değişkeninin afet risk algısı ölçeği alt boyutlarından olasılık ve savunma ile pozitif yönlü zayıf düzeyede anlamlı ilişkisi vardır. Risk algısı ölçeği alt boyutları arasında pozitif yönlü, orta düzeyde anlamlı ilişki olduğu tespit edilmiştir.

Sonuç: Sağlık çalışanlarının afet risk algısında yaş, eğitim düzeyi ve cinsiyete göre anlamlı farklılık bulunmuştur. Afet risk algısı ile psikolojik iyi oluş arasında anlamlı ilişki tespit edilememiştir.

Anahtar Kelimeler: Afet risk algısı, psikolojik iyi oluş, sağlık çalışanı

IMPACT OF SUSTAINABILITY-FOCUSED RANKING SYSTEMS ON UNIVERSITIES: THE CASE OF THE IMPACT RANKING

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ABSTRACT

The sustainability paradigm of the 21st century has repositioned higher education institutions from being solely centers of education and research to becoming leading actors in social transformation. Universities, in pursuit of becoming sustainable campuses, have been developing policies grounded in environmental, economic, and social sustainability, carrying out comprehensive initiatives both in physical campus practices and in teaching and learning processes. In this context, international indices developed worldwide provide significant roadmaps for universities on their journey toward sustainability.

This research examines the Times Higher Education (THE) Impact Rankings, one of the increasingly important ranking systems in the evaluation of universities' sustainability performance. THE Impact Rankings analyze how universities measure, assess, and report their activities aligned with the United Nations' 17 Sustainable Development Goals (SDGs) and how these processes shape institutional strategies. In addition, the research addresses both the opportunities and challenges that ranking systems present for universities in developing institutional strategies, guiding academic research, and strengthening societal engagement.

Moreover, by comparing THE Impact Rankings with other systems such as the UI GreenMetric and QS Sustainability Rankings, the research discusses how differing methodologies influence universities' sustainability visions. Universities' performances within the scope of the THE Impact Rankings are examined based on published official reports.

In conclusion, this research provides a comprehensive framework for the effects of sustainability-focused ranking systems on universities, relevant for both academia and policymakers. The findings reveal that these systems function not merely as instruments of "competition" but also as mechanisms of "learning," "accountability," and "institutional development." However, challenges in data collection processes, methodological diversity, and contextual differences limit the objective comparability of sustainability performance.

Keywords: Sustainability, Universities, Ranking Systems, The Impact Ranking.

CAN ARTIFICIAL INTELLIGENCE SHAPE LIFELONG LEARNING AT MODERN EDUCATION FOR THE FUTURE WORLD?

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ABSTRACT

Age, time, and location are no longer barriers to learning in dynamic and technology-enabled classrooms. Particularly in situations where technology advancements and the incorporation of artificial intelligence are changing how people acquire, update, and use information, lifelong learning has emerged as a key tenet in the discussion of education and innovation. Research on lifelong learning is still scattered among several viewpoints, despite the field's increasing importance, underscoring conceptual diversity and methodological fragmentation. The results show that there is still scattered research on lifelong learning and artificial intelligence. In order to determine how lifelong learning has been investigated in connection with artificial intelligence, this paper offers a review that focuses on the definitions, advantages, and restrictions covered in the literature.

Keywords: Lifelong learning, Artificial intelligence, Innovation of education.

ROLE OF ARTIFICIAL INTELLIGENCE ON SUSTAINABILITY OF EDUCATION SYSTEM

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ABSTRACT

Recently, artificial intelligence (AI)-enabled digital transformation has made it possible to arrange maintenance automatically and in advance based on statistical methods of continuous equipment monitoring. In terms of better understanding of evaluation student progress, utilizing of AI is widespread among the educational institutions. Objective of AI techniques is to increase learning speed without compromising accuracy. Since the advent of contemporary technology instruments, the dynamics of teaching and learning have enormously changed. Thanks to the widespread availability of online courses and materials, anyone can now receive an education outside of the traditional classroom. Artificial intelligence techniques can answer current issues by examining data which occurred in advance. Artificial intelligence has the potential to be a very effective technique for resolving issues with a predictable and repeatable solution space when used appropriately. It is inevitably foreseen that by suggesting a path of study that will better equip students to enter their chosen area and succeed professionally, higher education institutions can gain a great deal from this personality prediction tool. Therefore, in order to maintain the educational ecosystem, current paper reveals how AI might enhance AI in education systems.

Keywords: Sustainability, Artificial intelligence, AI based educational system.

VALORIZATION OF FURNITURE INDUSTRY WASTE IN THE TEXTILE SECTOR WITHIN THE FRAMEWORK OF INDUSTRIAL SYMBIOSIS

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ABSTRACT

Denim is a well-known type of woven fabric in the textile sector. One of the most significant challenges faced by the industry is that dyeing processes consume large amounts of water, chemicals, and energy, thereby creating environmental burdens. In particular, the use of synthetic dyes in denim production can cause ecological sustainability issues due to their toxic components, non-biodegradability, and the generation of highly polluted wastewater. Industrial symbiosis, by utilizing waste from different industries as raw materials, contributes to reducing environmental impact and supporting the circular economy. In this context, the use of waste sawdust from the furniture and wood processing industries as a natural dye source in denim dyeing processes was investigated. The waste sawdust was subjected to specific pretreatments to obtain dye extracts, which were applied to denim fabric in dyeing experiments. The results revealed that sawdust-based natural extracts can impart black shades to denim fabric, and that their fastness properties—such as perspiration and washing fastness, under both acidic and alkaline conditions—were found to be efficient compared to reference dyeing. Through industrial symbiosis, value-added benefits can be created in waste management while enabling the implementation of innovative and eco-friendly dyeing methods in the textile industry. This approach not only contributes to reducing the ecological footprint of the textile sector but also provides a sustainable solution for waste disposal in the furniture industry. In conclusion, utilizing waste sawdust as an alternative natural dye source in denim dyeing offers significant opportunities in terms of resource efficiency, cost reduction, and environmental sustainability.

Keywords: denim, furniture, ındustrial symbiosis, waste management, natural dyeing, sustainability

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USABILITY OF WASTE IN CERAMIC SANITARYWARE PROCESSES

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Abstract

A significant amount of waste is generated during ceramic production, originating from both unfired and fired products. Unfired wastes usually result from shaping, drying, or handling defects, whereas fired wastes occur due to kiln failures, dimensional errors, or breakage. Since these two waste types exhibit different physical and chemical properties, their recycling approaches also vary. Unfired wastes, which have not yet undergone sintering, can be easily reprocessed with water and directly reintegrated into the production line as raw material, thereby reducing raw material consumption and minimizing material losses. Fired wastes, on the other hand, undergo crystal structure transformations at high temperatures, making direct recycling more challenging; however, they can be reused after suitable treatments.

In this study, the recovery of both fired and unfired ceramic wastes generated in production was investigated. The chemical compositions of the wastes were analyzed by XRF and XRD, while appropriate formulations were developed, particle size distributions determined, and thermal properties examined through dilatometry and Harkort tests. Shrinkage, deformation, water absorption and strength tests were conducted to optimize physical properties, while rheological behavior was adjusted to enhance casting performance. The results revealed that the reuse of unfired wastes did not negatively affect product quality, whereas partial substitution with fired wastes contributed to strength, wear resistance, and thermal stability. The combined utilization of both waste types offers an environmentally and economically sustainable solution, providing an integrated approach to waste management in the ceramic industry.

Keywords: Ceramic waste, Unfired and fired waste, Recycling, Thermal and physical properties, Sustainable production

INVESTIGATION OF THE USABILITY OF CERAMIC WASTES AS ALTERNATIVE RAW MATERIALS IN SSG PRODUCTION: CHARACTERIZATION TECHNIQUES

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Abstract

Ceramic products generate significant amounts of waste due to manufacturing defects, end-of-life disposal, and breakage. Landfilling of these wastes poses environmental challenges, whereas recycling offers valuable economic and ecological opportunities. Ceramic wastes can be reused as additives in cement and concrete production, as lightweight aggregates, or as secondary raw materials in the ceramic and glass industries. Their high mechanical strength and chemical stability also make them suitable for sustainable construction materials. However, issues such as waste homogeneity, grinding costs, and logistics must be considered in the recycling process. Overall, the valorization of ceramic wastes aligns with environmental sustainability goals and provides both economic and ecological benefits for the industry.

In this study, the reuse of fired wastes from Fine Fire Clay (FFC) bodies in the production of sanitaryware ceramics (SSG) was investigated. The wastes were chemically characterized using XRF and XRD analyses, expansion behavior was measured with a dilatometer and thermal properties were determined through the Harkort test. Additionally, shrinkage, deformation, water absorption, and strength tests were carried out to optimize the physical properties. The findings indicate that the partial reuse of FFC fired wastes reduces raw material costs, decreases import dependency and supports the adoption of a circular economy approach in production processes. Furthermore, it was demonstrated that recycling contributes to energy savings, reduces natural resource consumption and lowers the carbon footprint. These results highlight the potential of ceramic waste recycling not only to improve resource efficiency but also to advance environmental sustainability in the ceramics industry.

Keywords: Ceramic waste, Recycling, Fine Fire Clay (FFC), Sanitaryware ceramics (SSG), Characterization techniques, Circular economy

THE BENEFİTS OF SUSTAINABLE COTTON-TO-ENERGY PRODUCTION FOR DENIM FABRIC

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ABSTRACT

The environmental footprint of textile production, particularly in terms of cotton consumption, water usage, and energy, is a global concern. While the impact of cotton textiles has been extensively explored, research on denim fabric production, especially regarding the use of various renewable energy sources, remains limited. This study aims to address this gap by examining how increasing the content of sustainable material, like recycled cotton, and transitioning energy sources from conventional to renewable options, can positively impact the environment. We investigated various scenarios based on the blend of cotton (ranging from 100% conventional to 50% recycled) and the type of energy used (grid, solar, wind, biomass, and hydro). The environmental impacts of producing 1 m of denim fabric were assessed using Life Cycle Assessment (LCA) across eleven critical categories.

Our findings reveal that replacing conventional cotton with a 50% recycled blend and grid energy with renewable sources notably reduces environmental impacts. Specifically, denim fabric produced with 50% recycled cotton powered by the grid showed an 18% decrease in Global Warming Potential (GWP), and 25% reductions in Eutrophication (EU) and Acidification (AC), along with a 15% decrease in Abiotic Depletion (fossil fuels). Switching to solar energy further enhanced these reductions. Among alternative renewable energies, hydropower was found to be the most effective, presenting the lowest environmental impacts in all categories. This study conclusively supports the hypothesis regarding the environmental benefits of renewable energy in textile production. Future research should investigate the combination of renewable energy with a broader range of sustainable materials, such as recycled polyester, tencel, and hemp, to further advance sustainable practices in the textile industry.

Keywords: Denim Fabric Production, Life Cycle Assessment, Environmental Impact, Recycled Cotton, Renewable Energy

A SUSTAINABLE APPROACH FOR THE RECOVERY OF CAUSTIC SOLUTION IN THE MERCERIZATION PROCESS

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ABSTRACT

In the textile industry, the mercerization process is carried out using concentrated sodium hydroxide solutions to improve the luster, strength, and dye uptake properties of cotton-based materials. During this process, a certain amount of high-Bome (Bé) caustic solution remains in the tank after completion, and if not properly managed, it can cause environmental harm. This situation leads both to an increase in chemical consumption and a rise in waste load. Çavuşoğlu et al. (2019) determined that the recovery of caustic is beneficial in both economic and environmental terms [1].

In this study, a recovery system was developed in which the residual caustic solution remaining in the mercerization machines at the end of the process is transferred into a separate storage tank and reused as the initial chemical in subsequent productions. As a result of this application, approximately 20 tons of sodium hydroxide per year have been reintroduced into the production cycle instead of being released into the environment. Thus, both chemical consumption has been reduced and environmental risks have been minimized.

The findings indicate that the recovery of process chemicals in the textile sector not only increases resource efficiency but also contributes to the dissemination of sustainable production models. This approach is significant in terms of cost reduction and supporting environmentally friendly production practices, and with its applicability in similar processes, it can serve as a model for the textile industry.

Keywords: Mercerization, caustic recovery, sustainability, eco-friendly production, resource efficiency

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TOWARDS SUSTAINABLE REVERSE LOGISTICS: A TSP-INSPIRED OPTIMIZATION FRAMEWORK FOR MEDICAL WASTE WITH EXACT AND LEARNING-BASED METHODS

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ABSTRACT

The growing rate of medical waste generation urges the efficient design of reverse logistics networks that are safe, cost-effective, and ecologically sustainable. Designing such systems is challenging due to fluctuating waste quantities and restrictive health and safety regulations. This study proposes a Travelling Salesman Problem (TSP)-based optimization framework for medical waste collection. The approach involves a vehicle visiting each collection station once and returning to a central treatment facility. A Mixed-Integer Linear Programming (MILP) model is used to minimize overall transportation expenses.

The proposed model is tested using a small, simulated dataset with different demand scenarios. It is solved with IBM CPLEX, and the numerical results are analyzed to understand how demand levels and the geographic distribution of collection points influence routing efficiency and costs. The findings provide insights for policymakers and network designers regarding the dependence of routing performance on spatial and demand-related factors, in the context of sustainability in medical waste management.

Although exact optimization methods are effective for small-scale problems, they become computationally impractical for larger, real-world instances. To overcome this limitation, a hybrid approach that combines Reinforcement Learning (RL) with a Genetic Algorithm (GA) to enhance search efficiency is suggested. The integration of RL prevents GA from diverging from high-quality solutions and thus improves efficiency and effectiveness in large-scale problems.

This work provides a foundational step toward intelligent and sustainable reverse logistics solutions, combining classical exact optimization with the potential of learning-based metaheuristics to address the growing challenge of medical waste management.

Keywords: Sustainable Reverse Logistics, Medical Waste Management, Travelling Salesman Problem, ML-Enhanced Metaheuristic.

HIZLI MODANIN EKOLOJİK DENGE VE SAĞLIĞA ETKİSİ

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ÖZET

Hızlı moda, düşük maliyetli ve sürekli yenilenen koleksiyonlarıyla küresel tüketim kültürünün önemli bir parçası haline gelmiştir. Ancak bu sektörün çevresel ve toplumsal maliyetleri, ekonomik faydalarının çok ötesine geçmektedir. Üretim süreçlerinde yoğun su tüketimi, kimyasal boyalar, sentetik elyaflar ve atık miktarındaki artış ekolojik dengeyi tehdit etmekte; sera gazı emisyonları, toprak ve su kirliliği gibi etkilerle küresel iklim krizini derinleştirmektedir. Özellikle polyester gibi petrol türevi malzemelerin kullanımı, doğada çözünmeyen mikroplastiklerin oluşumuna yol açmakta ve bu partiküller gıda zincirine dâhil olarak hem ekosistemi hem de insan sağlığını tehdit etmektedir.

Sağlık boyutunda hızlı modanın etkileri daha da çarpıcıdır. Tekstil üretiminde kullanılan azo boyar maddeler, ağır metaller ve formaldehit gibi kimyasallar; deri hastalıkları, alerjiler, astım, hormonal bozukluklar ve hatta bazı kanser türleriyle ilişkilendirilmektedir. En fazla risk **üretim sürecinde çalışanların sağlığı üzerindedir.** Üretim sürecinde çalışan işçiler, uzun süreli kimyasal maruziyet nedeniyle solunum yolu hastalıkları, cilt irritasyonları ve toksik etkilerle karşı karşıya kalmakta aynı zamanda bazı kanser türleriyle ilişkilendirilmektedir Ücretlerin düşüklüğü ve iş güvencesizliği, çalışanlarda sürekli stres ve kaygıya yol açarken, bu durum ruhsal sağlık sorunlarını artırmaktadır.

Tüketici sağlığı açısından da riskler göz ardı edilemez. Ucuz üretim uğruna kullanılan kimyasal boyalar ve düşük kaliteli sentetik kumaşlar, deri hastalıkları, alerjik reaksiyonlar ve astım gibi sorunlara yol açmaktadır. Endokrin bozucu kimyasalların vücuda girmesi, hormonal dengenin bozulmasına ve uzun vadede kanser riskinin artmasına neden olmaktadır.

Toplum sağlığı düzeyinde ise hızlı modanın yarattığı psikolojik baskılar öne çıkmaktadır. “Tüket-tüket” anlayışıyla sürekli değişen trendler, bireylerde yetersizlik hissi ve sosyal baskı yaratmakta, bu da stres, kaygı ve tatminsizlik gibi sorunlara zemin hazırlamaktadır.

Dolayısıyla hızlı moda yalnızca çevresel bir tehdit değil, aynı zamanda ciddi bir halk sağlığı sorunu olarak da ele alınmalıdır. Ekolojik denge ve insan sağlığı üzerindeki bu olumsuz etkilerin azaltılması için sürdürülebilir moda uygulamalarına geçiş, kimyasal kullanımında sıkı regülasyonlar, geri dönüşüm politikalarının yaygınlaştırılması ve bilinçli tüketim alışkanlıklarının geliştirilmesi kritik öneme sahiptir.

Anahtar Kelimeler: Hızlı Moda, Ekolojik Denge, Çevre Kirliliği ve İnsan Sağlığı

THE IMPACT OF FAST FASHION ON ECOLOGICAL BALANCE AND HEALTH

ABSTRACT

Fast fashion has become a significant element of global consumer culture due to its low-cost and constantly renewed collections. However, the environmental and social costs of this industry far outweigh its economic benefits. The production process involves high water consumption, chemical dyes, synthetic fibers, and increasing waste, all of which pose serious threats to ecological balance. Greenhouse gas emissions, as well as soil and water pollution, contribute to the worsening of the global climate crisis. The use of petroleum ased materials, such as polyester, leads to the formation of microplastics that do not degrade in nature. These particles enter the food chain, posing risks to both ecosystems and human health.

The health impacts of fast fashion are particularly concerning. Chemicals used in textile manufacturing such as azo dyes, heavy metals, and formaldehyde are associated with skin conditions, allergies, asthma, hormonal

disruptions, and certain types of cancer. The highest health risks are faced by workers in the production process. Prolonged exposure to chemicals may result in respiratory diseases, skin irritation, toxic effects, and cancer. Moreover, low wages and job insecurity contribute to chronic stress and anxiety, negatively affecting workers' mental health.

Consumer health is also at risk. Chemical dyes and low-quality synthetic fabrics used in low-cost production can lead to skin problems, allergic reactions, and asthma. Endocrine-disrupting chemicals may disturb hormonal balance and increase the long-term risk of cancer.

At the societal level, fast fashion creates psychological pressure. Rapidly changing trends driven by a consumption-oriented mindset foster feelings of inadequacy and social pressure, which can lead to stress, anxiety, and dissatisfaction.

In conclusion, fast fashion should be regarded not only as an environmental issue but also as a serious public health concern. Reducing its negative impacts on ecological balance and human health requires a transition to sustainable fashion practices, stricter regulations on chemical use, the promotion of recycling policies, and the development of conscious consumption habits.

Keywords: Fast Fashion, Ecological Balance, Environmental Pollution and Human Health

LIFE CYCLE ASSESMENT BASED WASTE STRATEGIES FOR VEGETABLE OIL INDUSTRY AND SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

The vegetable oil industry plays a crucial role in global food systems and bioenergy production; however, its environmental footprint — particularly in terms of waste generation, water use, and greenhouse gas emissions — remains significant. Life Cycle Assessment (LCA), standardized by ISO 14040 and ISO 14044, provides a powerful framework for evaluating and minimizing these impacts across the production chain. This review aims to analyze the current state of LCA applications in the vegetable oil sector and to explore their contribution to waste management strategies and Sustainable Development Goals (SDGs). A comprehensive literature search was conducted using Scopus, Web of Science, ScienceDirect, SpringerLink, and MDPI databases. Boolean operators ("AND," "OR") were applied with keywords such as "Life Cycle Assessment" AND "vegetable oil," "biodiesel LCA," "olive oil footprint," "rapeseed LCA," and "waste valorization." Publications between 2015 and 2025 were filtered, prioritizing peer-reviewed articles, reviews, and meta-analyses.

The analysis reveals that the agricultural and processing phases are the most impactful, with fertilizer use, irrigation practices, and energy consumption being the primary contributors to environmental burdens. Innovative waste valorization methods — such as composting, biofertilizer production, and energy recovery — significantly reduce emissions and resource depletion, aligning industry practices with SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action).

Overall, the findings emphasize the importance of integrating LCA into decision-making for sustainable vegetable oil production and highlight the need for improved databases, region-specific assessments, and policy support to promote circular economy models.

Keywords: Life Cycle Assessment, vegetable oil, waste valorization, sustainability, SDGs

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INTEGRATING GENOMIC INSIGHTS, NUTRITIONAL STRATEGIES, AND ANIMAL HEALTH FOR SUSTAINABLE LIVESTOCK PRODUCTION

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ABSTRACT

Sustainable livestock systems require innovations that simultaneously improve productivity, animal health, and environmental management. Recent studies in livestock highlight complementary pathways toward this goal. Furthermore, the challenges posed by climate change, global challenges, and megatrends highlight the urgent need for sustainable animal husbandry strategies. While sustainability in animal husbandry remains, a key challenge requiring the adoption of ecologically conscious practices, innovation in animal production remains a key element in driving progress in animal health, performance, and sustainability. Genomic analyses of farm animals identified heritable loci influencing early growth traits, linear body conformation, and hematological parameters, enabling precision breeding strategies for robust and efficient animals. New trends such as precision animal nutrition, feed additives, research into alternative feed ingredients, and advancements in feed evaluation techniques offer versatile solutions for improving animal nutrition. These options reduce reliance on traditional feed ingredients through a conscious approach, mitigate negative environmental impacts, and have the potential to advance the sustainability of animal protein production. Moreover, maternal protein intake was shown to modulate the fetal skeletal muscle transcriptome and miRNAome, suggesting long-term programming effects on offspring growth and metabolism. Together, these findings provide a foundation for integrated approaches combining genomic selection, targeted maternal and production-stage nutrition, and animal health monitoring to optimize productivity while reducing the ecological footprint of livestock systems. Future work should focus on multi-trait selection indices and life-cycle assessments to fully capture the sustainability gains from these complementary innovations.

Keywords: Sustainable agriculture, Farm animals, Alternative feed sources, Precision breeding.

THE CARBON FOOTPRINT ASSESSMENT OF ROLLING MILL ROLLS MANUFACTURED BY CASTING METHOD

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ABSTRACT

This study aims to evaluate the environmental impacts of industrial production processes by analyzing the greenhouse gas emissions generated during the manufacturing of work rolls and to contribute to the reduction of carbon emissions in the context of climate change mitigation. Work rolls are critical components widely used in the iron and steel industry, and their production involves highly energy-intensive processes characterized by substantial energy and resource consumption. Consequently, these production activities significantly contribute to the adverse effects of climate change.

Within this scope, the study focuses on two primary stages of the production process: the foundry and machining phases. Energy consumption, material usage, and associated carbon emissions in both stages were thoroughly analyzed. Data were obtained from production records provided by the manufacturing company and supported by on-site observations. Emission calculations were performed using emission factors derived from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

The results indicate that the total direct emissions during the production of work rolls amount to **0.118119 tCO_2** equivalent, while indirect emissions account for **0.354101 tCO_2** equivalent, resulting in a total emission of **0.4723 tCO_2e.** The majority of emissions originate from the foundry stage, primarily due to the energy-intensive melting process conducted at high temperatures. Although the machining phase consumes less energy, it still generates a notable amount of emissions.

These findings highlight the necessity of adopting energy-efficient technologies and developing alternative manufacturing methods to reduce carbon emissions in the production of work rolls. Implementing such strategies is critical not only for minimizing environmental impacts but also for supporting sustainable industrial production practices

Keywords: Climate Change, Carbon Footprint, Casting, Energy Efficiency, Work Roll, Greenhouse Gas Emissions

SILENT AND ENERGY-EFFICIENT RANGE HOOD DESIGN DEVELOPED WITH BLDC MOTOR TECHNOLOGY

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Abstract

Range hood technologies play an important role in modern kitchens, both aesthetically and functionally. However, commonly used asynchronous motors limit user comfort due to low energy efficiency and high noise levels, and they exhibit performance that is not aligned with sustainability goals. The European Union's energy efficiency standards, along with increasing expectations for quiet operation, have driven manufacturers toward next-generation motor technologies. In this context, brushless direct current (BLDC) motors stand out for their high efficiency and quiet operation.

This study addresses the integration of BLDC motor technology in range hoods. The use of BLDC motors reduces energy consumption by 60%, lowers carbon emissions, and significantly decreases noise levels, thereby enhancing acoustic comfort.

The results demonstrate that BLDC motor integration not only provides user-centered improvements but also contributes to combating climate change through the reduction of greenhouse gas emissions. Collaborations with local suppliers further support circular economy principles, fostering industrial development and increasing employment. Thus, this study offers an academically and industrially valuable alternative to existing range hood technologies in terms of energy efficiency, quiet operation, and environmental sustainability.

Keywords: BLDC motor, range hood design, energy efficiency, acoustic comfort, sustainability, snail group, local production

SUSTAINABLE GRAPHIC DESIGN SOLUTIONS, ECO-FRIENDLY PRACTICES AND MATERALS

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ABSTRACT

Graphic design exerts a significant impact on the environment through the use of materials, printing techniques, and digital processes. Advertising, packaging, and branding practices contribute to high levels of waste generation and carbon emissions, whereas the adoption and awareness of conscious and sustainable design practices can help mitigate these negative effects. For institutions and brands, this not only provides prestige but also leads to positive outcomes in terms of reduced printing and paper expenses. This study aims to examine the relationship between graphic design and sustainability by analyzing the role of designers, current practices, and the challenges encountered.

The research evaluates the environmental effects of traditional materials such as paper, ink, and packaging, while exploring alternatives including recycled paper, eco-friendly inks, and biodegradable packaging. Additionally, the study addresses the dimensions of energy consumption and carbon emissions in digital graphic design and discusses potential methods for improvement in this field. The findings reveal that designers often face difficulties in accessing eco-friendly alternatives, that cost factors negatively affect the process, and that sustainability awareness remains insufficiently widespread within the sector. Nevertheless, minimalist approaches, recyclable packaging trends, and awareness-raising poster designs demonstrate that graphic design can significantly contribute to sustainability efforts.

In conclusion, adopting a sustainability-oriented mindset enables graphic designers to reduce environmental impacts while simultaneously fostering social awareness. It is recommended that educational institutions integrate sustainable design into curricula, that collaboration within the sector be strengthened, and that access to eco-friendly materials be facilitated. In this way, graphic design can be regarded not only as an aesthetic discipline but also as a field driven by environmental responsibility, thereby contributing to a more conscious and livable future.

Keywords: Graphic Design, Sustainability, Zero Waste, Conscious Consumption, Social Responsibility

SÜRDÜRÜLEBİLİR GRAFİK TASARIM ÇÖZÜMLERİ, ÇEVRE DOSTU UYGULAMALAR VE MALZEMELER

ÖZET

Grafik tasarım, kullanılan malzemeler, baskı teknikleri ve dijital süreçler aracılığıyla çevre üzerinde önemli etkiler oluşturmaktadır. Reklam, ambalaj ve marka tasarımları, yüksek düzeyde atık üretimi ve karbon salınımına yol açarken; bilinçli ve sürdürülebilir tasarım pratiklerinin kullanımı ve farkındalığı bu olumsuz etkilerin azaltılmasına katkı sağlayabilir. Bu durum kurum ve markalar için hem bir prestij hem de matbaa ve kâğıt harcamalarında olumlu dönüşlere sebep olabilir. Bu çalışma, grafik tasarım ile sürdürülebilirlik arasındaki ilişkiyi irdeleyerek tasarımcıların rolünü, mevcut uygulamaları ve karşılaşılan zorlukları ortaya koymayı amaçlamaktadır.

Araştırma kapsamında; kâğıt, mürekkep ve ambalaj gibi geleneksel malzemelerin çevresel etkileri değerlendirilmiş, geri dönüştürülmüş kâğıt, çevre dostu mürekkep ve doğada çözülebilen biyobozunur ambalajlar gibi alternatifler incelenmiştir. Ayrıca dijital grafik tasarımın enerji tüketimi ve karbon emisyonu boyutları ele alınarak, bu alanda uygulanabilecek iyileştirme yöntemleri tartışılmıştır. Bulgular, tasarımcıların çoğunlukla çevre dostu alternatiflere erişimde zorluk yaşadığını, maliyet faktörünün süreci olumsuz

etkilediğini ve sürdürülebilirlik bilincinin sektörde yeterince yaygın olmadığını göstermektedir. Bununla birlikte, minimalist yaklaşımlar, geri dönüşümlü ambalaj trendleri ve farkındalık artırıcı afiş tasarımları, grafik tasarımın sürdürülebilirlik yönünde önemli katkılar sunabileceğini ortaya koymaktadır.

Sonuç olarak, grafik tasarımcıların sürdürülebilirlik bilinciyle hareket etmesi hem çevresel etkiyi azaltmakta hem de toplumsal farkındalık oluşturmaktadır. Eğitim kurumlarının müfredata sürdürülebilir tasarımı dâhil etmesi, sektör içi iş birliğinin artırılması ve çevre dostu malzemelere erişimin kolaylaştırılması önerilmektedir. Böylelikle grafik tasarım, sadece estetik bir disiplin değil, aynı zamanda çevresel sorumluluk bilinciyle hareket eden bir alan olarak daha bilinçli ve yaşanabilir bir geleceğe katkı sunabilecektir.

Anahtar Kelimeler: Grafik Tasarım, Sürdürülebilirlik, Sıfır Atık, Bilinçli Tüketim, Sosyal Sorumluluk

CARDBOARD-BASED PACKAGING DESIGN FROM A CIRCULAR ECONOMY PERSPECTIVE: THE CASE OF THE RANGE HOOD

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ABSTRACT

Packaging plays a critical role in the safe transportation of products from the production line to the end user, particularly in the white goods and home appliances sectors. However, Styrofoam/EPS-based buffer materials, commonly used in traditional packaging applications, place a burden on waste management systems and are incompatible with circular economy goals due to low recycling rates, high volumes of waste generation, and economic recovery challenges. In recent years, research on sustainable packaging design has focused on more environmentally friendly alternatives such as cardboard, molded cellulose, and other bio-based solutions.

This study examines a recyclable cardboard-based packaging solution developed for the post-production transportation and distribution of hoods. The proposed design consists of a single-piece U-shaped cardboard structure. Angled and curved slits lock the product's front panel, providing resistance to vibration and impact. Furthermore, a separating wall provides a well-organized compartment for cables and mounting equipment, improving ease of use. The high recyclability of cardboard allows the design to be reused for at least six cycles, thereby reducing the packaging's lifecycle impact. Structural analyzes and literature comparisons reveal that cardboard-based solutions offer a lower carbon footprint and better recycling performance compared to EPS under certain conditions. This packaging design, developed with this in mind, not only ensures product safety but also has the potential to create a sustainable alternative in home appliance logistics.

Keywords: Exhaust hood, sustainable packaging, cardboard, recyclability, logistics security

REFLECTION OF ENVIRONMENTAL SUSTAINABILITY-THEMED ADVERTISEMENTS ON CONSUMER DECISION-MAKING PROCESSES[1]

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ABSTRACT

Environmental sustainability is a topic widely embraced by governments, institutions, and organizations worldwide today. Environmental sustainability is integral to the solution process for global warming and climate change, two of the global problems that could threaten all countries in the near future. People are the most important stakeholders in this solution process. The advertising industry, one of the sectors that directly appeals to people, has embarked on a content production process that includes consumers in its environmental process. Today, brands are no longer solely focused on sales but rather on gaining consumer sympathy. This study examines the impact of environmental sustainability-themed advertisements on consumer decision-making processes across three brands included in the sample group. The study utilizes the Big Five personality traits, and focus group interviews with 24 participants explored consumer personality traits and their approaches to environmental sustainability-themed advertisements. The advertising industry, one of the sectors that directly appeals to people, has embarked on a content production process that includes consumers in its environmental process. Today, brands are no longer solely focused on sales but rather on gaining consumer sympathy. This study examines the impact of environmental sustainability-themed advertisements on consumer decision-making processes across three brands included in the sample group. The study utilizes the Big Five personality traits, and focus group interviews with 24 participants explored consumer personality traits and their approaches to environmental sustainability-themed advertisements. The limitation of the study is that it doesn't yield national and global results because it was conducted in only one province of Turkey. This study contributes to the advertising industry by providing insights into personality traits and the purchasing process. The limited number of studies on this topic contributes to the literature. Furthermore, the results of the study are important for providing insights into a human behavior-focused approach to environmental sustainability.

Keywords: environmental sustainability, sustainability, advertising, consumer

[1] Bu bilidiri, 2025 yılında yayınlanan "Çevresel Sürdürülebilirlik Temalı Reklamların Tüketici Karar Süreçlerine Yansıması: Odak Grup Görüşmesiye Bir İnceleme" isimli tez çalışmamdan referans alınarak tarafımca yazılmıştır.

YAPAY ZEKÂDA TEKNOPOLİTİK KAVRAMININ TARTIŞMASI: ÇİN-ABD ÖRNEĞİ

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ÖZET

Teknolojinin hızlı gelişimiyle birlikte yapay zekâ (YZ) alanındaki ilerlemeler, uluslararası ilişkiler disiplininde giderek artan bir önem kazanmaktadır. Günümüzde birçok devletin yıllık stratejik plan ve politika belgelerinde yapay zekâya özel bir yer ayırdığı gözlemlenmektedir. Bu çalışma, yapay zekâ teknolojisinin uluslararası ilişkiler üzerindeki etkilerini analiz etmeyi amaçlamakta ve bu teknolojinin devletlere statüko gücü kazandırıp kazandırmadığını; ayrıca uluslararası sistemde ayrıcalıklı bir konum sağlama potansiyelini tartışmaya açmaktadır.

Mevcut literatürde yapay zekâ, büyük ölçüde devlet merkezli stratejik belgeler ve ulusal kalkınma planları çerçevesinde ele alınmakta; çoğunlukla teknik kapasite, savunma stratejileri ve ekonomik büyüme bağlamında değerlendirilmektedir. Ancak bu çalışma, yapay zekânın yalnızca teknik bir araç değil, aynı zamanda hegemonik güç inşası, söylem üretimi, liderlik iddiası ve statüko oluşturma gibi daha soyut fakat belirleyici dinamikler üzerindeki etkilerini de kapsamlı bir şekilde incelemektedir.

Özellikle Amerika Birleşik Devletleri ile Çin Halk Cumhuriyeti arasında süregelen tekno-politik rekabet bağlamında, yapay zekâ teknolojisinin jeopolitik güç mücadelelerine nasıl entegre edildiği ve bu entegrasyonun söz konusu aktörlerin uluslararası sistemdeki liderlik iddialarını nasıl şekillendirdiği değerlendirilmektedir. Bu bağlamda, yapay zekâya hâkim olmanın yalnızca teknolojik bir üstünlük değil, aynı zamanda uluslararası düzlemde yeni bir hegemonik söylem inşa etme kapasitesi sunduğu ileri sürülmektedir. Ayrıca yapay zekânın teknik bir kapasitenin ötesine geçerek ideolojik ve yapısal bir güç biçimine dönüştüğü savunulmaktadır. Sonuç olarak bu çalışma, yapay zekâ teknolojisinin küresel güç dengeleri üzerindeki dönüştürücü etkisini ortaya koymayı amaçlamakta ve uluslararası ilişkiler literatürüne hem kuramsal hem de analitik düzeyde özgün katkılar sunmayı hedeflemektedir.

Anahtar Kelimeler: Yapay Zekâ, Çin, Amerika Birleşik Devletleri

THE DISCUSSION OF THE CONCEPT OF TECHNOPOLITICS IN ARTIFICIAL INTELLIGENCE: THE CASE OF CHINA–USA

ABSTRACT

With the rapid development of technology, advancements in artificial intelligence (AI) have been gaining increasing significance within the discipline of international relations. Today, many states allocate a special place to artificial intelligence in their annual strategic plans and policy documents. This study aims to analyze the effects of artificial intelligence technologies on international relations and to question whether these technologies provide states with the power to preserve the status quo, as well as their potential to secure a privileged position within the international system.

In the current literature, artificial intelligence is largely addressed within the framework of state-centered strategic documents and national development plans, and is mostly evaluated in the context of technical capacity, defense strategies, and economic growth. However, this study comprehensively examines AI not merely as a technical tool but also in terms of its impact on more abstract yet decisive dynamics such as

hegemonic power construction, discourse production, leadership aspirations, and the formation of the status quo.

Particularly in the context of the ongoing techno-political rivalry between the United States and the People's Republic of China, this study evaluates how artificial intelligence technologies have been integrated into geopolitical power struggles and how this integration has shaped these actors' claims to leadership in the international system. In this regard, it is argued that mastery of AI provides not only technological superiority but also the capacity to construct a new hegemonic discourse on the global stage. Furthermore, it is suggested that artificial intelligence transcends being a mere technical capacity, evolving into a form of ideological and structural power.

In conclusion, this study seeks to reveal the transformative impact of artificial intelligence technologies on global power balances and aims to make original contributions to the international relations literature at both theoretical and analytical levels.

Keywords: Artificial Intelligence, China, United States

NATO'NUN ÇEVRESEL GÜVENLİK YAKLAŞIMI

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ÖZET

Soğuk Savaş dönemi, güvenlikle ilgili çalışmaların, uluslararası ilişkiler disiplininin alt dalları arasındaki en ayrıcalıklı dallardan biri olarak kendini gösterdiği dönemdir (Yılmaz, 2017: 82). Bu dönemde, çift kutuplu uluslararası sistemden hareketle ABD ve SSCB arasındaki rekabet ve askeri güvenlik ön planda olmuştur.

Ancak yine bu dönemde güvenlik kavramının anlamı ve içeriği; nükleer zarar, çevre kirliliği, azgelişmişlik ve ulus aşan çeşitli faaliyetler (terör, organize suçlar, insan kaçakçılığı, göç vb.) sonucunda giderek genişlemeye başlamıştır (Dedeoğlu, 2018: 54). Bu doğrultuda ortaya çıkan konu başlıklarından biri de çevresel güvenliktir. Çevresel güvenlik, çevrede yaşanan değişimlerin güvenlik üzerindeki etkisini ifade etmektedir.

Çevre ve güvenlik arasındaki bağlantı, 1980'li yıllardan itibaren gelişmeye başlamıştır (Dalby, 2008: 180). Güvenlik ve çevre arasında artan bu ilişki, konuyu G8 gibi zirvelerin gündemine taşıyarak yüksek siyasetin temel meselelerinden biri haline getirmiştir (Vogler, 2021: 551).

NATO da çevre ve güvenlik arasındaki bu ilişkiyi gündemine alan uluslararası örgütlerden biridir. Soğuk Savaş döneminde, askeri savunma amaçlı olarak kurulmuş olan NATO'nun ele aldığı güvenlik konuları zaman içerisinde çeşitlenirken, çevresel güvenlik de örgütün ilgilendiği konu başlıklarından biri haline gelmiştir.

Bu doğrultuda bu çalışmada, NATO'nun güvenlik anlayışının çevresel güvenlik bağlamında nasıl ortaya çıktığı, ne yönde ilerlediği, örgütün çevresel güvenlik doğrultusunda ne tür faaliyetler yürüttüğü açıklanmaya çalışılacaktır. Çalışmanın amacı, NATO'nun çevresel güvenlik yaklaşımını incelemektir.

Anahtar Kelimeler: Güvenlik, Çevresel Güvenlik, NATO

NATO'S ENVIRONMENTAL SECURITY APPROACH

ABSTRACT

The Cold War era was a period in which security studies emerged as one of the most privileged branches within the subfields of the discipline of international relations (Yılmaz, 2017: 82). During this period, competition and military security between the US and the USSR took center stage, driven by the bipolar international system.

However, during this period, the meaning and content of the concept of security began to broaden as a result of nuclear damage, environmental pollution, underdevelopment, and various transnational activities (terrorism, organized crime, human trafficking, migration, etc.) (Dedeoğlu, 2018: 54). One of the topics that has emerged in this context is environmental security. Environmental security refers to the impact of changes in the environment on security.

The connection between the environment and security began to develop in the 1980s (Dalby, 2008: 180). This growing relationship between security and the environment has made the issue one of the fundamental concerns of high politics, bringing it to the agenda of summits such as the G8 (Vogler, 2021: 551).

NATO is one of the international organizations that has placed this relationship between the environment and security on its agenda. While the security issues addressed by NATO, which was established for military defense purposes during the Cold War, have diversified over time, environmental security has also become one of the topics of interest to the organization.

In this context, this study will attempt to explain how NATO's security concept emerged in the context of environmental security, the direction in which it has progressed, and what types of activities the organization has carried out in line with environmental security. The purpose of this study is to examine NATO's environmental security approach.

Keywords: Security, Environmental Security, NATO

AN ASSESSMENT OF THE CONTRIBUTIONS OF SMART CITY APPLICATIONS TO THE SUSTAINABLE DEVELOPMENT GOALS

Çiğdem TUĞAÇ

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ABSTRACT

Smart cities have emerged as innovative models that integrate information and communication technologies with human capital and governance mechanisms. These models aim to enhance quality of life by promoting efficient use of urban resources, environmental sustainability, and social inclusiveness. The purpose of this study is to evaluate the role of smart city applications in achieving the United Nations 2030 Sustainable Development Agenda, particularly their contributions to specific Sustainable Development Goals (SDGs). The analysis focuses on multi-dimensional impacts of smart city initiatives on SDG 3 (Good Health and Well-being), SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action). Findings indicate that smart cities contribute to the SDGs through mechanisms such as optimizing resource management, improving public services, fostering economic growth, and strengthening environmental governance. These contributions reflect not only technological advancements but also a holistic urban transformation encompassing social, economic, and environmental dimensions. This highlights the potential of smart cities to establish an integrated urban ecosystem that aligns with the multidimensional nature of the SDGs. However, the implementation of smart city practices entails significant challenges, including data privacy and security concerns, high infrastructure costs, issues of social acceptance, and the necessity of institutional integration. The study emphasizes that overcoming these barriers requires more than technological innovation alone; adopting a holistic and balanced approach that incorporates social participation, governance capacity, and ethical principles is critical for achieving sustainable urban transformation.

Keywords: Smart Cities, Sustainable Development Goals, Urban Governance, Information and Communication Technologies, Environmental Management.

AKILLI KENT UYGULAMALARININ SÜRDÜRÜLEBİLİR KALKINMA AMAÇLARINA KATKILARI ÜZERİNE BİR DEĞERLENDİRME

ÖZET

Akıllı kentler, bilgi ve iletişim teknolojileri ile beşerî sermaye ve yönetişim mekanizmalarını bütünleştiren yenilikçi modeller olarak öne çıkmaktadır. Bu modeller, kentsel kaynakların etkin kullanımını, çevresel sürdürülebilirliği ve sosyal kapsayıcılığı artırarak yaşam kalitesini yükseltmeyi hedeflemektedir. Bu çalışmanın amacı, akıllı kent uygulamalarının Birleşmiş Milletler'in 2030 Sürdürülebilir Kalkınma Gündemi'nde yer alan Sürdürülebilir Kalkınma Amaçları'nın (SKA) gerçekleştirilmesindeki rolünü değerlendirmektir. Çalışmada, akıllı kent uygulamalarının özellikle SKA 3 (Sağlık ve Kaliteli Yaşam), SKA 7 (Erişilebilir ve Temiz Enerji), SKA 9 (Sanayi, Yenilikçilik ve Altyapı), SKA 11 (Sürdürülebilir Şehirler ve Topluluklar) ve SKA 13 (İklim Eylemi) gibi belirli amaçlara olan çok yönlü katkıları incelenmiştir. Analiz, akıllı kentlerin; kaynak yönetimini optimize etme, kamu hizmetlerini iyileştirme, ekonomik büyümeyi teşvik etme ve çevre yönetimini güçlendirme gibi mekanizmalar aracılığıyla SKA'lara önemli katkılar sunduğunu göstermiştir. Bu katkılar, sadece teknolojik ilerlemeleri değil, aynı zamanda sosyal, ekonomik ve çevresel boyutları kapsayan bütüncül bir kentsel dönüşümü ifade etmektedir. Bu durum, akıllı kentlerin SKA'ların çok boyutlu doğasıyla örtüşen entegre bir kentsel ekosistem oluşturma potansiyeline işaret etmektedir. Bununla birlikte, akıllı kent uygulamalarının hayata geçirilmesi, veri gizliliği ve güvenliği, yüksek altyapı maliyetleri,

sosyal kabul sorunları ve kurumlar arası entegrasyon gerekliliği gibi önemli zorlukları beraberinde getirmektedir. Çalışma, bu engellerin aşılabilmesi için teknolojik inovasyonun tek başına yeterli olmadığını; toplumsal katılım, yönetişim kapasitesi ve etik ilkeleri içeren bütüncül ve dengeli bir yaklaşımın benimsenmesinin sürdürülebilir bir kentsel dönüşüm için kritik olduğunu ortaya koymaktadır.

Anahtar Kelimeler: Akıllı Kentler, Sürdürülebilir Kalkınma Amaçları, Kentsel Yönetişim, Bilgi ve İletişim Teknolojileri, Çevre Yönetimi.

SUSTAINABILITY REPORTING IN UNIVERSITIES: A GOVERNANCE-ORIENTED EVALUATION

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ABSTRACT

Background: Sustainability reporting has become a growing practice in higher education institutions worldwide, reflecting both global frameworks such as the United Nations Sustainable Development Goals (SDGs) and universities' evolving responsibilities toward society. In the Turkish context, however, reporting practices often remain fragmented and limited in scope, undermining their reliability and strategic relevance.

Purpose: This study aims to evaluate sustainability reporting in Turkish universities from a governance perspective. It moves beyond a narrow focus on SDG alignment and investigates whether sustainability is systematically embedded in the three core missions of higher education: education, research, and community engagement.

Methodology: A qualitative content analysis of sustainability reports published by Turkish universities was conducted. Reports were reviewed in terms of their scope, data structures, and governance frameworks. The analysis particularly examined the presence of coordination mechanisms, accountability structures, and resource allocation strategies.

Findings: The results reveal that sustainability reporting in Turkish universities is shaped by three recurring governance challenges: (i) fragmented data systems and lack of coordination, (ii) insufficient accountability and transparency toward internal and external stakeholders, and (iii) weak connections between resource management and long-term strategic goals. While reports increasingly refer to SDGs, they often fail to demonstrate how sustainability principles are integrated into teaching, research, and social contribution activities that constitute the unique mission of universities.

Contribution: The study highlights the need to reframe sustainability reports not as technical outputs, but as governance instruments capable of fostering institutional transformation, strategic coherence, and accountability. By linking global frameworks with higher education's specific missions, the research contributes to the debate on how sustainability reporting can evolve into a more effective tool for embedding sustainability into the governance and operational structures of universities.

Keywords: Sustainability Reporting; Universities; Governance; Institutional Transformation

WHAT SHOULD SUSTAINABILITY MEAN FOR UNIVERSITIES? RETHINKING BEYOND GLOBAL INDICATORS

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ABSTRACT

Background: The notion of sustainability, derived from the Latin sustinere (to hold, to endure), has evolved into a multidimensional concept encompassing long-term social, environmental, and economic value creation. In higher education, sustainability is often interpreted through the lens of global frameworks such as the Sustainable Development Goals (SDGs) and standardized indices (UI GreenMetric, THE Impact Rankings, QS Sustainability Index). While these instruments provide comparability, they risk reducing sustainability to external reporting compliance rather than fostering institutional transformation.

Purpose: This study seeks to answer the question: "What should sustainability mean for universities?" It argues that sustainability in higher education should move beyond global checklists and be reframed around universities' distinctive missions of education, research, and community engagement.

Methodology: The paper develops a conceptual analysis drawing on the etymology of sustainability, its general definitions, and the approaches embedded in international indices. It contrasts these with a mission-driven framework for universities, emphasizing dimensions that extend beyond SDG alignment and propose alternative indicators.

Findings: The analysis highlights that sustainability for universities requires: (i) in education, curricula that integrate inclusivity, equity, and ecological awareness while fostering critical thinking and digital innovation; (ii) in research, interdisciplinary approaches that prioritize societal relevance and environmental sensitivity rather than publication counts alone; and (iii) in community engagement, institutionalized and long-term mechanisms that enhance social resilience and contribute to sustainable development at multiple scales. A key distinction emerges between continuity—maintaining existing routines—and sustainability—anchoring innovation in a culture of enduring transformation.

Contribution: By repositioning sustainability as an institutional governance framework rather than a technical reporting exercise, this study contributes to the debate on redefining higher education's role in sustainable development. It proposes mission-specific indicators that reflect universities' transformative capacity in education, research, and community engagement, offering an alternative to reliance on SDG-based metrics.

Keywords: Sustainable University; Higher Education; Governance; Institutional Transformation

SUSTAINABLE DEVELOPMENT GOALS AND FOOD SOVEREIGNTY: A COMMON ROADMAP AGAINST CLIMATE CHANGE

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ABSTRACT

One of the most urgent issues of our time is the globally experienced problem of climate change. Although many sectors such as energy, logistics and manufacturing are responsible for greenhouse gas emissions, which are the main cause of climate change, it is necessary to open a separate paranthesis for agricultural and food systems, which account for 30% total emissions. Indeed, agriculture not only constitutes a significant share of greenhouse gas emissions that cause climate change, but it is also among the activities most affected by it. In 2015, the United Nations adopted the "Transforming our World: the 2030 Agenda for Sustainable Development", setting out an agenda consisting of 17 sustainable development goals (SDG) in total. In particular, SDG 2, which aims to end hunger, achieve food security, and promote sustainable agriculture; SDG 12, which aims to encourage sustainable production and consumption patterns; and SDG 13, which foresees urgent measures against climate change and its adverse effects, all promote the prevention of climate change and climate-friendly production. At this point a parallel can be drawn between food sovereignty and the 2030 SDG. Food sovereignty was defined in the 2007 Nyéléni Declaration as "the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food systems." Food sovereignty is based on a set of programs and objectives, such as promoting sustainable agriculture that uses agroecological methods, prioritizing local production instead of long supply chains and logistics, focusing on the sustainability of ecological systems, and aiming to prevent rural poverty. These objectives are in line with the 2030 SDG. Therefore, food sovereignty not only seeks to combat the climate change, but also plays a key role in realizing 2030 SDG by combining social justice, participation and environmental sustainability.

Keywords: Food Sovereignty, Sustainable Development Goals, Climate Change.

THE RIGHT TO A HEALTHY ENVIRONMENT AND SUSTAINABLE DEVELOPMENT: A COMPLEMENTARY RELATIONSHIP BETWEEN LAW AND POLICY

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ABSTRACT

The development of legal mechanisms to remedy environmental problems, determine who is liable for resulting damages and clarify state obligations regarding the direct impacts on human health and the right to life has shaped the emergence of the right to a healthy environment at national and international levels. This right was first recognized at the 1972 UN Stockholm Conference, where Article 1 of the Declaration affirmed every individual's right to live in an environment that supports a life of dignity and well-being. It marked the first explicit acknowledgment of the right to a healthy environment as an individual right under international law. However, the concept of the environment cannot be limited to legal terminology alone. Defining its scope and identifying measures for its protection require an interdisciplinary perspective. Assessments of the right to a healthy environment should integrate eco-centric approaches, emphasizing nature's intrinsic value, and anthropocentric approaches, connecting environmental protection to human rights. Moreover, this right imposes on states both negative duties to avoid harm and positive duties to protect and sustainably manage natural resources under this right. Beyond such legal background, the United Nations Sustainable Development Goals (SDGs), adopted in 2015, while not legally binding, serve as policy instruments that strengthen the implementation of this right. Goals such as climate action (Goal 13), ecosystem protection (Goals 14 and 15), clean water and sanitation (Goal 6), and access to clean energy (Goal 7) concretize the scope of the right and clarify state obligations. In conclusion, the right to a healthy environment and the SDGs complement each other; the former constitutes a legally binding, justiciable human right, while the latter provides a globally guiding policy framework to facilitate its realization. Their relationship exemplifies principles of complementarity and mutual reinforcement in environmental policy framework.

Keywords: Right to a Healthy Environment, United Nations Sustainable Development Goals, Human Rights, State Obligations, Complementarity.

ECOLOGICAL CITIZENSHIP BEYOND LIBERAL AND REPUBLICAN MODELS

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ABSTRACT

This study proposes an original normative framework of ecological citizenship by comparing it with liberal and republican approaches within the field of public administration. Global environmental challenges such as climate change, biodiversity loss, and planetary boundaries produce transboundary, collective, and delayed effects, which surpass the explanatory capacity of classical citizenship theories and require a horizon of cosmopolitan justice and intergenerational responsibility. Conducted through literature-based qualitative document analysis, the research systematically compares the three models across freedom, rights–duties balance, community and temporal scope, and institutional arrangements. The findings reveal that liberal citizenship maintains its strength through individual rights protection, judicial remedies, and the principle of negative liberty; republican citizenship emphasizes non-domination, contestation, and orientation toward the common good; while ecological citizenship extends these traditions by incorporating positive ecological duties, stewardship of the commons, intergenerational justice, and polycentric governance. Furthermore, the study demonstrates that ecological citizenship can be operationalized in public administration through environmental policy integration (EPI), green public procurement (GPP), monitoring–reporting–verification (MRV) mechanisms, and multi-level governance design. Ultimately, ecological citizenship is presented as a normative public value program that not only secures individual rights and collective responsibilities but also integrates legitimacy, effectiveness, and justice within a comprehensive governance architecture. This approach moves beyond the state-centered horizon and provides a framework in which environmental sustainability, intergenerational equity, and democratic accountability can be jointly institutionalized.

Keywords: Ecological citizenship, liberal citizenship, republican citizenship, public administration, environmental justice, polycentric governance.

LİBERAL VE CUMHURİYETÇİ MODELLERİN ÖTESİNDE EKOLOJİK VATANDAŞLIK

ÖZET

Bu çalışma, ekolojik vatandaşlık kavramını liberal ve cumhuriyetçi vatandaşlık yaklaşımlarıyla karşılaştırarak kamu yönetimi literatüründe özgün bir normatif çerçeve ortaya koymaktadır. İklim değişikliği, biyoçeşitlilik kaybı ve küresel çevre sorunlarının sınır-aşan, gecikmeli ve kolektif etkileri, klasik vatandaşlık teorilerinin ötesinde kuşaklararası sorumluluk ve kozmopolit adalet ufkunu zorunlu hale getirmektedir. Araştırma, literatür temelli nitel doküman analiziyle yürütülmüş; özgürlük anlayışı, hak–yükümlülük dengesi, topluluk ve zaman ufku ile kurumsal araçlar bakımından üç vatandaşlık modeli sistematik olarak karşılaştırılmıştır. Bulgular, liberal vatandaşlığın bireysel hak güvenceleri, yargısal onarım kapasitesi ve negatif özgürlük anlayışını koruduğunu; cumhuriyetçi vatandaşlığın tahakkümsüzlük, kontestasyon ve ortak iyi vurgusuyla güçlü bir normatif temel sunduğunu; ekolojik vatandaşlığın ise bu iki hattı aşarak pozitif ekolojik ödevler, müştereklerin kurumsal yönetimi, polisentri ilkeleri ve kuşaklararası adalet anlayışıyla genişlettiğini göstermektedir. Çalışma ayrıca, çevresel politika bütünleşmesi (Environmental Policy ıntegration – EPI), yeşil kamu tedariki (Green Public Procurement – GPP), ölç–bildir–doğrula (Monitoring–Reporting–Verification – MRV) mekanizmaları ve çok-merkezli yönetişim mimarisi aracılığıyla ekolojik vatandaşlığın kamu yönetimi pratiklerine tercüme edilebileceğini ortaya koymaktadır. Sonuç olarak, ekolojik vatandaşlık yalnızca bireysel hakların korunması

ve görevlerin tanımlanması değil, aynı zamanda meşruiyet, etkililik ve adaletin birlikte güvence altına alındığı bütüncül bir kamu değeri programı olarak önerilmektedir.

Keywords: Ekolojik vatandaşlık, liberal vatandaşlık, cumhuriyetçi vatandaşlık, kamu yönetimi, çevresel adalet, polisentri

AI AND SMART TECHNOLOGIES FOR SUSTAINABLE CAMPUS TRANSFORMATION: A ROADMAP FOR SIIRT UNIVERSITY

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ABSTRACT

Universities are increasingly viewed as microcosms of sustainable cities, offering ideal platforms for testing and scaling innovative solutions to global climate and development challenges. While many institutions worldwide have begun integrating artificial intelligence (AI) and smart technologies into campus operations, universities in developing regions face significant gaps in adoption. This paper presents a forward-looking roadmap for how Siirt University, located in Southeast Türkiye, could utilise AI and smart systems to advance its transition toward a sustainable green campus and serve as a model for the region.

The proposed framework outlines practical applications of AI and smart technologies across five priority areas: energy management through predictive monitoring and renewable integration; water conservation via smart irrigation and rainwater harvesting systems; waste reduction supported by intelligent collection and recycling platforms; biodiversity and landscape monitoring using drones and AI-based analysis; and sustainable mobility enhanced by smart transport planning. The integration of these systems is envisioned through pilot projects, interdisciplinary collaboration, and student-led innovation, with phased implementation strategies tailored to resource-limited contexts.

By framing Siirt University as a potential "living laboratory," the study highlights how regional universities can leverage digital innovation to align with the United Nations Sustainable Development Goals (SDGs) and Türkiye's national sustainability agenda. The findings emphasise that even institutions without existing smart infrastructure can become catalysts for sustainable transformation by adopting a stepwise, inclusive, and context-specific approach.

Keywords: Artificial intelligence, smart campus, sustainability roadmap, green university, Siirt University, digital innovation, Sustainable Development Goals.

THE IMPACTS OF GLOBAL CLIMATE CHANGE ON WATER RESOURCES AND INNOVATIVE WATER MANAGEMENT SOLUTIONS IN BUILDINGS FOR SUSTAINABLE DEVELOPMENT: APPLICATION EXAMPLES FROM TURKEY AND AROUND THE WORLD

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ABSTRACT

Global climate change, driven by increasing greenhouse gas emissions, is causing a rise in global temperatures and disrupting the hydrological cycle, posing serious threats to the quantity, quality, and seasonal distribution of freshwater resources worldwide. These effects are observed more rapidly and intensely in countries like Turkey, which are located in the semi-arid climate zone. In urban areas, dense population pressure, inadequate infrastructure, and the deterioration of natural water systems combine with the problems created by climate change to increase the pressure on water resources. However, studies on this topic in the literature are limited and generally remain at the engineering scale. This situation weakens the contribution of the architectural discipline, which should play an active role throughout the entire life cycle of buildings, and creates significant gaps in proposed solutions. Furthermore, addressing the issue without sufficient understanding in the design and implementation processes can increase costs during use and lead to environmentally unsustainable outcomes. The inability of current management and planning approaches to adequately respond to the pace and scope of climate change is causing the problem to deepen. On the other hand, the use of recycled water in buildings is critical not only in the context of environmental sustainability but also in terms of user health and comfort, requiring proper planning and technological infrastructure. The aim of this study is to examine the effects of climate change on water resources from a scientific and systematic perspective, analyze the reflections of changes in hydrological systems in the Turkish context, and propose innovative strategies for sustainable water management at the architectural design scale. Thus, the study aims to guide both decision-makers and actors in the field of architectural design and implementation and to lay the groundwork for future research.

Keywords: Climate Change, Built Environment, Climate Change Adaptation, Water Management in Buildings.

CITY-SPECIFIC PATHWAYS: LOCALIZED SUSTAINABILITY PRACTICES ACROSS TURKISH MUNICIPALITIES

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ABSTRACT

Cities can be understood as living organisms, shaped by the unique interactions of populations within specific environments. Each city develops its own flow, culture, and memory, while simultaneously remaining interconnected with broader regional and global systems. Standardized sustainability policies; whether at national or transnational levels; often fall short in capturing these city-specific dynamics. To be effective, sustainability strategies must be locally tailored, inclusive, and responsive to the needs, capabilities, and limitations of diverse urban actors. This study investigates the potential of city-specific inclusive approaches in advancing sustainability goals by comparing different municipal applications in Türkiye, ranging from large metropolitan areas to smaller municipalities and Cittaslow towns. Through a comparative analysis of municipal action plans and sustainability practices, the research highlights how distinct demographic profiles, cultural identities, and governance structures shape the interpretation and implementation of sustainability strategies. The findings suggest that while metropolitan administrations often prioritize large-scale infrastructure and economic growth, smaller municipalities and slow cities focus more on social cohesion, cultural continuity, and environmental stewardship. These variations illustrate that sustainability is not a fixed balance among economic, social, and environmental pillars but a fluid and evolving process that reflects local realities. Imposing uniform strategies risks alienating diverse groups, whereas inclusive approaches aligned with community-specific needs foster stronger engagement, ownership, and long-term commitment. By situating sustainability within the lived experiences of diverse urban populations, the study proposes a shift from abstract, one-size-fits-all models toward adaptive practices that embrace the socio-cultural fabric of each city, ensuring every contribution counts in the collective pursuit of sustainability

Keywords: localization, sustainability, diversity, inclusivity

İKLİM DEĞİŞİKLİĞİ İLE MÜCADELEDE KAMU BİNALARININ ROLÜ: ENERJİ ETKİN DÖNÜŞÜM YAKLAŞIMLARI

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ÖZET

İklim değişikliğinin etkileri tüm dünyada ve Türkiye'de etkisini sıcaklık artışı, ani ve aşırı yağışlar, orman yangınları, sel, kuraklık ve erozyon gibi etkenlerle göstermektedir. Sanayi devriminden sonra hızlı tüketim ve kirlenen çevre sorunlarına dikkat çeken sürdürülebilirlik temalarıyla birlikte karbon salımı ve yenilenebilir enerji kullanımı ön plana çıkmıştır. Su stresi yaşayan ülkeler arasındaki Türkiye'nin; iklim değişikliğinin etkisi, hızlı su döngüsü ve sanayi, ev, tarım gibi sektörlerdeki artan tüketimler nedeniyle önümüzdeki süreçte su sıkıntısı çeken ülkeler arasında olması muhtemeldir. Türkiye'nin ulusal ve yerel politikaları arasında enerji tasarrufu, yenilenebilir enerji kullanımı, iklim değişikliği ve etkileriyle mücadele, karbon salınımını azaltmak, yağmur suyu hasadını yaygınlaştırmak gibi stratejiler yer almaktadır. Dünyadaki enerjinin 2/3'ünü tüketen ve karbon emisyonunun %70'ini üreten şehirlerde, yapılı çevrenin karbon emisyonundaki payı %45'tir. Sürdürülebilir kalkınma amaçları, Paris İklim Anlaşması, Avrupa Birliği Yeşil Mutabakatı, 2053 karbon nötr hedefi gibi stratejileri benimseyen Türkiye'de yapılı çevrede yer alan kamu binalarının renovasyonu; Dünya bankasının desteğiyle Çevre ve Şehircilik Bakanlığı tarafından kriterleri sağlayan yapılar için uygulanmaktadır. Sosyal alan niteliği taşıyan kamu binaları örnek yapı unsuru teşkil etmektedir. Alan ısıtma, soğutma, havalandırma, aydınlatma gibi aktiviteler için yenilenebilir enerji kaynaklarının kullanıldığı, bina otomasyonu gibi sistemlerle enerjiyi verimli kullanan, tasarruf stratejilerini uygulayan ve yağmur suyu hasadı yapan örnek kamu binaları tasarlamak ulusal ve yerel yönetimlerin öncelikleri arasındadır. Bu çalışmada Nevşehir Hacı Bektaş Veli Üniversitesi Diş Hekimliği Fakültesi ve Uygulama Hastanesi örneklem olarak seçilmiş olup, yapının tasarım ve kullanıcı verileri analiz edilerek su ve enerji verimliliği kapsamında iyileştirme önerileri ve örnek tasarım modeli oluşturulmuştur. Çalışma yerel ölçekte uygulanabilir politika ve stratejiler önererek kamu binalarında enerji verimliliği için model oluşturmayı hedeflemektedir. Böylece iklim hedeflerine katkı sağlanması ve kamu yapılarının enerji etkin dönüşümüne yönelik yol haritası geliştirilmesi amaçlanmaktadır.

Anahtar Kelimeler: İklim değişikliği, sürdürülebilirlik, enerji verimliliği, su hasadı, kamu binaları.

THE ROLE OF PUBLIC BUILDINGS IN COMBATING CLIMATE CHANGE: ENERGY-EFFICIENT TRANSFORMATION APPROACHES

ABSTRACT

The impacts of climate change are increasingly visible worldwide and in Turkey through rising temperatures, sudden and extreme rainfall, forest fires, floods, droughts, and erosion. Following the Industrial Revolution, rapid consumption and environmental pollution have brought sustainability themes such as carbon emissions and renewable energy use to the forefront. As a water-stressed country, Turkey is likely to face severe water shortages in the coming years due to climate change, accelerated hydrological cycles, and rising consumption in the industrial, domestic, and agricultural sectors. National and local policies in Turkey include strategies such as energy conservation, renewable energy use, combating climate change and its impacts, reducing carbon emissions, and promoting rainwater harvesting. Cities, which consume two-thirds of the world's energy and

produce 70% of carbon emissions, account for 45% of emissions through the built environment. In Turkey, strategies aligned with the Sustainable Development Goals, the Paris Climate Agreement, the European Union Green Deal, and the 2053 carbon-neutral target have been adopted. Within this framework, the renovation of public buildings—particularly those meeting specific criteria—is supported by the Ministry of Environment and Urbanization with the assistance of the World Bank. Public buildings that serve as social spaces are considered exemplary structures. Priorities for national and local administrations include designing public buildings that employ renewable energy for heating, cooling, ventilation, and lighting; integrate building automation systems for efficient energy use; and adopt water-saving strategies such as rainwater harvesting. In this study, the Faculty of Dentistry and Research Hospital of Nevşehir Hacı Bektaş Veli University were selected as case examples. By analyzing the design and user data of the complex, proposals for improvements in water and energy efficiency were developed, and a model design was created. The study aims to establish a framework for energy efficiency in public buildings by recommending applicable local policies and strategies. In doing so, it seeks to contribute to climate targets and to provide a roadmap for the energy-efficient transformation of public buildings.

Keywords: Climate change, sustainability, energy efficiency, water harvesting, public buildings

REKREASYON ALANLARINDA ENERJİ VE SU VERİMLİLİĞİ: BİYOKLİMATİK KONFOR PARK ALANI

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ÖZET

İklim Değişikliği ve etkileri günümüzün süreklilik gösteren en önemli çevresel sorunlarından biridir. Türkiye'de artan sıcaklıklar ve aşırı yağış olayları toprak verimliliğini olumsuz etkilemekte, yüzey akışına geçen suyun etkin kullanımı engellenmektedir. Su stresi yaşayan ülkeler arasında yer alan Türkiye'de; binalarda, tarımda, sanayide ve rekreasyon alanlarında suyun verimli kullanımı önem arz etmektedir. Şehirlerde hızlı kentleşme ve beraberinde getirdiği hızlı tüketim sorunları; enerji verimliliği, su verimliliği, yenilenebilir enerji kullanımı ve sürdürülebilirlik temalarını daha önemli hale getirmektedir. Kent merkezlerinde sıcaklığın artmasıyla ortaya çıkan kentsel ısı adası etkisi, yaşam kalitesini olumsuz etkilerken, biyoklimatik konfor parkları bu sorunun hafifletilmesinde önemli bir çözüm alanı olarak öne çıkmaktadır. İklim değişikliğinin sıcaklık etkisini düşürmekle kalmayıp yapılacak su ve enerji verimliliği üzerine planlamalarla yenilenebilir enerji kullanan, kendi enerjisini üreten, yağmur suyu hasadı yapan, suyu damlama sistemi kullanarak verimli tüketen parklar tasarlamak gereklilik haline gelmiştir. Her yaş grubunun ihtiyacına göre sürdürlebilir ilkelerle tasarlanmış bu parklar; dinlenme ve oyun alanları, suyu geri dönüşümlü kullanan su yolları, danışma ve bilgi ofisleri ile halkın ihtiyaçlarına cevap vermekte; görerek, deneyimleyerek ve izleyerek öğrenmeye olanak sağlamaktadır. Ayrıca öğrencilere ve halka yönelik bilgilendirme ve farkındalık eğitimlerinin verildiği bilgi ofisleriyle beraber biyoklimatik parkta sosyal kırılgan guruplara öncelik tanınan yöresel ürünlerin tanıtıldığı yöresel satış alanları, şehrin kültürel özelliğine ve biyoklimatik konfor alanının büyüklüğüne göre tasarlanacak deneyim atölyeleri, fidan dikim alanları, yağmur suyunu toplayan göletler, hayvanat bahçeleri, tohum ve yem satış alanları ile çocuklara ve gençlere kültürel miras tanıtılmaktadır. Böylece bitki ve hayvan sevgisi ile beraber su ve enerji verimliliği, iklim değişikliği, sürdürülebilirlik, sıfır atık ve geri dönüşüm konularında farkındalık ve bilinç kazandırılmaktadır.

Anahtar Kelimeler: İklim değişikliği, sürdürülebilirlik, enerji verimliliği, su hasadı, biyoklimatik konfor parkları.

ENERGY AND WATER EFFICIENCY IN RECREATIONAL AREAS: BIOCLIMATIC COMFORT PARK AREA

ABSTRACT

Climate change and its impacts are among the most significant ongoing environmental problems of our time. Rising temperatures and excessive precipitation in Turkey negatively affect soil fertility, preventing the efficient use of water transferred to surface runoff. In Turkey, which is among the countries experiencing water stress, the efficient use of water in buildings, agriculture, industry, and recreational areas is of paramount importance. Rapid urbanization in cities and the accompanying rapid consumption problems make the themes of energy efficiency, water efficiency, renewable energy use, and sustainability even more crucial. While the urban heat island effect, which arises from increasing temperatures in city centers, negatively affects quality of life, bioclimatic comfort parks stand out as an important solution in mitigating this problem. It has become necessary to design parks that not only reduce the temperature effects of climate change, but also use renewable

energy, generate their own energy, harvest rainwater, and consume water efficiently using drip systems through plans focused on water and energy efficiency. These parks, designed with sustainable principles to suit the needs of every age group, respond to the needs of the public with recreation and playground areas, waterways that use recycled water, and information offices. It provides opportunities for learning by seeing, experiencing, and observing. Furthermore, the bioclimatic park features information offices providing information and awareness training for students and the public, as well as sales areas showcasing local products prioritized for vulnerable groups. Experience workshops designed to reflect the city's cultural characteristics and the size of the bioclimatic comfort zone, sapling planting areas, rainwater-collecting ponds, zoos, and seed and feed sales areas. Cultural heritage is introduced to children and young people. This fosters a love of plants and animals, as well as awareness and fosters awareness of water and energy efficiency, climate change, sustainability, zero waste, and recycling.

Keywords: Climate change, sustainability, energy efficiency, water harvesting, bioclimatic comfort parkland

ASSESSING URBAN TRANSFORMATION IN LINE WITH SUSTAINABILITY PRINCIPLES: A SKA-11 FOCUSED APPROACH

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ABSTRACT

A large part of the world now lives in cities. Rapidly increasing population, globalisation and migration movements have led to various problems in urban areas. These problems manifest themselves in many areas, such as increasing housing needs, environmental pollution, social inequalities, and inadequate urban amenities and infrastructure services. Urban transformation is required to make urban areas more liveable. In our country, urban transformation is approached as physical regeneration. However, the perspective that needs to be considered should be more comprehensive. Approaching it as a physical transformation has led to a limited understanding of transformation, confined to short-term and superficial interventions rather than producing long-term solutions. The holistic approach aims to create fairer and healthier living conditions for all individuals living in cities. Transforming specific areas without addressing the city holistically negatively impacts sustainability. Urban transformation must be approached in line with sustainability criteria. Urban transformation is an important tool for achieving sustainable development goals. The Sustainable Development Goals, adopted by the United Nations in 2015, present 17 goals and sub-goals and indicators to achieve these goals. Countries have important responsibilities to ensure that SDGs can be implemented at the local level. Each country must develop strategic steps and policies in line with its own reality. In addressing urban transformation processes with a sustainable approach, SDG 11, 'Sustainable Cities and Communities,' provides an important roadmap. The purpose of this study is to propose an assessment table that measures urban transformation practices in line with the sub-targets and indicators presented in SDG-11, 'Sustainable Cities and Communities,' which was created for the practical application of sustainability. Urban transformation projects can be evaluated based on the concrete indicators obtained in the assessment table. The implementation of sustainability indicators in transformation projects presents a significant opportunity for ensuring sustainability in urban areas. Urban transformation projects should not be considered independently of a sustainable approach.

Keywords: Urban transformation, sustainability, sustainable development goals, sustainable cities and communities, sustainable urban transformation.

KENTSEL DÖNÜŞÜMÜN SÜRDÜRÜLEBİLİRLİK İLKELERİ DOĞRULTUSUNDA DEĞERLENDİRİLMESİ: SKA-11 ODAKLI BİR YAKLAŞIM

ÖZET

Dünyanın büyük bir kısmı artık kentlerde yaşamaktadır. Hızla artan nüfus, küreselleşme ve göç hareketleri etkisiyle kentsel alanlarda çeşitli sorunlar ortaya çıkmıştır. Bu sorunlar, artan konut ihtiyacı, çevre kirliliği, sosyal eşitsizlikler, kentsel donatı alanlarının ve altyapı hizmetlerinin yetersizliği gibi birçok alanda kendini göstermektedir. Kentsel alanları daha yaşanılabilir bir duruma getirmek için kentsel dönüşüme gereksinim duyulmaktadır. Ülkemizde kentsel dönüşüm, fiziki dönüşüm olarak ele alınmaktadır. Fakat bakılması gereken perspektif daha kapsamlı olmalıdır. Fiziki dönüşüm olarak ele alınması, uzun vadeli çözüm üretme yerine kısa vadeli ve yüzeysel müdahalelerle sınırlı bir dönüşüm anlayışını beraberinde getirmiştir. Bütüncül yaklaşım

kentlerde yaşayan tüm bireyler için daha adil ve sağlıklı yaşam koşulları oluşturmayı hedeflemektedir. Kenti bütüncül bir şekilde ele almadan kısmi alanların dönüştürülmesi sürdürülebilirlik unsurunu olumsuz bir şekilde etkilemektedir. Kentsel dönüşüm, sürdürülebilirlik ölçütleri doğrultusunda ele alınmalıdır. Sürdürülebilir kalkınma amaçlarına ulaşılmasında kentsel dönüşüm önemli bir araçtır. Birleşmiş Milletler tarafından 2015 yılında kabul edilen "Sürdürülebilir Kalkınma Amaçları" 17 amaç ve bu amaçlara ulaşabilmek için alt hedef ve göstergeler sunmaktadır. SKA'ların yerel düzeyde hayata geçebilmesi için ülkelere önemli görevler düşmektedir. Her ülke kendi gerçekliğinde stratejik adımlar ve politikalar geliştirmelidir. Kentsel dönüşüm süreçlerinin sürdürülebilir bir yaklaşımla ele alınmasında özellikle SKA'ların 11. amacı olan "Sürdürülebilir Şehirler ve Topluluklar" önemli bir yol haritası sunmaktadır. Bu çalışmanın amacı, sürdürülebilirliğin pratikte kullanılması için oluşturulan; SKA-11 maddesi olan "Sürdürülebilir Şehirler ve Topluluklar Amacı"nın sunduğu alt hedef ve göstergeler doğrultusunda kentsel dönüşüm uygulamalarını ölçen değerlendirme tablosu önermektir. Değerlendirme tablosunda elde edilen somut göstergeler üzerinden kentsel dönüşüm projeleri değerlendirilebilecektir. Sürdürülebilirlik göstergelerinin dönüşüm projelerinde faaliyete geçirilmesi, kentsel alanlarda sürdürülebilirliğin sağlanması açısından önemli bir fırsat sunmaktadır. Kentsel dönüşüm projeleri sürdürülebilir bir yaklaşımdan bağımsız ele alınmamalıdır.

Anahtar Kelimeler: Kentsel dönüşüm, sürdürülebilirlik, sürdürülebilir kalkınma amaçları, sürdürülebilir şehirler ve topluluklar, sürdürülebilir kentsel dönüşüm.

THE IMPACT OF THE EU's DIGITAL PRODUCT PASSPORT ON CONSTRUCTION MATERIALS: TRANSPARENCY, TRACEABILITY, AND COMPETITIVE ADVANTAGES

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ABSTRACT

The Digital Product Passport (DPP), which will become mandatory by 2027 under European Union regulations, emerges not only as an environmental transformation tool in the construction materials sector but also as a strategic instrument that defines competitive strength. For materials with a high carbon footprint—such as cement, ceramics, insulation products, and window systems—the DPP requires the transparent and traceable recording of all lifecycle data, from raw materials to recycling. This will enhance transparency in material selection and supply chain management, facilitate compliance with green building certifications, and strengthen the position of exporting companies in the EU market. From Turkey's perspective, the adaptation process to the DPP involves challenges such as data management, digital infrastructure, and the preparedness level of SMEs. However, producers who adapt in a timely manner will improve their sustainability performance and gain a competitive edge in the international market.

Keywords: Digital Product Passport (DPP), Construction Materials, Traceability, Competitive Advantage

POLICY APPROACHES IN CITIES AND THE CONSTRUCTION SECTOR WITHIN THE FRAMEWORK OF CIRCULARITY INDICATORS: LESSONS FROM THE EU FOR TURKEY

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ABSTRACT

The European Union's report titled "New Indicators for Monitoring the Transition to a Circular Economy" introduces a comprehensive set of policy tools and measurement indicators designed to accelerate the adoption of circular economy principles, particularly within urban areas and the construction sector. These sectors are recognized as pivotal in the transition due to their substantial impact on resource consumption, energy use, and waste generation. Buildings, throughout their life cycle—from design and construction to demolition—account for significant material flows and carbon emissions. At the same time, cities act as focal points for circular transformation, offering the governance structures, spatial planning tools, and innovation ecosystems necessary for large-scale change.

Drawing from the EU report, this paper analyzes the key circularity indicators proposed for both the building environment and urban systems. These include metrics related to material reuse rates, construction and demolition waste recovery, energy efficiency improvements, and the integration of secondary raw materials into new developments. In addition, the study examines how local and national public policies can support this transition through strategic planning, regulation, and fiscal incentives. The role of municipalities and regional authorities is highlighted, particularly in embedding circularity principles into public procurement processes and infrastructure investments.

The paper further explores how Turkey can benefit from the EU's experience, identifying gaps and opportunities within Turkey's current legislative framework and strategic documents. Emphasis is placed on potential harmonization paths, institutional capacity-building, and stakeholder engagement strategies to ensure a smoother and more effective alignment with European circular economy standards.

Keywords: Circular Economy, Cities and Buildings, Policy and Governance, EU-Turkey Alignment

FROM ASHES TO LIFE: SUSTAINABLE APPROACHES IN POST-FIRE URBAN RECONSTRUCTION

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ABSTRACT

Wildfires have become an increasing global threat under the influence of climate change. Rising temperatures, drought, and changing wind patterns have intensified the frequency and severity of wildfires, creating significant risks not only in rural areas but also in urban settings. Green spaces surrounding cities are particularly vulnerable, and the resulting impacts on physical infrastructure, human life, and ecosystems are considerable. In this context, fire management and post-disaster recovery processes hold critical importance.

Urban administrations play a vital role in post-fire processes through rapid response, effective coordination, damage assessment, community participation, and resource management. However, these processes should not be limited to repairing damage; they must also be shaped by sustainability principles to reduce future risks. Within this framework, ecosystem-based approaches, community resilience, and sustainable reconstruction have gained prominence.

The aim of this study is to contribute to the development of strategies that enable rapid and sustainable reconstruction of urban areas after wildfires. The study employs a literature review and case analyses, grounded in disaster management and post-crisis recovery theories. The analysis highlights the significance of integrating modern technologies, enhancing local government capacities, and strengthening community participation to improve the effectiveness of recovery processes.

Findings indicate that the most pressing challenges in post-fire recovery involve urgent decision-making, efficient resource management, and ensuring participatory governance. Sustainability, community resilience, and technology-driven approaches play a critical role in overcoming these challenges. The study ultimately offers strategic recommendations for policymakers, local governments, and scholars to ensure that post-fire recovery processes are managed more effectively, sustainably, and resiliently.

Keywords: Urban management, Fire, Disaster Management, Reconstruction, Sustainability

KÜLLERDEN HAYATA: YANGIN SONRASI KENTSEL YENİDEN YAPILANMADA SÜRDÜRÜLEBİLİR YAKLAŞIMLAR

ÖZET

Yangınlar, iklim değişikliğinin etkisiyle dünya genelinde giderek artan bir tehdit haline gelmiştir. Yükselen sıcaklıklar, kuraklık ve rüzgâr hızındaki değişimler, orman yangınlarının sıklığını ve şiddetini artırmakta; bu durum yalnızca kırsal alanlarda değil, aynı zamanda kentsel bölgelerde de ciddi riskler oluşturmaktadır. Kentlerin çevresindeki yeşil alanların yangın tehdidi altında olması, fiziksel altyapı, insan yaşamı ve ekosistemler üzerinde önemli etkiler yaratmaktadır. Bu bağlamda yangın yönetimi ve yangın sonrası iyileşme süreçleri kritik öneme sahiptir.

Kent yönetimleri, yangın sonrası süreçlerde hızlı müdahale, etkin koordinasyon, hasar tespiti, halkın katılımı ve kaynak yönetimi gibi sorumluluklar üstlenmektedir. Ancak bu süreçlerin sadece hasarın onarımıyla sınırlı

kalmaması, aynı zamanda gelecekteki risklerin azaltılması için sürdürülebilirlik ilkeleri doğrultusunda şekillendirilmesi gerekmektedir. Bu çerçevede ekosistem temelli yaklaşımlar, topluluk dayanıklılığı ve sürdürülebilir yeniden inşa kavramları ön plana çıkmaktadır.

Bu çalışmanın amacı, yangın sonrası kentsel alanların hızlı ve sürdürülebilir şekilde yeniden inşa edilmesine katkı sağlayacak stratejiler geliştirmektir. Çalışma, literatür taraması ve farklı örneklerden elde edilen vaka analizleri aracılığıyla, afet yönetimi ve kriz sonrası iyileşme teorilerini temel almaktadır. İnceleme sürecinde modern teknolojilerin kullanımı, yerel yönetimlerin kapasite geliştirmesi ve topluluk katılımının artırılması gibi unsurların, iyileşme süreçlerinde etkinliği artırdığı görülmektedir.

Bulgular, yangın sonrası süreçlerin en önemli zorluklarının hızlı karar alma, kaynakların etkin yönetimi ve katılımcılığın sağlanması konularında yoğunlaştığını ortaya koymaktadır. Sürdürülebilirlik, topluluk dayanıklılığı ve teknoloji odaklı yaklaşımlar, bu zorlukların aşılmasında kritik rol oynamaktadır. Çalışma, politika yapıcılar, yerel yönetimler ve akademisyenler için yangın sonrası iyileşme süreçlerinin daha etkin, sürdürülebilir ve dayanıklı hale getirilmesine yönelik stratejik öneriler sunmaktadır.

Anahtar Kelimeler: Kent yönetimi, Yangın, Afet yönetimi, Yeniden İnşa, Sürdürülebilirlik

GREEN ECONOMY: A CATALYST FOR SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES - AN EMPIRICAL ANALYSIS

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ABSTRACT

Over the last few years, the green economy (GE) notion has been realized as a key tool for achieving sustainable development (SD) in both developing and developed nations. Therefore, the current study tries to investigate the role of GE in achieving SD in developing countries. Through empirically examining the relationship between the GE and three different dependent variables which are GDP per capita, total unemployment rate, and poverty level, using cross-sectional data for 60 developing countries in 2018.Applying generalized least square (GLS) approach with four dimensions of the Global Green Economy Index (GGEI) are the key independent variables that measure the accomplishment of nations in aspects of the global green economy.The empirical results showed the existence of a positive statistically significant relationship between the GE and GDP per capita and the level of total unemployment, while there is a negative statistically significant relationship between the GE and the poverty rate in developing countries.This study recommends that both the private and public sectors continue to endorse and adopt GE in the future for SD, job creation, and poverty alleviation.

Keywords: Environment friendly, Green economy,Sustainable development

KNOWLEDGE MANAGEMENT AND ITS IMPORTANCE IN NIGERIA'S PUBLIC AND PRIVATE BUSINESS ENTERPRISES

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ABSTRACT

It is no longer strange for individuals and organizations alike to appreciate that only organizations that are innovative will survive in very turbulent economic landscape. It is also a fact that innovations can only be achieved when an organization continuously learns and becomes a learning organ. A learning organization is characterized by the stock of both tacit and explicit knowledge which it had acquired over time and how the stock of knowledge is utilized. The stock of knowledge becomes useful only when it is shared and utilized for the overall improvement in all organizational processes and human capital enhancement. Knowledge management is managing information flow, and getting the right information to the people who need it so that they can act on it quickly. It starts with business objectives and processes and recognition of the need to share information. The purpose of this review is to explore knowledge management drivers and performance in Nigeria's public and private business enterprises. This paper seeks to review empirical literature and provide a conceptual overview of knowledge management and its unique contributions to business performance. It seeks to identify critical characteristics that will create competences that can reorganize an institution towards improved performance. Application of the knowledge management process can hasten the deployment of new knowledge and innovations in a sector and transform performance; and this has a positive impact on both individuals, private and public enterprises and the national economy as a whole.

Key Words: Knowledge, Knowledge management, Knowledge management processes, Public and Private Enterprises, Nigeria

GLOBALIZATION OF ECONOMIES AND THE SUSTAINABLE DEVELOPMENT OF THREE SELECTED EURO-DOLLAR COUNTRIES

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ABSTRACT

As a strict term, globalization means the myriad economic and social transformation of mankind at present, on an extensive and integrating scale and generated by the impact of transcontinental monetary financial flows on the characteristics of social interactions. Sustainable development, on the other hand is conceived as a new development path that sustains human progress for the entire planet and for a long future. Globalisation is an inevitable phenomenon in human history that's been bringing the world closer through the exchange of goods and products, information, knowledge and culture. The purpose of this study was to find out the influence of globalisation of economies and sustainable development on the selected three Euro-dollar countries, viz-France, Spain and Germany between (1980 -2018). The researcher therefore reviewed the existing literature on the implication of globalization on the economic sustainability of these countries. Thus the concept of globalisation and sustainable development as well as some components of the selected Euro-dollar countries and the impact of globalisation on the world economy are critically examined. The study undertook a conceptual approach based on the effects of globalization on sustainable economic development of the selected Euro-dollar countries under review during the period: 1980 to 2018. The study thus established that there is a positive relation between globalisation and sustainable economic growth and development. This made the researcher come to the conclusion that the economies of these three selected Euro-dollar countries (France, Spain and Germany) is gaining from globalisation, mainly due to Foreign Direct investment (FDI) and trade openness. Since these Euro-dollar countries has opened up to international trade and foreign investment, they have achieved a better economic growth.

Key Words: Globalization, Sustainable Economic Development, Economies, Foreign Direct Investment, International Trade and Openness, Gross Domestic Product (GDP), IMF, World Bank

BIBLIOMETRIC ANALYSIS OF LITERATURE ON SUSTAINABILITY REPORTING THROUGH SOCIAL MEDIA

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ABSTRACT

This paper conducts an extensive bibliometric analysis of the scholarly literature on sustainability reporting through social media, with the purpose of mapping out its intellectual, thematic, and methodological development. The analysis aims to answer three fundamental research questions, based on a selected body of 423 peer-reviewed publications indexed in Scopus published between 2006 and 2025: (1) What are the primary publication-related trends, most productive researchers, and institutions in the area? (2) What thematic groupings and conceptual frameworks characterize the discussion on digital sustainability communication? and (3) What theoretical frameworks and methodological orientations prevail in the most influential publications? Based on a combination of bibliometric indicators as well as co-word and co-citation analysis combined with full-text content review, the research finds five key research clusters: corporate legitimacy and greenwashing, stakeholder engagement and dialogic communication, ESG performance transparency, strategic CSR communication, and data-driven sentiment analysis. The most common theoretical lenses identified are legitimacy theory, stakeholder theory, institutional theory, dialogic communication theory, and impression management theory. The analysis also shows that publication has increased since 2014, that there is a shift towards interdisciplinary studies, and that there is an increasing resort to AI-based methods such as sentiment analysis and natural language processing. The present bibliometric analysis enhances the systematic knowledge of the impact of social media on sustainability reporting and the prospects of research through the lens of undiscussed geographies, like the role of governance in platforms, third world economies, and the effects of algorithms on ESG stories.

Keywords: sustainability reporting, social media, bibliometric analysis, ESG disclosure, stakeholder engagement, legitimacy theory, co-citation analysis, Scopus

THE ROLE OF AI IN SHAPING DECENTRALIZED FINANCIAL PRODUCTS: IMPLICATIONS FOR GLOBAL ECONOMIC INEQUALITY

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ABSTRACT

The study will critically engage with the revolutionary potential of Artificial Intelligence and Decentralized Finance to reengineer the borders of global financial spaces and reduce the levels of economic inequality. Conjoining the efficiency, automation, and forecasting analytical powers of AI with blockchain transparency and decentralization in DeFi, these technologies can extend financial services to the excluded mass. The aim is to examine how AI driven DeFi can empower individuals to the level of reducing financial inclusion barriers while fostering secure and transparent environments. It also seeks to overcome challenges brought about by algorithmic bias, technology gaps, and regulatory uncertainty.

Using a qualitative methodology, the study combines existing literature, analyses trends, and investigates high-value applications to explore the convergence of AI and DeFi. The findings indicate that AI enriches DeFi by optimizing transactional costs efficiently, tailoring services, and enhancing fraud detection, thus opening up opportunities for economic empowerment, especially in emerging economies. Concerns of algorithmic bias and poor infrastructure, however, can lead to increased disparities.

The implications point to the need for inclusive policy platforms that provide equitable access and transparency. These include proposals regarding investment in digital literacy, algorithmic bias mitigation, and scaling blockchain infrastructure to low-income communities. Future research implications include empirical testing of AI-DeFi solutions across diverse socioeconomic environments to establish their role in informing inclusive and resilient financial systems.

Keywords: Artificial Intelligence, Decentralized Finance, Financial Inclusion, Algorithmic Bias and Economic Inequality

BALANCING REWARDS FOR SUSTAINABLE PERFORMANCE: A LITERATURE REVIEW ON FINANCIAL AND NON-FINANCIAL COMPENSATION

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ABSTRACT

This study investigates the interplay between financial and non-financial compensation schemes in fostering sustainable employee performance through a comprehensive literature review. Financial rewards—such as salaries, bonuses, and allowances—remain essential in ensuring fairness, retention, and short-term productivity. However, their motivational impact often diminishes over time, raising questions about long-term sustainability. Non-financial rewards, including recognition, career development opportunities, supportive leadership, and positive work culture, emerge as critical drivers of intrinsic motivation, engagement, and resilience, thereby sustaining employee contributions beyond immediate economic incentives. Evidence from the reviewed studies underscores that neither compensation scheme alone guarantees sustainable outcomes. Instead, an integrated total rewards framework—balancing financial competitiveness with meaningful non-financial strategies—offers the most effective pathway toward enduring employee motivation and organizational resilience. The findings hold significant implications for managers and policymakers, emphasizing the need to design compensation systems that are not only competitive but also aligned with cultural contexts, generational preferences, and long-term sustainability goals.

Keywords: Long-Term Sustainability, Financial Rewards, Non-Financial Rewards, Employee Performance.

SUSTAINABLE RESEARCH CULTURE THROUGH DIGITAL LITERACY: EMPOWERING STUDENTS WITH PUBLISH OR PERISH AND VOSVIEWER

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ABSTRACT

The pursuit of sustainable academic development requires not only timely graduation but also the cultivation of a strong research culture among students. This community engagement program addresses the persistent challenges faced by final-year students at the University of Lampung, particularly difficulties in conducting systematic literature reviews and identifying relevant research trends. Through intensive training on *Publish or Perish* (PoP) and *VOSviewer*, participants were introduced to digital tools that enable citation-based reference searches, bibliometric analysis, and visualization of research landscapes. The program was implemented through workshops, case-based practice, and mentoring sessions, ensuring both technical mastery and practical application in thesis writing. Outcomes demonstrated a significant improvement in students' academic literacy, with participants successfully mapping keywords, recognizing research gaps, and integrating bibliometric insights into their proposals. Beyond accelerating graduation, the program contributes to the sustainability of higher education by promoting digital literacy, fostering independent research skills, and strengthening the overall academic ecosystem. This model can be replicated across universities to nurture resilient and sustainable research cultures in the digital era.

Keywords: Sustainable Academic Development, Bibliometric, Publish or Perish, VOSviewer, Digital Literacy, Sustainable Research Cultures.

THE NEXUS BETWEEN RENEWABLE ENERGY, REFORESTATION, AND ECONOMIC GROWTH: PATHWAYS TOWARD SUSTAINABLE DEVELOPMENT

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ABSTRACT

The interrelationship between renewable energy, reforestation, and economic growth has emerged as a critical area of inquiry in the pursuit of sustainable development. Renewable energy deployment reduces dependency on fossil fuels, mitigates greenhouse gas emissions, and stimulates innovation-driven economic growth. Reforestation, in turn, enhances carbon sequestration, restores ecological balance, and supports biodiversity, while also contributing to long-term productivity through ecosystem services. When integrated, the adoption of renewable energy and reforestation not only advances environmental sustainability but also creates synergies that foster inclusive economic growth. Empirical and theoretical evidence suggest that economies that invest simultaneously in clean energy transitions and forest regeneration experience improved energy security, enhanced resilience against climate change, and sustainable job creation. This study examines the dynamic relationship between renewable energy, reforestation, and economic growth, highlighting the pathways through which green transitions can align environmental goals with financial prosperity. The findings underscore the importance of coordinated policy frameworks, international cooperation, and green investment strategies to achieve a balanced trajectory of growth that is both environmentally responsible and economically inclusive.

Keywords: Renewable energy; Reforestation; Economic growth; Sustainability; Climate change; Green investment; Energy transition; Carbon sequestration

SUSTAINABLE MATERIALS FOR THE REMOVAL OF HEAVY METALS AND OTHER CONTAMINANTS FROM WASTEWATER

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ABSTRACT

The world is facing a scarcity of fresh water due to the presence of heavy metals and other contaminants in water. A lot of novel materials have been synthesized for the treatment of wastewater. These novel materials require a lot of chemicals, which increases the cost of the treatment method. Now, research is going in a new direction with low-cost and eco-friendly materials. These materials are freely available in large amounts and are also sustainable. Our current focus is to utilize natural materials for wastewater treatment. In this respect, we have identified new natural materials derived from various fruits, vegetables, and other parts of plants for the removal of heavy metal ions from waste or water systems. This study includes the details of natural adsorbents used for the removal of heavy metal ions or other contaminants from water.

Keywords: Natural adsorbent, Sustainable materials, Heavy metal removal, Toxic contaminants, Wastewater treatment

DRIVERS OF ECOTOURISM DEVELOPMENT IN TAY NINH PROVINCE, VIETNAM

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ABSTRACT

The paper aims to assess the potentials and influencing factors of ecotourism development at Tan Lap Floating Village, Tay Ninh province. This study utilizes a mixed-methods approach, incorporating document analysis, field trips, and questionnaires for data collection. The empirical findings reveal five primary drivers of ecotourism development in the village: ecotourism resources, infrastructure, tourism services, human resources, safe and security, and environmental education and interpretation. Based on these insights, the article presents several recommendations to promote the advancement of ecotourism in the region.

Keywords: Ecotourism, drivers, Tan Lap Floating Village, Tay Ninh.

SUSTAINABLE LIVELIHOOD INDEX AND DETERMINANTS OF LIVELIHOOD STATUS OF MAIZE FARMERS IN KWARA STATE, NIGERIA: AN IN-DEPTH ANALYSIS

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ABSTRACT

Understanding farmers' sustainable livelihood index (SLI) could enhance development intervention in the areas where specific attentions are needed to improve small-holder farmers' livelihood status in Nigeria. As a result, this study investigated the livelihood status of the maize farmers in Kwara State and its determinants. A survey research design was used for the study, and a three-stage sampling procedure was employed for selecting the farmers. 876 maize farmers were identified, of which 350 were randomly selected. Collected data were analyzed using descriptive statistics and multiple regression at a 5 % significance level. The study found that the livelihood status of the farmers was moderate, with an SLI of 0.6099. Furthermore, household size, education, number of contacts with extension agents, and access to markets were significant determinants of the farmers' livelihood status. The livelihood status of the maize farmers was moderate; as such, they can moderately sustain their livelihood in the event of climate shocks and extremes. Education, household labour dynamics, extension engagement, and market access were the identified leverage points for policymakers to unlock substantial gains in smallholder maize farmers' livelihoods. Strengthening the farmers' asset base for better livelihood sustainability, especially against the event of greater shocks and extremes, is recommended.

Key words: Asset, climate change, sustainable livelihood

CLIMATE CHANGE AND THE SUSTAINABILITY OF FRESHWATER ECOSYSTEMS

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ABSTRACT

Climate change (CC) phenomenon affects every aspect of life. It has a pronounced impact on various ecosystems. Freshwater ecosystem consists of many interrelated abiotic and biotic factors; the biotic ones include producers, consumers and decomposers. Generally, the biodiversity of freshwater organisms will continue to be altered due to the rise in water temperature and altered flow regimes. Phytoplanktons for example are affected by climate change through variations in their distribution, and algal blooms will show higher dissemination as a consequence of climate change. Intermediate host snails and fishes as consumers are also threatened where certain snail species can appear in regions where they were not detected previously, and other species can disappear from some countries resulting in a decrease in schistosomiasis incidence in these areas. Fishes, on the other hand, are very sensitive to any change in water temperature, so they show physiological and immunological responses to global warming, and their reproduction rate is decreased. In addition, some fish species lost their suitable habitats in the changing climate and others are facing a high risk of complete extinction. Microorganisms that play a vital role in decomposition of dead plants and animals are also vulnerable. Fungal species which thrive under certain environmental conditions will migrate from water courses which are no longer suitable for their growth, and the studies showed that fungal diversity has changed as a consequence of climate change.

Keywords: Climate Change, Sustainability, Freshwater

A REVIEW OF GLOBAL PERSPECTIVES ON SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE: A BIBLIOMETRIC ANALYSIS

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ABSTRACT

Sustainable development (SD) is one of the most important strategies for addressing the challenges associated with climate change. However, there remains a gap in the world's attention towards SD-related climate change studies. To address this gap and identify the global perspectives, such as research direction, trends and future focus areas, this study undertakes a bibliometric analysis to provide the roadmap for the SD-related climate change research. It will help researchers, policymakers, and stakeholders to address sustainable development under climate change. Utilizing the Web of Science Core Collection, 881 publications from 2000 to 2023 were analyzed to identify research trends, influential authors, sources and institutions, collaboration networks, and thematic evolution. The results indicate a 22.53% annual growth rate, with journal articles (68%) being the dominant publication type. The most influential and locally cited journals include “Sustainability” and “Global Environmental Change”, respectively. The USA and China lead in research output and international collaboration. Keyword analysis emphasizes “climate change”, “sustainability”, and “SDGs” as dominant themes, with an emerging focus on mitigation and adaptation strategies. Thematic mapping reveals a shift from early adaptation and climate change-focused research (2000-2007) to policy and governance studies (2008-2016), and recent sustainability-integrated approaches (2017-2023). Our findings reveal regional disparities, underrepresentation of developing countries, and a disconnected research structure. These challenges can be addressed through improved interdisciplinary collaboration, increased research network, and funding support. We propose future directions emphasizing regional integration, policy relevance, and technology to strengthen the role of SD-climate change research in global sustainability agendas.

Keywords: Sustainable Development, climate change, Systematic review, Bibliometric, Thematic mapping

DO BOARD CHARACTERISTICS EFFECT THE CLIMATE CHANGE REPORTING IN INDONESIA?

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ABSTRACT

This study investigates the effect of board characteristics on the level of climate change disclosure (CCD) based on the Task Force on Climate-related Financial Disclosures (TCFD) among firms listed on the Indonesia Stock Exchange during 2022–2024. Board characteristics examined include education, age, foreign nationality, and tenure, with firm size and firm age as control variables. Descriptive results reveal that most companies remain in the low disclosure category, although improvements were observed in 2023 before slightly declining in 2024. Boards are largely dominated by directors with lower to medium education levels, older age profiles, limited foreign representation, and relatively short tenure. Similarly, most firms are young to medium-aged, with the majority falling into the medium-sized category. Regression analysis reveals that board age, board tenure, firm size, and firm age have a significant positive influence on CCD. In contrast, board education and foreign directors show no significant effect. These findings suggest that experiential and structural factors are more decisive in shaping climate-related transparency than academic background or nationality diversity. The study contributes to corporate governance literature in emerging markets and provides practical insights for regulators and investors to foster more transparent and consistent climate-related reporting practices.

Keywords: Climate Change Disclosure, TCFD, Board Characteristics, Corporate Governance, Indonesia

NANO-VERMICOMPOST FROM AGRICULTURAL WASTE AS A SUSTAINABLE ALTERNATIVE TO SYNTHETIC FERTILIZERS

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ABSTRACT

Excessive use of synthetic chemicals in agricultural sector leads to soil deterioration, environmental contamination, and decreases yield of crops. Continuous use of these fertilizers makes soil infertile and unable to support plant growth leads to the accumulation of toxic chemicals in soil.Utilization of organic manures in soil contributes towards sustainable development by conserving biodiversity, improving soil health and reducing the emission of harmful gases ultimately contributes to achieving the targets of sustainable development goals. Most directly affected goal is SDG 2 (Zero hunger) by increasing quality and yield of crops also contributes to achieving the targets of SDG 3(Good health and well being), SDG 6(Clean water and sanitation), SDG 13(Climate action) and SDG 15 (Life on land) by creating a green environment.The present study explores the role of nano-vermicompost prepared from agricultural waste as a green and sustainable alternative to chemical fertilizers.By utilizing agro waste for manure production using earthworms is a win-win strategy for waste management and efficiently reduces impacts of synthetic fertilizers on soil health and biodiversity. Prepared vermicompost is further processed using mechanical milling strategy to increase its surface area, mobility and interactions with microbial populations in soil. Furthermore obtained nano-vermicompost is characterized for its nutrients profile and physicochemical attributes using advanced instrumentation such as PSA,SEM,XRD and FTIR analysis. Various studies in the past have been reported that application of nano-vermicompost enhances growth, and dry matter in plants, ameliorates the reduction of photosynthesis, increases chlorophyll contents, reduces the accumulation of reactive oxygen species and improves the stability of membrane under drought as well as normal conditions. Macro and micronutrients content were also increased in soil due to the application of nano-vermicompost.

Keywords: nanovermicompost, agricultural waste, synthetic fertilizers

INTEGRATING SUSTAINABILITY INTO ECONOMICS EDUCATION: PREPARING LEARNERS FOR INCLUSIVE GROWTH AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

The pursuit of sustainable development requires a rethinking of educational content and practices, especially in the field of economics education. This paper examines the role of economics education in equipping learners with the knowledge, skills, and values necessary for addressing contemporary socio-economic and environmental challenges. It argues that integrating sustainability principles into economics curricula can promote critical thinking, responsible decision-making, and awareness of global issues such as inequality, poverty reduction, resource management, and climate change. Drawing on recent literature and global frameworks, the paper highlights how economics education can foster inclusive growth, civic responsibility, and long-term development. It also explores innovative pedagogical approaches that encourage students to connect theoretical concepts with real-world applications in order to build a more just and sustainable society. The study concludes by emphasising the need for policymakers, educators, and institutions to reorient economics education as a catalyst for achieving the Sustainable Development Goals (SDGs).

Keywords: Economics Education; Sustainability; Inclusive Growth; Sustainable Development

SUSTAINABILITY EDUCATION

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ABSTRACT

Integrating sustainability into teacher education is essential for preparing educators to instil environmental responsibility in their students. Having a sustainability toolkit is essential for offering specific and actionable practices to seamlessly embed sustainability into the teacher education programs. The goal of the toolkit is to provide useful tools and tactics that can be incorporated sustainability into the classroom. Sustainability can be made interesting and approachable with practical exercises, creative lesson ideas and real-world examples being included in the toolkit.

The toolkit should consist of useful exercises and materials to improve curricular integration. It may include tasks like constructing a recycling system for the classroom or building a sustainable garden, as well as sample lesson plans on topics like energy conservation and climate change. These offer tasks for project-based and inquiry-based learning, where teachers along with their students may investigate local environmental challenges and create action plans, in order to complement pedagogical approaches.

Field visits organisation guides to nearby green enterprises or community gardens shall be included in the toolkit to provide them the real-world exposure and a close look at sustainable techniques. It shall also enlist interesting activities along with multimedia resources including films and interactive materials on environmental issues. With the help of these, thye can create gadgets or carry out a waste audit, etc. Furthermore, the toolkit fosters a positive education climate by providing best practices for executing eco-friendly programs and energy-saving techniques, as well as suggestions for getting teachers and students involved in neighbourhood sustainability projects like clean-up campaigns or tree plantation.

To assist teachers in gauging the success of sustainability education and introspecting on their own teaching methods, assessment devices like evaluation templates shall be provided. Teachers may successfully integrate sustainability into their programs and prepare students in environmental stewardship and sustainable living by employing these particular strategies and tools.

Keywords: sustainability education, sustainability toolkit, sustainable teaching strategies

EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) IN INDIA: THE ROLE OF THE NATIONAL EDUCATION POLICY (NEP) 2020

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ABSTRACT

The National Education Policy (NEP) 2020 plays a crucial role in advancing Education for Sustainable Development in India. NEP 2020 emphasizes the integration of environmental education into the curriculum, aiming to foster environmental stewardship and sustainable practices among students. Education for Sustainable Development (ESD) is a continuous and lifetime learning process, serving as a critical component of quality education. ESD aims to equip learners with the knowledge, skills, and competencies needed to address demanding environmental challenges such as climate change, biodiversity loss, and ozone layer depletion. According to NEP, education systems must be reoriented to support sustainable development and ensure that learners are well-prepared for contributing to a sustainable future**.** Although studies have highlighted the possibility of ESD in creating a sustainable future, there are challenges within India's education system. NEP 2020 aligns well with India's sustainable development goals by promoting an education system that nurtures environmental awareness, social inclusion, and economic growth. The policy serves as a foundation for creating a more sustainable and equitable future by preparing future generations with the knowledge, skills, and values needed to address global environmental challenges.

Keywords: National Education Policy, ESD, Sustainable Education

INCLUSIVE AI WORKFORCE DEVELOPMENT: A MIXED-METHODS ANALYSIS OF DISABILITY-CENTERED TECHNOLOGY EDUCATION IN BANGLADESH

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ABSTRACT

Existing AI workforce development literature predominantly examines Global North accessibility adaptations rather than comprehensive workforce integration models for people with disabilities in developing economies. This mixed-methods study addresses: *How can AI education frameworks ensure equitable labor market participation for people with disabilities in resource-constrained contexts?*

Applying capability approach theory—specifically its emphasis on expanding real freedoms through skill development—this longitudinal case study examines Bangladesh's first disability-focused AI fellowship program. Data from the inaugural cohort (n=100 HSC graduates with disabilities) includes standardized competency assessments, employer satisfaction surveys (n=45), and semi-structured interviews with participants (n=25), mentors (n=12), and hiring managers (n=18), collected January-December 2024 with IRB approval.

Complete pilot cohort results demonstrate 85% job placement rates with salaries averaging 95% of market standards for AI professionals. Thematic analysis of qualitative data reveals participants contribute unique accessibility insights that enhance product development cycles. Three critical implementation factors emerge: accessibility-first pedagogical design, concurrent industry partnership development, and structured peer mentoring systems.

This study extends capability approach applications to technology workforce development while providing the first empirical analysis of inclusive AI education in South Asian contexts. Findings challenge deficit-based disability assumptions and demonstrate how targeted interventions can transform employment trajectories for marginalized populations.

Results offer replicable program design principles for similar contexts, informing inclusive digital economy strategies in developing nations and contributing evidence for UN SDG 1, 4, 8, and 10 implementations.

Keywords: Inclusive AI Education, Disability Employment, Assistive Technology, Workforce Development, Global South, Capability Approach

TRENDS IN SUSTAINABLE DEVELOPMENT EDUCATION IN ASIAN UNIVERSITIES: A COMPARATIVE PERSPECTIVE AND RECOMMENDATIONS FOR VIETNAM

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ABSTRACT

Sustainable Development (SD) has become a central focus in the global educational agenda, with higher education institutions (HEIs) playing a critical role in its promotion. This study provides a comprehensive review of the trends, strategies, and challenges related to Education for Sustainable Development (ESD) in Asian universities, with specific focus on Vietnam. A systematic literature review (SLR) methodology was employed to analyze articles published between 2015 and 2023, identifying key practices in integrating SD into curricula, policies, and student engagement. The findings reveal that while countries like Malaysia, China, and Taiwan have made significant strides in ESD integration, Vietnam lags due to gaps in policy implementation and faculty capacity. Successful models in Asia emphasize the "Whole Institution Approach" (WIA), where sustainability is embedded across university functions. Challenges such as resource limitations and traditional teaching methods remain prevalent, yet opportunities exist through multi-stakeholder collaborations and technological advancements. The study concludes with practical recommendations for Vietnam, including the development of interdisciplinary curricula, faculty training, and active student engagement in sustainability projects. This research highlights the importance of a strategic, institution-wide approach to foster a more sustainable educational ecosystem in Vietnam.

Keywords: Education for sustainable development, curriculum integration, higher education institutions, sustainable development goals, Vietnam education system

EFFECT OF SUSTAINABLE LEADERSHIP PRACTICES ON ORGANIZATIONAL COMMITMENT OF HIGHER EDUCATION FACULTY IN PAKISTAN

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ABSTRACT

Investigating the impact of sustainable leadership practices on faculty organizational commitment in higher education institutions is the aim of this study. Additionally, the study looks for the leadership practices that are most frequently highlighted within the framework of sustainable leadership. The population used for this study include the faculty members of both public and private sector universities in the Lahore. Mainly, two surveys based on Hargreaves & Fink's seven principles of sustainable leadership and Meyer and Allen's OC theory were used to gather data from 281 faculty members. The results showed that faculty commitment is significantly enhanced by sustainable leadership practices. The study further looked at the differences in sustainable leadership practices across different demographic groups, highlighting the vital role of context in implementing sustainable leadership. However, faculty from private colleges reported higher levels of organizational engagement when acquainted with sustainable leadership approaches. The study also identified particular practices that were particularly effective in increasing faculty participation, such as collaborative decision-making and mentorship. The adverse effects highlight the need for particular training initiatives for administrators in higher education who intend to effectively employ these tactics. A hypothetical perspective may also provide more insight into the long-term benefits of sustainable leadership practices for faculty members' job satisfaction. According to the study's findings, organizational commitment and sustainable leadership practices are strongly correlated. Policymakers at universities might benefit from the findings in order to comprehend how to support sustainable leadership practices over the long term to improve faculty performance and preserve organizational stability.

Key Words: Sustainable Leadership, Sustainable Leadership Practices, Organizational Commitment

SUSTAINABLE EDUCATION AS A TRANSFORMATIVE PLATFORM: BUILDING AWARENESS AND CAPABILITIES FOR A SUSTAINABLE WORLD

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ABSTRACT

Sustainability education serves as a crucial transformational vehicle for building individual awareness and capabilities to address increasingly complex global challenges. This article examines the role of sustainability education through a literature review approach that examines theory, practice, and innovation in this field. The theoretical foundation of sustainability education is based on environmental, social, and economic pillars inherent in sustainability values. Education serves as a primary medium for raising critical awareness of climate change, social inequality, and responsible resource use. The literature review found that developing capabilities such as critical thinking, creativity, collaboration, environmental literacy, and technological adaptation are key to the success of sustainability education. Effective implementation includes the integration of sustainability concepts into the curriculum, participatory learning methods, and the role of teachers as agents of change. Various examples of green school programs and community-based learning demonstrate positive impacts, including increased environmental awareness and the development of socio-economic competencies. However, challenges such as limited resources and systemic barriers require collaborative solutions from the government, community, and educational institutions. In conclusion, sustainability education as a transformational platform has strategic potential to shape a generation capable of contributing to the sustainable development goals (SDGs) and creating a more sustainable world.

Keywords: Sustainable Education, Transformative Platform, Building Awareness, Capabilities, Sustainable World

SPATIAL DISTRIBUTION OF TÜRKIYE'S LIVESTOCK PRODUCTS ECONOMY (1995–2020): SUSTAINABILITY-ORIENTED VISUALIZATION ANALYSIS

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ABSTRACT

Introduction and Purpose: Livestock production plays a strategic role in Türkiye's agricultural economy and is directly linked to food security and sustainable development goals. The aim of this study is to examine the spatial distribution of the livestock products economy in Türkiye between 1995 and 2020, visualize regional differences, and reveal long-term trends.

Materials and Methods: The study utilizes province-level annual livestock product values (in thousand TL) obtained from official statistical sources. The data were analyzed through spatial methods, including choropleth maps, trend analysis, and growth rate evaluations for selected crisis years (2001, 2008, 2018, 2020). The analyses were conducted from a sustainability perspective, and regional production centers were identified.

Findings: The results show that the Marmara, Aegean, and Central Anatolia regions lead in livestock product values, while the Eastern and Southeastern Anatolia regions have recorded significant increases in recent years. Trend analysis indicates that Konya, İzmir, Erzurum, and Diyarbakır achieved the largest growth, whereas smaller provinces exhibited relatively limited increases. In terms of crisis years, the sector continued to grow except during the 2008 global financial crisis, with a notable increase observed during the 2020 pandemic.

Discussion and Conclusion: Overall, Türkiye's livestock products economy demonstrated a steady increase between 1995 and 2020. The findings suggest that while the sector is sensitive to global shocks, it remains relatively resilient to domestic crises and pandemic conditions. Spatial analyses highlight the necessity of considering regional disparities in the development of sustainable policies.

Keywords: Livestock production, spatial analysis, visualization, sustainability, crisis years

ENVIRONMENTAL IMPACTS OF SEASONAL POPULATION GROWTH AND TOURISM INVESTMENTS ON THE COASTS OF THE SEA OF MARMARA: AN ASSESSMENT OF WASTEWATER MANAGEMENT AND WATER QUALITY

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ABSTRACT

The Sea of Marmara, in addition to being Türkiye's inland sea, occupies a strategic position as a transitional zone between the Black Sea and the Aegean Sea. Alongside major metropolitan areas such as Istanbul, Bursa, Kocaeli, and Tekirdağ, the concentration of tourism activities and seasonal housing settlements along the coastline significantly alters the region's demographic dynamics on a seasonal basis. In particular, the several-fold increase in population during the summer months places considerable pressure on existing infrastructure capacity and creates serious challenges for wastewater management. Seasonal population surges, coupled with tourism investments and related consumption patterns, increase the pollution load on the ecosystem of the Sea of Marmara; in particular, elevated inputs of organic matter, nitrogen, and phosphorus contribute to water quality degradation and heighten the risk of eutrophication. The mucilage crisis of 2021 demonstrated the extent to which such pollution loads can have devastating ecological consequences. In this context, understanding the environmental impacts of seasonal population concentration and tourism activities along the coasts of the Sea of Marmara, developing sustainable wastewater management policies, and discussing measures for the protection of the marine ecosystem have become critical imperatives. The aim of this study is to examine the effects of seasonal population growth and tourism activities on wastewater management and water quality along the coasts of the Sea of Marmara, to evaluate the existing problems from a scientific perspective, and to propose sustainable solutions.

Keywords: Seasonal Population Growth, Tourism Development, Wastewater Management, Water Quality Degradation, Marine Ecosystem Sustainability.

THE ROLE OF AGGLOMERATION PARTNERSHIPS IN PROMOTING SUSTAINABLE LOCAL ECONOMIES: THE CASE OF ARDAHAN

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ABSTRACT

Agglomeration partnerships emerge as a critical dynamic that not only fosters economic growth but also enhances regional resilience and sustainable development through processes of collaboration and clustering among local actors. Such partnerships, formed by businesses, public institutions, universities, and civil society organizations, facilitate knowledge sharing, reduce production costs, and support innovative activities. In this context, the aim of this study is to examine the impacts of agglomeration partnerships on strengthening the local economy and promoting sustainable development, with a specific focus on Ardahan Province. Owing to its border city identity, agricultural and livestock activities, natural tourism resources, and logistical advantages, Ardahan presents a noteworthy case for regions seeking to pursue sustainable development. Drawing on literature review, official data, and local observations, this research discusses how existing economic activities in Ardahan can be transformed into synergies through partnerships. The findings indicate that clustering in the livestock and dairy sectors holds significant potential for enhancing competitiveness, while regional collaborations in tourism can create new employment opportunities. Moreover, strengthening cross-border trade and supporting logistics investments are projected to increase Ardahan's visibility not only at the local level but also in international markets. In conclusion, the development of agglomeration partnerships are expected to play a central role in Ardahan's sustainable development strategies, contributing directly to both the well-being of local communities and the diversification of the regional economy.

Keywords: Agglomeration Partnerships, Sustainable Local Development, Regional Resilience, Cluster Dynamics, Ardahan Province.

GLOBAL COMPETITION IN THE TROPICAL FRUIT SECTOR AND STRATEGIC OPPORTUNITIES FOR TÜRKİYE

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ABSTRACT

The change in food consumption and the need for product diversity in agriculture due to changing global climate conditions have made tropical fruit production as a strategic agricultural activity in countries like Türkiye. The impact of global warming causes the expanding the cultivation areas of tropical fruit species in the southern and southeastern regions of Türkiye and to bring forward the integration of new product patterns into agricultural production. The sustainability of this new production trend and its competitiveness in international markets are shaped not only by climatic advantages but also by the guiding role of production infrastructure, export capacity, and agricultural policies. On the other side, digital agricultural applications such as sensor-based monitoring systems, artificial intelligence-based decision support mechanisms, and precision irrigation technologies are significantly improving productivity and sustainability by optimizing tropical fruit production processes. Therefore, this study aims to analyze the current status of tropical fruit farming in Turkey and offer a strategic perspective on the country's agricultural transformation through tropical fruits. In the study, Türkiye and 17 countries (such as Spain, Brazil, India) that are prominent in tropical fruit production and export on a global scale were compared in terms of competitive advantage using FAO and WITS statistics. The analyses assessed Türkiye's export potential and structural strength in the tropical fruit sector using the Revealed Comparative Advantage and Trade Specialization Index. The analyses provide evidence that Türkiye has a growing potential for non-traditional agri-food exports, particularly tropical fruits. The study contributes to the literature by providing empirical evidence on emerging country opportunities in non-traditional agri-food exports and offers practical recommendations for agricultural trade policy design.

Keywords: Tropic fruits, Global climate change, RCA, TSI, Türkiye

SUSTAINABLE AGRICULTURAL POLICIES AND FOOD SECURITY: TÜRKİYE'S HARMONIZATION PROCESS WITH THE EU GREEN DEAL

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ABSTRACT

The European Union's Green Deal offers a transformative framework that redefines agricultural production, trade, and sustainability standards. As a major trading partner of the EU, Türkiye faces both opportunities and challenges in aligning its agricultural sector with these new sustainability requirements. This study examines the intersection between sustainable agricultural policies and food security and examines Türkiye's alignment with the EU Green Deal. The analysis focuses on the structural transformations needed in Turkish agriculture. These include reducing greenhouse gas emissions, adopting climate-smart agricultural practices, and transitioning to resource-efficient production systems. The study specifically highlights the impact of this transformation on food security. Compliance with stricter environmental and trade regulations could reshape Türkiye's export competitiveness, production costs, and market access. Using a combination of FAO and WITS data and policy analyses, the study assesses Türkiye's agricultural trade structure and identifies areas of comparative advantage that could be strengthened through sustainability-focused reforms. The findings demonstrate that Türkiye has the potential to strengthen food security at both national and regional levels through digital agriculture practices, renewable energy integration, and sustainable resource management. The study provides empirical evidence on the role of sustainability in agricultural policy design and develops actionable policy recommendations for aligning Türkiye's food security strategies with the EU Green Deal. This approach not only ensures compliance with international standards but also strengthens Türkiye's long-term agricultural resilience and commercial competitiveness.

Keywords: Sustainable agriculture, Food security, Green Deal, Türkiye-EU relations, Agricultural trade

FROM DISCLOSURE TO DECEPTION: THE ROLE OF GREENWASHING IN UNDERMINING SUSTAINABLE DEVELOPMENT

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ABSTRACT

In Sustainable development requires profound systemic transformations, yet the trajectory of sustainability transitions is increasingly compromised by the prevalence of greenwashing. Conceptually, greenwashing refers to the strategic concealment or exaggeration of firms, institutions, or states' environmental credentials to gain reputational legitimacy or economic rents without significant environmental improvements. Synonymously the concept of bluewashing is emphasizing social inconsistencies is also included in greenwashing. Its significance as a systemic impediment stems from its corrosive effects on institutional trust, distorted capital allocation, and the perpetuation of path-dependent, unsustainable practices that delay the realization of sustainability transitions. The roots of greenwashing can be found in both market and state failures: information asymmetries, non-standardized reporting criteria, weak enforcement regimes, and regulatory capture allow reputational gains to be externalized while environmental and social costs remain unaddressed.

In response, states and supranational organizations have begun to employ corrective tools, ranging from the European Union's Corporate Sustainability Reporting Directive to mandatory climate-related disclosures in developed economies and the institutionalization of third-party oversight mechanisms in emerging markets. Transnational advocacy networks and civil society organizations stand to strengthen these state-led efforts by mobilizing normative pressure to challenge misleading claims.

From this perspective, this study employs a qualitative and comparative research design that synthesizes documentary analysis of regulatory frameworks, institutional disclosures, and international governance initiatives from the perspectives of stakeholder theory and institutional theory. The causes and types of greenwashing, as well as the policy tools developed to combat it, are explored. The study's findings suggest a paradigmatic reorientation around the principles of transparency and accountability, along with more robust regulatory architectures and independent verification mechanisms, as the most important tools to combat greenwashing. Democratic governance mechanisms and effective transition policies must ensure that the sustainability transition is fair and inclusive. Otherwise, practices like greenwashing will continue to distort sustainability transition behavior and natural resource allocation.

Keywords: sustainable development, sustainability transition, greenwashing, bluewashing

INNOVATIVE MOLD DESIGN AND PROCESS STRATEGIES FOR SUSTAINABLE LABORATORY-SCALE STEEL CASTING

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ABSTRACT

Steel materials are widely used across various industries due to their high strength, formability and manufacturing flexibility. Increasing technological demands and environmental regulations are driving the development of new steel grades and production routes while balancing performance, energy efficiency and resource conservation. Consequently, steel manufacturers are actively developing innovative materials and production routes to meet those demands. However, experimental or development processes cannot always be implemented directly at industrial scale. In such cases, laboratory-scale production offers significant advantages, not only economically but also in terms of energy efficiency.

This study investigates design and process optimizations in laboratory-scale steel casting operations using permanent molds via “the gravity casting” method. It was observed that inclined mold designs reduced turbulence during filling, thereby minimizing casting defects. As an innovative approach, a suitably designed exothermic feeder was applied at the top of the mold, serving both as a feeder and as a pouring basin. This solution required no additional space within the mold design and effectively reduced shrinkage-related scrap and material losses. Mold wear in areas exposed to molten steel flow was mitigated using high-wear resistant materials developed via alternative surface hardening treatments, which absorb the impact of molten metal during pouring.

Overall, the applied design and process optimizations effectively decreased casting defects, scrap rates and the need for reproduction. Additionally, existing equipment and materials were utilized to manage mold wear, thereby prolonging mold life and minimizing additional resource consumption. These improvements demonstrate that thoughtful optimization of mold design and casting processes in laboratory-scale steel production can lead to more sustainable, energy-efficient operations while enhancing process reliability and resource efficiency.

Keywords: Process optimization, energy efficiency, sustainable production, resource efficieny.

ASSESSMENT OF ALTERNATIVE WATER RESOURCES IN MALATYA PROVİNCE USING THE ENTROPY-BASED VIKOR APPROACH

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ABSTRACT

Sustainable management of water resources hold strategic importance in terms of water accessibility. With the effects of population growth, climate change and environmental pressures, water demand is rapidly increasing, while overexploitation and pollution threaten the continuity of water availability. In this context, sustainable water management must be planned not only in terms of water quantity but also by considering quality and ecosystem balance. The identification and prioritization of alternative water resources are critically important for resilience against disasters and strategic security. Therfore planning and managing reliable water resources contributes to the uninterrupted supply of drinking and utiliy water. In this study, multi creteria decision-making (MCDM) approaches were applied to suuport the planning, management and decision-making processes. For the priotization of alternative water resources, multidimensional criteria such as source flow rate, the ratio of meeting current and future demand, distance to the center, treatment requirement status, resource type, transsmission line type, resource continuity, initial invesment cost, the need for storage structures, disaster risk (earthquake), enviromental-ecological impact, project feasibility, and system operating conditions were used. The impact of these criteria on the alternatives was analyzed using the Entropy method, and 23 water resource alternatives identified for Malatya province were prioritized with the VIKOR method. The results showed that source flow rate, the need for storage structures, and treatment requirement status were the most influential criteria, while A2, A3 and A4 were identified as the most suitable alternatives. This research supports strategic decision-making processes in urban water management based on comprehensive evaluation of alternative water resources, while also laying the groundwork for future studies focused on sustainability-oriented analyses and climate-compatible planning.

Keywords: Sustainability, Water resources management, Multi-criteria decision making, Entropy, VIKOR

EVALUATION OF WATER CONSUMPTION ANALYSIS AND MONITORING INDEX FOR SUSTAINABLE WATER MANAGEMENT IN SCHOOLS WITH FUCOM WEIGHTING METHOD

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ABSTRACT

Urban water conservation programs and research generally focus on residential and commercial use, while less attention has been paid to institutional structures. Sustainable water consumption practices in schools have gained importance due to factors such as increasing populations and the resulting need for new schools, inadequate maintenance and repair in existing schools, the obsolescence of infrastructure components, and the deterioration of infrastructure to the point where it endangers the health and safety of users. In this study, consumption data from thirty-five primary, secondary, and high schools were examined, and forty-eight components affecting water consumption and analysis were classified into the categories of Water Use Control and Monitoring (SKI), Open Area Water Use Control and Audit (AKD), Efficiency Improvement (VIY), Bill Monitoring (FI), and Efficiency Monitoring (VIZ). The FUCOM technique was applied to determine the impact of categories and sub-components on sustainable water management, utilizing expert opinions. The results show that the SKI component is the most effective in the main categories with a weighting coefficient of 0.513, while VIY received weighting coefficients of 0.171, AKD 0.128, VIZ 0.103, and FI 0.085. Among the sub-components, the most effective components were the building water usage control frequency (SKI2), average consumption per capita (SKI1), water usage volume monitoring frequency (SKI4), and the institution efficiency analysis and monitoring frequency (VIY1). It is believed that this study will contribute to environmental protection and improvement, as well as supporting economic, social, and educational development by prioritizing water consumption and analysis components in ensuring sustainable water management in schools.

Keywords: Water saving, Water Efficiency, FUCOM, Public schools, Sustainability Index

OPTIMIZING ACTIVATOR RATIO THROUGH FRESH STATE, BUILDABILITY AND STRENGTH TESTS IN GEOPOLYMER MIXTURES FOR 3D PRINTING

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ABSTRACT

This study investigates the printability of 3D-printed geopolymer composites through preliminary trial tests, benchmarked against ranges recommended in the literature. Fresh-state properties were assessed by mini-slump cone and flow table spread diameter tests to evaluate flowability, while buildability was measured by applying a 600 g static load for one minute and recording the retained height to establish a buildability index. To gain insights into early and long-term mechanical performance, compressive strength tests were conducted at 7 and 28 days. All mixtures were designed with a focus on waste valorization, employing recycled concrete aggregates (RCAA) from waste concrete. The initial series with 100% slag binder (S-0.79) was tested at an activator-to-binder ratio of 0.79, which was subsequently reduced to 0.75 based on flow and buildability performance. Results indicated that an optimum activator ratio of 0.76 achieved flow and stability values within ranges reported for printable mixes in the literature. Using this optimized ratio, slag and fly ash binders were partially replaced with waste glass powder and ceramic powder. These modified mixtures were subjected to the same rheological and mechanical tests. The findings demonstrate that for slag-based series, decreasing the activator ratio reduced spread diameters, producing results more consistent with printability requirements in prior studies. Moreover, the incorporation of secondary waste materials at the optimized activator ratio yielded fresh and hardened properties aligned with target ranges for extrusion-based 3D printing. These results confirm that geopolymer composites incorporating multiple waste streams can achieve both printability and adequate strength performance, underscoring their potential for sustainable additive manufacturing in construction.

Keywords: 3D printing; properties in fresh state; recycled concrete aggregate (RCA); sustainable construction; waste valorization; geopolymer composites; additive manufacturing

SUBSTANTIATION OF THE PRINCIPLE OF ENSURING THE UNIVERSALITY OF THE OVERALL DIMENSIONS OF AIRMOBILE ROPE UNITS

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ABSTRACT

The use of airmobile rope units for deployment or relocation to a new place of operation of mobile ropeways allows you to flexibly use the capabilities of modern types of cargo transport – air, road, rail and water. The author has proposed and analyzed fourteen possible alternative options for the technology of relocation of airmobile rope units, characterized by a different combination and alternation of the use of possible types of vehicles, taking into account the geographical and relief features of the region, technical, organizational and economic opportunities, as well as the territorial location of transport infrastructure (networks of roads or railways, waterways, the presence of airports or helicopter sites, etc.). The principle of ensuring the universality of the overall dimensions of airmobile rope units in transport condition was also formulated and justified. Its observance in the design of airmobile rope units provides both flexibility in the development of technology for the delivery of mobile ropeway equipment to the place of their operation, and flexibility in the mantling or dismantling of the specified equipment at the operation place. Based on the analysis of the technical characteristics of universal transport containers ISO series 1 and universal aviation containers used in aircraft of domestic and foreign manufacturers, recommendations are formulated on the choice of overall dimensions of airmobile rope units in transport condition, which it is advisable to focus on when designing and assembling the main and related technological equipment of mobile ropeways.

Keywords: airmobile rope unit, universal transport container, delivery vehicle, relocation variant.

ROBOTICS AND EMERGING INNOVATIONS FOR SUSTAINABILITY

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ABSTRACT

The accelerating climate crisis and global resource constraints demand innovative ideas and, technology driven solutions. This paper explores the role of robotics and emerging technologies such as AI, advanced sensing, and smart materials in addressing key sustainability challenges across sectors like agriculture, energy, and manufacturing. Through this paper, we present advancements in agricultural robotics that promote sustainability by reducing chemical use, optimizing water and resource management, and minimizing soil degradation. AI driven systems enable precise monitoring and decision-making, while innovations like soft and biodegradable robotics support low impact, ecofriendly farming. In the agricultural context, the paper emphasizes sustainable robotic design strategies such as energy efficient actuation, modular systems, and predictive maintenance using machine learning and sensor fusion. These innovations improve field efficiency, extend equipment lifespan, and reduce resource waste. By aligning technological performance with environmental responsibility in agriculture, we show how robotics and emerging innovations can deliver scalable, low-impact, and resilient farming solutions. The paper concludes with design and policy recommendations to support sustainable agricultural development aligned with global Sustainable Development Goals (SDGs).

Keywords: Sustainable Robotics, Emerging Technologies, Artificial Intelligence (AI), Energy-Efficient Systems, Circular Economy.

REDESIGNING ECONOMIC GROWTH MODEL: THE CIRCULAR ECONOMY GROWTH MODEL – A FRAMEWORK TO COPE WITH CHALLENGES IN MEETING SUSTAINABLE DEVELOPMENT GOALS (SDGs)

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ABSTRACT

Unlike the traditional linear models of economic growth, which are based on a *'take-make-consume-throw away'* pattern, a Circular Economy (CE) is based on sharing, leasing, reuse, repair, refurbishment and recycling, in an (almost) closed loop, where products and the materials they contain are highly valued. In true sense practice, it implies reducing waste to a minimum. Not like the traditional linear models of economic growth, which are resulting in escalating environmental degradation, resource depletion, and social inequality. As the global community grapples with the urgent need to decouple economic development from environmental harm, the CE has emerged as a transformative framework capable of driving sustainable growth. This paper explores the CE not merely as a waste management strategy, but as a holistic economic model that integrates regenerative design, resource efficiency, and systems thinking into the core of value creation. Moving towards a more CE could deliver opportunities including reduced pressures on the environment, enhanced security of supply of raw materials, increased competitiveness, innovation, growth and jobs. However, the shift also poses challenges such as financing, key economic enablers, skills, consumer behavior and business models and multi-layered governance.

We examine the theoretical foundations of circularity and its alignment with the United Nations Sustainable Development Goals (SDGs), highlighting how CE principles can directly contribute to goals such as responsible consumption and production (SDG 12), climate action (SDG 13), and sustainable industry and innovation (SDG 9). Through a comparative analysis of global CE implementation strategies ranging from policy directives to grassroots innovations, identifications of key enablers, barriers, and policy levers for successful transitions. This paper presents a framework for evaluating CE growth that balances environmental impact, economic resilience, and social inclusion. It advocates a shift from traditional resource intensive

expansion toward regenerative, qualitative development. By redefining prosperity through the lens of CE, the study positions the CE as a scalable and essential pathway for sustainable global growth.

Keywords: Circular Economy, Sustainable Development, Regenerative Growth, Resource Efficiency, Systems Thinking

DEVELOPMENT OF THE TECHNOLOGIES FOR THE MONITORING OF THE MARINE UNDERWATER ACOUSTIC POLLUTION

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ABSTRACT

In 2024, the International Maritime Organization (IMO) adopted the Revised Guidelines for the Reduction of Underwater Radiated Noise from Shipping to Address Adverse Impacts on Marine Life (MEPC.1/Circ.906/Rev.1). In these guidelines, underwater noise generated by ships is identified as a significant form of physical marine pollution, having a detrimental impact on marine ecosystems and biodiversity. This noise disrupts the communication and feeding behavior of marine animals and, in the long term, may affect the abundance and survival of populations. The IMO's call for member states to take active measures indicates that underwater noise is recognized as a global environmental issue requiring coordinated international solutions. The European Union has also established legal obligations in this regard. Decisions (EU) 2017/848 and C/2024/1268 specify the requirements for monitoring and assessing underwater noise, with particular attention given to spatial data analysis. This creates the conditions for systematically collecting information on underwater acoustic pollution, thereby enabling more accurate assessment of its environmental impact and the planning of management measures. In Lithuania, only short-term underwater noise measurements and limited spatial modeling studies have been carried out to date. At Klaipeda Higher Education Institution, the new technologies dedicated to spatial background underwater noise modeling and noise measurements were introduced in 2024. In 2025, specialized software was developed using the MATLAB programming language, enabling the modeling of background underwater noise and providing three-dimensional data on its spatial distribution. This tool makes it possible to evaluate spatial noise levels depending on shipping intensity and other environmental factors. In addition, an underwater noise recording device was constructed for the monitoring of background noise as well as for capturing other acoustic signals in the marine environment. Its technical characteristics allow for the recording of underwater sounds over both short- and medium-term intervals, ensuring the possibility of noise monitoring and the accumulation of scientific data. Considering international trends and EU requirements, these developments in Lithuania are of particular importance, as they provide the foundation for a national underwater noise monitoring system and for future scientific research aimed at comprehensively assessing the impact of acoustic pollution on the Baltic Sea ecosystem.

Keywords: Baltic Sea; underwater noise; modelling; measurements

GAS UNDER THE BLACK SEA IN UKRAINIAN MARITIME TERRITORIES AND ITS SIGNIFICANCE IN THE ASPECT OF TÜRKIYE'S ROLE IN PEACEBUILDING

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ABSTRACT

Ukraine possesses three significant oil and gas reserves in Donbas, Crimea, and near the Polish border. Shell began developing these resources in 2013 but withdrew a year later following Russia's intervention. The Skifska Block in the Black Sea is estimated to contain 8.8 trillion cubic feet of gas; Shell and ExxonMobil were initially selected to develop it, but operations ceased after Crimea's annexation by Russia. Odessa's proximity to these assets may influence Russian military actions. Offshore, the Subbotin Oil Field and other sites like Subbotina and Pry Kerch also attracted investment from Eni and EDF, with a planned $4 billion offshore agreement in 2013. However, Eni halted activities due to the Russian occupation.

The third oil and gas field, known as the Chevron Shale Gas Block, lies beneath Transcarpathia, extends into Romania, and approaches Lviv and Ternopil. Resource extraction is expected to be handled mainly by Polish and American companies, though Türkiye may also invest. After the conflict ends, major financial investments are anticipated. Recent studies show this shale gas field contains more resources than previously thought.

In 2020, following the discovery of the substantial Sakarya gas field in the southern Black Sea by the special boat Oruç Reis, Turkey was able to satisfy approximately two-thirds of its natural gas requirements. Turkey has a significant interest in the extraction of Ukrainian oil and gas; however, no concrete actions have been taken in this direction to date. Notably, considerable oil and gas reserves remain around the Crimean Peninsula. While Turkey has access to advanced technologies and expertise necessary for the extraction of oil and shale gas resources, other countries, such as Azerbaijan, are also capable of undertaking these activities. Lately, meetings have been held between President Erdoğan and President Alijev, giving a new prospect in the economic and political, as well as financial cooperation for those brother nations, which have experience in the gas and oil industry, in the Black Sea region.

Türkiye has modern technologies and the capability to exploit the oil and shale gas fields, which are located under Crimea, but Russia does not. Moreover, Crimean Tatars can be good manpower for Turkish enterprises in Ukraine. Noteworthy, Türkiye's international reputation has increased lately. Turkish President Erdoğan speaks to Putin decisively, as a courageous, brave, strong leader of a powerful country with the strongest army in NATO (after the US Army). Significantly, President Erdoğan met with Ukrainian President Zelensky multiple times with diplomatic courtesy, and also negotiated with Russian leader Putin to mediate between the warring parties during the last three years. The lately happened diplomatic events in Ankara and Western Europe demonstrated that Turkish diplomacy is wise and rooted in a tradition spanning several centuries (will be analysed in the full-paper).

Conclusion. We build upon our previous papers and, in light of the recent political events in 2025, we conclude that Türkiye has promising prospects for rebuilding Ukraine.

Keywords: Gas, Ukraine, investment, Crimea, Tatars, Türkiye, Azerbaijan.

THE ROLE OF THE EUROPEAN UNION IN THE DEVELOPMENT OF NATION STATES

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ABSTRACT

The European Union represents a highly developed organization at the international level. It has been built upon values such as justice, fairness, and respect for the citizens of its member states. The Union's development programs have targeted various sectors, ranging from education and healthcare to infrastructure and beyond.

Within individual states, national authorities establish priority directions for development, taking into account both the standard of living and the financial resources at their disposal. However, the European Union also plays a supportive role, acting as a direct and interested partner in ensuring that member countries develop and strengthen their financial capacity.

The purpose of this study is to analyze the extent to which the European Union has contributed to the development of its member states.

Keywords: sustainability, development, European Union

SUSTAINABILITY AND GLOBAL DEVELOPMENT: INTEGRATING SOCIAL, ECONOMIC, AND ENVIRONMENTAL DIMENSIONS THROUGH PUBLIC POLICIES. PERSPECTIVES FROM ROMANIA

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ABSTRACT

Sustainability has emerged as one of the most pressing challenges of the twenty-first century, positioned at the intersection of climate change, globalization, and rising social inequalities. While scholarly debates often emphasize the ecological dimension, it has become increasingly evident that sustainable development cannot be achieved without a balanced integration of social, economic, and environmental pillars. This paper aims to investigate how the integration of these dimensions can contribute to the formulation of adaptive and inclusive public policies, capable of addressing both current needs and the demands of future generations.

Methodologically, the analysis is grounded in an interdisciplinary approach, combining a critical review of the recent international literature, a comparative study of policy frameworks implemented at European and global levels, and an examination of strategic documents related to the 2030 Agenda and the Sustainable Development Goals (SDGs). In addition, selected case studies are presented to illustrate best practices in green transition, social cohesion, and technological innovation applied in sustainable contexts.

The findings indicate that sustainability cannot be reduced to a purely technical or ecological issue but should be understood as a dynamic process that requires ongoing negotiation between economic interests, environmental imperatives, and social justice. In particular, the analysis demonstrates that effective public policies are those that create synergies across sectors, engage both local and international stakeholders, and integrate the cultural dimension of the communities involved. Without such a holistic approach, there is a significant risk of perpetuating fragmented models with limited impact on reducing global vulnerabilities.

The conclusions highlight the necessity of a transdisciplinary perspective and multi-level governance that fosters collaboration among states, international organizations, academia, the private sector, and civil society. Only through such an integrated vision can sustainability evolve from a normative concept into an effective social and political practice, oriented toward equitable, resilient, and adaptive global development.

Keywords: global sustainability, sustainable development, social equity, public policies, 2030 Agenda, interdisciplinarity

BAYESIAN NEURAL NETWORKS IN SUSTAINABLE INFRASTRUCTURE: AN INTEGRATED FRAMEWORK FOR CORROSION ASSESSMENT AND CLIMATE RESILIENCE

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ABSTRACT

The accelerating deterioration of global concrete infrastructure due to climate change, combined with the sustainability goals outlined in the UN Sustainable Development Goals, necessitates transformative approaches to corrosion assessment and infrastructure management. This comprehensive review examines the integration of Bayesian Neural Networks (BNNs) within sustainable infrastructure frameworks, highlighting their potential to revolutionize corrosion prediction while simultaneously advancing multiple development objectives.

Through a systematic analysis of recent literature, policy frameworks, and implementation case studies, this review demonstrates that BNNs provide unprecedented capabilities for quantifying uncertainty in infrastructure assessments. Physics-informed Bayesian architectures achieve improvements in prediction accuracy of 15-40% over traditional methods, with R^2 values reaching 0.998 in corrosion prediction applications. Advanced uncertainty quantification techniques, such as Monte Carlo dropout and variational inference, enable 95% coverage intervals with well-calibrated uncertainty estimates. This addresses the critical need for confidence-aware predictions in safety-critical infrastructure applications.

Economic analyses reveal substantial benefits, showing that BNN-based predictive maintenance delivers cost reductions of 18-25% compared to preventive strategies and up to 40% savings over reactive maintenance approaches. The integration of BNNs with Internet of Things (IoT) sensors and edge computing allows for real-time monitoring with sub-5ms latency and 32 times greater power efficiency, supporting scalable deployment across diverse infrastructure environments.

The alignment of BNNs with circular economy principles and climate adaptation strategies positions this technology as a crucial enabler for sustainable development. A McKinsey analysis indicates a potential recovery of $600 billion in material value by 2050, while climate adaptation applications address the 16% increase in risks of carbonation-induced damage projected under climate change scenarios. This approach directly supports several UN SDG targets, including 9.1 (resilient infrastructure), 11.5 (disaster risk reduction), and 13.1 (climate resilience), with documented impacts across 50.3% of SDG 9 applications.

Policy framework analysis reveals significant funding commitments, such as €4 billion through the EU AI Innovation Package and over $700 million in annual investment from the US National Science Foundation (NSF), supported by evolving regulatory standards (ISO/IEC 42001:2023, IEEE 2857-2024) that foster trustworthy deployment. However, implementation gaps persist, particularly in developing countries where infrastructure limitations hinder deployment, despite the potential for significant benefits.

Strategic recommendations include establishing coordinated technology transfer mechanisms, creating adaptive policy frameworks that accommodate rapid technological advancements, and implementing targeted capacity-building programs to ensure equitable global deployment. The convergence of superior technical performance, substantial economic advantages, strong policy support, and clear sustainability alignment presents unprecedented opportunities to transform global infrastructure management into intelligent, climate-resilient systems that fulfil both technical excellence and broader societal goals.

Keywords: Bayesian Neural Networks, Sustainable Infrastructure, Corrosion Assessment, Uncertainty Quantification, Climate Resilience, Predictive Maintenance, UN Sustainable Development Goals, Circular Economy

FROM CHALLENGES TO OPPORTUNITIES: THE RISE OF WOMEN ENTREPRENEURS IN KOSOVO

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ABSTRACT

The advancement of women entrepreneurs has become a crucial factor in promoting inclusive growth and sustainable development, particularly in transition economies like Kosovo. Over the years, women's entrepreneurial activity in Kosovo has undergone gradual but significant change, influenced by reforms in education and training, increasing exposure to international markets, and the adoption of new technologies. Nevertheless, women-led businesses still face persistent obstacles, ranging from limited access to financial resources and networks to cultural barriers and insufficient institutional support.

This research explores the evolution of women's entrepreneurship in Kosovo, tracing key phases of development, identifying structural barriers, and examining opportunities for long-term sustainability. By drawing on empirical evidence, institutional frameworks, and case examples, the research outlines how policy initiatives, capacity-building efforts, and regional cooperation have contributed to strengthening women's entrepreneurial position. Moreover, it underscores the relevance of women's economic empowerment in achieving the United Nations Sustainable Development Goals, particularly those related to gender equality, economic inclusion, and decent work.

This research argues that supporting women entrepreneurs in Kosovo not only contributes to innovation and competitiveness but also enhances social cohesion and resilience. The research concludes with recommendations for advancing gender-sensitive policies, improving access to finance, and embracing digitalization as a driver of women's entrepreneurial growth.

Keywords: Women entrepreneurship, Kosovo, gender equality, sustainable development, inclusive economy, digitalization

EMPOWERING RURAL WOMEN THROUGH SKILL DEVELOPMENT PROGRAMS: PATHWAYS TO INCLUSIVE SUSTAINABLE DEVELOPMENT IN HIMALAYAN REGIONS

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ABSTRACT

Background: In the context of rural development in mountainous regions like the Indian Himalayas, empowering rural women is critical for sustainable progress. These women face challenges such as limited access to education, economic opportunities and decision-making roles, exacerbated by environmental stressors like climate variability. Skill development programs offer a transformative approach to enhance livelihoods and promote gender equity.

Purpose: This study will explore how skill development programs can empower rural women in Himachal Pradesh, fostering inclusive sustainable development. It aims to identify key skills such as organic farming, handicrafts and digital literacy—that enhance employability, income generation and community resilience, aligning with SDG 5 (Gender Equality) and SDG 8 (Decent Work and Economic Growth).

Methodology: The study will adopt a mixed-methods approach, utilizing secondary data from government reports and NGO evaluations, supplemented by primary data from participatory workshops and surveys with rural women in Shimla district of Himachal Pradesh. This will assess skill gaps, design culturally relevant training modules and evaluate their potential integration with schemes like the National Rural Livelihood Mission (NRLM).

Results: Findings will highlight how skill development can increase women's economic contributions by 15-20%, reduce rural-urban migration and strengthen community resilienceProgram combining traditional knowledge with modern skills, such as eco-tourism management and marketing of regional products in national and global markets through expanded online platforms, will be emphasized for their scalability.

Conclusion: Integrating skill development into rural development frameworks will promote inclusive growth in mountainous regions. Addressing barriers like resource access and cultural biases will be crucial for equitable outcomes. This study will advocate for global-south collaborations to scale these initiatives, ensuring sustainable livelihoods for rural women.

Keywords: Rural Development, Women Empowerment, Skill Development, Sustainable Development, Himalayas, Gender Equity

THE INTERPLAY OF EXTERNAL DEBT, INEQUALITY, AND SUSTAINABLE DEVELOPMENT: A BIBLIOMETRIC ANALYSIS (SINCE 2016)

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ABSTRACT

Using a systematic search strategy across Dimensions and Scopus academic databases, this paper presents a bibliometric analysis of the research landscape exploring the interplay of external debt, inequality, and sustainable development since 2016. Utilizing VOSviewer, we performed a descriptive analysis of publication trends and network analyses of keyword co-occurrence, co-authorship, and bibliographic coupling. Our analysis reveals a growing body of literature, with a notable increase in publications post-2022, reflecting the heightened global focus on external debt and its effect on inequality and Sustainable Development. The bibliometric analysis illustrates that USA and UK together with International Monetary Fund (IMF) and University of London are dominating the field with significant contributions. The most prominent author is Okere, Kingsley Ikechukwu, while the journal Sustainability is the leading publication venue. Keyword analysis identified five distinct clusters, highlighting a thematic shift from purely economic analyses toward a more holistic perspective that integrates environmental challenges. This is evidenced by the emergence of concepts such as "climate debt" and "debt-for-nature swaps". Finally, by providing a more refined comprehension of the intellectual structure of the research on the complex interrelationships between external debt, inequality and sustainable development, our research provides a foundation for scholars to develop robust conceptual frameworks and for practitioners to formulate sustainable development pathways that optimize the use of external debt.

Keywords: External Debt; Bibliometric Analysis, VOSviewer, Inequality, and Sustainable development

GREEN TRAVEL – SUSTAINABLE TRANSPORT IN TOURISM

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ABSTRACT

At a time when the effects of climate change and environmental degradation are increasingly evident, the development of sustainable tourism has become a global necessity. One of the key aspects of this development is the promotion of green transport, which significantly reduces pollution and minimizes the negative environmental impacts of travel. This study aims to analyze the degree of integration of ecological transport within the tourism sector in Kosovo**,** and to compare its progress with countries that lead in sustainable tourism, such as Germany**,** Sweden, and the Netherlands**.** The main issue addressed in this research is the lack of adequate infrastructure for sustainable transport in Kosovo, the high usage of polluting vehicles, and the absence of integrated strategies between the transport and tourism sectors. To conduct this research, a mixed-methods approach was used, including a comparative analysis of national and international policies, interviews with sector experts, and surveys with domestic and international tourists to assess environmental awareness levels. The findings of the study indicate that, although there is a growing interest in green travel in Kosovo, practical implementation remains limited. The research highlights the importance of developing clear policies and investing in green infrastructure as essential conditions for advancing sustainable tourism. The comparison with developed countries provides valuable models that can be adapted to the local context. This study contributes to the existing literature by offering a practical and integrative analysis of how green transport can serve as a catalyst for a more environmentally friendly and economically viable tourism model in Kosovo.

Keywords: green transport, sustainable tourism, eco-travel, environment, Kosovo, international comparison, environmental policy.

PRELIMINARY FIELD TRIAL OF A MICROBIAL BIO-ANTICIDE FOR THE CONTROL OF DEFOLIATING ANTS

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ABSTRACT

Leaf-cutter ants are considered a highly destructive pest in agricultural and forestry systems. The objective of this study was to evaluate the effectiveness of microbial bio-anticide as a sustainable management strategy. The formulation developed by ARVO Biociencias Natural® contained *Trichoderma* sp., *Metarhizium* sp. and *Beauveria bassiana*, obtained through controlled fermentations and synergistic co-cultures to enhance the production of volatile compounds, enzymes and organic acids. The field trial was conducted in an active nest with three openings and five branches, applying three treatments: T1 (Myrmec®, 50 g of pellets per opening/day), T2 (Hor-tal®, 10 cc/L sprayed on 1 kg of rice + 50 g of icing sugar) and T3 (ARVO microbial bio-anticide, 90 ml/L sprayed on 1 kg of rice + 50 g of icing sugar). Treatments T2 and T3 were divided into 300 g per opening/day, applied for three consecutive nights. Foraging activity, mortality, and the status of the symbiotic fungus were monitored for 30 days. T3 was the only bait actively removed during the first nights, achieving a 100% reduction in foraging and approximately 95% mortality in 15 days. T1 and T2 showed no control effect. Motor incoordination and death outside the nest were also observed. These results suggest that microbial bio-anticide ARVO is a promising alternative for the sustainable management of leaf-cutter ants, reducing dependence on chemical pesticides and improving environmental protection. This work aligns with SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 15 (Life on Land).

Keywords: *Trichoderma*, *Metarhizium*, *Beauveria bassiana*, biocontrol

SUSTAINABLE ODOUR CONTROL MEASURES AMONG POULTRY FARMERS IN ENUGU EAST SENATORIAL ZONE, ENUGU STATE, NIGERIA

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ABSTRACT

The study assessed sustainable odour control measures among poultry farmers in Enugu east senatorial zone, Enugu State, Nigeria. Multistage sampling procedure was used in the selection of sixty poultry farmers. Data was collected using structured interview schedule. Data was analyzed using frequency, percentage, mean and standard deviation. Results revealed that the poultry farmers sustainable odour control measure include: regular cleaning of poultry house ($\bar{x}$=2.91), removing carcasses immediately there is mortality ($\bar{x}$=2.73), locating manure storage away from sensitive receptors ($\bar{x}$ =2.67), cleaning up spillages in the poultry farm ($\bar{x}$= 2.63), and proper ventilation of poultry houses ($\bar{x}$=2.58). Also, result show that the environmental impacts of odour from poultry farm include: poultry odour causes nuisance to the neighbour ($\bar{x}$= 2.25), air pollution through emission of dusts, microorganisms and organic compounds ($\bar{x}$= 2.03), and water pollution ($\bar{x}$=2.02). Data show that the perceived effects of odour from poultry farms on the health of farmers include: loss of appetite, stomach discomfort ($\bar{x}$=2.20), and difficulty in breathing ($\bar{x}$=2.03). Result show that the farmers waste management practices were: drying of the poultry manure and bagging for sale (95.0%), use of manure for improving plant growth (86.7%), and land filling techniques (53.3%). The poultry farmers should be trained by government through the organization of workshops where these poultry farmers will be educated on emerging technologies such as addition of bentonite to poultry feed during feed formulation to control odour.

Keywords: Poultry Farming, Odour control Measure

AGRICULTURAL EXTENSION AND SUSTAINABLE LAND MANAGEMENT: A REVIEW OF CONSERVATION PRACTICES AMONG SMALLHOLDER MAIZE FARMERS IN NIGERIA

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ABSTRACT

This review synthesizes literature (2020–2025) on sustainable land management (SLM) and conservation practices among smallholder maize farmers in Nigeria, with emphasis on the role of agricultural extension in promoting adoption. The paper summarizes the extent and drivers of land degradation affecting maize systems, presents commonly promoted conservation practices (conservation agriculture, agroforestry, residue management, terracing, contour farming, integrated soil fertility management), and examines empirical evidence on adoption determinants, impacts on productivity, and barriers to uptake. The review highlights the critical role of extension services public, private, and farmer-led in knowledge transfer, capacity building, and facilitating access to inputs and finance. Key constraints include insecure land tenure, short-term planning horizons, limited extension capacity, labour and residue use competition, and weak market linkages. We close with recommendations for strengthening extension systems, policy measures, and research gaps to support wide scale adoption of SLM among maize smallholders.

Keywords: Sustainable land management; conservation agriculture; maize; smallholders; agricultural extension; Nigeria

SUSTAINABLE APPLICATIONS OF ALGAL EXTRACTS: IMMUNITY, PARASITE CONTROL, AND INNOVATION

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ABSTRACT

Algae are promising environmental and economic resources with the potential to support sustainable development. These studies investigate the bioactive potential of algal extracts using *Biomphalaria alexandrina* snails as a biological model. The extracts of *Chlorella vulgaris* and *Pediastrum boryanum*, carried on nanocrystalline cellulose (NCC) as immunostimulants, were evaluated for their effects on snail immune responses. Results showed that C. vulgaris induced numerous hemocytes around immature cercariae and sporocysts, while *P. boryanum* caused degeneration of sporocysts with abundant hemocyte accumulation. The NCC carriers enhanced the delivery of microalgal components, leading to morphological alterations in cercariae and improved immune defense in snails. Additionally, the extract of *Cladophora glomerata* exhibited anesthetic properties and stimulated hemocyte proliferation, demonstrating potential for new therapeutic applications. Relaxation effects were observed at 100 and 300 mg/L, while full anesthesia occurred at 500 mg/L, indicating dose-dependent responses. The extract was safe for snails and rapidly modulated hemocyte morphology and activity. In conclusion, these findings highlight the potential of algal extracts as innovative and eco-friendly bioactive compounds. They enhance immune responses, supporting good health and well-being (SDG 3)**,** help control waterborne parasites, contributing to clean water and sanitation (SDG 6)**,** and utilize nanocrystalline cellulose for efficient delivery, promoting innovation and sustainable technologies (SDG 9)**.** Overall, these studies demonstrate the value of algae as sustainable resources with both environmental and biomedical applications.

Keywords: Algal extracts - Immunostimulants - Anesthesia - Hemocytes - Histopathology - SDGs

A PROTOCOL-AWARE MULTI-ROBOTIC SYSTEM FOR ANOMALY DETECTION AND CROP YIELD OPTIMIZATION IN SUSTAINABLE AGRICULTURE

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ABSTRACT

The global issue of food security, worsened by the environmental effects of traditional farming, requires us to adopt smart and sustainable farming methods. This paper introduces a new framework for a protocol-aware multi-robot system that uses artificial intelligence (AI) to improve precision agriculture. Our system, which consists of a fleet of low-cost mobile robots, is built to navigate crop fields on its own while gathering real-time data on soil health, pest problems, and plant growth. The heart of the system is an AI-based anomaly detection model that analyzes data from on-board sensors. It can accurately spot potential threats to crop health. This model, driven by a Temporal Graph Neural Network (TGNN), looks at both the spatial and temporal patterns in agricultural data, offering valuable insights that traditional methods often overlook.

The proposed method emphasizes an efficient robotic control and communication protocol. This allows for a coordinated approach to tasks, such as targeted pest control and nutrient application. By reducing resource use and minimizing human involvement, the system meets the urgent need for sustainable farming practices. Initial simulations show that our approach can significantly cut down on water and pesticide use while boosting overall crop yield by up to 20%. This research adds to the growing field of agricultural robotics and smart automation, providing a scalable and energy-efficient solution for future food production. The framework is designed to work with different crop types and environmental conditions, making it a useful tool for promoting sustainable farming worldwide.

Keywords: Artificial Intelligence, Agricultural Robotics, Sustainable Farming, Anomaly Detection, Precision Agriculture, Internet of Things

ADOPTION BARRIERS OF EFFICIENT IRRIGATION SYSTEMS IN PURULIA DISTRICT, WEST BENGAL, INDIA: PATHWAYS TO SUSTAINABLE AGRICULTURE

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ABSTRACT

Integration of efficient irrigation systems is key to increasing crop productivity while conserving dwindling water resources. Drip and sprinkler systems offer both advantages. Despite numerous benefits, such as reduced water requirement and increased yield, these systems are still not widely used by farmers in Purulia district, which falls under the undulating red and lateritic belt of West Bengal, India. This study aimed to identify the barriers to adoption of such technologies by farmers. To achieve this, a survey was conducted in four blocks under Raghunathpur subdivision: Neturia, Santuri, Raghunathpur I, and Raghunathpur II, to understand the challenges and farmers' perceptions regarding efficient irrigation systems. Both qualitative and quantitative approaches were adopted, using well-structured interviews with 100 farmers, 25 from each of the four blocks. It was found that economically, the high initial investment cost, limited access to credit or subsidies, and uncertainty about returns can discourage adoption. Technically, many farmers lack the knowledge and training required, find the systems complex to install and maintain, or struggle with the limited availability of spare parts. Social and behavioural factors, such as resistance to change from traditional practices, low community support, and limited awareness of the benefits, also play a role. Finally, institutional and policy-related barriers, such as weak extension services, insufficient government support or incentives, and poor water management infrastructure, can prevent farmers from implementing these efficient irrigation systems effectively. This study emphasizes the need for an integrated approach—combining financial support, technological interventions, and knowledge dissemination—to enhance agricultural productivity and water-use efficiency in the region.

Keywords: adoption barriers, drip and sprinkler irrigation, red and laterite zone, water-use efficiency

LEVERAGING AI IN SMART FARMING AND GREENHOUSE MONITORING FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN NIGERIA

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ABSTRACT

The study examines the issue of small crop production and unpredictable performance within Nigerian greenhouse cultivation. The challenges that farmers always face include unfavorable weather, pest infestation, and restricted access to modern technology. The purpose of the work is to optimize forecasts of agricultural yields and incomes of farmers with the help of artificial intelligence (AI) and demonstrate how it is possible to promote the implementation of AI to enhance sustainable and better farming. The study used a curated dataset named nigeria_ai_greenhouse, and it has attributes such as the size of the farms, type of crop, irrigation, fertilizer, weather, soil moisture, greenhouse, and household income. Four machine learning models were trained and tested after cleaning and preparation of the data: Ridge Regression, XGBoost, TensorFlow Decision Forests Random Forest (TF-DF RF), and TensorFlow Decision Forests Gradient Boosted Trees (TF-DF GBT). MAE, RMSE, R^2, MAPE, and median absolute error were used to measure model performance. The results obtained demonstrated that XGBoost is the best-performing model with the least errors (MAE 237.26, RMSE 325.16, R^2 0.982), followed by TF-DF Random Forest (MAE 309.64, R^2 0.968). Ridge regression and regression performed all quite well, and TF-DF gradient boosted trees gave the least accurate predictions. Finally, it can be recommended to expect the delivery of reliable predictions made by AI models, particularly XGBoost and TF-DF Random Forest, coupled with supporting greenhouse farming and contributing to the enhancement of sustainable farming in Nigeria.

Keywords: Artificial Intelligence, Crop Yield Prediction, Greenhouse Farming, Machine Learning Models.

BIOACTIVE COMPOUNDS FROM MEDICINAL PLANTS AS A PATHWAY TO ATTAINING SUSTAINABLE DEVELOPMENT GOAL 3: GOOD HEALTH AND WELL-BEING.

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ABSTRACT

Africa possesses a rich heritage of medicinal plants that remain indispensable to global healthcare, offering therapeutic benefits through diverse bioactive compounds such as alkaloids, flavonoids, terpenoids, phenolics, and saponins. These compounds exhibit broad pharmacological activities; including antimicrobial, anticancer, antioxidant, and anti-inflammatory effects; contributing directly to Sustainable Development Goal 3 (SDG 3): ensuring healthy lives and promoting well-being for all. Traditional medicine, deeply rooted in African societies, continues to inspire modern drug discovery, as demonstrated by plant-derived drugs such as artemisinin, quinine, paclitaxel, and morphine. Advances in phytochemistry, molecular biology, and computational approaches now accelerate the discovery and optimization of bioactive compounds, enhancing their role in addressing infectious diseases, chronic illnesses, and emerging health threats. Beyond health, medicinal plants present major opportunities for Africa's economic development. Their cultivation and processing support industrial diversification, job creation, and structural transformation. Under frameworks such as AfCFTA, standardized herbal products can strengthen intra-African and global trade, while sustainable resource management preserves biodiversity and secures community benefits. Growing interest from foreign investors and African entrepreneurs further positions medicinal plants as drivers of innovation and value-added industries. Access to microfinance and fintech can empower small producers to scale operations, improve quality, and access wider markets. Case studies; including *Azadirachta indica (neem), Curcuma longa (turmeric), Moringa oleifera (moringa), Vernonia amygdalina (bitter leaf), and Hibiscus sabdariffa (sorrel);* demonstrate contributions to healthcare, nutrition, and pharmaceutical innovation while offering economic potential for local communities. However, challenges remain in standardization, regulatory frameworks, and conservation. Addressing these requires integrating indigenous knowledge with modern science, advancing policy support, and fostering sustainable harvesting. Medicinal plants thus represent both a healthcare asset and a catalyst for Africa's economic transformation, offering a sustainable pathway toward global health equity and inclusive development.

Keywords: Medicinal plants, bioactive compounds, SDG 3, traditional medicine, Africa, drug discovery, economic development.

ECO-FRIENDLY Ag-Ag_2O/TiO_2/Cellulose BIOCOMPOSITE FILM FOR ENVIRONMENTAL AND BIOLOGICAL APPLICATIONS

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ABSTRACT

The development of a bio-composite material with photocatalytic properties, using a natural material such as cellulose, is an important issue in the field of environmental sustainability. In this work, Ag-Ag_2O/TiO_2/cellulose biocomposite was prepared in a two-step process at a moderate temperature. The first step involved coating the cellulose structure with TiO_2, followed by the second step where Ag-Ag_2O was deposited onto the TiO_2/cellulose via an immersion method. The successful loading of both Ag-Ag_2O and TiO_2 onto the cellulose matrix was confirmed by Raman spectroscopy, XRD, and XPS. Scanning electron microscopy (SEM) images further demonstrated that the cellulose matrix was coated with a TiO_2 layer decorated with Ag-Ag_2O nanoparticles. Photometric measurements showed that the resulting biocomposite material exhibits enhanced visible light absorption and high charge separation efficiency, thanks to the synergistic interaction between the Ag-Ag_2O and TiO_2. The developed biocomposite demonstrated high activity in removing the carcinogenic compound aniline from water. It also completely removed alcoholic gases from the air. Furthermore, it proved effective in killing pathogenic bacteria (*Escherichia coli*). The superior performance of this biocomposite can be attributed to its unique properties, such as charge separation, high visible light absorption, and its pure and homogeneous structure. This study presents a promising new strategy for preparing a highly efficient, sustainable, and multifunctional biocomposite material for environmental and biological applications. This work represents the first of its kind in utilizing the Ag-Ag_2O/TiO_2/cellulose material as a multifunctional and sustainable biocomposite.

Keywords: Ag-Ag_2O/TiO_2/cellulose; Sustainable biocomposite; Water treatment; Air purification; Antibacterial property.

SUSTAINABLE FOOD SYSTEMS AND NUTRITION SECURITY

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ABSTRACT

Sustainable food systems are integral to achieving nutrition security, particularly amid global challenges such as climate change, population growth, urbanization, and the depletion of natural resources. These systems encompass the entire spectrum of food production, processing, distribution, and consumption, aiming to deliver safe, nutritious, and culturally appropriate diets while maintaining ecological integrity, economic viability, and social equity. This paper explores the complex interconnections between sustainable agricultural practices, efficient food supply chains, and improved nutritional outcomes. It emphasizes the need for holistic approaches that integrate environmental sustainability, economic development, and social inclusion to create resilient food systems capable of addressing both current and future nutritional needs. Through a comprehensive review of recent literature, policy frameworks, and relevant case studies, the paper identifies key strategies for promoting sustainable food systems, including climate smart agriculture, agroecology, crop diversification, utilization of indigenous and biofortified crops, reduction of post-harvest losses, and promotion of nutrition-sensitive interventions. The study also examines persistent challenges, such as climate variability, infrastructural limitations, policy gaps, and socio-economic inequities, alongside emerging opportunities offered by technological innovations, community based programs, and multi-sectoral collaboration. Policy recommendations and actionable insights are provided to guide decision makers, researchers, and practitioners in designing and implementing effective interventions. Generally, the paper underscores that building sustainable food systems is essential not only for enhancing nutrition security but also for supporting environmental stewardship, economic resilience, and the well-being of communities worldwide.

Keywords: Sustainable food systems, Nutrition security, Climate resilient agriculture, Food policy, food sovereignty.

CLIMATE CHANGE MITIGATION AND ADAPTATION STRATEGIES

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ABSTRACT

Climate change poses unprecedented threats to ecosystems, economies, and societies across the globe. Addressing these challenges requires a comprehensive dual approach consisting of mitigation, which focuses on reducing greenhouse gas emissions, and adaptation, which strengthens resilience against the impacts of climate change. This paper reviews a wide range of strategies applied in energy systems, agriculture, urban development, and natural resource management, while also emphasizing the importance of effective policy frameworks and community based solutions. Mitigation efforts include expanding the use of renewable energy, enhancing energy efficiency, promoting reforestation, and advancing low carbon transport alternatives. Adaptation measures focus on climate smart agriculture, the development of resilient infrastructure, sustainable management of water resources, and the establishment of early warning systems for disasters. Case studies drawn from different regions highlight the multiple benefits of integrated approaches, including improved food security, biodiversity protection, poverty reduction, and strengthened economic resilience. Despite these opportunities, significant barriers remain, including financial constraints, gaps in governance and policy alignment, as well as technological and capacity limitations. The paper argues that stronger international cooperation, increased investment in climate finance, and the promotion of locally driven and culturally relevant solutions are essential to accelerate climate action. Findings suggest that adopting a proactive and coordinated strategy that brings together governments, private sector actors, researchers, and communities is critical for safeguarding human well-being, protecting ecosystems, and achieving the long term goals of global climate stability and sustainable development.

Keywords: Climate change, Mitigation, Adaptation, Resilience, Sustainability

PRACTICAL PATHWAYS TO SUSTAINABILITY IN THE FOOD INDUSTRY: WASTE VALORIZATION, SMART TECHNOLOGIES, AND NOVEL PROTEIN SOURCES

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ABSTRACT

The food industry is under increasing pressure to adopt environmentally friendly practices due to climate change, resource constraints, and rising demand for healthy options. While many sustainable solutions are available, implementation remains challenging. This study examines practical approaches, including waste reuse, smart technologies, and alternative protein sources.

Food waste, which is often discarded, can be converted into valuable resources. It can be used to produce animal feed, renewable energy, and even biodegradable packaging. These approaches not only reduce the environmental burden but also create new economic opportunities for producers. In this way, practices that once seemed costly or complex can become profitable and widely accessible.

In addition, the use of smart tools such as digital supply chain tracking, artificial intelligence to predict food waste, and joint water and energy management is enabling farmers and producers to operate more efficiently. Such technologies help businesses save costs, improve transparency, and respond more quickly to market and consumer demands. They also make it easier to measure the actual impact of sustainability efforts, which is critical for long-term success.

New protein sources like plants, algae, insects, and lab-grown meat are becoming more common. They have a much smaller environmental impact compared to traditional factory farming. Beyond reducing pressure on land and water use, these alternatives also offer dietary diversity and new products that appeal to health-conscious consumers. Their increasing availability suggests that future food systems will look very different from those of today.

These efforts help the environment, support the economy, and meet what society expects. To make progress faster, policymakers, business leaders, and researchers all need to work together. Building such collaborations will be essential for scaling up solutions, sharing best practices, and ensuring that sustainability in the food industry moves from small projects to global transformation.

Keywords: Sustainability, Food Industry, Waste Valorization, Smart Technologies, Alternative Proteins

ON THE CHRONIC POVERTY AND FOOD INSECURITY IN MALAWI AND THE POSSIBILITIES FOR DEVELOPMENT AND SUSTAINABILITY WITH THE ADVANCE OF THE CLIMATE CHANGES

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ABSTRACT

According to the UN criteria and recent UN reports there are 44 countries in the world that fulfill the criteria for least developed country and Africa is the richest continent in this deplorable statistics by hosting 32 of them. Further, it is no surprise that in the chart of top 10 poorest countries in the world 9 are African ones. In this deplorable chart Malawi holds the 4th place – a country that once upon a time was blessed with natural resources and beauty, nowadays struggles on daily basis for survival with GDP per capita equaling approximately 1.5 US dollars per day.

Before the invasion, conquest and colonization by the west Europeans the people of Malawi lived self-sustained life in harmony with the environment. This sustainable living became a sweet memory from the past when the west European colonialists confiscated and alienated the land of the ingenious people and imposed forced labor and enslavement upon them and exploitation of the resources of their motherland. All this mistreatment, racism and exploitation has long lasting and far reaching effects even more than half century after Malawi became part of the world community of the independent states. Nowadays the overwhelming majority of the Malawian people live in perpetual chronic poverty and malnourishment without hope for substantial improvement of their wellbeing in the observable future. The situation gets further worsened by the advance of the climate changes which often devastate the agriculture dependent fragile economy and cause national crisis and emergencies.

In the present work the authors elaborate on the impacts of colonialism heritage and climate changes on the fragile Malawian economy and the possibilities for implementation and adoption of the knowledge and practices field of agricultural science, ecology and etc. to improve the state of chronic humanitarian crisis in this impoverished country.

Key words: Malawi, Sustainability, Poverty, Food security, Colonialism, Climate changes, Agroecology.

TREATMENT OF WASTE AND EFFLUENTS FROM THE AGRI-FOOD INDUSTRY: THE CASE OF THE DAIRY INDUSTRY

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ABSTRACT

The Moroccan dairy sector plays a central role in the agri-food industry, processing billions of liters of milk into cheese, yogurt, and other fermented products. However, this activity generates large volumes of acid whey, a by-product that remains underexploited and creates significant environmental, economic, and regulatory challenges. Acid whey is characterized by an acidic pH (4–5) and a high organic load, with proteins of considerable nutritional and functional value. Conventional biological treatments are often inefficient, leading to disposal issues and missed opportunities for valorization.

The objective of this doctoral research is to develop an integrated and sustainable strategy dedicated to the **concentration and food valorization of proteins from acid whey**. By focusing on this abundant and rich fraction, the study aims to transform a problematic effluent into a resource of high added value, while proposing solutions adapted to the specific constraints of Moroccan dairy SMEs.

Our work explores and optimizes several concentration and purification techniques, such as ultrafiltration, selective precipitation, and chromatography, in order to obtain stable and high-quality protein fractions. These proteins have promising applications as functional food ingredients, owing to their emulsifying, gelling, and nutritional properties. They can be incorporated into the development of value-added products, including protein supplements, fortified beverages, and food substitutes.

This research ultimately seeks to provide innovative, cost-effective, and environmentally responsible solutions, enhancing the sustainable management of acid whey while contributing to food security and the circular economy in the dairy sector.

Keywords: Dairy industry, Acid whey, Proteins, Concentration, Food valorization.

TRAFFIC SIGNAL OPTIMIZATION IN URBAN INTERSECTIONS: A MATHEMATICAL PROGRAMMING MODEL

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ABSTRACT

Rapid urban development and the growing number of vehicles in major cities such as Tirana have placed considerable pressure on existing road infrastructure. Effective traffic management, particularly the optimization of signalized intersections, has therefore become crucial for reducing congestion, minimizing delays, cutting fuel consumption, and limiting air pollution. The “21 Dhjetori” intersection represents one of the most critical traffic nodes in Tirana, characterized by high traffic volumes and inefficiencies caused by non-optimized signal control systems.

This study develops a rigorous Mixed-Integer Linear Programming (MILP) model for traffic signal optimization, aiming to minimize the average waiting time of vehicles and improve overall flow efficiency, while ensuring road safety and pedestrian accessibility. The model is based on a structured phase plan derived from the incompatibility of traffic streams and incorporates essential constraints such as minimum and maximum green times per phase, total cycle length, effective green time, and lost time during phase transitions, in addition to observed vehicle flow volumes.

Empirical traffic data were collected through field observations and time-based measurements at different periods of the day. These data were applied in constructing and solving the MILP model using numerical algorithms capable of handling discrete and continuous variables. The optimized results showed a significant reduction in total waiting time across all approaches and a marked improvement in signal system efficiency compared with the current timing plan.

Overall, the proposed MILP-based framework demonstrates strong potential as a scalable technical tool for enhancing urban traffic performance and supporting sustainable mobility strategies in cities with similar traffic conditions.

Keywords: Traffic signal optimization, mathematical programming, waiting time minimization, sustainable transportation

ADVANCING SUSTAINABLE DEVELOPMENT THROUGH MATHEMATICAL MODELING, COMPUTATIONAL ANALYTICS, AND CLOUD-ENABLED BUSINESS INTELLIGENCE

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ABSTRACT

The increasing complexity of global sustainability challenges necessitates innovative and interdisciplinary approaches that integrate mathematical and computational sciences with modern technological solutions. This study explores the critical role of complex systems modeling, data analytics, and cloud-enabled business intelligence in supporting sustainable development initiatives. Complex systems modeling provides a robust framework for understanding dynamic interactions, interdependencies, and feedback mechanisms across environmental, social, and economic systems, enabling researchers and policymakers to anticipate emergent behaviors and design adaptive strategies.

Data analytics, including large-scale statistical analysis, predictive modeling, and machine learning, facilitates the extraction of actionable insights from diverse and heterogeneous datasets. These methodologies support evidence-based decision-making, allowing organizations to optimize resource allocation, reduce inefficiencies, and enhance overall sustainability outcomes. By employing algorithmic approaches, such as optimization techniques, simulations, and scenario analysis, decision-makers can evaluate alternative strategies and implement solutions that are both efficient and resilient.

Cloud-enabled business intelligence platforms further enhance the capacity for real-time data integration, visualization, and collaboration across multiple stakeholders. These technologies allow organizations to process and analyze vast datasets dynamically, foster interdisciplinary research, and coordinate cross-sectoral initiatives that address complex, interconnected sustainability challenges. The combination of cloud analytics and computational methodologies provides a flexible and scalable infrastructure for supporting innovative solutions in areas such as energy management, urban planning, environmental protection, and social resource distribution.

Furthermore, the integration of mathematical modeling, computational analytics, and cloud-based intelligence promotes interdisciplinary and collaborative research. By bridging traditional disciplinary boundaries, these approaches enable innovative frameworks that link diverse methodological perspectives, encouraging joint efforts among scientists, engineers, policymakers, and industry practitioners. This convergence is critical for addressing the multifaceted nature of sustainability challenges, which are often characterized by complex, interrelated environmental, social, and economic factors.

This paper demonstrates that leveraging these advanced computational and analytical tools is not only a technical endeavor but also a strategic imperative for sustainable development. The findings emphasize that effective integration of these approaches facilitates informed decision-making, enhances adaptive capacity, and supports long-term resilience and competitiveness. By illustrating practical applications and emerging methodologies, this study contributes to a deeper understanding of how interdisciplinary computational and cloud-enabled solutions can serve as powerful enablers of sustainable development in a rapidly evolving global context.

Keywords: Complex Systems Modeling. Data Analytics. Algorithmic Approaches. Sustainable Development. Cloud-Based Business Intelligence. Computational Methods

EVALUATION OF RESEARCH AND DEVELOPMENT PROJECTS IN TERMS OF PUBLIC INCENTIVES

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ABSTRACT

The dynamic and variable nature of the Industrial Revolution, which began in the second half of the eighteenth century and has continuously changed in nature and even name over time, has necessitated research and development activities. These activities have begun to gain increasing momentum and importance. During the transformation of the agricultural society, the term 'industry' conjured images of material assets such as steam-powered machines, internal combustion engines and factories. However, with the digital transformation, these have begun to give way to non-material and digital assets. In this process, the importance of research and development activities is increasing inevitably. Governments implement various incentive policies to regulate these activities and direct them towards areas that promise public benefit. Substantial financial support is available for R&D projects. If the institution carrying out the projects is a higher education institution, the academic staff and students involved who meet the required conditions also benefit from this support. Difficulties in distinguishing R&D projects from other scientific research projects affect the appropriate and effective use of state support. Therefore, the concept of R&D and the distinguishing features of R&D projects should be clarified through the development of existing legislation. This would ensure that the matter is based on objective principles rather than administrative discretion and serves the public interest. This paper will discuss these issues and possible solutions.

Key Words: Research and Development, Research and Development Project, R&D, Public Incentive, State Support.

SÜRDÜRÜLEBİLİRLİK VE DOĞAL AFET YÖNETİMİ İLİŞKİSİ ÇERÇEVESİNDE DEPREMLERİN MAKROEKONOMİK ETKİLERİNİN ANALİZİ

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ÖZET

Birleşmiş Milletler'in tanımıyla sürdürülebilir kalkınma, "bugünün ihtiyaçlarını, gelecek nesillerin kendi ihtiyaçlarını karşılama yeteneğinden ödün vermeden karşılamaktır". Bu çerçevede ekonomik ve sosyal sürdürülebilirliğin, doğal afet yönetimi ile önemli bir bağı bulunmaktadır. İnsanlığın varoluşundan günümüze doğal afetler nedeniyle dünyada ve ülkemizde yüksek beşeri, sosyal ve ekonomik kayıplar yaşanmaktadır. Bu kaynak kayıpları, kalkınma inisiyatiflerini geriye götürebilmektedir. Sürdürülebilir kalkınma hedeflerine destek olmak üzere afetlerin öncesinde, esnasında ve sonrasında doğru ve etkin yönetilmesi ve olumsuz etkilerinin minimize edilmesi elzemdir. Depremler, en çok hasara neden olan doğal afetlerin başında gelmektedir. Depremlerin sık yaşandığı Alp-Himalaya-Akdeniz deprem kuşağında yer alan Türkiye'de, yüksek riskli faylar bulunmaktadır. 1923-2023 arası dönemde Türkiye ve çevresinde Mw 7'nin üzerinde başta 1939 Erzincan, 1999 Kocaeli, 1999 Düzce ve 2023 Kahramanmaraş depremleri olmak üzere büyük depremler yaşanmıştır. Bu çalışmada, depremlerin makroekonomik göstergeler üzerindeki olumsuz etkileri incelenmektedir. Olası şiddetli bir Marmara depreminin potansiyel etkileri analiz edilmiştir. Marmara Denizi'ne kıyısı olan 7 ilin, bölgedeki diğer illerden daha fazla etkilemesi beklenmekte olup bölgenin sosyo-ekonomik durumu düşünüldüğünde, olası şiddetli ve yıkıcı bir deprem ülkemiz için çok büyük tehdit oluşturmaktadır. Bu çalışmada, olası şiddetli bir Marmara Depremi'nin Türkiye GSYH'si ve temel sektörlere etkisi, Exponential Decay modeli kullanılarak analiz edilmiştir. En olumsuz senaryo baz alınarak yapılan projeksiyonda, büyük deprem şokuyla GSYH'nin ve temel sektörlerin önemli ölçüde daralacağı ve depremin ardından 10 yıllık dönemde dahi tam olarak toparlanmanın mümkün olmayacağı tahmin edilmiştir. Ülkemizde depremlerin zararlarını en aza indirmede alınacak tedbirler ve çözüm önerileri hayati öneme sahiptir. Bu amaçla kapsayıcı, bütüncül, bilimsel ve etkili tedbirlerin ivedilikle hayata geçirilmesi gerekmektedir. Bu çerçevede TBMM bünyesinde daimi bir deprem komisyonu kurulması, deprem fonu oluşturulması, sanayi tesislerinin daha az riskli bölgelere taşınması, depreme dirençli kentler oluşturulmasında Japonya gibi ülkelerin risk azaltma yöntemlerinin uygulanması, yaptırımları artırıcı mevzuat düzenlemelerinin getirilmesi, kurumların yapısal olarak güçlendirilmesi, riskli alanlarda kentsel dönüşüme öncelik verilmesi, deprem sonrası göç dalgasını gözeten tedbirlerin alınması, eğitim-öğretim müfredatına depremle ilgili dersler eklenmesi, deprem senaryolarına göre tatbikatlar yapılması, STK faaliyetlerinin ve akademik çalışmaların artırılması önerilmektedir.

Anahtar Kelimeler: Deprem, makroekonomik etkiler, ekonometrik analiz, politika önerileri

ANALYSIS OF THE MACROECONOMIC EFFECTS OF EARTHQUAKES IN THE CONTEXT OF SUSTAINABILITY AND NATURAL DISASTER MANAGEMENT

ABSTRACT

According to the United Nations, sustainable development is defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” In this context, economic and social sustainability are closely linked to natural disaster management. From the dawn of humanity to the present day, natural disasters have caused high human, social, and economic losses around the world and in our country. These resource losses can set back development initiatives. To support sustainable development goals, it is essential to manage disasters correctly and effectively before, during, and after they occur and to minimize their negative effects. Earthquakes are among the natural disasters that cause the most damage. Türkiye, located in the Alpine-Himalayan-Mediterranean seismic belt where earthquakes occur frequently, has high-risk fault lines. Between 1923 and 2023, major earthquakes with a magnitude of Mw 7 or higher occurred in Türkiye and its surroundings, notably the 1939 Erzincan, 1999 Kocaeli, 1999 Düzce, and 2023 Kahramanmaraş earthquakes. This study examines the negative effects of earthquakes on macroeconomic indicators. The potential effects of a possible destructive Marmara earthquake have been analyzed. The seven cities bordering the Sea of Marmara are expected to be more affected than other cities in the region. Considering the socio-economic situation of the region, a probable destructive earthquake poses a very significant threat to our country. This study analyzes the impact of a potential destructive Marmara earthquake on Türkiye's GDP and main sectors using the Exponential Decay Model. Based on the most pessimistic scenario, projections indicate that GDP and main sectors would significantly contract due to the major earthquake shock, and a full recovery would not be possible even within a 10-year period following the earthquake. Measures and solutions to minimize the damage caused by earthquakes in our country are of vital importance. To this end, comprehensive, holistic, scientific, and effective measures must be implemented immediately. In this context, it is necessary to establish a permanent earthquake commission within the Grand National Assembly of Türkiye, create an earthquake fund, relocate industrial facilities to less risky areas, implement risk reduction methods used in countries such as Japan to create earthquake-resistant cities, introduce legislation that increases sanctions, strengthen institutions structurally, prioritize urban transformation in risky areas, taking measures to address post-earthquake migration waves, adding earthquake-related courses to the education curriculum, conducting drills based on earthquake scenarios, and increasing NGO activities and academic studies.

Keywords: Earthquake, macroeconomic effects, econometric analysis, policy recommendations

STEEL PRODUCTION AND CONSUMPTION BALANCES IN THE EUROPEAN UNION: THE ROLE OF IMPORT DEPENDENCY IN THE CBAM FRAMEWORK

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ABSTRACT

The Carbon Border Adjustment Mechanism (CBAM), which the European Union (EU) will fully implement by 2026, aims to reflect carbon costs on imported products in high-carbon emission sectors. One of the sectors most directly affected by this regulation is the iron and steel industry. The balance of steel production and consumption within the EU varies between countries. This study examines the steel balances of the EU-27 countries using average data from 2020–2024 and discusses the future implications of these balances in the context of CBAM. According to the findings obtained from these data, net exporting countries such as Germany, France, Luxembourg, Belgium, Austria, the Czech Republic, Slovakia and Sweden exceed their consumption with their production. These countries will be in a relatively advantageous position under CBAM, but the pressure to modernise their production processes will increase due to high carbon prices. Net importer countries such as Italy, Spain, Portugal, Greece, Poland, Hungary, Bulgaria, Romania, Croatia, Slovenia, Estonia, Latvia, Lithuania, Cyprus, Malta and Ireland meet a significant portion of their steel needs through imports. CBAM may limit competitiveness in steel-intensive sectors (construction, automotive) by increasing costs in these countries. Countries with balanced or medium levels of dependence, such as the Netherlands, Denmark, and Finland have similar values in terms of production and consumption and have flexibility in the CBAM process. Furthermore, a positive correlation has been observed between per capita steel consumption and GDP per capita. This situation indicates that CBAM costs may be felt more acutely in high-income countries. These findings show that CBAM will have critical consequences not only for non-EU countries but also for internal EU balances. Net importing countries, in particular, will be forced to pass on CBAM costs to domestic markets, which could increase consumer prices. Net exporter countries, on the other hand, will be protected from external competition thanks to CBAM, but will have to accelerate transformation investments due to increased carbon costs under the ETS. A cross-sectional analysis based on average data from 2020–2024 reveals that steel production and consumption balances are quite heterogeneous among EU countries. The implementation of CBAM will make these differences more visible and reshape countries' steel policies. In this context, the study serves as a guide for policymakers within the EU in assessing the impact of CBAM on domestic market balances as well as foreign trade.

Keywords: CBAM, steel sector, European Union, import dependence, carbon regulation.

THE BANKRUPTCY OF GLOBAL DEVELOPMENTALISM?

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ABSTRACT

In the 1980s, debates on the end of national development strategies gained momentum, with the bankruptcy of national developmentalism and the rise of globalization becoming the dominant arguments of the period. At this point, the concept of *sustainability*—aligned with globalization discourse and grounded in the assumption of international cooperation—emerged to rescue the declining notion of development.

In its modern sense, *sustainable development* was first introduced by the **1980 World Conservation Strategy** and gained global recognition with the **1987 Brundtland Report**. It was institutionalized at the **1992 Rio Summit** and later became the backbone of the development discourse through the **2000 Millennium Development Goals (MDGs)** and the **2015 Sustainable Development Goals (SDGs)**. Thus, sustainability became embedded at the center of the global developmentalist discourse, providing a framework for offering solutions—based on international cooperation—to the multifaceted challenges of development.

The SDGs enabled some progress in certain areas, such as reducing maternal and child mortality, particularly by providing financial resources for the development processes of less developed countries. However, from a broader perspective, the expected level of progress has not been achieved. One reason is the unrealistic assumption of a harmonious "global society." More importantly, recent significant shifts in the functioning of the global system, particularly under the leadership of the United States, have further undermined the agenda.

Today, it is possible to argue that what happened to national developmentalism in the 1980s is now happening to global developmentalism. Alongside debates on the end of globalization, the decision of the United States—the core actor of liberal international order and international institutions—to withdraw from the SDGs has made the crisis of global development discourse visible as a concrete reality. This paper aims to discuss this crisis and its implications.

Keywords: sustainable development, global developmentalism, sustainable development goals.

RETHINKING THE GREEN ECONOMY WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT

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ABSTRACT

The green economy has emerged as a multidimensional conceptual framework aimed at reconciling economic growth with environmental sustainability, resource efficiency, and social inclusion. Rooted in traditions of environmental and ecological economics, it incorporates practical approaches such as circular economy, industrial ecology, and renewable energy transitions. Yet, persistent definitional ambiguities—ranging from "weak" sustainability, which prioritizes substitutability between ecological and economic goals, to "strong" sustainability, which calls for structural transformation—pose challenges for coherent measurement and policy implementation.

Recent literature highlights the inadequacy of GDP-centered metrics, underscoring the need for multidimensional indicators that integrate economic, social, and ecological dimensions. Business studies indicate that green practices can enhance competitiveness through eco-efficiency, risk management, and green human resource management, though outcomes depend on regulatory frameworks, sectoral contexts, and managerial commitment. Similarly, circular economy strategies and renewable energy transitions align with the United Nations Sustainable Development Goals but raise concerns about unintended socio-environmental consequences and biodiversity trade-offs.

Employment and social equity represent another critical frontier. While green jobs offer opportunities for inclusivity and local development, definitional inconsistencies and weak transition mechanisms risk undermining their transformative potential. Furthermore, financial innovation, such as the proposed digital green waqf, demonstrates the importance of culturally embedded approaches but also reveals challenges in governance and implementation.

Overall, the green economy literature underscores both its transformative potential and systemic limitations. Moving forward, coordinated efforts among governments, businesses, and civil society, supported by robust measurement tools, technological investment, and inclusive policies, are essential for achieving sustainability goals. This theoretical synthesis suggests that the future of green transformation depends not only on advancing conceptual clarity but also on embedding equity and resilience into policy design.

Keywords: Green Economy, Sustainability, Circular Economy, Social Inclusion

GÖÇ VE BÖLGESEL KALKINMA İLİŞKİSİ: SÜRDÜRÜLEBİLİR KALKINMA HEDEFLERİ BAĞLAMINDA TEORİK BİR DEĞERLENDİRME

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ÖZET

Göç, tarihsel olarak yalnızca demografik bir hareketlilik değil, aynı zamanda toplumsal, ekonomik ve mekânsal dönüşümlerin belirleyici bir dinamiği olarak değerlendirilmiştir (Castles & Miller, 2009). Günümüzde göçün bölgesel kalkınma üzerindeki etkileri, işgücü piyasalarının yeniden şekillenmesinden kentleşme süreçlerine, sosyal uyumdan çevresel sürdürülebilirliğe kadar çok boyutlu alanlarda kendisini göstermektedir. Bu çalışma, göç ve bölgesel kalkınma ilişkisini Birleşmiş Milletler'in Sürdürülebilir Kalkınma Hedefleri (SKH) çerçevesinde teorik olarak irdelemeyi amaçlamaktadır. Özellikle SKH 8 (İnsana Yakışır İş ve Ekonomik Büyüme), SKH 10 (Eşitsizliklerin Azaltılması) ve SKH 11 (Sürdürülebilir Şehirler ve Topluluklar) bağlamında göçün bölgesel kalkınmaya etkileri tartışılacaktır. Göçün, belirli bölgelerde ekonomik canlılığı artırma potansiyeli (de Haas, 2010), aynı zamanda sosyal eşitsizlikleri yeniden üretme riski (Portes, 1997) literatür ışığında ele alınacaktır. Ayrıca, göçmenlerin sahip oldukları sosyal ve kültürel sermayenin (Bourdieu, 1986) yerel kalkınma süreçlerine katkısı teorik bir eksen üzerinden değerlendirilecektir. Bu bağlamda çalışma, göçün yalnızca bir "sorun alanı" olarak değil, aynı zamanda bölgesel kalkınma için bir "fırsat alanı" olarak da görülebileceğini vurgulamaktadır. Çalışma, sürdürülebilir kalkınma hedefleri doğrultusunda göç politikalarının bölgesel kalkınma stratejileriyle uyumlu hale getirilmesi gerekliliğine dikkat çekmekte ve gelecekteki araştırmalar için teorik bir çerçeve sunmaktadır. Bu teorik çerçeve, göçün sürdürülebilir kalkınma hedefleriyle uyumlu politikalar aracılığıyla bölgesel kalkınmaya katkı sağlayabileceğini göstermektedir. Sonuç olarak, göç ve kalkınma ilişkisinin çok boyutlu doğası, ulusal politikaların ötesinde bölgesel ölçekte stratejik yaklaşımlar geliştirilmesini gerekli kılmaktadır.

Anahtar Kelimeler: Göç, Bölgesel Kalkınma, Sürdürülebilir Kalkınma Hedefleri (SKH).

THE RELATIONSHIP BETWEEN MIGRATION AND REGIONAL DEVELOPMENT: A THEORETICAL ASSESSMENT IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT GOALS

ABSTRACT

Historically, migration has been regarded not only as demographic mobility but also as a defining dynamic of social, economic, and spatial transformations (Castles & Miller, 2009). Today, the effects of migration on regional development manifest themselves in multidimensional areas ranging from the reshaping of labor markets to urbanization processes, social integration, and environmental sustainability. This study aims to theoretically examine the relationship between migration and regional development within the framework of the United Nations Sustainable Development Goals (SDGs). Specifically, the effects of migration on regional development will be discussed in the context of SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), and SDG 11 (Sustainable Cities and Communities). The potential of migration to increase economic vitality in certain regions (de Haas, 2010), as well as the risk of reproducing social inequalities (Portes, 1997), will be addressed in light of the literature. Furthermore, the contribution of migrants' social and cultural capital (Bourdieu, 1986) to local development processes will be evaluated from a theoretical perspective. In this context, the study emphasizes that migration can be seen not only as a "problem area" but also as an "opportunity area" for regional development. The study highlights the need to align migration policies with regional development strategies in line with sustainable development goals and provides a theoretical framework for future research. This theoretical framework demonstrates that migration

can contribute to regional development through policies aligned with sustainable development goals. Consequently, the multidimensional nature of the relationship between migration and development necessitates the development of strategic approaches at the regional level, beyond national policies.

Keywords: Migration, Regional Development, Sustainable Development Goals (SDGs).

EXAMINING THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND ENVIRONMENTAL SUSTAINABILITY ON THE AXIS OF SUSTAINABLE DEVELOPMENT GOALS: A COMPARATIVE STUDY ON DEVELOPED AND DEVELOPING COUNTRIES

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ABSTRACT

This study aims to analyze the complex relationship between the main indicators of economic development and the critical components of environmental sustainability within the framework of the United Nations Sustainable Development Goals (SDGs). The primary research question is whether economic growth invariably has a negative impact on environmental degradation, or if this relationship changes direction after a certain level of development is achieved. By comparatively examining this relationship in the specific contexts of developed and developing country groups, the study intends to derive findings that will inform sustainability policies.

The research will employ a quantitative secondary data analysis method. The dataset will be compiled from publicly available databases of international organizations such as the United Nations (UNData) and, the World Bank (World Bank Open Data) covering the period from 2000 to 2025. In the analysis, Gross Domestic Product (GDP) per Capita and the Human Development Index (HDI) will be used as indicators of economic development. As for environmental sustainability indicators, variables such as Carbon Emissions per Capita (CO2), Renewable Energy Consumption (%), Forest Area as a Percentage of Land Area (%), and Freshwater Withdrawals will be considered. The data will be analyzed using panel data analysis and correlation matrices, and the differences between country groups will be statistically tested.

This study contributes to the sustainability and development literature by offering a current and holistic perspective through the use of a large dataset and a comparative approach. The findings will assist policymakers in developing more effective and evidence-based strategies that integrate economic development goals with environmental protection objectives.

Keywords: Sustainability, Development, Environment, Sustainable Development Goals, Environmental Kuznets Curve.

KARADENIZ TECHNICAL UNIVERSITY WITHIN THE FRAMEWORK OF SUSTAINABLE GREEN CAMPUSES

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ABSTRACT

Today, climate change and environmental sustainability are among the priority issues in the spatial planning of higher education institutions. University campuses are not only educational spaces but also serve ecological, social, and cultural functions as important components of the urban ecosystem. In this context, the concept of a "sustainable green campus" encompasses multifaceted goals such as energy efficiency, water and waste management, biodiversity conservation, and carbon emission reduction. Many universities are developing planning and implementation policies to this end. International examples (Stanford University, University of Nottingham, National University of Singapore, etc.) demonstrate that sustainable campus approaches are supported by renewable energy use, green transportation systems, habitat management plans, and community engagement. Karadeniz Technical University (KTU), with its natural topography, rich vegetation, and the advantages offered by the Black Sea climate, is a prime example of a green campus. Its proximity to the marine and forest ecosystems, in particular, supports the campus's ecological diversity. However, rapid urbanization pressures, increasing student and staff numbers, and infrastructure problems pose some disadvantages in terms of sustainability goals. While KTU's advantages include its extensive green space and its integration with natural ecosystems, its disadvantages include the inadequate management of this potential and limited climate change adaptation strategies. This study assesses KTU's current situation by examining examples of international best practices and discusses the strategic steps necessary to achieve its sustainable green campus vision.

Keywords: Sürdürülebilir kampüs planlaması, iklim değişikliğine uyum stratejileri, ekosistem hizmetleri, yeşil kampüs

DESIGNING CHILDREN'S PLAYGROUND WITH SUSTAINABLE MATERIALS

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ABSTRACT

Children's playgrounds in cities are not only play spaces but also important urban components that support children's physical, social, and cognitive development and foster social integration. In today's context of climate change, resource depletion, and environmental sustainability, the quality of materials used in playground design is becoming increasingly important. Sustainable materials, energy-saving production processes, recyclability, natural material selection, and low carbon emissions contribute to reducing environmental impacts. International examples (such as natural playgrounds in Denmark, parks made with recycled materials in Germany, ecological playgrounds in Japan, etc.) highlight successful designs that encourage children to grow in interaction with nature while also meeting safety and durability criteria. These designs demonstrate that playgrounds are not only a means of entertainment but also a tool for raising environmental awareness. Trabzon's Yomra City Park, with its location, extensive open space, and proximity to the coastal ecosystem, offers significant potential for sustainable playground design. The park could incorporate natural wood, repurpose recycled plastic and metal elements, and incorporate rainwater harvesting into green spaces, along with a diverse array of plants and play spaces. This will support children's healthy development and implement environmentally friendly design principles. This study aims to discuss the design principles of sustainable playgrounds, specifically for Yomra City Park, by examining international examples.

Keywords: Sustainable landscape design, Ecological playgrounds, Environmentally friendly materials, Urban open space planning

WOODY FLORA OF KASTAMONU UNIVERSITY: INSIGHTS FOR SUSTAINABLE AND CLIMATE-RESPONSIVE GREEN SPACES

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ABSTRACT

Türkiye, owing to its diverse climatic zones and geomorphological variety, hosts one of the richest floras at a global scale. This biological diversity provides significant potential not only for the conservation of natural ecosystems but also for the development of climate-adaptive and sustainable landscape planning strategies. In this study, woody plant species integrated with natural and cultural landscape elements within the boundaries of the Kastamonu University Central Campus were identified, and their floristic composition was examined. For this purpose, field surveys were conducted, specimens were collected, and taxonomic identification was carried out.

According to the findings, a total of 70 taxa belonging to two classes (Gymnospermae and Angiospermae) were recorded in the campus area. The Gymnospermae class accounted for 24.2% of the total species, with the Pinaceae and Cupressaceae families representing the highest diversity within this group. In the Angiospermae class, the Rosaceae family was dominant with 12 species, while the class as a whole represented broader diversity with 53 species (75.8%).

The results reveal the richness of woody species that contribute both aesthetic and ecological functions to the campus landscape, indicating that this diversity may serve as an important resource for sustainable green space planning. Identifying floristic diversity provides a strategic basis for integrating climate-resilient, low-maintenance, and ecosystem service-oriented species into landscape design. In this context, the study contributes to the development of climate-adaptive and sustainable planting practices in urban green spaces such as university campuses.

Keywords: Floristic diversity, Sustainable planting practices, Urban green spaces

THE RELATIONSHIP BETWEEN ACCESSIBILITY TO URBAN GREEN SPACES AND SUSTAINABLE DEVELOPMENT GOALS: THE CASE OF BARTIN CITY CENTER

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ABSTRACT

Cities are places that increase climate change, concentrate poverty and inequality, and exert pressure on the urban periphery; technology, social justice, and the economy are inclusive development centers that offer a high quality of life. Urban open-green spaces are elements that serve sustainable development goals and improve quality of life. Therefore, accessibility to these areas plays a major role in ensuring sustainable cities and achieving Sustainable Development Goals. City of Bartın, which has 56% green space, was selected as the material for the study. The sample of the study is the city center of Bartın. The aim of the study is to evaluate the accessibility of open-green spaces located in the city center and their contribution to achieving sustainable development goals. Active open-green spaces are considered as city and neighborhood parks, nature parks, and recreational areas.

The study was conducted in four stages: literature review, analysis, evaluation, and conclusion. In the literature review stage, the local and foreign literature was thoroughly examined using the keywords Sustainable Development Goals, climate change, and open-green spaces. Based on these data, the “Buffer Analysis” method, which is used to measure accessibility to active open-green spaces, was utilized, and the study material was evaluated using this method. Recommendations were made to contribute to the Sustainable Development Goals based on the analyses conducted throughout the study.

Keywords: Climate change, Open-green spaces, Sustainable Development Goals.

WASTE MANAGEMENT AND BIOECONOMY: THE EXAMPLE OF THE BLACK SOLDIER FLY, *Hermetia illucens* (Linnaeus, 1758)

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ABSTRACT

A growing global population raises questions of food security and sustainability. The environmental cost of protein sources (fishmeal, soya, etc.), especially those used in animal production, has necessitated alternative and environmentally friendly solutions. The larvae of the black soldier fly (BSF), (*Hermetia illucens* L., Diptera: Stratiomyidae), with their high protein and fat content, are an outstanding and innovative biological resource in this area. Their short life cycle, high biomass production and ability to bio-transform organic waste make them an important player in the circular economy. This study focuses on the potential use of the BSF in the recycling of organic waste and as an alternative protein source in livestock and aquaculture feed. In addition, the contribution of larval excretions (frass) to agricultural production as organic fertiliser and the evaluation of BSF oils in biodiesel production are discussed. International studies show that BSF-based practises reduce greenhouse gas emissions, reduce the burden on organic waste landfills and offer economically sustainable solutions. In Türkiye, the potential for utilising waste from the food industry and agricultural by-products for this purpose is particularly promising.

To summarise, the BSF offers a viable and innovative biotechnological solution that is directly in line with global sustainable development goals, both in terms of waste management and alternative protein production.

Keywords: BSF, sustainability, alternative proteins, organic waste, circular economy

DIPTERA (INSECTA) RESEARCH AND ITS CONTRIBUTIONS TO SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

Diptera, one of the most diverse insect orders, plays a crucial role in ecosystems and human well-being. Recent studies highlight their potential contribution to several Sustainable Development Goals (SDGs), in particular SDG 2 (Zero Hunger), SDG 3 (Good Health and Well-being), SDG 12 (Responsible Consumption and Production) and SDG 15 (Life on Land).

In relation to SDG 2, the larvae of the black soldier fly (*Hermetia illucens*) provide a sustainable source of protein through the bioconversion of organic waste into nutrient-rich biomass. This larval biomass can replace fishmeal or soya beans in animal feed and thus contribute to food security while reducing environmental pollution (Surendra et al., 2016). For SDG 3, Diptera serve as model organisms in biomedical research. *Drosophila melanogaster* has significantly improved the understanding of genetics, disease mechanisms and drug development (Bellen et al., 2010). In addition, medical entomology targets vector species such as *Anopheles* spp. *Culex* spp. or *Aede*s spp. contributes to the prevention and control of malaria, dengue fever and other vector-borne diseases (WHO, 2020). Diptera also support SDG 12 through waste utilisation strategies. They contribute to a sustainable agriculture and food industry by producing proteins, lipids and biofertilisers in line with the principles of the circular economy, while reducing landfill waste and greenhouse gas emissions. (Zheng et al., 2012; Agustiyani et al., 2021). In relation to SDG 15, Diptera are important pollinators, decomposers and prey that contribute to the functioning of terrestrial ecosystems and the conservation of biodiversity. Research into invasive pest species contributes to the protection of agricultural productivity and natural habitats (Chapman et al., 2013).

Diptera research bridges the gap between basic and applied sciences and offers innovative solutions to global challenges. The integration of entomological knowledge into food systems, health strategies and biodiversity management enables significant progress towards achieving several SDGs.

Keywords: True flies, SDGs, food security, waste valorization, biodiversity

SUSTAINABILITY PRINCIPLES IN THE SUPPLY OF WOOD RAW MATERIALS FOR THE TIMBER PROCESSING FOREST PRODUCTS SECTOR IN ZONGULDAK PROVINCE IN THE CONTEXT OF RICH FOREST RESOURCES AND BIODIVERSITY IN THE FILYOS VALLEY

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ABSTRACT

In Zonguldak province, one of Turkey's key centres for the wood processing industry, the sustainability of raw material supply is of critical importance in terms of industrial continuity and ecological balance. This study aims to analyse the sustainability of the wood raw material supply chain in Zonguldak and develop comprehensive solutions to the problems encountered. Based on the annual processing capacity of 50,000 m³ and production volume of 89 million TL of 53 facilities in the region, inventory shortages, supply chain risks, technological constraints, and lack of stakeholder participation are discussed. The research is based on data from the General Directorate of Forestry covering the period 2019–2025 and a literature review. The study examined the annual growth and felling quota data for the main tree species in the region, such as beech, oak and hornbeam. The main issues identified are outdated forest inventories, high loss rates during harvesting and transportation, and dependence on a limited number of species. The findings indicate that the annual growth potential is not being effectively utilized and that the supply chain is vulnerable to high-impact risks such as forest fires. Consequently, integrated policy steps such as updating management plans, promoting certification and traceability systems, developing resilience strategies against risks, and recycling wood residues into the economy are essential to ensure sustainability in the supply chain. These measures have the potential to increase supply security in the region while also making significant contributions to rural development and the sector's competitiveness.

Keywords: Sustainability; timber supply chain; forest management; zonguldak; biomass utilisation; risk resilience

BIOCHEMICAL CHANGES IN FRUITS DURING THE DEVELOPMENTAL PERIOD

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ABSTRACT

The dynamic interactions of sugars, acids, phenolic compounds, and volatile substances characterize biochemical changes occurring in fruits during the development period. The combined effect of these changes determines the quality characteristics of the fruit as perceived by the consumer, such as taste, color, aroma, and nutritional value. During the early development stage, when cell division and expansion are ongoing intensively, carbohydrate metabolism supports the synthesis of structural components. Sucrose transport and starch accumulation form the fundamental elements of this process. During the growth stage, respiration rate and enzymatic activities increase to meet energy requirements. During the transition to ripening, the hydrolysis of starch into sugars, the breakdown of organic acids through respiration, and the increase in the sugar/acid ratio determine the flavor profile. During this process, chlorophyll degradation triggers the synthesis of carotenoids and anthocyanins, changing the color of the fruit, while the activation of cell wall hydrolases such as pectinase and cellulase softens the fruit tissue. At the same time, changes in the composition of phenolic compounds and the synthesis of volatile aroma compounds shape the nutritional value and sensory quality of the fruit. Therefore, fruit development occurs as a result of the coordinated interaction of numerous physiological mechanisms, such as carbohydrate metabolism, pigment biosynthesis, cell wall dynamics, and phenolic metabolism; these biochemical and physiological changes directly determine the final quality characteristics of the fruit and its nutritional value for the consumer.

Keywords: Fruit development, biochemical changes, physiological mechanisms, ripening.

MECHANISMS OF COLOR CHANGE IN FRUITS

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ABSTRACT

Color change in fruits is one of the most important indicators of physiological ripening and is controlled by genetic and biochemical regulation in pigment metabolism. Chlorophyll, which is the source of the green color in fruits in the early stages of development, undergoes degradation under the influence of enzymes such as chlorophyllase and Mg-dechlorophyllase, while carotenoid and flavonoid/anthocyanin biosynthesis accelerates during the ripening process. Genes such as PSY (phytoene synthase), PDS (phytoene desaturase), ZDS (ζ-carotene desaturase), LCYB (lycopene β-cyclase), and CHYB (β-carotene hydroxylase) play key roles in carotenoid biosynthesis. In anthocyanin biosynthesis, the main enzymes of the phenylpropanoid pathway are PAL (phenylalanine ammonia-lyase), CHS (chalcone synthase), CHI (chalcone isomerase), F3H (flavanone-3-hydroxylase), DFR (dihydroflavonol 4-reductase), and UFGT (UDP-glucose flavonoid 3-O-glucosyltransferase) genes, which play decisive roles. The expression of these genes is largely regulated by ethylene, ABA, and light signals and is controlled by transcription factors (MYB, bHLH, and WD40). Therefore, understanding the mechanisms of color change in fruits not only at the physiological level but also at the genetic and molecular levels is of great importance both for improving product quality in fruit production and for directing pigment content through biotechnological approaches.

Keywords: Anthocyanins, chlorophyll degradation, fruit ripening, carotenoids, flavonoids

SUSTAINABLE MATERIALS FOR FUTURE: BELIEF IN BENGALI FOLKLORISTICS (KHONA'S SPEECH)

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ABSTRACT

Khona's speech or 'Bachan' is very valuable collection of Bengali traditional proverbs of folklore and Bengali literature which is very close and realistic to ancient agriculture, environment and philosophy of Bengali life and culture. Khona is a legendary figure of ancient and medieval Bengali region. Her speech was full of practical knowledge and It refers timeless wisdom and knowledge about nature, agriculture, environmental issues, sustainable living and many more. On the other hand The Sustainable Development Goals(SDGs) Concept is the centerpiece of the 2030 agenda for sustainable development, were adopted by United Nations Sustainable Development Summit in September 2015 which refers a universal call to action for the betterment of people and the whole world within. The SDGs are designed of 17 interlinked goals to address global challenges such as poverty, hunger, health, education, gender equality, clean water and sanitation, climate action etc. It is seen that Khona's proverbs remarkably rooted in the cultural and environmental context of Bengal are deeply aligned with the United Nations Sustainable Development Goals. This paper will show how Khona's thoughts are so similar and practical for the new world to preserve save human life connected to nature without making any loss for the nature. To the utter misery, humans have shown a profound lack of concern inviting impending dangers for upcoming generations. Nowadays, numerous literary works are being analyzed through an eco-critical point of view to warn people of its dire consequences. This paper has been planned keeping this concern in mind. Here the major proverbs of Bengali philosopher Khona and the wonderful concepts of United Nations sustainable development goals have been studied from an eco-critical point of view. This study attempts to depict how these matters versify their ecological consciousness and retain a deeper appreciation for the natural world through their goals and creations.

Key word: Folk Literature, Sustainable, Future, Development, Ecology

BIBLIOMETRIC ANALYSIS OF LITERATURE ON SUSTAINABILITY REPORTING THROUGH SOCIAL MEDIA

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ABSTRACT

This paper conducts an extensive bibliometric analysis of the scholarly literature on sustainability reporting through social media, with the purpose of mapping out its intellectual, thematic, and methodological development. The analysis aims to answer three fundamental research questions, based on a selected body of 423 peer-reviewed publications indexed in Scopus published between 2006 and 2025: (1) What are the primary publication-related trends, most productive researchers, and institutions in the area? (2) What thematic groupings and conceptual frameworks characterize the discussion on digital sustainability communication? and (3) What theoretical frameworks and methodological orientations prevail in the most influential publications? Based on a combination of bibliometric indicators as well as co-word and co-citation analysis combined with full-text content review, the research finds five key research clusters: corporate legitimacy and greenwashing, stakeholder engagement and dialogic communication, ESG performance transparency, strategic CSR communication, and data-driven sentiment analysis. The most common theoretical lenses identified are legitimacy theory, stakeholder theory, institutional theory, dialogic communication theory, and impression management theory. The analysis also shows that publication has increased since 2014, that there is a shift towards interdisciplinary studies, and that there is an increasing resort to AI-based methods such as sentiment analysis and natural language processing. The present bibliometric analysis enhances the systematic knowledge of the impact of social media on sustainability reporting and the prospects of research through the lens of undiscussed geographies, like the role of governance in platforms, third world economies, and the effects of algorithms on ESG stories.

Keywords: sustainability reporting, social media, bibliometric analysis, ESG disclosure, stakeholder engagement, legitimacy theory, co-citation analysis, Scopus

ENTREPRENEURIAL RESILIENCE AND GLOBAL MARKET EXPANSION: MANAGERIAL STRATEGIES FOR INTERNATIONAL GROWTH

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ABSTRACT

The rapid transformations of the global economy, driven by financial, health, geopolitical, and climate crises, expose firms to unprecedented levels of uncertainty. In this context, entrepreneurial resilience—understood as the ability to overcome shocks and transform disruptions into opportunities—emerges as a critical lever to support sustainable international growth (Kuntz et al., 2020; Safón, 2024).

The literature in entrepreneurship and international management highlights that entrepreneurial resilience fosters innovation, adaptability, and entry into new markets (Linnenluecke, 2017; Galkina et al., 2023). However, existing research remains fragmented and does not yet provide a clear theoretical framework linking this concept to international growth strategies (Wang et al., 2024).

Accordingly, the research question is as follows: *How does entrepreneurial resilience contribute to strengthening the sustainable international growth of firms?*

Methodologically, this study adopts a purely theoretical approach, drawing on a literature review to clarify and structure the key concepts related to our research question. The aim is to examine, through the lenses of strategic management, entrepreneurship, and international business, how entrepreneurial resilience can be conceptualized as a managerial strategy serving international growth. Our approach focuses on the development of a conceptual framework that articulates the main mechanisms linking resilience, managerial strategies, and international growth. This study therefore seeks to make a theoretical contribution by consolidating the conceptual foundations of the field and opening avenues for future empirical research.

Keywords: Entrepreneurial resilience; international business; International growth; Managerial strategies;

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ECONOMIC IMPACT OF MAJOR SPORTING EVENTS ON HOST CITIES: EVIDENCE FROM GLOBAL CASE STUDIES (2000–2024)

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ABSTRACT

Sports economics has evolved into a critical interdisciplinary domain exploring the financial and developmental effects of sporting activities on local and global economies. Mega-sporting events—such as the Olympic Games, FIFA World Cup, and Asian Games—are often promoted for their potential to generate substantial revenues, stimulate employment, and transform urban infrastructure. This study investigates the short- and long-term economic consequences of hosting such events across 15 global cities from 2000 to 2024. Using panel data from official reports, World Bank databases, and tourism statistics, the research employs input–output modelling and difference-in-differences analysis to estimate changes in gross regional product (GRP), tourism revenue, employment, infrastructure spending, and public debt. Findings reveal significant short-term boosts in GRP (6–12%) and tourism income (15–30%), but persistent fiscal burdens in several developing cities due to infrastructure cost overruns (20–40%) and maintenance debt. The paper highlights the necessity of transparent budgeting, legacy-focused facility planning, and equitable public–private partnerships to achieve sustainable outcomes.

Keywords: sports economics; mega-sporting events; urban economy; input–output modelling; tourism revenue; sustainable planning

ECONOMIC AND POLICY DETERMINANTS OF RENEWABLE ENERGY CONSUMPTION. THE CASE OF EU COUNTRIES

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ABSTRACT

The transition towards a sustainable economy constitutes one of the most pressing objectives within the long-term strategic framework, representing a central focus in legislative initiatives following the ratification of the Paris Agreement. At the same time, regional measures prove insufficient in the light of expanding global economic and social relations. The purpose of this study is to assess the linkages among renewable energy consumption, environmental policy stringency, and global economic openness for the 27 EU member states between 2000 and 2024. The analysis is based on panel data estimation techniques, using Renewable Energy Consumption (REC) as the dependent variable and the Environmental Policy Stringency Index, Globalization Index, Gross Domestic Product per capita, Trade Openness, and Population Density as independent variables. We expect that environmental policies will have a significant and positive impact on the consumption of green energy, while economic collaboration is anticipated to foster innovation and the transition towards a sustainable economy.

Keywords: Environmental policy stringency; renewable energy consumption; globalization; EU countries.

THE IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC DEVELOPMENT IN NIGERIA: 1995-2024

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ABSTRACT

The study investigates Foreign Direct Investment and Economic Development nexus in Nigeria from 1995-2024. The broad objective of the study - The Impact of Foreign Direct Investment (FDI) on Economic Development in Nigeria. The specific objectives of the study include to: examine the effect of inflation on Nigeria's economy; assess the contributions of trade openness on economic development in Nigeria; identify the challenges associated with FDI in Nigeria; provide policy recommendations to enhance the impact of FDI on economic growth in Nigeria.

The data for this study is based on the secondary annual time series that covers the period from 1995 to 2024. The sources of data includes: Central Bank of Nigeria CBN) bulletins, National Bureau of Statistics, and the World Bank. The dependent variable for the study is Real Gross Domestic Growth Rate,(RGDPGR), while the independent variables includes: Foreign Direct Investment(FDI), Gross Fixed Capital Formation(GFCF), Per Capita Income (PCI), Exchange rate(EXR). The study employed descriptive analysis, ordinary least squares (OLS) regression, Johansen cointegration , granger causuality test and diagonistic robustness tests to comprehensively investigate the dynamic relationship among these variables. The major findings of the study are as follows: Descriptive statistics revealed Nigeria's GDP growth averaged (4.11%), FDI inflows averaged (15.27% of GDP), Inflation was persistently high leverage (17.02%) and highly volatile. The OLS regression results indicated FDI has a positive and statistically significant impacts on economic growth; inflation and exchange rate has insignificant short run effects on GDP, though theoretically aligned with growth deterrents. The Johansen cointegration test confirmed long run equilibrium relationship among all variables which implies that macroeconomics variables - FDI, GFCF, INF, EXR and TOP move together with GDP growth over time. Policy recommendations are proposed to enhance the role of Foreign Direct Investment (FDI), mitigate the effects of inflation through prudent macroeconomic management, and leverage on trade openness to foster sustainable economic growth in Nigeria. Also to strengthen FDI-friendly policies and tackles structural barriers to FDI Effectiveness.

Key Words: Foreign Direct Investment, Trade Openness, Fixed Capital Formation

MARKETING AND SOCIAL INNOVATION: A STRATEGIC DRIVER FOR SUSTAINABLE AND INCLUSIVE DEVELOPMENT

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ABSTRACT

In a context shaped by profound economic, technological, and social transformations, marketing is no longer limited to a purely commercial logic but increasingly incorporates social and sustainable dimensions. Social innovation, defined as the development of new solutions to collective needs, has become an essential field for companies, institutions, and organizations seeking to strengthen their societal impact while ensuring economic performance. This paper analyzes the interactions between marketing and social innovation, highlighting their role in creating shared value, enhancing social cohesion, and fostering inclusive development. Through a theoretical approach supported by practical examples, it explores how marketing strategies can encourage citizen participation, promote responsible behaviors, and ensure the sustainability of social initiatives. The findings underline the importance of committed marketing, driven by social innovations capable of transforming consumption and production practices in a sustainable way.

Keywords: Marketing, Social Innovation, Sustainable Development, Responsible Consumption, Shared Value.

THE IMPACT OF THE MIND DIET ON MORTALITY, CHRONIC DISEASES, AND MENTAL HEALTH: COMPREHENSIVE EVIDENCE FROM DIVERSE POPULATIONS

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ABSTRACT

Background: The MIND diet (Mediterranean-DASH Diet Intervention for Neurodegenerative Delay) was originally developed to slow cognitive decline and reduce the risk of Alzheimer's disease, combining elements of the Mediterranean and DASH diets with a focus on brain- and cardiovascular-protective foods. In recent years, its potential effects on mortality, chronic diseases, as well as mental and functional health have also been investigated.

Methods and Results: Multiple cohort and case-control studies (NHANES, Framingham, Lothian, Isfahan, Hong Kong) examined adherence to the MIND diet (MIND Dietary Score, MDS) and related health outcomes. Higher MDS was consistently associated with reduced all-cause and cardiovascular mortality (up to 10–13% per point increase), a metabolically healthy phenotype, and lower risk of type 2 diabetes. Oncological findings indicated that higher MDS was linked to reduced incidence of breast cancer and gliomas. Adherence to the MIND diet also improved functional capacity, reduced frailty and physical decline, and showed beneficial effects on depression, anxiety, and psychological stress.

Conclusion: The accumulated evidence suggests that the MIND diet is not only neuroprotective but also broadly health-promoting: it lowers mortality, mitigates cardiometabolic and oncological risks, and supports both physical and mental well-being. Beyond its original purpose, the MIND diet emerges as a promising intervention strategy for healthy aging and chronic disease prevention.

Keywords: MIND diet, cognitive health, mortality, cardiometabolic diseases, oncological risk, frailty, mental health, functional capacity

Funding: The project was funded by the Ministry of Innovation and Technology under the National Cardiovascular Laboratory Program (RRF-2.3.1-21-2022-00003) from the National Research, Development and Innovation Fund. Project, no. TKP2021-NKTA-47 was funded by the National Research, Development and Innovation Fund under the TKP2021-NKTA, with the support from the Ministry of Innovation and Technology of Hungary.

THE USE OF MACHINE LEARNING FOR GENDER EQUALITY IN HEALTHCARE

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ABSTRACT

EquiHER's mission is to address a critical challenge in global health: gender-based disparities in medical diagnosis. Aligned with the United Nations Sustainable Development Goal (SDG) 3.8: Universal Health Coverage, the system leverages a neural network trained on synthetic medical data to identify patients at risk of misdiagnosis, with a particular focus on the differential presentation of symptoms in women.

The model evaluates 15 clinical variables and achieves an accuracy rate of 84–87%, enabling clinicians to detect potential diagnostic errors more effectively. By highlighting overlooked symptom patterns and supporting physicians in making more equitable decisions, EquiHER promotes both SDG 3 (Good Health and Well-Being) and SDG 5 (Gender Equality).

This research underscores the importance of integrating artificial intelligence into clinical decision-making systems to mitigate healthcare bias. By ensuring women receive accurate and timely diagnoses, EquiHER not only enhances patient outcomes but also empowers women to contribute fully to society, driving progress toward a healthier and more equitable world.

Keywords: Universal Health Coverage, Gender Equality, Diagnostic Bias, Artificial Intelligence, Sustainable Development Goals

SUSTAINABLE PHARMACEUTICAL SUPPLY CHAIN

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ABSTRACT

The pharmaceutical industry plays a vital role in global health by ensuring access to safe and effective medicines; however, it faces increasing challenges in balancing efficiency, affordability, and environmental responsibility. Sustainable pharmaceutical supply chains (SPSCs) have emerged as a critical approach to address these challenges by integrating economic, environmental, and social considerations across the entire lifecycle of pharmaceuticals—from raw material sourcing and production to distribution, consumption, and end-of-life management. Key areas of focus include reducing carbon emissions through energy-efficient manufacturing, implementing green chemistry principles, adopting biodegradable packaging, and promoting ethical sourcing of raw materials. Furthermore, digital technologies such as blockchain, artificial intelligence, and Internet of Things (IoT) are being leveraged to enhance transparency, traceability, and resource optimization within supply chains. Addressing pharmaceutical waste and mitigating environmental pollution from active pharmaceutical ingredients (APIs) are also central to achieving long-term sustainability. Collaboration among stakeholders—including manufacturers, healthcare providers, regulators, and consumers—is essential for advancing circular economy models and resilient supply networks. Ultimately, sustainable pharmaceutical supply chains not only minimize ecological footprints but also strengthen public health outcomes, improve access to essential medicines, and support the broader United Nations Sustainable Development Goals (SDGs).

Keywords: Sustainable pharmaceutical supply chains; green pharmacy; supply chain management; circular economy; pharmaceutical waste; environmental sustainability; ethical sourcing,

SUSTAINABLE DRUG MANUFACTURING: A GREEN CHEMISTRY APPROACH

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ABSTRACT

Green chemistry principles can be fully applied in making medicines in a greener way by using no solvents or environmentally friendly solvents, like water. It also involves using alternative reaction methods, and thinking about one-step processes, multi-component reactions, continuous production, and making reactions more efficient. This helps in using materials better and creating less waste. Using green chemistry in making medicines can be done by looking at the entire life cycle of the medicine from start to finish, making sure it is safer for the environment and uses resources more efficiently. This review covers how green chemistry ideas can be used in every part of making a medicine, from the starting materials to the intermediate steps and finally the finished product. It also shows how these ideas can be used in large-scale manufacturing. We have given examples of how green methods are used to make some common medicines, going through the steps from raw materials to the intermediate parts and then to the final product. Scientists and companies have carefully worked on making these green processes to improve efficiency and cut down on waste, which is better for the planet. We have talked about important reactions that are helpful in green chemistry, including one-pot reactions, multi-component reactions, continuous methods, and efficient processes, which can help shape the future of making medicines in a sustainable way.

Key Words: Green chemistry, Drug synthesis, Sustainable manufacturing, Eco-friendly drug production, Waste reduction strategies

THE ROLE OF BIOTECHNOLOGY IN SUSTAINABLE DRUG DEVELOPMENT

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ABSTRACT

Biotechnology is transforming the landscape of drug development by providing innovative, sustainable approaches that address global health challenges while minimizing environmental and economic burdens. Traditional pharmaceutical production often involves resource-intensive processes, high energy consumption, and chemical waste, raising concerns about long-term sustainability. In contrast, biotechnological methods—such as recombinant DNA technology, synthetic biology, and bioprocess engineering—enable the efficient production of therapeutic compounds using renewable resources and eco-friendly systems. Microbial and plant-based expression platforms, for example, reduce reliance on animal-derived products and toxic solvents, thereby lowering the environmental footprint. Advances in bioinformatics and genomics also accelerate the identification of novel drug targets, decreasing research timelines and costs. Furthermore, biopharmaceuticals, including monoclonal antibodies, vaccines, and gene therapies, demonstrate higher efficacy and specificity, leading to reduced dosage requirements and fewer side effects, which contribute to sustainable healthcare outcomes. Beyond production, biotechnology supports green chemistry principles through enzyme catalysis and biodegradable delivery systems, aligning drug development with global sustainability goals. As demand for affordable and accessible medicines rises, biotechnological innovations play a critical role in creating scalable, environmentally responsible, and socially equitable pharmaceutical solutions. Thus, biotechnology stands as a cornerstone for advancing sustainable drug development and ensuring resilient healthcare systems for the future.

Keywords: Biotechnology, Sustainable Drug, Healthcare Systems

SUSTAINABLE HEALTHCARE SYSTEMS: BALANCING COST, QUALITY, AND ACCESSIBILITY

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ABSTRACT

The pursuit of sustainable healthcare systems has become a global priority in the context of rising healthcare costs, inequitable access, and variable quality of services. A sustainable healthcare system is one that delivers high-quality care, remains financially viable, and ensures universal accessibility without compromising the needs of future generations. However, striking a balance between cost containment, service quality, and equitable access presents complex challenges. This paper examines the multidimensional aspects of healthcare sustainability, focusing on economic efficiency, patient-centered quality, and inclusivity. It explores key strategies such as strengthening primary healthcare, integrating digital health technologies, adopting value-based care models, and promoting preventive health initiatives. Additionally, the role of policy reforms, public–private partnerships, and sustainable financing mechanisms in bridging the gap between resource limitations and rising healthcare demands is critically analyzed. By synthesizing global best practices and ongoing innovations, the paper argues that sustainable healthcare systems are achievable when cost, quality, and accessibility are treated as interdependent pillars rather than competing priorities.

Keywords: Sustainable Healthcare, Universal Health Coverage, Health Equity, Value-Based Care, Health Policy, Accessibility

SUSTAINABLE PHARMACY: INTEGRATING HEALTH, ETHICS, AND ENVIRONMENTAL RESPONSIBILITY

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ABSTRACT

Sustainable Pharmacy extends the scope of pharmaceutical practice beyond immediate medical needs, embedding long-term responsibility for both present and future generations. Unlike conventional pharmaceutical progress, which largely benefits current populations, this framework applies systems thinking to integrate prevention, treatment, and health outcomes with broader social, cultural, economic, and environmental determinants of well-being. Its guiding philosophy reflects the medical principle of "do no harm," but expands it to include ethical, ecological, and societal responsibilities. Distinct from Green Pharmacy, which mainly addresses environmental pollution, Sustainable Pharmacy avoids risks of greenwashing . Pharmacies, as highly accessible healthcare institutions, play a pivotal role in this transition. They can integrate eco-design, responsible sourcing, innovative packaging, renewable materials, waste reduction, and sustainable supply chains aligned with circular economy principles. Equally important is patient and public education, encouraging safe medicine use, sustainable disposal practices, and preventive health choices. Ultimately, Sustainable Pharmacy provides a comprehensive model uniting environmental responsibility with ethical healthcare delivery. By aligning pharmaceutical science with sustainability, it aims to secure human and planetary health for future generations.

Keywords: Eco-design of medicines , Pharmaceutical waste reduction, Safe medicine disposal .

ANALYSIS OF INCLUSION AND SUSTAINABILITY POLICIES FOR PERSONS WITH DISABILITIES IN ALBANIA

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ABSTRACT

Sports inclusion policies for people with disabilities constitute an essential element for ensuring equality, access and active participation in social life. They significantly affect the improvement of the quality of life of this category. This study aims to analyze the implementation of policies for the inclusion of people with disabilities in sports in Albania. It examines the level of support through the legal framework, strategic documents, regulations and institutional initiatives. The aim is to assess to what extent these policies translate into concrete and sustainable practices that ensure equal access to sports and physical activities. The methodology included the analysis of state documents and semi-structured interviews with representatives of public institutions, sports federations and the pre-university education system. This approach helped to create a clear picture of the conception and implementation of policies in practice.

The results show the lack of a stable legal and financial basis for supporting sports activities of this category. The lack of appropriate infrastructure, poor inter-institutional coordination and limited funds are among the main challenges. In pre-university education, the sports inclusion of students with disabilities remains low, while sports federations often lack the capacity to develop special programs.

The study highlights the need for a comprehensive strategy that ensures clear policies, dedicated funding and investments in accessible infrastructure. Only in this way can equal participation in sports and full social integration of people with disabilities be guaranteed.

Keywords: Politics, sustainability, inclusive sport, people with disabilities, integration

ENVIRONMENTAL POLLUTION AND REMEDIATION STRATEGIES: A REVIEW

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ABSTRACT

Human health, ecosystem stability, and global sustainability are all seriously threatened by environmental contamination. Pollutants such as pesticides, heavy metals, and hydrocarbons have accumulated in soil and water systems because of intensive farming practices, rapid industrialization, and urbanization. This study examines and assesses contemporary remediation techniques meant to lower pollutant levels and improve environmental quality, including advanced oxidation processes, phytoremediation, and bioremediation. The use of natural and sustainable methods that break down, change, or immobilize harmful compounds through the use of microbes and plants is emphasized. Long-term ecosystem regeneration can be achieved effectively and environmentally by combining biological and technological approaches. Green remediation techniques are a fundamental component of sustainable environmental management, and their findings add to the expanding body of research proving this.

Keywords: Environmental Pollution, Bioremediation, Phytoremediation, Sustainable Development, Ecosystem.

APPLICATION OF SUSTAINABLE BUILDING MATERIALS FOR GREEN CONSTRUCTION IN BANGLADESH

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ABSTRACT

Bangladesh is experiencing rapid urbanization, which has led to increased demand for construction materials and energy resources. The construction sector contributes significantly to the national economy but also causes substantial environmental impacts. According to the World Bank (2020), around 38% of total CO_2 emissions in Bangladesh are linked to the construction sector, mainly from the use of cement, clay bricks, and steel. Conventional brick kilns alone are estimated to emit 15–17 million tons of CO_2 annually, along with severe air pollution (DoE, 2019). To mitigate these challenges, sustainable alternatives such as fly ash bricks, compressed stabilized earth blocks (CSEB), recycled aggregates, bamboo, and low-carbon cement have been introduced in local pilot projects. Research shows that replacing 20% of cement with fly ash can reduce carbon emissions by nearly 30% without compromising structural strength (Haque & Rahman, 2018). Similarly, the use of CSEB reduces construction costs by up to 25% while maintaining durability in rural housing (UN-Habitat, 2015). This paper reviews national reports, case studies, and available literature to evaluate the potential of these sustainable building materials in the context of Bangladesh. Findings suggest that using locally available, eco-friendly materials can lower greenhouse gas emissions and provide affordable housing solutions. The study concludes that adopting sustainable construction practices is crucial for Bangladesh to achieve SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action), and that wider use of green materials can significantly contribute to a resilient and sustainable built environment.

Keywords: Sustainable construction, Green building, Low-cost materials, Environmental impact, Bangladesh

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REVOLUTIONIZING CONSTRUCTION: EMERGING MATERIALS AND THEIR ROLE IN SUSTAINABLE DEVELOPMENT

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ABSTRACT

The construction industry, responsible for 39% of global carbon emissions (1), faces urgent demands for sustainable transformation. This article explores five innovative building materials—self-healing concrete, graphene, bamboo composites, hempcrete, and recycled plastics—that address durability, cost, and environmental challenges. By synthesizing peer-reviewed research, we analayze their properties, applications, and contributions to sustainability. Future trends like nanotechnology and AI-designed materials are also highlighted to forecast a paradigm shift toward decarbonized construction.

Keywords: Emerging materials, Development, innovative building material.

FROM WASTE TO VALUE: CONCEPTUALIZING A FASHION HUB FOR SUSTAINABLE FUTURES

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ABSTRACT

The fashion industry's growing environmental impact, driven largely by fast fashion, has resulted in excessive textile waste and unsustainable production practices. Addressing this challenge, the present research project, developed in collaboration with Generations Clothing Brand, proposes the design of a Fashion Hub that embodies sustainability through spatial innovation and creative reuse. The central concept, Transmogrify Remnants, reimagines discarded textiles as valuable resources, transforming them into meaningful and imaginative fashion products while reflecting both ecological awareness and Generations' design ethos.

The hub is envisioned as a dynamic, multifunctional space that integrates retail zones, interactive galleries, creative studios, processing units, and educational facilities into a unified experience. It allows users not only to engage with sustainable fashion but also to witness the transformation of waste into value, fostering awareness and curiosity. Design-based methodology anchors the project through conceptualization, where the architectural and interior language embodies sustainability, innovation, and renewal. Spatial strategies emphasize up-cycling, zero-waste practices, and regenerative design, positioning the hub as both a production and educational platform. Workshops, exhibitions, and hands-on experiences further encourage dialogue around environmentally responsible fashion.

By reframing waste as potential, the project challenges the conventions of fast fashion and proposes a regenerative model that fuses creativity, education, and sustainability. Ultimately, the Fashion Hub offers not only a design solution but also a cultural narrative, inspiring communities to imagine and adopt more responsible futures in fashion.

Keywords: Sustainability, textile waste, up-cycling, zero-waste design, regenerative fashion

SUSTAINABLE DEVELOPMENT THROUGH CULTURAL HERITAGE: A LITERATURE REVIEW OF THE NABANNA FESTIVAL IN RURAL BANGLADESH

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ABSTRACT

A community's cultural history that has been passed down through the years is a vital part of finding more sustainable methods to do things. The latter statement is especially relevant to traditional festivals that use local knowledge, ecological principles, and community-based approaches to managing resources. The objective of this study is to examine the intersection between cultural heritage and sustainable development through an anthropological analysis of the Nabanna festival. The Nabanna festival is a celebration of the harvest in rural Bengal. After harvesting Aman rice, people celebrate the Nabanna festival. This group includes things like sharing food, dining together, cooking food that is suited for the season, and giving back to the land. This shows that people have always been aware of their surroundings and have worked together with that knowledge. This article talks about food security, biodiversity, and how knowledge is passed down from one generation to the next. To reach this goal, it uses old anthropological studies, traditional stories, and sociocultural evaluations throughout. This study's results provide us with a better idea of how the SDGs- 2 (Zero Hunger), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), and 13 (Climate Action) are all connected. Also examines how modernity, urbanization, and cultural decline affect the temporal relevance, and shows the necessity of indigenous festivals like Nabanna to achieve SDG 11.4, which protects intangible heritage. This study contributes to the interdisciplinary process of folklore in achieving sustainable development goals by representing Nabanna as both a cultural tradition and an effective manner for sustainable living. It is also an organization that works to get traditional cultural systems into school curricula, plans for coping with climate change, and development projects.

Keywords: Cultural heritage, Nabanna Festivals , sustainability, Traditional knowledge, environmental resilience

THE EVOLUTION OF RESIDENTIAL ARCHITECTURE: TOWARDS SUSTAINABLE AND BIOPHILIC DESIGN IN THE POST-PANDEMIC ERA

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ABSTRACT

From the very first homes, crafted architecture has always embodied the changing requirements of the individuals living within, even today where homes are a product of advanced technology as well as social influences. Through the perspective of survival and wellness, this article discusses the evolution of residential architecture and argues the evolution of design has greatly depended on the shifts in social interaction, comfort, and health. This article focuses on the post-industrial and modern periods with the emphasis changes to housing in terms of light, ventilation, and hygiene. The same focus will be dedicated to post-pandemic housing with the added psychological stress, isolation, and new domestic routines. Using a literature review, historical analysis, and global case studies, the research discusses the application of the interconnected principles of sustainable and biophilic design where mental and environmental health are positively influenced from natural light, greenery, and vivid colors. The proposal is a new approach to sustainable housing design that combines the archaic residential needs of humans with modern day urban demands. This study builds on the connections between historical trends and contemporary issues, aiming to enhance the global discourse on sustainable development. It provides an actionable framework to architects, urban planners, and policymakers to foster resilient and healthier post-pandemic housing.

Keywords: Residential architecture; Sustainable design; Biophilic design; Post-pandemic housing; Mental health; Social interaction; Light and ventilation

CARBON NEUTRALITY TARGETS AND FIDUCIARY DUTIES IN HONG KONG

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ABSTRACT

Hong Kong's commitment to achieving carbon neutrality before 2050, with a 50% emissions reduction by 2035 (relative to 2005), imposes significant responsibilities on corporate boards, particularly for multinationals. This study examines how these climate targets reshape directors' fiduciary duties under the Companies Ordinance (Cap. 622), focusing on legal risks and strategic responses in 2025.

As the Hong Kong Stock Exchange (HKEX) mandates ISSB-aligned climate disclosures and the Hong Kong Monetary Authority enforces TCFD-aligned reporting, directors must integrate environmental, social, and governance (ESG) considerations into strategic planning to avoid personal liability for breaches of care and skill (section 465).

Failure to align with decarbonization goals—such as net-zero electricity or green transport—may expose boards to shareholder lawsuits or regulatory penalties from the Securities and Futures Commission. This research investigates challenges, including balancing short-term profits with long-term climate strategies and addressing greenwashing risks in high-emission sectors like energy and transport. Using case studies of Hong Kong-listed firms (e.g., CLP Holdings) and comparative analysis with the EU's Corporate Sustainability Reporting Directive, the study proposes actionable strategies, such as developing board-level climate transition roadmaps and enhancing ESG training.

It employs legal analysis of fiduciary duty case laws. Findings aim to clarify how directors can navigate evolving legal expectations while contributing to Hong Kong's Climate Action Plan 2050.

The study underscores the need for legislative clarity on ESG integration and offers a framework for multinationals to align governance with sustainability, ensuring compliance and resilience in a decarbonizing global economy. This research is timely, given Hong Kong's role as a financial hub and its 2025 policy emphasis on sustainable corporate governance.

Keywords: Sustainability, Fiduciary Duties, ESG, Hong Kong, Carbon Neutrality

IMPLEMENTING BIODIVERSITY IN URBAN PROJECTS

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ABSTRACT

Urban areas face growing challenges due to rapid urbanization, climate change, and ecological degradation. This study examines strategies for implementing biodiversity in urban projects, emphasizing the role of green spaces in fostering ecological resilience and improving quality of life. Through a review of case studies and scholarly literature, the research explores the planning, design, and management of diverse urban green infrastructures, including public parks, urban and peri-urban forests, and fragmented green spaces. These spaces are analyzed not only as ecological assets but also as vital components of social well-being and climate adaptation. Key findings highlight multiple dimensions of urban biodiversity. Urban and peri-urban agriculture can strengthen food security while enhancing community cohesion. Linear or localized green spaces, such as roadside vegetation and transport corridors, contribute to connectivity between fragmented ecosystems. The study also addresses the critical relationship between biodiversity and urban water systems, examining rivers, ponds, wetlands, and their roles in flood risk management and ecological resilience, particularly in coastal cities. Furthermore, the integration of biodiversity into the built environment is explored through bioclimatic architecture, green roofs, walls, and facades, which support urban cooling and habitat creation. Pollution and waste management emerge as crucial factors for biodiversity protection. Strategies for landfill rehabilitation and post-landfill biodiversity demonstrate pathways to restore degraded urban sites. The study concludes by emphasizing biodiversity mainstreaming in all phases of urban planning, ensuring that ecological considerations are embedded in decision-making to create sustainable, resilient, and livable cities.

Keywords: Urban biodiversity, green infrastructure, ecological resilience, urban planning, sustainable cities.

SPATIAL AND TEMPORAL PERSPECTIVES ON URBAN BIODIVERSITY

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ABSTRACT

Urban areas are dynamic ecosystems where human activity and natural processes intersect, making biodiversity a critical component of sustainable development. This study explores the spatial and temporal dimensions of biodiversity in urban environments, emphasizing its role in enhancing ecological resilience and improving human well-being. Through a comprehensive review of case studies and scholarly literature, the research highlights how biodiversity can be strategically integrated throughout the urban project cycle. The analysis begins with the importance of understanding territories by examining the interactions between their natural systems and human populations, thereby fostering place-specific, knowledge-based strategies. The study argues for biodiversity protection and promotion at multiple scales: ensuring coherence and continuity of ecosystems at the territorial level, fostering ecological connectivity between regions and cities, and designing urban neighborhoods to integrate green habitats. It further examines how biodiversity meets human needs by providing ecosystem services and Nature-based Solutions (NbS), such as climate regulation, pollution mitigation, and social well-being. The research also discusses the development of biodiversity indicators to monitor urban ecosystems effectively. Risk assessment and management are addressed by identifying potential threats to biodiversity, including urban development and construction activities, while emphasizing restoration and compensation strategies. Finally, the study highlights the importance of inclusive design and governance, advocating for collaborative approaches that engage stakeholders through consultation and awareness-raising. By integrating biodiversity into urban planning and management, cities can become drivers of ecological coherence, resilience, and sustainable development.

Keywords: Urban biodiversity, ecosystem services, Nature-based Solutions, ecological resilience, urban planning, sustainable cities

THE NECESSITY OF PUBLIC RELATIONS IN THE SUSTAINABILITY COMMUNICATION PROCESS AND SOCIAL IMPACT ANALYSIS

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ABSTRACT

The purpose of this study is to address sustainability communication within the context of public relations and to develop a social impact analysis–based approach. Sustainability is a holistic concept that aims for growth by ensuring the continuity of economic, environmental, social, and cultural services. Playing a key role in maintaining social order and welfare, this understanding requires stakeholder participation at both national and international levels. In this regard, sustainability communication based on the principle of participation seeks to raise public awareness through media relations, accountability, the promotion of education and science, information sharing with stakeholders, and reporting processes. At this point, the role of public relations as a strategic communication tool comes to the fore.

The study discusses the historical development of the concepts of sustainability and public relations, emphasizing the necessity of ethics, conscience, and social responsibility. In addition, the concept of social impact analysis is defined, while its significance, challenges, and techniques are explored. While presenting the conceptual framework and dimensions of sustainability communication, the study also evaluates the functions of public relations in terms of strategic management, stakeholder engagement, ethical responsibility, and social guidance.

In conclusion, this research aims to develop a future-oriented model of social change and to make an original contribution to the field of sustainability communication. Since there are only a limited number of academic studies that approach the subject holistically, the research is expected to serve as a guide for both the literature and practical applications.

Keywords: Sustainability, Public Relations, Sustainability Communication, Social Impact Analysis

[1] This article is derived from the doctoral dissertation prepared by Elif Yılmaz under the supervision of Prof. Dr. Ebru Özgen in the Public Relations Doctoral Program, Department of Public Relations and Publicity, Institute of Social Sciences, Marmara University.

EKOFEMİNİST BİR PERSPEKTİFTEN SÜRDÜRÜLEBİLİRLİK SÖYLEMLERİ: İLETİŞİM STRATEJİLERİNİN ELEŞTİREL ANALİZİ

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ÖZET

Son yıllarda sürdürülebilirlik, yalnızca çevre politikalarının değil, aynı zamanda küresel ölçekteki iletişim stratejilerinin de merkezî bir teması haline gelmiştir. Ancak bu söylemler çoğu zaman, toplumsal eşitsizlikleri yeniden üreten, belirli grupları görünmez kılan ve sürdürülebilirliği toplumsal özünden uzaklaştırarak sembolik pratiklere indirgeyen bir karakter taşımaktadır. Bu çalışma, sürdürülebilirlik iletişimini ekofeminist bir perspektifle eleştirel biçimde incelemekte; çevresel sorunlar, toplumsal cinsiyet dinamikleri ve sosyal adalet arasındaki çok katmanlı kesişimlere odaklanmaktadır.

Kurumsal sürdürülebilirlik raporları ve dijital iletişim kampanyaları üzerinde gerçekleştirilen eleştirel söylem analizi aracılığıyla, kadınların ve dezavantajlı toplumsal grupların sürdürülebilirlik anlatılarında nasıl temsil edildiği veya hangi noktalarda dışlandığı araştırılmaktadır. Elde edilen bulgular, ekofeminizmin yalnızca çevresel sorumluluğu vurgulamakla kalmadığını; aynı zamanda eşitlik, kapsayıcılık ve toplumsal dönüşüm için güçlü bir çerçeve sunduğunu göstermektedir.

Türkiye'den seçilen vaka örnekleri ile küresel pratiklerin karşılaştırmalı olarak ele alınması, mevcut sürdürülebilirlik iletişimi stratejilerinin hem potansiyelini hem de sınırlarını ortaya koymaktadır. Çalışma, daha kapsayıcı, şeffaf ve sosyal açıdan sürdürülebilir yeni iletişim modellerinin geliştirilmesine katkı sağlamayı amaçlamaktadır.

Anahtar Kelimeler: Sürdürülebilirlik iletişimi, ekofeminizm, söylem analizi, toplumsal cinsiyet, sosyal sürdürülebilirlik

SUSTAINABILITY DISCOURSES FROM AN ECOFEMINIST PERSPECTIVE: A CRITICAL ANALYSIS OF COMMUNICATION STRATEGIES

ABSTRACT

In recent years, sustainability has become not only a central theme of environmental policies but also a focal point of global communication strategies. However, these discourses often reproduce social inequalities, render certain groups invisible, and reduce sustainability to symbolic practices that detach it from its social essence. This study critically examines sustainability communication from an ecofeminist perspective, focusing on the multilayered intersections between environmental issues, gender dynamics, and social justice.

Through a critical discourse analysis of corporate sustainability reports and digital communication campaigns, the research investigates how women and marginalized groups are represented or excluded within sustainability narratives. The findings demonstrate that ecofeminism offers more than an emphasis on environmental responsibility; it provides a transformative framework that foregrounds equality, inclusivity, and social change.

By analyzing case studies from Turkey alongside comparative global practices, the study reveals both the potentials and the limitations of current sustainability communication strategies. Ultimately, the paper seeks to contribute to the development of new communication models that are more inclusive, transparent, and

socially sustainable, thereby addressing the urgent demands of global sustainability and sustainable development.

Keywords: Sustainability communication, ecofeminism, discourse analysis, gender, social sustainability

HEMŞİRELİK ÖĞRENCİLERİNİN SÜRDÜRÜLEBİLİR KALKINMA AMAÇLARINA YÖNELİK FARKINDALIKLARININ VE KÜRESEL GELECEĞE İLİŞKİN ALGILARININ İNCELENMESİ: TANIMLAYICI KESİTSEL BİR ÇALIŞMA

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ÖZET

Bu çalışmanın amacı, hemşirelik öğrencilerinin 2030 Sürdürülebilir Kalkınma Amaçları'na (SKA) yönelik farkındalıklarını ve küresel geleceğe ilişkin algılarını incelemektedir. COVID-19 pandemisi, iklim krizi, göç ve toplumsal eşitsizlikler gibi güncel küresel sorunlar sağlık sistemlerini yeniden şekillendirmiş, hemşireleri yalnızca klinik bakım sunan profesyoneller değil, aynı zamanda sürdürülebilirlik, sağlık eğitimi ve koruyucu hizmetlerin geliştirilmesinde kritik birer "değişim aktörü" haline getirmiştir. Araştırma, 2024–2025 öğretim yılında İstanbul'daki önde gelen devlet ve vakıf üniversitelerinde öğrenim gören 229 hemşirelik öğrencisi ile yürütülmüştür. Veriler, Bilgi Formu, Sürdürülebilir Kalkınma Farkındalık Ölçeği ve Algılanan Küresel Gelecek Ölçeği kullanılarak toplanmıştır. Bulgular, öğrencilerin %89,5'inin SKA'lara aşina olduğunu, %98,7'sinin ise hemşirelerin bu hedeflerin gerçekleştirilmesinde rol ve sorumluluk sahibi olduklarını kabul ettiğini göstermektedir; ancak yalnızca %14,8'i lisans eğitimi sırasında SKA ile ilgili bir eğitim aldığını belirtmiştir. Hemşirelik öğrencilerinin SKA farkındalık düzeyi yüksek bulunmuştur (Ort. = 166,27 ± 11,19) ve özellikle çevresel ve ekonomik sürdürülebilirlik boyutlarında güçlüdür. Öğrencilerin SKA içinde en çok önem verdiği alanlar; aşırı yoksulluğun ortadan kaldırılması, sağlıklı bireyler, temiz su ve sıhhi koşullar, iklim eylemi olarak bulunmuştur. Küresel geleceğe ilişkin algılar ise ortanın üstünde olumlu bulunmuştur (Ort. = 137,20 ± 22,46) ve en yüksek puan "Sağlığın Geleceği" boyutunda elde edilmiştir. Korelasyon analizlerinde, öğrencilerin SKA farkındalıkları ile küresel gelecek algıları arasında düşük düzeyde pozitif bir ilişki saptanmıştır. Lisans eğitiminin küresel gelecek sorunlarına hazırladığına inanma, sınıf düzeyi, ikamet yeri ve aile gelir düzeyi değişkenleri ile SKA farkındalıkları arasında anlamlı farklılıklar saptanmıştır. Sonuçlar, öğrencilerin sürdürülebilirlik konusunda yüksek düzeyde farkındalığa sahip olmalarına rağmen SKA temelli içeriklerin hemşirelik müfredatına yeterince entegre edilmediğini ortaya koymaktadır. Küresel geleceğe yönelik algıların, SKA farkındalıklarını etkileyen önemli bir unsur olduğu söylenebilir. Bu sonuçlar, sürdürülebilirlik eğitiminin hemşirelik eğitim programlarına sistematik olarak dahil edilmesinin önemini vurgulamakta ve öğrencilerin küresel geleceğe ilişkin algılarını daha derinlemesine inceleyen araştırmalara ihtiyaç olduğunu ortaya koymaktadır.

Anahtar Kelimeler: Hemşirelik Eğitimi, Sürdürülebilir Kalkınma Hedefleri, Küresel Gelecek Algısı, Küresel Sağlık, Hemşirelik

EXPLORING NURSING STUDENTS' AWARENESS OF THE SUSTAINABLE DEVELOPMENT GOALS AND PERCEPTIONS OF THE GLOBAL FUTURE: A DESCRIPTIVE CROSS-SECTIONAL STUDY

ABSTRACT

The aim of this study is to examine nursing students' awareness of the 2030 Sustainable Development Goals (SDGs) and their perceptions of the global future. Contemporary global challenges such as the COVID-19 pandemic, climate crisis, migration, and social inequalities have profoundly reshaped healthcare systems. These changes have transformed nurses from being solely clinical care providers into critical "agents of change" in advancing sustainability, health education, and preventive services. This descriptive study was conducted with 229 nursing students enrolled at leading public and private universities in Istanbul during the 2024–2025 academic year. Data were collected using an Information Form, Sustainable Development Awareness Scale, and Perceived Global Future Scale. The findings revealed that 89.5% of students were familiar with the SDGs, and 98.7% acknowledged that nurses have significant roles and responsibilities in achieving them. However, only 14.8% reported receiving any education related to the SDGs during their undergraduate studies. Students' overall awareness of the SDGs was high (Mean = 166.27 ± 11.19), particularly in the domains of environmental and economic sustainability. The SDGs considered most important by students were "no poverty," "good health and well-being," "clean water and sanitation," and "climate action." Perceptions of the global future were found to be moderately positive (Mean = 137.20 ± 22.46), with the highest scores observed in the "Future of Health" dimension. Correlation analyses indicated a low but positive relationship between students' SDG awareness and their global future perceptions. Significant differences in SDG awareness were observed according to variables such as belief in the preparedness provided by undergraduate education for global challenges, year of grade, place of residence, and family income level. The results indicate that although nursing students possess a high level of awareness regarding sustainability, SDG-focused content is not sufficiently integrated into nursing curricula. Global future perceptions appear to influence students' awareness of the SDGs. These findings emphasize the necessity of systematically incorporating sustainability education into nursing programs and highlight the need for further research to gain deeper insights into students' perceptions of the global future.

Keywords: Nursing Education, Sustainable Development Goals, Global Future Perception, Global Health, Nursing

WEB-BASED SUSTAINABILITY COMMUNICATION OF REGIONAL DEVELOPMENT-ORIENTED UNIVERSITIES: A CONTENT ANALYSIS OF UI GREENMETRIC PARTICIPANTS FROM TÜRKİYE

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ABSTRACT

Sustainability is increasingly recognized as a global norm, requiring a holistic approach encompassing environmental, economic, and social dimensions. Universities, as institutions that generate knowledge and innovation, play a crucial role in promoting sustainable development. In this context, the UI GreenMetric World University Ranking system has emerged as a globally acknowledged reference for measuring and comparing sustainability practices of universities. UI GreenMetric provides an objective evaluation framework that assesses universities across six categories -setting and infrastructure, energy and climate change, waste management, water management, transportation, and education and research- based on 58 distinct indicators. As of 2025, a total of 1,477 universities from 95 countries are included in the UI GreenMetric ranking, with 120 universities from Türkiye represented for their sustainability efforts on this global platform. Among them, 17 are specialization universities designated under the Council of Higher Education's "Regional Development-Oriented Mission Differentiation and Specialization" project, which constitute the sample group of this study. The research systematically analyzed the sustainability sections accessible via the websites of these 17 specialization universities listed in the UI GreenMetric ranking through a content analysis approach. Through this method, a detailed and comparative evaluation was conducted regarding the universities' sustainability policies, performance reports, environmentally friendly practices, social awareness projects, and the digital messages provided on accessibility. The most direct access to sustainability policies was identified on Yozgat Bozok University's homepage through a dedicated "sustainability" tab. In contrast, 13 universities presented their sustainability practices and related details under the headings of coordination offices/committees. No sustainability web pages were accessible for Artvin Çoruh, Batman, and Çankırı Karatekin Universities. Bartın, Düzce, Iğdır, and Kastamonu Universities, on the other hand, were found to regularly publish sustainability reports. These findings reveal variations in the digital sustainability communication of specialization universities and highlight the importance of disseminating good practices in this field. This study aims both to assess the effectiveness of digital communication in the field of sustainability and to shed light on how universities' sustainability profiles are reflected in practice.

Keywords: UI GreenMetric, Regional development-oriented universities, Sustainability

SUSTAINABLE DIGITALIZATION IN EDUCATIONAL INSTITUTIONS: OPPORTUNITIES, CHALLENGES AND POLICY DIRECTIONS

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ABSTRACT

This study aims at exploring the intersection of digitalization and sustainability in educational management with a particular focus on how technology both enables and complicates sustainable practices in schools. Prior research highlights the potential of online learning platforms, cloud computing and virtual administrative systems to improve resource efficiency and reduce the carbon footprint of educational institutions. At the same time, the literature underscores critical challenges including the growth of e-waste, the energy demands of digital infrastructure and the persistence of the digital divide. Studies have also emphasized the role of governance and institutional policies in shaping sustainable digital practices with attention to strategies such as device lifecycle management, e-waste reduction and green IT implementation. In addition, research points to the importance of stakeholder engagement, particularly the awareness and participation of educators and students, in advancing sustainable digitalization. By synthesizing these strands of scholarship, this review identifies both the opportunities and tensions in aligning technological innovation with sustainability objectives in education. It concludes by outlining gaps in the current literature and suggesting directions for future research, particularly regarding leadership practices and governance frameworks that can bridge digital transformation with environmental stewardship.

Keywords: Sustainability, education for sustainability, digitalization, educational management.

INTEGRATING SUSTAINABLE DEVELOPMENT GOALS INTO LANGUAGE LEARNING AS A BRIDGE TO GLOBAL RESPONSIBILITY

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ABSTRACT

The United Nations in 1992 held the Conference on Environment and Development in Rio de Janeiro and outlined a program of action for the XXI century to achieve sustainable development between human consumption of resources and the Earth's ability to sustain life.

Sustainable development determines a balance between the urgent matters of the environment, economics, social issues, and improving the quality of life for people. The Sustainable Development Goals (SDGs) reflect the urgent problems of today: climate change, inequality, and poverty; therefore their integration into education is crucial. Concentrating on these goals, students will encounter issues that affect their future. These problems are not sufficiently studied at university, particularly if the students do not major in the natural sciences.

Foreign language courses differ from other subjects because they can allow discussions of any topic, making them an ideal platform for addressing the Sustainable Development Goals as well as developing intercultural critical thinking, and social responsibility.

In practice, integration of SDGs into language learning can be achieved through thematic units such as Nature, Weather, Environment, and Education which are learnt according to the curriculum, and provide contexts for developing both linguistic and global competencies, allowing students to link practice with real-world issues. Examples of exercises and tasks for both classroom and online learning are provided. It is noted that the most interesting tasks for students are the quizzes to guess one of the 17 Global Goals encoded in a riddle or a particular subject, creating an online poster for one of the goals, and debates where they discuss the achievability of these goals. Such an approach enhances learners' motivation and strengthens communicative competence in both professional and academic contexts.

Keywords: Sustainable Development Goals (SDGs), foreign language, language learning, students, university, students' competencies

KENTSEL MİRAS TEMELLİ SÜRDÜRÜLEBİLİR KALKINMA VE DÖNÜŞÜM: FESHANE ÖRNEĞİ

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ÖZET

Kentsel miras alanları, gelenek ile modernite arasındaki karmaşık ilişki nedeniyle stratejik bir önem taşımaktadır. Bu alanlar, tarihsel kimliği ve kolektif hafızayı koruma işlevi üstlenirken aynı zamanda çağdaş yaşamın dinamiklerine uyum sağlama zorunluluğu ile karşı karşıya kalmaktadır. Bu çalışma, İstanbul'un endüstriyel mirasının simgesel yapılarından biri olan Feshane fabrikasının sürdürülebilir dönüşüm pratiklerini incelemektedir. Araştırmada, kentsel miras paradigması bağlamında ele alınarak, kültürel miras alanlarının işlevsel gereklilikleri ile gelenek ve modernite arasındaki denge arayışına odaklanılmaktadır.

Osmanlı İmparatorluğu'nun modernleşme politikalarının bir parçası olarak on dokuzuncu yüzyılın son çeyreğinde inşa edilen Feshane, dönemin teknolojik ilerlemelerini temsil eden önemli bir endüstriyel tesis olarak öne çıkmaktadır. Fabrikanın mekânsal konumu ve Türkiye'nin endüstriyel miras kentsel alanları içerisindeki dönüştürücü rolü dikkate değerdir. Yirminci yüzyılda fabrikanın kültürel ve sanatsal faaliyetler için yeniden işlevlendirilmesi, yalnızca fiziksel koruma ile sınırlı kalmayan; aynı zamanda kolektif hafızanın yeniden üretilmesine ve kültürel kimliğin sürekliliğinin sağlanmasına katkı sunan bütüncül bir stratejinin somut bir örneğini oluşturmaktadır.

Bu araştırma, kültürel mirasın sürdürülebilir kalkınma hedefleriyle nasıl uzlaştırılabileceğini irdelemekte ve Feshane örneği üzerinden mirasın dönüşümünde ortaya çıkan temel sorun ve fırsatları analiz etmektedir. Çalışma kapsamında, geleneksel değerlerin korunması ile kültürel varlıkların çağdaş sanatsal pratikler aracılığıyla yerel topluluklarla yeniden ilişkilendirilmesi arasındaki etkileşim vurgulanmaktadır.

Elde edilen bulgular, Feshane'nin yalnızca kentsel mirasın fiziksel olarak korunması açısından değil; aynı zamanda toplumsal hafızanın canlandırılması, kültürel sürekliliğin güvence altına alınması ve mirasın gelecek kuşaklara aktarılması açısından da kritik bir rol üstlendiğini göstermektedir. Kültürel ve sanatsal etkinliklere ev sahipliği yapan bu dönüşüm süreci, yapının tarihsel öz değerini korurken ona toplumsal bağlamda yeni anlam katmanları eklemiştir.

Araştırmanın sonucunda, Feshane örneği İstanbul'un kentsel kimliğini zenginleştiren nitelikli bir vaka çalışması olarak değerlendirilmekte; bu bağlamda kentsel mirasın korunması ile sürdürülebilir kalkınma stratejilerinin, küreselleşme olgusu çerçevesinde nasıl bütünleştirilebileceğine dair önemli içgörüler sunmaktadır. Feshane'nin dönüşüm süreci, kentsel miras alanlarının sürdürülebilir biçimde yeniden işlevlendirilmesinde paydaş katılımı, kültürel koruma ve çağdaş kullanışlılık arasında kurulan etkin dengeyi gözler önüne sermektedir.

Anahtar Kelimeler: Feshane, Kültürel miras, Kültürel Sürdürülebilirlik

SUSTAINABLE DEVELOPMENT AND TRANSFORMATION INFORMED BY URBAN HERITAGE: A CASE STUDY OF FESHANE

ABSTRACT

Urban historical areas possess significant strategic relevance, stemming from the intricate interplay between tradition and modernization. The regions in question face the formidable task of safeguarding their historical identity and collective memory while navigating the complexities of modern existence. This research investigates the sustainable transformation strategies employed by the Feshane factory, a significant emblem

of Istanbul's industrial heritage. This study investigates the essential functions of cultural heritage regions within the framework of urban heritage, highlighting the pursuit of equilibrium between tradition and contemporary influences.

Established in the late nineteenth century amidst the modernization initiatives of the Ottoman Empire, Feshane became a notable industrial entity that represented the technological progress of its era. The spatial configuration of the factory and its significant impact on Turkey's industrial legacy within urban settings merit thorough investigation. The transformation in the twentieth century into a hub for cultural and artistic endeavors exemplifies a comprehensive approach that transcends mere physical preservation, playing a crucial role in the reproduction of collective memory and the perpetuation of cultural identity. This research examines the interplay between cultural heritage and sustainable development objectives, while also evaluating the primary challenges and opportunities associated with heritage transformation, as illustrated by the Feshane case study. Moreover, it underscores the connection between the preservation of traditional values and the reintegration of cultural assets with local communities via modern artistic practices. The findings indicate that Feshane is integral to the physical preservation of urban heritage while also revitalizing collective memory, maintaining cultural continuity, and facilitating the transmission of heritage to future generations. The process of transformation, characterized by cultural and creative initiatives, has successfully maintained the historical intrinsic value of the structure while simultaneously introducing new layers of meaning within a social framework.

The research culminates in an assessment of Feshane, positioning it as a pivotal case study that enhances the urban identity of Istanbul. This context provides valuable insights into the integration of urban heritage conservation and sustainable development strategies within the framework of globalization. The transformation process of Feshane exemplifies a proficient equilibrium among stakeholder engagement, the preservation of cultural heritage, and the practical application of contemporary utility in the sustainable repurposing of urban heritage sites.

Keywords: Feshane, Urban Heritage, Cultural Sustainability

WASTE-BASED BUILDING MATERIALS AND INDOOR AIR QUALITY: RISKS, POTENTIALS AND GAPS

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ABSTRACT

Waste-derived building materials demonstrate noteworthy results in terms of energy efficiency, mechanical strength, and thermal performance. However, the use of materials derived from industrial and municipal waste, which may contain potentially harmful substances such as heavy metals and volatile organic compounds (VOCs), poses risks in terms of creating healthy indoor environmental conditions. This systematic review examines the effects of various waste-based building materials, such as recycled wood, insulation materials produced from industrial and agricultural waste, and clay bricks containing urban waste, on indoor air quality.

The literature between 2015 and 2025 was searched using the Scopus and Web of Science databases. Initially, 77 studies were identified, but this number was reduced to 5 after selecting studies that focused directly on the topic and remained within the defined research areas. The limited number of studies in this field highlights the research value of the topic. The indoor pollutants examined were classified under three headings: (i) VOCs and formaldehyde; (ii) inorganic gases and particulate matter; (iii) mold.

The findings show that the use of low levels of waste in building materials does not pose a significant risk to indoor air quality. However, the limited number of studies on the health risks that industrial wastes such as fly ash and bottom ash may lead to due to their heavy metal content increases the uncertainties in this area. This study aims to highlight the gaps in the available literature and emphasize the indoor air quality dimension of sustainable building practices.

Keywords: Waste-based building materials, industrial and municipal waste, indoor air quality, indoor pollutants.

A SYSTEMATIC REVIEW ON INDOOR AIR QUALITY IN PASSIVE BUILDINGS

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ABSTRACT

Despite significant advances in energy efficiency, the passive building approach may vary in terms of indoor air quality (IAQ) applications. The effects of passive buildings with high airtightness and mechanical ventilation on user health and comfort are of particular interest.

This systematic review evaluates IAQ studies in passive buildings published over the last decade. A search of the Scopus database initially identified 28 studies, but only 9 studies focused directly on indoor air quality in passive buildings and included long-term measurements. This highlights the limited literature and the need for more comprehensive research.

The selected studies were examined in terms of the number of buildings evaluated, the IAQ parameters measured, the recording periods, and the reported findings. The results show that well-designed heat recovery mechanical ventilation systems (MVHR/HRV) in passive buildings reduce CO_2, particulate matter, and volatile organic compound (VOCs) levels thanks to their high air exchange rate. However, cooking-related pollutants in kitchens, outdoor pollution, and inadequate particulate filtration can have negative effects on IAQ. Furthermore, the lack of long-term measurements in climate zones outside Europe indicates that the subject requires further study on an international scale.

Based on the findings, three key requirements stand out for the sustainable improvement of IAQ in passive buildings: (i) Clarifying standards for design, filter selection, and maintenance processes in MVHR/HRV systems, (ii) conducting long-term field measurements that include not only CO_2 but also particulate matter, VOCs, and humidity parameters, and (iii) performing multi-parameter long-term measurements in different climate zones outside Europe. Future research covering different climate conditions and building types will strengthen the health-focused sustainability dimension of the passive building approach.

Keywords: Passive building, indoor air quality, IAQ, healthy indoor environments.

COMMUNITY-CENTRED FIRE RISK MANAGEMENT APPROACH FROM A SOCIAL SUSTAINABILITY PERSPECTIVE

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ABSTRACT

The preservation of cultural heritage is an indispensable component of sustainable development, and protecting historic buildings from fire is critically important in this context. According to UNESCO data, numerous historic buildings are damaged by fire worldwide every year, resulting in irreparable consequences for collective memory and identity. Traditional fire safety approaches focus on technical standards and engineering solutions while disregarding the social fabric of historic environments and local users' living relationship with these spaces.

This study examines the problematic of current risk assessment systems remaining engineering-oriented and neglecting the social contextual role of historic buildings. The research aims to develop a community-centered fire risk management approach based on the "living heritage" concept by analyzing local communities' interaction with historic buildings on fire risk perception. A structured questionnaire exploring themes of building relationships, fire safety awareness, risk perception, and protective behaviors with responsibility was administered to 53 historic building users of old bazaar district in Safranbolu.

The survey findings reveal that while 96.2% of participants highly value cultural heritage. Moreover, 94.3% of them support active community participation and 83% of them consider current fire safety measures insufficient. Because 69.8% of users have lack knowledge on fire suppression 96.2% of them expressed willingness to participate in training programs.

In conclusion, this community-centered approach offers an integrative framework for sustainable cultural heritage conservation and enhanced community resilience, providing actionable recommendations for policymakers.

Keywords: Social sustainability, Living heritage, Community-centered fire risk management.

KONUT SEKTÖRÜNDE YALIN ÜRETİM İLKELERİNİN İRDELENMESİ: TOKİ KONUTLARI ÖRNEĞİ

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ÖZET

Konut ihtiyacı, hızlı kentleşme, nüfus artışı ve sosyo-ekonomik değişimlerle birlikte günümüzde daha da önemli hale gelmiştir. Türkiye'de sanayileşme, kentleşme ve yoğun göç süreçleri konut ihtiyacını artırmış, bu durum gece kondu, kooperatif, lojman ve toplu konut gibi farklı konut sunum modellerinin gelişmesine yol açmıştır. Türkiye'de Toplu Konut İdaresi Başkanlığı (TOKİ), 1984 yılından itibaren sosyal konut üretiminde etkin bir rol üstlenmiştir. TOKİ'nin temel hedefi, dar ve orta gelir gruplarına erişilebilir konut sunarken maliyet etkinliği, standartlaşma, üretim hızı, dayanıklılık ve yerel koşullara uyum gibi kriterlerin de göz önünde bulundurulduğu toplu konut üretimi gerçekleştirmektir. Konut talebinin karşılanması ve planlı kentleşmenin sağlanması açısından toplu konut projelerinin önem kazanması sürecinde büyük üretim kapasitesiyle TOKİ öne çıkmıştır. TOKİ'ye ait projelerde konut açığının azaltılması ve kentlerde yaşam kalitesinin artması hedeflesen de inşaat süreçlerinin uzun süreleri, yüksek maliyetleri ve planlanlanamaması sorunlar yaşanmasına neden olabilmektdir.

Yalın üretim, verimsizlikleri ortadan kaldırmaya ve süreçleri daha verimli hale getirmeye odaklanan bir yönetim felsefesidir. İnşaat sektöründe yalın inşaat yönetimi maliyetlerin düşürülmesi, verimliliğin artırılması, kullanıcıya değer sağlanması ve süreçlerin bütüncül ve hızlı yönetilmesi gibi prensiplere sahip olmasıyla sürdürülebilir üretime önemli bir katkı sağlamaktadır. Bu çalışmada TOKİ'nin toplu konut üretim modeli, yalın üretim yönetimi ilkeleri çerçevesinde ele alınmıştır. Çalışmanın temel amacı, TOKİ'nin toplu konut üretiminin, verimlilik ve sürdürülebilirlik gibi yalın üretim kriterlerine uygunluk düzeyini ortaya koymaktır. Literatürde tanımlanan yalın üretim ilkeleri doğrultusunda TOKİ projeleri değerlendirilmiş, süreç verileri ve uygulama örnekleri üzerinden analiz edilmiştir.

Sonuç olarak TOKİ'nin konut üretiminde maliyet etkinliği, süreç verimliliği ve israfın azaltılması açısından yalın üretim ilkeleriyle örtüştüğü ancak tasarım esnekliği, kullanıcı geri bildirimi ve sosyo-kültürel farklılıkların yeterince dikkate alınmaması gibi nedenlerle süreçte yalın üretimden uzaklaşıldığı ortaya koyulmuştur. Bilgi yönetiminin güçlendirilmesi, yerel mimarinin entegre edilmesi ve kullanıcı odaklı tasarım süreçlerinin geliştirilmesiyle TOKİ uygulamalarının sürdürülebilirlik ve yalın üretim hedefleriyle daha uyumlu hale gelebileceği düşünülmektedir.

Anahtar Kelimeler: TOKİ, Toplu Konut, Yalın Üretim, Sürdürülebilirlik.

AN ANALYSIS OF LEAN PRODUCTION PRINCIPLES IN THE HOUSING SECTOR: THE CASE OF TOKİ HOUSING

ABSTRACT

Housing needs have become even more important today due to rapid urbanization, population growth, and socio-economic changes. In Turkey, industrialization, urbanization, and intense migration processes have increased housing needs, leading to the development of different housing supply models such as shantytowns, cooperatives, lodgings, and mass housing. In Turkey, the Mass Housing Development Administration of

Turkey (TOKİ) has played an active role in social housing production since 1984. TOKİ's primary goal is to produce mass housing while providing affordable housing to low- and middle-income groups, taking into account criteria such as cost-effectiveness, standardization, production speed, durability, and adaptation to local conditions. TOKİ has come to the fore with its large production capacity in the process of mass housing projects gaining importance in terms of meeting housing demand and ensuring planned urbanization. Although TOKİ projects aim to reduce the housing shortage and improve the quality of life in cities, the long construction periods, high costs, and lack of planning can cause problems.

Lean production is a management philosophy focused on eliminating inefficiencies and making processes more efficient. In the construction sector, lean construction management contributes significantly to sustainable production with its principles of reducing costs, increasing efficiency, providing value to users, and managing processes holistically and quickly. This study examines TOKİ's mass housing production model within the framework of lean production management principles. The main objective of the study is to reveal the level of compliance of TOKİ's mass housing production with lean production criteria such as efficiency and sustainability. TOKİ projects were evaluated in line with the lean production principles defined in the literature and analyzed based on process data and application examples.

As a result, it was found that TOKİ's housing production aligns with lean production principles in terms of cost-effectiveness, process efficiency, and waste reduction. However, it was also revealed that the process deviates from lean production due to reasons such as insufficient consideration of design flexibility, user feedback, and socio-cultural differences. It is believed that TOKİ's practices could become more aligned with sustainability and lean production goals by strengthening knowledge management, integrating local architecture, and developing user-centered design processes.

Key Words: TOKİ, Mass Housing, Lean Production, Sustainability.

SÜRDÜRÜLEBİLİRLİK EKSENİNDE BİO MALZEMELERİN ÜRÜN TASARIMINDA KULLANIMINA YÖNELİK YÖNTEMSEL YAKLAŞIMLAR

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ÖZET

Bu çalışma, sürdürülebilirlik bağlamında biyo malzemelerin ürün tasarımında kullanımını ve bu alana yönelik yöntemsel yaklaşımları ele almaktadır. Günümüzde artan çevresel sorunlar ve kaynakların tükenme riski, tasarım disiplinlerinde yeni malzeme arayışlarını zorunlu hale getirmiştir. Bu noktada, biyolojik olarak yenilenebilir, geri dönüştürülebilir ve çevreye minimum zarar veren biyo malzemeler önemli bir seçenek olarak öne çıkmaktadır. Özellikle ürün tasarımı süreçlerinde biyo malzemelerin kullanımı, yalnızca malzeme seçimi ile sınırlı kalmayıp üretim yöntemlerinden ürün ömrü yönetimine kadar geniş bir etki alanı yaratmaktadır. Yaşam döngüsü analizi (LCA), karbon ve su ayak izi ölçümleri gibi araçlar, biyo malzemelerin çevresel etkilerini değerlendirmede ve tasarım kararlarını yönlendirmede temel yöntemlerdir. Bunun yanında, modüler tasarım, onarıma elverişlilik ve geri dönüşüm dostu bağlantı çözümleri gibi yaklaşımlar, ürünlerin sürdürülebilirliğini artırmaktadır. Güncel uygulamalarda biyopolimerler, bitki ve mantar temelli malzemeler ya da lif bazlı kompozitler, hem endüstriyel hem de deneysel tasarım projelerinde kullanılmaktadır. Ancak bu malzemelerin dayanıklılık, maliyet ve seri üretim gibi konularda belirli sınırlılıkları da vardır. Bu nedenle, akademi ve endüstri iş birlikleri, AR-GE faaliyetleri ve standart geliştirme süreçleri kritik bir rol oynamaktadır. Çalışma, ayrıca biyo malzeme kullanımının yalnızca çevresel değil, ekonomik ve toplumsal boyutlarının da göz önünde bulundurulması gerektiğini vurgulamaktadır. Tedarik zincirinde şeffaflık, etik kaynak kullanımı ve kullanıcı farkındalığı, bu sürecin tamamlayıcı unsurlarıdır. Sonuç olarak, ürün tasarımında biyo malzemelerin yöntemsel olarak ele alınması, sürdürülebilirlik hedeflerinin gerçekleştirilmesi açısından güncel ve geleceğe dönük stratejik bir gereklilik olarak değerlendirilmelidir.

Anahtar Kelimeler: Endüstriyel Tasarım, Ürün Tasarımı, Bio Malzemeler, Sürdürülebilirlik, Tasarım Yöntemleri

METHODOLOGICAL APPROACHES TO THE USE OF BIOMATERIALS IN PRODUCT DESIGN FROM A SUSTAINABILITY PERSPECTIVE

ABSTRACT

This study addresses the use of bio-based materials in product design within the context of sustainability and examines methodological approaches related to this field. Increasing environmental challenges and the risk of resource depletion have made the search for new materials in design disciplines a necessity. At this point, bio-materials that are biologically renewable, recyclable, and cause minimal harm to the environment emerge as a significant alternative. In particular, the use of bio-materials in product design processes extends beyond material selection and creates a wide sphere of influence, ranging from production methods to product life cycle management. Tools such as Life Cycle Assessment (LCA), carbon footprint, and water footprint measurements serve as fundamental methods for evaluating the environmental impacts of bio-materials and guiding design decisions. In addition, approaches such as modular design, repairability, and recycling-friendly connection solutions contribute to enhancing the sustainability of products. In current applications, biopolymers, plant- and fungus-based materials, as well as fiber-based composites, are increasingly utilized in

both industrial and experimental design projects. However, these materials also present certain limitations in terms of durability, cost, and mass production. For this reason, collaborations between academia and industry, R&D activities, and standardization processes play a critical role. The study also emphasizes that the use of bio-materials should be considered not only from an environmental perspective but also from economic and social dimensions. Transparency in the supply chain, ethical sourcing, and user awareness are complementary components of this process. In conclusion, the methodological integration of bio-materials into product design is evaluated as both a current and future-oriented strategic necessity for achieving sustainability goals.

Keywords: Industrial Design, Product Design, Biomaterials, Sustainability, Design Methods

INTANGIBLE CULTURAL HERITAGE FOR SUSTAINABLE CITIES AND COMMUNITIES IN THE RELATIONSHIP BETWEEN CULTURE AND DEVELOPMENT

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ABSTRACT

The concept of sustainability, with its environmental, economic, social and cultural dimensions and its multifaceted nature within these dimensions, has been the focus of many disciplines in recent years. Initially associated more with the environment and environmental protection, the cultural dimension of sustainable development has also been opened up for discussion in recent years and has begun to be addressed in official documents. The prominence of 'harmony with sustainable development' in UNESCO conventions and documents focused on preserving cultural heritage, and the emphasis on the relationship between 'culture and development' in documents related to sustainable development, highlight the relationship between sustainable development and culture. This paper discusses the importance and place of intangible cultural heritage for sustainable cities and communities through four interrelated concepts (sustainability, city, community and intangible cultural heritage). In this regard, the sustainability approach and traces of sustainable development will first be traced from international documents, and the involvement of culture in this development approach will be examined. Subsequently, urban conservation, or in other words, the relationship between urban sustainability and culture, was addressed. Following all these readings, the place and role of intangible cultural heritage in today's cities for sustainable cities and communities was examined. In this context, recommendations were put forward regarding the place and importance of the community in the processes of sustainable development and the preservation of intangible cultural heritage, the unifying and connecting function of intangible cultural heritage in cities, its function in contributing to economic and social development, and the importance of utilising intangible cultural heritage in cities for the climate and food crisis.

Keywords: Intangible cultural heritage, sustainable development, sustainable cities and communities, urban conservation.

SÜRDÜRÜLEBİLİR KIRSAL KALKINMA İÇİN KIRSAL MİMARİ MİRAS VE KIRSAL TURİZM: BURSA İZNİK ÖRNEĞİ

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ÖZET

Bir kalkınma seçeneği olarak görülen kırsal turizm, keşfedilmemiş doğal ve kültürel zenginliklerin olduğu alanlarda yeni, otantik deneyimler arayan turistleri çekme konusunda önemli bir potansiyele sahiptir. Kırsal alanlarda doğal ve kültürel çevreden beslenerek, yöreye özgü etkinliklerin ve kırsal yaşam kültürünün izlenip deneyimlenebildiği kırsal turizm faaliyetlerinde mimari yapılar önemli yerel değerlerdir. Günümüzde ekonomik, sosyal ve çevresel zorluklarla karşı karşıya olan kırsal alanlardaki bu miras değerlerinin dönüştürücü gücü, sürdürülebilir kırsal kalkınmanın temel bileşenlerinden biri olarak kabul görmektedir. Çalışma alanı olarak doğal, tarihi ve kültürel değerleri, kırsal mimari miras öğeleri ve kırsal turizm potansiyellerinin olduğu İznik kırsalı seçilmiştir. Çalışma UNESCO Dünya Mirası çalışmalarının yürütüldüğü İznik'teki kırsal kalkınmaya destek sağlama, mimari miras ve özgün yaşam kültürüne ait değerlerin belirlenmesi ve turizm faaliyetlerinin çeşitlendirilmesi bakımından önemlidir. Terk edilme ve miras değerlerini kaybetme riski taşıyan kırsal alanlar için örnek teşkil eden bu çalışmanın, sürdürülebilir kırsal kalkınma, koruma ve turizm çalışmalarının bütünleştirilmesinde yol gösterici olması düşünülmektedir.

Anahtar Kelimeler: Sürdürülebilir kırsal kalkınma, kırsal mimari miras, kırsal turizm, İznik (Nikaia/Nicaea)

RURAL ARCHITECTURAL HERITAGE AND RURAL TOURISM FOR SUSTAINABLE RURAL DEVELOPMENT: BURSA IZNIK EXAMPLE

ABSTRACT

Rural tourism, viewed as a development option, has significant potential to attract tourists seeking new, authentic experiences in areas rich in unexplored natural and cultural values. Architectural heritage structures stand out as important local elements in rural tourism activities, where activities specific to the region are carried out in rural areas and rural life culture can be observed and experienced. Today, the transformative power of rural heritage values in rural areas facing economic, social, and environmental challenges is recognized as one of the key enablers of sustainable development. The rural area of Iznik was selected as the study area with its natural, historical and cultural values, rural architectural heritage elements and rural tourism potentia. The study is important in terms of providing support for rural development in Iznik, where UNESCO World Heritage studies are carried out, determining the values of architectural heritage and unique living culture, and diversifying tourism activities. This study, which sets an example for rural areas at risk of abandonment and loss of heritage values, is thought to be a guide in the integration of conservation, tourism and development studies.

Keywords: Sustainable rural development, rural architectural heritage, rural tourism, Iznik (Nikaia/Nicaea)

INTEGRATING RENEWABLE ENERGY WITH INTELLIGENT TRANSPORTATION SYSTEMS FOR SUSTAINABLE DEVELOPMENT: AN ENHANCED FRAMEWORK WITH STATISTICAL VALIDATION

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ABSTRACT

The growing need for sustainable mobility has accelerated the integration of renewable energy into Intelligent Transportation Systems (ITS). This paper presents an enhanced Renewable Energy Integrated ITS (REI-ITS) framework that combines solar- and wind-powered charging stations, IoT-based traffic monitoring, and AI-driven routing algorithms with rigorous statistical validation. The model is formulated as a multi-objective optimization problem targeting the minimization of travel time, energy consumption, and CO_2 emissions while maximizing renewable energy utilization and stabilizing peak grid loads.

Comprehensive experiments conducted on simulated smart city scenarios with 1,000-5,000 electric vehicles, 200-800 IoT sensors, and 60-240 renewable charging stations demonstrate statistically significant improvements. The REI-ITS achieves average travel time reduction of 20.2% ± 2.1% ($p<0.001$), energy consumption reduction of 21.1% ± 1.8% ($p<0.001$), and emissions reduction of 20.2% ± 2.3% ($p<0.001$), while improving renewable energy utilization by 24.7% ± 3.2% ($p<0.001$) compared to state-of-the-art baselines. Statistical analysis across 50 simulation runs confirms the robustness and reliability of these improvements.

Keywords: Intelligent Transportation Systems, Renewable Energy Integration, Multi-objective Optimization, Statistical Validation, Sustainable Mobility

PERFORMANCE AND BENEFITS OF HYBRID SYSTEMS COMBINING SOLAR ENERGY WITH RENEWABLE AND CONVENTIONAL SOURCES

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ABSTRACT

This study evaluates the performance and benefits of hybrid energy systems that integrate solar with renewable and conventional sources in Nigeria. Motivated by persistent electricity shortages despite abundant resources, the research analyzed 1,000 hours of hybrid system operation using descriptive statistics, regression analysis, and forecasting models (ARIMA, Prophet, and LSTM). Key performance indicators—supply, demand, losses, and battery state of charge (SoC)—were assessed. Results show that solar and wind contributed the bulk of supply, with the grid acting primarily as backup. Regression analysis revealed strong positive contributions from solar and wind, while excessive grid reliance increased losses. Forecasting outcomes indicated that LSTM achieved superior accuracy ($R^2 = 0.91$, RMSE = 3.10, MAPE = 5.1%) over ARIMA and Prophet. Optimization further reduced losses and enhanced battery performance. The study concludes that hybrid systems enhance reliability, efficiency, and cost-effectiveness, recommending incentives, advanced storage investment, machine learning integration, and smart grid adoption for sustainable energy delivery in Nigeria.

Keywords: Hybrid Energy Systems, Solar Energy, Renewable Energy, Battery State of Charge, Reliability, Efficiency, Smart Grid.

DFT STUDIES ON PEROVSKITE SOLAR CELLS: BRIDGING INNOVATION AND SUSTAINABILITY GOALS

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ABSTRACT

Perovskite materials have emerged as one of the most promising candidates for sustainable energy conversion owing to their exceptional optoelectronic properties and low-cost fabrication routes. Their unique features, such as high absorption coefficients, tunable band gaps, and long carrier diffusion lengths, position them as highly competitive alternatives to conventional silicon-based photovoltaics. In the context of global sustainability, perovskite solar cells offer an opportunity to accelerate the transition toward clean energy by reducing production costs and enabling flexible, lightweight devices. Nevertheless, key challenges related to long-term operational stability, environmental impact of lead-containing compounds, and large-scale manufacturing still need to be addressed further. Recent advances in material engineering, including compositional tuning, interface optimization, and the development of lead-free alternatives, have shown remarkable progress in enhancing both performance and durability. Furthermore, integrating perovskites into tandem architectures with silicon or other absorbers has opened new pathways for surpassing efficiency limits. Our work highlights the potential of perovskite materials in bridging the gap between scientific innovation and real-world deployment, emphasizing their role in advancing global sustainability goals. Employing density functional theory (DFT) to investigate the structural, electronic, and optical properties of hybrid and inorganic perovskites, aiming to provide fundamental insights that support their application in solar energy conversion. By combining interdisciplinary research efforts, perovskite solar cells make a significant contribution to meeting future energy demands while supporting climate change mitigation strategies.

Keywords: DFT, Perovskite solar cells, sustainability, renewable energy, photovoltaic materials.

SMART GRIDS WITH EDGE–AI FOR SUSTAINABLE ENERGY MANAGEMENT

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ABSTRACT

The global energy sector is undergoing a paradigm shift toward sustainability, efficiency, and resilience. Smart grids, which integrate digital technologies with power systems, have emerged as a cornerstone of this transformation. However, the growing scale, variability, and complexity of renewable energy sources require real-time analytics and decision-making capabilities. This paper investigates the role of Edge Artificial Intelligence (Edge–AI) in enabling sustainable energy management within smart grids. Using an experimental simulation framework, Edge–AI was deployed for load forecasting, fault detection, and demand response optimization in a distributed grid environment. Results demonstrate that Edge–AI enhances latency reduction by 38%, improves renewable energy utilization by 22%, and reduces power losses by 17% compared to conventional cloud-centric approaches. These findings highlight the potential of Edge–AI as a transformative enabler of sustainable, reliable, and adaptive smart grid systems.

Keywords: Smart grids, Edge–AI, sustainable energy, demand response, renewable energy, energy management

SMART METERING FOR ENHANCING ENERGY EFFICIENCY AND CONSUMER AWARENESS

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ABSTRACT

Smart metering has emerged as a transformative technology in the target of global sustainability and development, offering a powerful tool for enhancing energy efficiency and increasing consumer awareness. As energy demands continue to rise worldwide, driven by urbanization, industrial growth, and digitalization, the need for smarter and more sustainable energy management systems becomes increasingly urgent. Smart meters enable real-time monitoring, two-way communication between consumers and utility providers, and detailed data analytics, allowing for more efficient energy distribution and usage. By providing consumers with timely and accurate information about their energy consumption patterns, smart metering systems empower individuals and businesses to make informed decisions that reduce energy waste and lower carbon footprints. On a broader scale, these systems support demand-side management, facilitate the integration of renewable energy sources, and enable dynamic pricing models, all of which contribute to more resilient and environmentally sustainable energy infrastructures. Furthermore, in emerging economies, smart metering can address issues of energy access, reduce non-technical losses, and improve grid reliability thereby contributing to economic development and social equity. Despite its potential, the widespread adoption of smart metering faces several challenges, including high initial investment costs, data privacy concerns, and the need for regulatory support and consumer education. This study examines the technological foundations, socio-economic benefits, and policy implications of smart metering, highlighting its vital role in advancing energy efficiency and promoting global sustainability and inclusive development.

Keywords: Energy Management; Electrical Power System Quality; Smart Grid; and Sustainable Energy.

SOLAR ENERGY REVOLUTION: ALGERIA'S PATH TO SUSTAINABLE RENEWABLE ENERGY

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ABSTRACT

Algeria is at a critical juncture in its energy strategy, poised to embark on a transformative shift towards sustainable renewable energy, particularly through solar power. Endowed with vast desert landscapes and abundant solar irradiance, Algeria has historically relied heavily on its substantial reserves of natural gas for energy production and export revenues. However, in response to global imperatives to combat climate change and diversify its energy portfolio, Algeria has initiated ambitious plans to harness its solar potential.

Central to Algeria's renewable energy ambitions is the Renewable Energy and Energy Efficiency Program (REEEP), which aims to significantly increase the share of renewable energy in the country's electricity generation capacity. The program focuses on developing large-scale solar projects across Algeria's expansive desert regions, aiming not only to capitalize on solar resources but also to stimulate economic growth, create jobs, and enhance energy security.

The transition to solar energy is not without challenges. Algeria faces technological and infrastructural barriers in scaling up solar power, including the need for robust grid integration to manage intermittent solar energy influxes. Moreover, ensuring the affordability and accessibility of renewable energy remains a priority amidst broader economic considerations.

Despite these challenges, Algeria possesses the necessary resources, political will, and institutional capacity to realize its renewable energy ambitions. By leveraging international partnerships, innovative financing mechanisms, and investments in research and development, Algeria aims to position itself as a regional leader in renewable energy deployment.

The benefits of Algeria's solar energy revolution extend beyond environmental stewardship. Embracing solar power promises to reduce greenhouse gas emissions, enhance energy independence, and foster sustainable economic development. Moreover, Algeria's commitment to renewable energy can attract foreign investment, strengthen diplomatic relations, and contribute to global efforts towards a sustainable future.

This article explores Algeria's strategic shift towards sustainable energy, focusing specifically on its ambitious adoption of solar power.

Keywords: Solar Energy Transition, Renewable Energy Strategy, Algeria's Energy Future, Sustainable Development.

SECURE GOSSIP LEARNING-BASED SUSTAINABLE IRRIGATION MANAGEMENT

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ABSTRACT

Effective irrigation control is crucial for agricultural sustainability, but centralised data-driven approaches may suffer from privacy, scalability, and communication overhead issues. To overcome these issues, we introduce a secure gossip learning–based irrigation management architecture. For local data analysis, a Long Short-Term Memory (LSTM) classifier is used. In this architecture, local models are trained on sensor data, including soil moisture, pH, and climate attributes (e.g., temperature and humidity)-related data, which are heterogeneously distributed among the edge devices. The edge devices collaborate among themselves using the mesh topology. For secure collaborative learning, an Advanced Encryption Standard (AES)- 128-based approach is used to encrypt local model weights before exchanging model updates. The devices receive encrypted model weights, decrypt them, and aggregate to build the global model. Finally, each device has a personalised local model and a global model. The LSTM-trained classifier acts in accordance with the distinctive time-varying characteristics and dependencies of soil moisture and irrigation events, and achieves an estimation accuracy above 97%. The response time and energy consumption are reduced by 36% than the edge-cloud framework and 91% than the cloud-only framework. The experiments demonstrate that the proposed framework can not only enhance the prediction but also protect data integrity and provide sustainability by reducing energy consumption. Taken together, the study provides a large-scale, privacy-preserved, sustainable, and robust service for intelligent irrigation management in smart farming systems.

Keywords: Gossip learning, Advanced Encryption Standard (AES), Long Short-Term Memory (LSTM).

SECURE DECENTRALIZED FEDERATED LEARNING-BASED SUSTAINABLE CROP YIELD PREDICTION

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ABSTRACT

Agricultural decision-making depends on intelligent recommendation systems to guide farmers in selecting suitable crops under diverse soil, climatic, and resource conditions. Centralized machine learning approaches, however, face limitations such as privacy risks, high communication costs, and reliance on a central server. To overcome these challenges, we propose a secure decentralized federated learning–based crop recommendation model. In the proposed framework, we have considered mesh topology to connect the edge computing nodes. Each node trains a local gated recurrent unit (GRU) model on its own time-series data and shares model updates with neighbours after encrypting model weights using advanced encryption standard (AES)-128. Each node after receiving model updates from neighbours, decrypts them and then aggregates to build the global model. This process continues to run in iterative manner until a global model with minimal loss is developed. As no raw data is shared and model weights are encrypted before transmission, a secure collaborative training is achieved. The experimental results show that the proposed model has above 90% accuracy in crop recommendation. The results also show that the proposed model reduces response time and energy consumption, and outperforms the existing approaches. The results also show that the proposed work maintains a trade-off between prediction accuracy, response time, data security, and sustainability.

Keywords: Federated learning, Advanced Encryption Standard (AES), Response time.

TOWARDS ENERGY SUSTAINABILITY IN ALGERIA: OPTIMIZING HYBRID SYSTEMS COMBINING RENEWABLE ENERGIES AND SMART TECHNOLOGIES

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ABSTRACT

Algeria, which has immense potential for renewable energy thanks to its solar, wind and geothermal resources, now faces major challenges in successfully transitioning to renewable energy. This work proposes an approach to optimizing hybrid energy systems, combining local renewable sources and smart technologies, in order to accelerate this transition while meeting the country's growing energy needs in a sustainable manner.

The study focuses on modelling hybrid systems adapted to Algeria's specific conditions, particularly the Saharan areas rich in solar radiation and the coastal regions suitable for wind power. Smart technologies, such as artificial intelligence and IoT systems, will be used to optimize energy flow management, anticipate the variability of renewable resources and improve the efficiency of storage infrastructure. In addition, an in-depth socio-economic analysis will be carried out, highlighting the advantages of decentralized models for rural and isolated areas, where access to energy remains limited.

The aim is to demonstrate that the integration of these hybrid systems can not only reduce greenhouse gas emissions, but also create significant local jobs and reduce the country's dependence on fossil fuels. This approach represents a unique opportunity for Algeria to capitalize on its abundant natural resources while pursuing a sustainable and inclusive development strategy.

Keywords: Hybrid energy systems**,** Renewable energies in Algeria**,** Energy optimization**,** Smart technologies**,** Energy transition**,** Sustainable development**,** Decentralized management.

ISLAMIC CHARACTER EDUCATION FOR SUSTAINABLE YOUTH DEVELOPMENT: A MODEL TO COUNTER STUDENTS' MORAL DECADENCE

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ABSTRACT

The moral decline among adolescents poses a critical challenge to the sustainability of Indonesia's human resources. This study aims to develop and analyze an Islamic character education model implemented at MTsN 1 Bandar Lampung as an effort to overcome students' moral decadence. Using a qualitative descriptive approach, data were collected through in-depth interviews, observations, and documentation involving five key respondents, including teachers, administrators, and students. The findings reveal that Islamic character education is integrated through worship habituation, value-based discipline, teacher exemplars, curriculum integration, and counseling support. Five core values—honesty, discipline, responsibility, social care, and politeness—were emphasized, contributing to a reduction in disciplinary violations and an increase in students' moral awareness. Despite challenges such as peer pressure, the influence of social media, limited instructional time, and inadequate teacher training, the model proved effective in promoting positive behavioral change. This research highlights the significance of character education rooted in Islamic values as a sustainable approach to youth development, offering both theoretical contributions and practical recommendations for schools and policymakers. It underscores the importance of continuous innovation, teacher capacity-building, and parental involvement to ensure long-term sustainability in character formation.

Keywords: Long-Term Sustainability, Youth Development, Islamic Character Education, Moral Decadence.

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SUSTAINABLE CATECHOL CHEMISTRY: DOPA-INSPIRED MATERIALS FOR ENVIRONMENTAL REMEDIATION AND AGRICULTURAL SCALE-UP

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ABSTRACT

Mussel adhesive proteins (MAPs) have unique physicochemical properties due to the catecholic amino acid L-3,4-Dihydroxyphenylalanine (L-DOPA). These properties enable versatile and robust functionalization in aqueous environments. While extensive research in synthetic catechol-functionalized polymers (Mussel-inspired materials) has predominantly focused on high-value biomedical applications, the critical challenge remains the development of cost-effective and genuinely green synthetic methodologies essential for large-scale adoption within the environmental and agricultural sectors. This review systematically addresses this crucial transition, evaluating the techno-economic viability required for industrial scale-up. We present a detailed analysis of sustainable production pathways, critically examining the efficiency of biocatalytic synthesis, particularly the enzymatic hydroxylation of L-Tyrosine, and the efficacy of microbial fermentation for generating functional recombinant MAPs (rMAPs). These aqueous, low-temperature methods significantly reduce the E-Factor (Environmental Factor), a prerequisite for environmentally responsible bulk chemical manufacturing. Furthermore, we explore the strategic utilization of abundant and renewable natural polyphenols, including gallic acid and tannic acid, as economical DOPA analogues for the functional modification of biopolymers. These chemical advancements are further translated into large-scale needs: enabling the use of the developed materials in water remediation as high-affinity adsorbents for heavy metals and microplastics, as well as non-toxic anti-fouling coatings for infrastructure; and in sustainable agriculture as sophisticated thin-film coatings for controlled-release fertilizers and encapsulated agrochemicals. This synthesis provides a comprehensive framework for selecting and optimizing catechol chemistries to deliver economically feasible and environmentally sound solutions to global sustainability imperatives.

Keywords: DOPA, mussel adhesive protein, green synthesis, biocatalysis, water remediation, sustainable agriculture.

SUSTAINABLE DEVELOPMENT THROUGH PARTICIPATIVE BUDGETING: A GLOBAL BIBLIOMETRIC PERSPECTIVE

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ABSTRACT

Participative budgeting has long been recognized as a managerial approach that enhances communication, transparency, and accountability in resource allocation. Beyond its organizational benefits, participative budgeting also holds strategic relevance in supporting the broader agenda of sustainable development by fostering inclusive decision-making, efficiency, and long-term resilience. This study presents a bibliometric analysis of 165 articles on participative budgeting published between 1982 and 2025, using data extracted from the Scopus database. Through tools such as VOSviewer and Publish or Perish, the study maps publication trends, citation networks, influential authors, and emerging research themes over more than four decades. The results reveal a growing interdisciplinary focus, with participative budgeting increasingly linked to governance, performance management, and sustainability practices. The analysis highlights that participative budgeting contributes not only to managerial performance and cost efficiency but also to sustainable organizational cultures rooted in collaboration and shared accountability. This study offers valuable insights for academics and practitioners by identifying future research opportunities and emphasizing the critical role of participative budgeting in advancing sustainable development at both organizational and societal levels.

Keywords: Sustainable Development, Participative Budgeting, Bibliometric Analysis, Governance, Sustainable Organizational Cultures.

SOCIAL AND SOLIDARITY ECONOMY IN THE DIGITAL AGE: ECONOMIC COMPETITIVENESS AND KNOWLEDGE-BASED DEVELOPMENT

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ABSTRACT

This paper examines the relationship between digital transformation, the knowledge economy, and the Social and Solidarity Economy (SSE) from an economic perspective. Digitalization is reshaping competitiveness by emphasizing intangible assets, knowledge capital, and innovation capacity (Foray, 2004; OECD, 1996). At the same time, global markets face labor polarization, productivity challenges, and governance gaps associated with automation and artificial intelligence. Within this scenario, SSE offers an alternative model of economic activity, embedding ethical labor practices, participatory governance, and cooperative entrepreneurship (Defourny & Nyssens, 2010; Utting, 2023). Drawing on five empirical case studies of SSE organizations in Portugal, the research analyzes how these entities adapt their business models to digital markets, strengthen resilience through collective governance, and integrate sustainability into competitive strategies. Expected results suggest that SSE enterprises can enhance labor market stability and inclusion while contributing to economic competitiveness by linking innovation with territorial development and sustainable value creation. The originality of this research lies in positioning SSE as a viable component of the knowledge economy, capable of bridging efficiency with social responsibility. Policy implications include regulatory frameworks and investment mechanisms that promote SSE as a driver of equitable, knowledge-based growth. By situating SSE within digital capitalism, this study advances the debate on reconciling competitiveness with inclusiveness and sustainability.

Keywords: Social and Solidarity Economy, Digital Transformation, Knowledge Economy, Competitiveness, Economic Development

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MARINE BIOTECHNOLOGY AND THE BLUE ECONOMY: A PATHWAY TO SUSTAINABILITY

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ABSTRACT

The blue economy, comprising of fisheries, aquaculture, biotechnology, shipping, and coastal tourism, is rapidly expanding yet faces pressing sustainability challenges. According to UNCTAD, the global ocean economy was valued at over US$2.2 trillion in 2023, with goods trade worth approximately US$899 billion and services nearly US$1.3 trillion. However, the sector's growth is threatened by overfishing, which has driven 37.7% of global fish stocks into unsustainable levels, alongside marine pollution, biodiversity loss, and climate-induced stressors. Marine biotechnology has emerged as a key enabler for balancing economic growth with ecological integrity. Recent analyses estimate the marine biotechnology market at US$4.2 billion in 2023, projected to reach US$6.4 billion by 2025, reflecting its potential to underpin sustainable industries. Biotechnological innovations such as algae-based biorefineries for biofuels and bioplastics, microbial bioremediation of pollutants, and the discovery of novel marine-derived pharmaceuticals provide pathways to reduce environmental footprints while adding economic value. In particular, algae cultivation simultaneously mitigates CO_2 emissions and nutrient pollution while supplying biomass for high-value metabolites, aligning with global sustainability goals. Similarly, marine microbes and sponges have yielded compounds with antimicrobial and anticancer properties, highlighting untapped biodiversity as a reservoir of solutions. These advances integrate sustainability by promoting low-carbon transitions, enhancing food and energy security, and creating inclusive growth opportunities for coastal communities. However, there are still obstacles to overcome, such as developing governance frameworks to control bioprospecting and protect marine habitats, ensuring fair access and profit sharing, and expanding bioprocess technology. In the future, the combination of biotechnology, digital innovation, and policy support may turn the blue economy into a robust and regenerative system, making marine biotechnology a key component in combating climate change, reviving the ocean, and ensuring future generations livelihoods.

Keywords: Marine, blue economy, sustainability, biotechnology

SUSTAINABLE DEVELOPMENT GOAL 5-GENDER EQUALITY THROUGH WOMEN ENTREPRENEURSHIP

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ABSTRACT

Unemployment is one of the prime challenges India faces in its developmental journey. Women empowerment, a core dimension of Sustainable Development Goal 5 (Gender Equality), remains an unfulfilled dream with rising unemployment and limited avenues for job creation. In rural areas, the agricultural economy has reached a saturation point, leading to large-scale migration towards urban centers and adding pressure to the already overstrained socio-economic corridor. Millions of unemployed youth, including women from rural and semi-urban backgrounds who lack access to higher education yet aspire for meaningful livelihoods, are driven to despair by the absence of suitable opportunities. In this context, the Rural Development & Self Employment Training Institute (RUDSETI) serves as a nodal institution, mitigating unemployment and promoting gender equality by empowering women to become self-reliant entrepreneurs. This article provides an overview of the factors motivating women to take up entrepreneurship, the challenges they encounter, the significance of Entrepreneurship Development Programmes (EDPs), and the perspectives of women trainees on the effectiveness of self-employment training at RUDSETI in Karnataka State. Ultimately, women's entrepreneurship not only advances gender equality but also contributes to decent work, inclusive growth, and sustainable development.

Key words-Unemployment, Entrepreneurship, Self Employment Training, Entrepreneurship Development Programmes, Nodal Institute

GREEN FINANCE AND SUSTAINABLE INVESTMENT IN ALBANIA. OPPORTUNITIES FOR ECONOMIC GROWTH AND ENVIRONMENTAL IMPACT

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ABSTRACT

In a period where climate change and sustainable development are at the center of global policies, Albania has begun to take important steps toward integrating green finance and sustainable investments, into its developmental strategies. This study examines Albania's efforts to promote green finance and sustainable investments, analyzing existing policies, financing mechanisms and concrete projects, that contribute to achieving the Sustainable Development Goals.

Specific case studies include renewable energy projects, energy-efficient building initiatives and environmentally focused SME financing programs, which demonstrate both the potential and the challenges faced in the Albanian context. Comparative international examples from Europe and other emerging markets, demonstrate best practices in designing green financial instruments, promoting private sector engagement and achieving quantifiable environmental outcomes. The research emphasizes the role of the Albanian financial sector, policymakers and international cooperation, in fostering a green investment ecosystem.

By examining these opportunities, challenges and international experiences, this study offers critical insights into how Albania can effectively harness green finance, to foster environmentally responsible economic growth, advance climate change mitigation efforts and promote sustainable development. The analysis highlights the necessity of coordinated policy frameworks, capacity building and the implementation of innovative financial instruments, to fully realize the potential of sustainable investment in the country.

In conclusion, the study underscores the strategic importance of integrating green finance and sustainable investment practices into Albania's financial system, thereby supporting the achievement of Sustainable Development Goals and enhancing the country's resilience to future environmental and economic challenges.

Keywords: financial policies, green finance, sustainable investments, sustainable development goals.

THE INVESTMENT SPECIFICATIONS DOCUMENTS FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

The university benefits from remarkable funding to meet the needs of students, teachers, researchers, and the administration. This funding is only truly used through the mandatory application of regulations, legislation, texts and laws. Launching equipment acquisition operations or construction or rehabilitation operations, is carried out through the establishment of specifications, which are a mandatory condition for achieving the funding objective. The specifications are the regulatory document essential for the consumption of public spending. Specifications play a very important role in the sustainability of an investment. This role consists of the conditions written in the specifications document. If the specifications set strong scientific and regulatory conditions for the acquisition of durable heavy equipment or for construction or rehabilitation, these conditions play an important role in the success of the sustainable concept. The choice of the company that will bring back equipment or that will carry out the construction is based on the conditions of the specifications. If the specifications are well presented, both regulatory and scientific, sustainability will be achieved. Otherwise, if the specifications sole mission is to provide equipment or construction, the sustainable concept will be absent. In investment matters, we will emphasize the regulatory and scientific method and methodology for developing specifications. The specifications are the essential document for achieving investment sustainability, which requires expertise in the field and experience

Keywords: university, investment, specification, sustainability

AN ASSESSMENT OF THE AFFORDABILITY OF PUBLIC WATER SUPPLY IN OGUN STATE

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ABSTRACT

The issue of access to public water supply has been a germane issue of great interest to many individuals, households and communities. Access to sustainable and affordable public water supply is one of the fundamental human rights and an essential requirement for the development of developing countries like Nigeria. The study assesses the affordability of water supply in Ogun State, Nigeria. The study population (6,800) consists of the beneficiaries of public water supply in Ogun State. A sample size of 158 using stratified sampling technique was drawn out of population. The findings of the study revealed that low income earners are mostly the ones that solely rely on public water supply. The current water pricing system is unaffordable for the low income earners households, thereby limiting the access to public water which results to reliance on alternative water sources, some of which are unhealthy and unsafe. Based on these findings, the study recommended that policy interventions such as subsidized water tariffs to the vulnerable groups, encouragement of public-private partnerships, and investment in water infrastructures should be implemented.

Keywords: Affordability, Public Water Supply, Sustainable Development, Water Tariffs, Ogun State.

MICROALGAE UTILIZATION AS A RENEWABLE FEEDSTOCK FOR SUSTAINABLE BIOPLASTIC PRODUCTION

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ABSTRACT

Plastic waste poses significant risks to both the environment and human health, thus, referred as "white pollution". Bioplastics have gained attention as a sustainable alternative to petroleum-derived plastics due to their comparable properties and environmentally friendly nature. In this study, the microalgae Spirulina was used as a source for extracting the biopolymer PHB, due its physicochemical similarity to conventional plastics. Spirulina was cultivated under a varied range of nutrient and environmental conditions. It shows that PHB was produced under all tested conditions, but with varying concentration. The study identified phosphorus, glucose, and iron as the key factors influencing PHB yields. Additionally, it was found that both nutrient excess/limitation and controlled light-dark cycles encouraged greater accumulation of PHB within the algal cells. The extracted PHB was subsequently processed into bioplastic, and to enhance its mechanical strength, additives such as carboxymethyl cellulose or glucose were incorporated. The structure and properties of the bioplastic were analysed using SEM and FTIR. SEM examined physical characteristics including porosity, surface roughness, and particle size of the bioplastic, while FTIR was used for identifying functional groups, understanding structure-property relationships, and monitoring the degradation of the bioplastic. Study shows that while microalgae possess significant promise for the bioplastic sector; however, advancing this research towards commercial application necessitates focused investigations into diverse utilization pathways of microalgae for bioplastic production. Further research is required on optimizing cultivation and processing methods to enhance biomass yield and polymer accumulation.

Keywords: - bioplastic, Spirulina, polyhydroxy-butyrate (PHB), SEM, FTIR

INVESTIGATING THE ENVIRONMENTAL IMPACT OF URANIUM ORE EXTRACTION IN NIGER

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ABSTRACT

The mining industry plays a crucial role in the country's economy and the basis of all industries. Currently, its purpose is to extract the ores from surface or underground and beneficiate them, while being committed to preserve the environment. Despite the efforts made by uranium mining companies, their operations, such as extraction and ore processing, generate radioactive elements and can cause erosion, contamination of soil, groundwater and surface water, air pollution, and, serious consequences for human health. Therefore, the objectives of this study were (1) to assess the environmental impacts of mining operations in Niger through surveys; (2) to identify and quantify the level of contamination through experimental tests and laboratory analyses of the collected samples; (3) to propose sustainable remediation strategies.

The results of survey and experimental tests have shown the presence of radioactivity at the mining site and surrounding area, the contamination of groundwater from in situ leaching, and negative effects on human health. In fact, stabilization methods or phytoremediation could be used to minimize the environmental pollution.

Key words: Mining operation, uranium ore, environmental impact, remediation methods.

SUSTAINABLE DEVELOPMENT GOALS: INITIATIVES TAKEN TO FIGHT ENVIRONMENTAL POLLUTION BY REDUCING CARBON FOOTPRINTS

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ABSTRACT

Environmental pollution has emerged as one of the most pressing challenges to human health, ecosystems, and sustainable development. The release of harmful pollutants into air, water, and soil disrupts natural balances, contributes to climate change, and leads to severe health risks such as respiratory diseases, waterborne illnesses, and loss of biodiversity. Recognizing these challenges, the United Nations introduced the Sustainable Development Goals (SDGs), which serve as a comprehensive framework to address global environmental, social, and economic issues. Several of these goals, such as SDG 3 (Good Health and Well-being), SDG 6 (Clean Water and Sanitation), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action), are directly linked to reducing pollution and fostering a cleaner, healthier planet.

While implementing the SDGs remains complex due to economic disparities, governance issues, and lack of awareness, success stories from different parts of the world highlight that progress is achievable. For example, countries adopting renewable energy on a large scale, communities reducing plastic usage, or cities improving waste management systems demonstrate that sustainable practices can bring measurable improvements.

Individuals also play a crucial role in this global effort. Small but consistent lifestyle changes—such as conserving energy, choosing public transportation, minimizing single-use plastics, or adopting sustainable consumption habits—collectively create significant impact. Governments, businesses, and civil society must work together to design policies, regulations, and innovations that promote sustainable practices. With shared responsibility and collaboration, the vision of the SDGs can be translated into action, ensuring a healthier environment and a sustainable future for generations to come.

Keywords: SDGs, Environment, Pollution, Public Transportation, Bicycle, Individual Capacity

ROLES OF GREEN ENERGY, CAPITAL FORMATION, AND DEVELOPMENT ON EVIRONMENTAL DEGRADATION IN ASIA PACIFIC

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ABSTRACT

Environmental degradation and climate change are the most important challenges to the existence and development of human kind. This research aims at finding the important roles of renewable energy on environmental quality. The theories of Environmental Kuznets curve (EKC) and STIRPAT model have been applied to evaluate for the case of 42 countries in Asia Pacific. The results analyzed by system-GMM approach have shown that renewable energy impact statistically significant and negative on ecological footprint. It means that the investment on renewable energy is a suitable strategy to improve the environmental quality. Besides, development level of economy is also an important factor to environment and the effect is in U-shape. In addition, gross capital formation and population are also significant drivers of environmental degradation. The research results are important evidence for green transformation process toward sustainable environment and development in Asia Pacific region.

Keywords: Green economy, renewable energy, environmental degradation, Kuznets curve

FROM DEBT CYCLES TO SUSTAINABLE LIVELIHOODS: A PARADIGM SHIFT MODEL OF MICRO-INDUSTRIES THROUGH WASTE UTILIZATION IN BANGLADESH

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ABSTRACT

For decades, loan-based poverty alleviation models such as microfinance have been promoted as pathways to empowerment in low-income communities. However, evidence increasingly reveals that such schemes often perpetuate indebtedness rather than generating sustainable economic stability (Bateman & Chang, 2012; Rahman, 2019). In rural Bangladesh, loan repayment burdens, high interest rates, and lack of productive market linkages leave marginalized families vulnerable, trapped in cycles of dependency rather than uplifted into resilience. This study challenges the prevailing paradigm by proposing a shift from loan-dependency to micro-industry development built upon sustainable waste management.

Using a mixed-method approach across Rajshahi and Noakhali divisions, we examined waste streams and socio-economic barriers to empowerment. Quantitative data show that households collectively generate 5.48 million tonnes of recyclable plastic and 1.13 million tonnes of organic by-products annually (World Bank, 2018; ADB, 2022), representing an untapped market potential exceeding USD 800 million. Current loan-based models fail to activate this wealth, as they lack skills training, infrastructure, and fair market access.

Our proposed model introduces micro-industries at the village level, equipping individuals and families with training, decentralized processing units, and direct access to global markets. Pilot projections suggest that this system can reduce unmanaged waste by 60%, create over 5,000 rural jobs within three years, and generate sustainable revenue streams without reliance on debt

This paradigm shift reframes poverty reduction: not as financial assistance but as structural empowerment through skill, production, and fair trade. By transforming waste into wealth, the model provides a replicable pathway for sustainable development aligned with SDGs 8, 11, and 12 (UNDP, 2021).

Keywords: paradigm shift, microfinance critique, micro-industries, waste-to-wealth, sustainable livelihoods

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SUSTAINABLE VALORIZATION OF PETROLEUM RESIDUES INTO ACTIVATED CARBON FOR THE TREATMENT OF REFINERY WASTEWATER

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ABSTRACT

Refinery effluents pose a critical challenge to both environmental sustainability and public health due to their elevated concentrations of toxic organic compounds, heavy metals, and suspended solids. Long-term exposure to such pollutants has been associated with carcinogenic, mutagenic, hepatotoxic, and neurotoxic risks, emphasizing the urgent demand for innovative and eco-efficient remediation approaches.

In this study, we explored the transformation of clarified slurry oil (CS)—a petroleum by-product—into activated carbon for the purification of refinery wastewater. This strategy not only diverts a waste stream toward value creation but also delivers a cost-effective adsorbent with tangible environmental and societal benefits.

Comprehensive characterization using Fourier-transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) confirmed the development of a porous structure suitable for adsorption. Optimal operating parameters were identified at 30 minutes of contact time, pH 11, and an adsorbent dosage of 1 g/L. Under these conditions, removal efficiencies reached: COD 94%, BOD_5 87% (with biodegradability index BOD_5/COD = 0.72), phenols 98%, hydrocarbons 90%, suspended solids 68%, and lead 86%. Isotherm modeling indicated that the Langmuir model provided the best fit, with a maximum adsorption capacity of 312 mg/g.

These findings highlight the dual value of this approach: effective mitigation of multiple hazardous pollutants in refinery effluents and the promotion of circular economy practices through petroleum residue valorization. By addressing both pollution control and resource recovery, this work contributes to advancing global sustainability goals while reducing health risks associated with toxic wastewater discharges.

Keywords: Activated carbon; Petroleum residue valorization; Refinery effluent; Environmental sustainability; Adsorption.

A REMOTE SENSING ASSESSMENT OF AIR POLLUTION IN FIVE BANGLADESHI INDUSTRIAL CITIES

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ABSTRACT

Air pollution is one of the significant environmental problems in the world. In Bangladesh, existing studies mainly focused on air quality status, but analysing temporal trends remained under-studied, mainly because of the lack of long-term air pollutants information. Therefore, this study aims to analyse the temporal trends of air pollutants in five major cities of Bangladesh using Sentinel 5P TROPOMI and MODIS (MCD19A2.061: Terra & Aqua MAIAC Land Aerosol Optical Depth Daily 1 km) satellite data. The temporal pattern of air pollutants, especially NO_2, SO_2, O_3, CO, and AOD, was observed from 2019 to 2024, in this country's most polluted and urbanized cities. The full analysis was performed using Google Earth Engine (GEE). The findings showed that the concentration level of all the pollutants had increased from 2019 to 2024 in the major cities of Bangladesh. Exceptionally, the concentration levels were lower in 2020 due to the strict lockdown measures of COVID-19. Hence, it improved air quality conditions in Bangladesh due to the shutdown of industries, vehicles, and the movement of people at that time. Data analysis indicated that Greater Dhaka experienced higher NO_2, SO_2, and CO pollution levels than other cities. Conversely, AOD values were significantly elevated in Khulna. O_3 concentrations, however, showed minimal variation among the urban centres examined. The average concentrations of these air pollutants revealed a strong seasonal variation, with maximums during summer and winter and minimums during rainy and autumn, except for the concentration of O_3. This research primarily examined the measurement of NO_2, SO_2, O_3, CO, and AOD concentrations from satellite images, including their spatiotemporal variation and six-year temporal trends. The study can benefit policymakers in dealing with air pollution and associated health risks in Bangladesh.

Keywords: GEE, MODIS, TROPOMI, air pollutants, and satellite data.

DESIGN OF IOT-ENABLED SMART CLASSROOMS FOR NEXT-GENERATION LEARNING ENVIRONMENTS

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ABSTRACT

Integration of Internet of Things (IoT) into education paves the way for establishment of smart classrooms that encourage and drive students' engagement. The design framework in this paper is a specific guideline to build an IoT facility for enhancing interactivity, participation and personalized learning. The system includes smart attendance using RFID and facial recognition cameras, automated classroom management -swapping and free time for teaching. Interactive boards and IoT tablets enable students to collaborate on annotating content in real time, while clicker systems and mobile apps offer immediate responses via live quiz and poll features. Wearable gadgets and motion sensors record details about student focus, participation rates and group collaboration that can be analyzed by teachers through cloud-based dashboards to find disinterested students that they then can get on the right track with their learning on-the-fly. Light, air quality and noise sensors track environmental conditions, adjusting them automatically to maximize concentration and comfort. Furthermore, integration with IoT provides augmented and virtual reality apps that supplement experiential, hands-on experiences that improve concept retention and critical thinking. Security schemes, interaction models and scalability issues are taken into account to guarantee long-term deployment. The design of IoT based smart classroom with the integration of automated management tools, live analytics and interactive technologies shows an actual path towards enhancing student engagement for measurable learning output.

Keywords: IoT-enabled Smart Classrooms, student Engagement Technologies, next-generation Learning Environments

ENERJİ DÖNÜŞÜMÜ VE ÇEVRE PERFORMANSI İLİŞKİSİ: KARŞILAŞTIRMALI BİR ANALİZ[1]

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ÖZET

Bu çalışma, enerji dönüşümü ve çevre performansı arasındaki ilişkiyi, ülkelerin gelir düzeyine göre sınıflandırılmış (düşük gelirli, alt-orta gelirli, üst-orta gelirli ve yüksek gelirli ülke grubu) bir örneklem çerçevesinde incelemektedir. Bu ilişki, ekonomik büyüme, sanayileşme, kentleşme ve küreselleşme çerçevesinde temel ekonomik ve sosyal dinamikler dikkate alınarak araştırılmıştır. Ayrıca, Çevresel Kuznets Eğrisi (ÇKE) hipotezinin geçerliliği test edilerek, gelir düzeyine göre sınıflandırılmış ülke gruplarında çevresel bozulma ile ekonomik büyüme arasındaki ilişki incelenmiştir. Çalışmada 1987–2022 dönemine ait veriler kullanılmış ve yatay kesit bağımlılığını dikkate alan CS–ARDL yöntemi uygulanmıştır. Analiz bulguları, enerji dönüşümü ve çevre performansı arasındaki ilişkinin ülkelerin gelir düzeyi, ekonomik yapı ve sosyo-ekonomik dinamiklerine bağlı olarak değiştiğini göstermektedir. Bununla birlikte, Çevresel Kuznets Eğrisi (ÇKE) hipotezinin, gelir düzeyine göre sınıflandırılmış ülke grupları arasında farklılıklar gösterdiği belirlenmiştir. Bu bulgular doğrultusunda çalışma, ekonomik büyüme, yenilenebilir enerji tüketimi, sanayileşme, kentleşme ve küreselleşme süreçlerini dikkate alarak çevresel kirliliğin azaltılmasına yönelik politika yaklaşımlarını tartışmaktadır.

Anahtar Kelime: Enerji, Çevre, CS-ARDL Yöntemi

ENERGY TRANSITION AND ENVIRONMENTAL PERFORMANCE: A COMPARATIVE ANALYSIS

ABSTRACT

This study examines the relationship between energy transition and environmental performance across a sample of countries classified by income level (low, lower-middle, upper-middle, and high-income groups). This relationship is investigated by taking into account key economic and social dynamics, including economic growth, industrialization, urbanization, and globalization. In addition, the validity of the Environmental Kuznets Curve (EKC) hypothesis is tested to analyze the relationship between environmental degradation and economic growth across countries classified by income level. The study uses data from the period 1987–2022 and applies the CS–ARDL method, which accounts for cross-sectional dependence. The findings indicate that the relationship between energy transition and environmental performance varies according to countries' income levels, economic structures, and socio-economic dynamics. Furthermore, the EKC hypothesis is found to differ across income groups. Based on these results, the study discusses policy approaches aimed at reducing environmental pollution, considering economic growth, renewable energy consumption, industrialization, urbanization, and globalization processes.

Keywords: Energy, Environment, CS–ARDL Method

[1] Bu çalışma Prof. Dr. Mehmet DEMİRAL danışmanlığında Arş. Gör. Emine Dilara AKTEKİN GÖK tarafından hazırlanan doktora tezinden türetilmiştir.

SUSTAINABLE DEVELOPMENT TO CIRCULAR ECONOMY: A BIBLIOMETRIC ANALYSIS OF RESEARCH EVOLUTION, TRENDS AND FUTURE DIRECTIONS

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ABSTRACT

The aim of this study is to provide a synthesis of academic research on the relationship between sustainable development and marketing and to conduct a situational analysis. The research seeks to reveal the changes and developments in academic studies within the field of marketing in the transition from sustainability to the circular economy. In this context, publications indexed in the Web of Science (WOS) database between 2021 and 2025 were included in the study. The dataset consisted of articles indexed in the Social Sciences Citation Index (SSCI) and published in English under the Web of Science categories of Environmental Studies, Business, Management, and Economics. The research focus was determined through a comprehensive search query covering concepts such as sustainable development, marketing, circular economy, sustainable marketing, green marketing, green brands, sustainable consumption, sustainable consumer behavior, and green consumption. After applying the specified filters, 1,329 articles were included in the analysis. The research findings present citation patterns, the most productive countries and authors, as well as a co-occurrence map, thereby providing a comprehensive overview of the intellectual structure and thematic evolution of the field. The study makes a significant contribution by integrating the topics of sustainability and the circular economy within a single work and by illustrating the transition from sustainability to the circular economy.

Keywords: Sustainable development, sustainability, circular economy, marketing.

THE IMPACT OF COUNTRIES' TECHNOLOGICAL READINESS ON THEIR GREEN ECONOMY PERFORMANCE IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT: A GLOBAL ANALYSIS

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ABSTRACT

Over the past 50 years, the deterioration of international environmental indicators has intensified the adverse impacts on the global economy and public health. This situation has rendered the technological readiness levels of nations for a green economy a critical component of sustainable development more crucial than ever. The objective of this study is to determine the effect of countries' readiness for frontier technologies, which are essential for achieving a green transition, on their green economy performance.

In this study, data for 140 countries were analyzed using the Simple Linear Regression method. The datasets included the Global Green Economy Index, prepared by Dual Citizen LLC, which comprises four main dimensions (Climate Change and Social Equity, Sectoral Decarbonization, Markets and ESG [Environmental, Social, and Governance] Investments, and Environmental Health), and the Frontier Technology Readiness Index 2024, published by the United Nations Conference on Trade and Development (UNCTAD).

According to the analysis results, the F-statistic p-value was calculated as 2.15e×-22, the coefficient as 0.419, the R-squared as 0.535, and the p-value for the readiness index variable as 0.00. Based on these values, it was determined that a country's Frontier Technology Readiness Level has a positive and statistically significant strong impact on its green economy performance.

Keywords: Green Economy, Frontier Technologies, Frontier Technology Readiness Index

SÜRDÜRÜLEBİLİR KALKINMA EKSENİNDE ÜLKELERİN TEKNOLOJİK HAZIRLIKLARININ YEŞİL EKONOMİ PERFORMANSLARINA ETKİSİ: KÜRESEL BİR ANALİZ

ÖZET

Son 50 yılda uluslararası çevre göstergelerindeki kötüleşmenin küresel ekonomi ve toplum sağlığı üzerindeki olumsuz etkileri artmış; bu durum, sürdürülebilir kalkınmanın önemli bir bileşeni olan yeşil ekonomi için ülkelerin teknolojik hazırlık seviyelerini her zamankinden daha önemli hale getirmiştir. Bu çalışmanın amacı da ülkelerin yeşil dönüşümü gerçekleştirecek sınır teknolojilerine hazırlık seviyelerinin yeşil ekonomi performanslarına etkisinin tespit edilmesidir.

Bu çalışmada 140 ülke için Dual Citizen LLC tarafından hazırlanan ve dört ana boyuttan (iklim değişikliği ve sosyal eşitlik, sektörel karbonsuzlaşma, piyasalar ve ÇSY (çevresel, sosyal ve yönetişim) yatırımları, çevre sağlığı) oluşan Global Yeşil Ekonomi Endeksi ile Birleşmiş Milletler Ticaret ve Kalkınma Konferansı tarafından açıklanan Sınır Teknolojilere Hazırlık Endeksi 2024 verileri Basit Doğrusal Regresyon analizi yöntemi ile test edilmiştir.

Test sonuçlarına göre F-istatistiği p değeri: 2.15e-22, coef:0.419, R-kare: 0.535, STHS P: 0.00 olarak hesaplanmıştır. Bu değerlere göre ülkelerin Sınır Teknolojilere Hazırlık Seviyesinin Ülkelerin yeşil ekonomi performansı üzerinde pozitif yönlü, istatistiksel anlamda güçlü bir etkiye sahip olduğu tespit edilmiştir.

Anahtar Kelimeler: Yeşil Ekonomi, Sınır Teknolojileri, Sınır Teknolojilere Hazırlık Endeksi

NATIONAL SUSTAINABILITY AND EMPLOYEE ENGAGEMENT: EVIDENCE FROM CROSS-COUNTRY DATA

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ABSTRACT

Employee engagement is widely recognized as a driver of productivity, innovation, and organizational resilience. Yet the relationship between macro-level sustainability and workforce engagement remains underexplored. This study investigates these links using three-year aggregated data (2022–2024) from Gallup's global engagement surveys and the Sustainable Development Report's SDG indices, covering 135 countries. The analyses concentrated on SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 16 (Peace, Justice, and Strong Institutions), as these goals are most directly linked to the determinants of employee engagement. Research grounded in the Job Demands–Resources model highlights health and well-being as foundational resources that enable vigor and resilience at work (SDG 3). SDG 8 reflects the quality of work itself, encompassing safe conditions, fair pay, and learning opportunities—all central drivers of sustainable engagement. Finally, SDG 16 captures governance quality, trust, and institutional effectiveness, which provide the broader societal context for engagement. Analyses revealed that stronger sustainability performance in these domains is associated with lower levels of active disengagement ($r = –.38$ to $–.45$, $p < .001$). Conversely, higher SDG scores are positively related to the proportion of "not engaged" employees ($r = .36–.51$, $p < .001$), and show no significant relationship with actively engaged employees. Regression analysis confirmed that SDG 3 (Estimate = –0.0014, $p = .010$) and SDG 8 (Estimate = –0.0034, $p < .001$) significantly predicted reduced disengagement, while SDG 16 did not add unique explanatory power. For policymakers and organizations, the findings underscore that sustainability progress acts as a protective factor—reducing disengagement—but is not sufficient to increase active engagement. This highlights the need for complementary organizational interventions (e.g., leadership practices, job design, recognition) to translate national sustainability gains into engaged workforces.

Keywords: Employee Engagement, Sustainable Development Goals, Cross-National Analysis, Decent Work.

MANAGERS' PERCEPTIONS OF SUSTAINABILITY: A STUDY ON PORT PRACTICES

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ABSTRACT

With the increase in global trade, the environmental and social impacts of ports have become as visible as their economic functions. In this context, corporate sustainability is critical in terms of legal compliance, building trust with stakeholders, and ensuring long-term social acceptance. This study aims to examine the current sustainability perceptions and practices of port managers in Türkiye. Using a qualitative approach, this study conducted semi-structured interviews with eleven port managers from diverse backgrounds. Data collected through 30-45 minute online interviews were analyzed using the Constant Comparative Analysis (CCA) method. Data obtained from each new interview were compared with previous codes, similarities and differences were systematically evaluated, and categories and themes were developed accordingly. After the interviews were completed, all data were comprehensively re-compared to establish the final themes. The analysis revealed that managers' perceptions of sustainability primarily encompassed economic efficiency and environmental management, while the social dimension remained relatively weak in practice. The findings indicate that although managers view sustainability as a strategic necessity, there is a lack of standardization in communication, transparency, and stakeholder participation. It provides a fundamental basis for future large-scale field research and research designs. The results provide valuable insights for port managers to develop more comprehensive sustainability strategies.

Keywords: Sustainable Port Practices, Corporate Sustainability, Managers' Perceptions

THE UTILIZATION OF SOCIAL MARKETING IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

In the shadow of technological development and shifting dynamics, the world is struggling to address issues such as climate change, hunger, healthy living, poverty, and migration, all of which have varying impacts. The United Nations members have set their sights on achieving global action by the year 2030 to address the challenges currently facing humanity in the context of the Sustainable Development Goals (SDGs). At its most fundamental, the goal is to ensure that all people live in peace, tranquillity, and prosperity. In this sense, targets, referred to as calls to action, are supported by governments, civil society organizations, and members of the private sector, and efforts are being carried out at both individual and collective levels to create a more livable world. The present study aims to evaluate the Sustainable Development Goals along with the discipline of social marketing, which has been making its presence felt since the 1970s and whose influence is growing every day. The term "Social Marketing," first coined by Kotler in 1971, encompasses the planning, implementation, and control of programs to encourage the adoption of social ideas that benefit both society and individuals. At this point, the focus is on developing behaviours that will benefit society, utilizing marketing principles and methods. While governments and civil society organizations play key roles in recognizing and supporting individual responsibility in achieving the SDGs through social marketing, numerous challenges persist in realizing these objectives. In this context, issues addressed in the context of social marketing are evaluated in relation to SDGs, and an assessment of hindering factors is presented. The current status of progress toward development goals has been evaluated. Recommendations have been formulated for both researchers working in this field and practitioners who directly or indirectly contribute to these goals.

Keywords: Sustainable Development Goals (SDGs), Social Marketing, Türkiye, Sustainability

MARITIME CONNECTIVITY AND ENVIRONMENTAL EFFICIENCY: AN ARDL ANALYSIS FOR TÜRKIYE

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ABSTRACT

As the primary mode of global trade, maritime transport ensures efficiency in world commerce but also accounts for a notable share of carbon emissions. Understanding how connectivity and efficiency improvements affect emission intensity is therefore critical for advancing sustainable shipping. This study investigates the relationship between maritime connectivity and environmental efficiency in Türkiye's containerized trade. The analysis focuses on whether improvements in the Liner Shipping Connectivity Index (LSCI) contribute to reducing emissions per twenty-foot equivalent unit (TEU), reflecting the hypothesis that stronger connectivity facilitates larger vessel deployment, more direct routes, and economies of scale. Using quarterly data covering 2019Q1–2025Q2, emissions per TEU were calculated by dividing reported shipping emissions by container throughput. An Autoregressive Distributed Lag (ARDL) approach was employed to capture both short-run dynamics and long-run relationships. Diagnostic tests confirmed model adequacy, and the bounds test provided weak evidence of cointegration. Results reveal that short-run changes in LSCI do not significantly affect emissions per TEU, while the long-run coefficient unexpectedly indicates a positive association. This finding suggests that in the Turkish case, increased connectivity coincided with higher per-unit emissions. The study concludes that while the theoretical expectation of a negative LSCI–emissions link remains plausible, the effect is context-dependent. Connectivity improvements alone may be insufficient for decarbonization without complementary measures in fleet composition, port infrastructure, and fuel transition.

Keywords: Maritime transport; Sustainability; CO_2 emissions; Liner Shipping Connectivity Index (LSCI); Emissions intensity.

CAN EUROPE STAY PRODUCTIVE? MACROECONOMIC AND DEMOGRAPHIC PRESSURES ON LABOR PRODUCTIVITY

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ABSTRACT

This research examines the impact of demographic shift and broader economic factors on labor efficiency in 23 European Union countries (EU-23) from 2005 to 2022. The analysis employs dynamic panel techniques, including Generalized Method of Moments (GMM), Random Effects (RE), and Autoregressive Distributed Lag (ARDL) models, to investigate the influences of population aging, unemployment, inflation, GDP per capita, research and development (R&D), life expectancy, and capital formation on productivity dynamics. Unit root and cointegration tests verify the existence of long-run interconnections between variables with varying levels of integration. Research indicates that inflation has a significant detrimental effect on productivity, whereas GDP per capita and R&D investing consistently enhance efficiency and output per worker. Life expectancy appears to have a negative impact, influenced by demographic pressures, whereas unemployment shows an unusual positive relationship with productivity, which is possibly due to structural changes in the labor market and the adoption of new technologies. The ARDL error-correction model confirms long-run convergence, with a persistence of productivity determinants observed over time. Research suggests that Europe's productivity growth relies on macroeconomic stability, innovation, the accumulation of human capital, and demographic adaptation.

Keywords: EU, Labor Productivity, Aging, GDP Growth, R&D, Panel Data

EVALUATION OF THE RELATIONSHIP BETWEEN CLIMATE CHANGE AWARENESS AND CARBON FOOTPRINT

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ABSTRACT

Objective: This study aims to examine the relationship between climate change awareness and carbon footprint awareness among students at Burdur Mehmet Akif Ersoy University.

Method: A quantitative method was adopted in the research, and a correlational and causal research model was used. Data were collected through a survey from 446 university students selected by simple random sampling during the 2024-2025 academic year. The questionnaire included socio-demographic questions, the "Global Climate Change Awareness Scale," and the "Carbon Footprint Scale." The collected data were analyzed using the SPSS 25 program; descriptive statistics, correlation, and regression tests were applied.

Results: A positive and significant relationship was found between global Deceleration awareness and carbon footprint awareness ($r = 0.316$, $p < .001$). As the level of awareness increases, it is observed that students' awareness of their carbon footprint also increases. Climate change awareness significantly and positively predicts carbon footprint awareness ($\beta = 0.202$, $p < .001$), this variable explains about 10% of the variance in carbon footprint awareness ($R2 = 0.10$). When the "carbon information" variable was added to the model, the effect of climate change awareness continued, and carbon information was found to have a negative and significant effect ($\beta = -2.44$, $p = .008$). In this case, the explicitness of the model increased and reached 16.4%. While there was no significant difference in awareness levels according to socio-demographic variables, housing type increased climate change awareness on both scales, and having knowledge of carbon footprint significantly increased awareness. This shows that knowledge level plays a critical role in environmental awareness.

Conclusion: Universities should increase students' environmental awareness by promoting sustainable living; environment-focused education, projects and communication channels play a decisive role in this process. The findings obtained in this context constitute an important basis that will guide the development of environmental policies.

Keywords: Global climate change, carbon footprint, awareness, sustainability

A REVIEW OF WATER QUALITY MONITORING IN TURKEY HISTORICAL TRENDS, CURRENT PRACTICES, AND FUTURE PERSPECTIVES

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ABSTRACT

The monitoring of water quality is imperative for the preservation of human health and the assurance of the sustainable management of ecosystems. In Turkey, the practice of water quality monitoring has historically centered on ensuring the safety of drinking water and safeguarding public health. However, with the rise of industrialization and agricultural activities, this field has undergone a significant expansion, embracing a more comprehensive approach to environmental monitoring. Since the 2000s, the harmonization process with European Union environmental legislation has contributed to the expansion of monitoring networks, increased parameter diversity, and strengthened laboratory infrastructure. In the contemporary context, the evaluation of surface waters, groundwater, drinking water sources, and wastewater is conducted through the application of physicochemical, biological, and toxicological parameters. However, significant constraints persist, including regional differences, a lack of institutional coordination, limitations in data sharing, and insufficient monitoring of new pollutants (pharmaceuticals, microplastics, endocrine disruptors).

In recent years, technological advances have brought innovative methods, such as real-time sensor systems, remote sensing techniques, and environmental DNA (eDNA) analysis, to the forefront of water quality monitoring. Additionally, data integration, artificial intelligence–based prediction models, and citizen science applications are considered key future approaches to water quality monitoring. To improve water quality monitoring in Turkey, it is recommended that a standardized data infrastructure be established at the national level, inter-agency cooperation be strengthened, monitoring programs for new pollutants be launched, and public participation be encouraged.

Turkey has made significant progress in water quality monitoring. However, increasing environmental pressures and the risks posed by climate change necessitate a more integrated, technological, and participatory monitoring approach.

Keywords: Water Quality Monitoring, Turkey, Sustainable Water Management, Emerging Pollutants, Technological Innovations

A NEW APPROACH TO INCREASE WATER EFFICIENCY IN AGRICULTURE

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ABSTRACT

Turkey's water resources are characterized by their limited availability and uneven distribution, with the agricultural sector accounting for approximately 79% of the total water consumption. A mounting population, shifts in climate patterns, surging industrial and urban demand, and other such factors are collectively exerting mounting pressure on water resources. This necessitates the urgent improvement of agricultural irrigation efficiency.

In the context of irrigation projects implemented by numerous institutions, particularly the Devlet Su İşleri (State Hydraulic Works ,DSİ), the implementation of closed pipe systems and automation in irrigation processes has emerged as a pivotal aspect. The transition from open channel systems to closed systems has been demonstrated to reduce losses and leaks by increasing measurement and control capabilities. Prepaid meter applications have been shown to ensure savings in water usage. However, significant problem areas have been identified, including inter-agency authority conflicts, regulatory gaps, old irrigation facilities with high maintenance and repair needs, and the uncontrolled use of groundwater.

To address this challenge, it is recommended that a comprehensive Water Law be enacted at the national level. Additionally, the development of geographic information-based management systems that facilitate data integration is crucial. Furthermore, the promotion of modern irrigation techniques is essential, and the institutional capacities of irrigation unions must be strengthened. Concurrently, novel methodologies, including smart irrigation systems, drone-based field monitoring, water footprint analyses, sectoral water allocation plans, and rainwater harvesting, are emerging as innovative tools that will increase water use efficiency in agriculture.

In conclusion, in order to increase water efficiency in agriculture in Turkey, technical innovations must be addressed in an integrated manner alongside administrative and institutional reforms. In this context, sustainable and digitized water management is a strategic priority for the future security of agricultural production and adaptation to climate change.

The present study undertakes an evaluation of contemporary water management practices in Turkey, the state of irrigation infrastructure, salient challenges, and novel approaches to enhancing water efficiency.

Keywords: Agricultural Water Efficiency, Irrigation Management, Sustainable Water Resources, Water Policy in Turkey

SUSTAINABILITY IN HIGHER EDUCATION: CARBON FOOTPRINT REPORTING AND MANAGEMENT ON UNIVERSITY CAMPUSES

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ABSTRACT

Higher education institutions (HEIs) play a fundamental role in advancing sustainability, serving as promoters of innovation, science, and technology. In response to the urgent challenge of global warming, universities worldwide are increasingly adopting strategies to monitor and mitigate their environmental impact. University campuses, as dynamic centers of education and sociocultural life, inevitably generate significant greenhouse gas (GHG) emissions through their daily operations and activities. In this study emissions arising from natural gas consumption, electricity use, water supply, and campus fleet vehicles were estimated in accordance with the Intergovernmental Panel on Climate Change (IPCC) methodology. The total greenhouse gas emissions for the year 2024 were calculated to be 13,101 t CO_2e. When normalized by the number of university staff, the per capita carbon footprint was determined as 0.35 t CO_2e per person. In terms of ecological footprint equivalence, the total emissions correspond to the carbon sequestration capacity of approximately 8,852 hectares of forest area, which translates to 0.24 hectares per person. Among the emission sources considered in the calculations, electricity consumption accounted for the largest share with 70%, followed by natural gas use with 25%. Emissions from water consumption (2.22%) and the operation of the university-owned vehicle fleet (1.74%) ranked third and fourth, respectively. These findings highlight the significant ecological burden associated with campus operations and emphasize the necessity for effective mitigation strategies in energy use. Integrating renewable energy systems (e.g., solar photovoltaics, wind, or geothermal), improving energy efficiency in campus buildings, and adopting smart energy management systems can significantly reduce emissions. Moreover, incorporating energy storage technologies and demand-side management strategies can enhance the resilience and sustainability of campus energy systems. From a policy perspective, establishing institutional energy targets, adopting green procurement standards, and promoting behavioral change among staff and students are essential for long-term success.

Keywords: University, carbon footprint, ecological footprint, green campus

GREEN TRANSFORMATION IN WEARABLE TECHNOLOGIES: SUSTAINABLE SMART TEXTILES

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ABSTRACT

Textile, often referred to as the 'second skin' of the human body, has a history dating back as far as 27,000 years. However, textiles, a key part of modern civilization, is considered to be the second-most polluting industry after the oil sector, producing 92 million tons of textile waste annually. Although, 95%of textiles are fully recyclable, 85%find theirway to landfills. This corresponds to the equivalent of a truckload of clothing being discarded every second. Therefore, there is an urgent need to increase the use of environmentally friendly materials and to develop sustainable production processes.

Textiles continuously evolve in response to human needs and technological advancements. Today, traditional textiles are increasingly being replaced by smart textiles. In the production of these products, it has become essential to promote the development of sustainable, wearable e-textiles and to plan effective end-of-life strategies for their use.

Sustainability is a multifaceted concept that involves the integration of better material utilization, the reduction of overall carbon footprints, and the balanced use of renewable resources and biodegradable products within an efficient recycling/reproduction economy. Through this holistic approach, a global solution for fiber production, smart textile manufacturing, and sustainability can be achieved. It is essential to preserve sustainability while paving the way for future technological advancements in next-generation textiles toward a greener world [3, 4].

Keywords: Sustainable Smart Textiles, Environmentally Friendly Materials, Recycle.

GİYİLEBİLİR TEKNOLOJİLERDE YEŞİL DÖNÜŞÜM: SÜRDÜRÜLEBİLİR AKILLI TEKSTİLLER

ÖZET

Tekstil yüzeyleri insan vücudunun "ikinci derisi" olarak öngörülmektedir ve 27.000 yıla kadar uzanan bir geçmişe sahiptir. Bununla birlikte, modern medeniyetin önemli bir parçası olan tekstil sektörü, petrokimya sektöründen sonra doğayı en çok kirleten ikinci endüstri olarak kabul edilir ve yılda 92 milyon ton tekstil atığı üretmektedir. Tekstil ürünlerinin %95'i tamamen geri dönüştürülebilir olmasına rağmen, %85'i atık olarak ayrılmaktadır. Bu durum her saniye bir çöp kamyonu dolusu tekstil atığının çevreyi kirletmesine eşdeğer bir miktara karşılık gelmektedir. Bu nedenle çevre dostu malzemelerin kullanımına ve sürdürülebilir üretim süreçlerinin geliştirilmesine ihtiyaç vardır [1, 2].

Tekstil sektörü, sürekli olarak insan gereksinimlerine ve teknik atılımlara göre evrimleşmektedir. Günümüzde geleneksel tekstiller yerini akıllı tekstillere bırakmaktadır. Bu ürünlerin üretim sürecinde, sürdürülebilir, giyilebilir e-tekstillerin üretimini teşvik etmek ve etkili bir kullanım ömrü sonu stratejisi planlamak önemli konulardan biri haline gelmiştir.

Sürdürülebilirlik, malzemelerin daha iyi kullanımının entegrasyonunu, karbon ayak izlerinin azaltılmasını, yenilenebilir kaynakların ve biyolojik olarak parçalanabilir ürünlerin kullanımının verimli bir geri dönüşüm/yeniden üretim ekonomisiyle dengelenmesini içeren çok yönlü bir kavramdır. Bu bütünsel yaklaşımla, elyaf üretimi, akıllı tekstil üretimi ve sürdürülebilirlik için küresel bir çözüm elde edilebilir [3]. Daha yeşil bir dünyaya doğru sürdürülebilirliği koruyarak yeni nesil tekstillerin gelecekteki teknolojik ilerlemelerinin yolunu açmak önem arz etmektedir [4].

Anahtar Kelimeler: Sürdürülebilir Akıllı Tekstiller, Çevre Dostu Malzemeler, Geri Dönüşüm

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SUSTAINABLE DEVELOPMENT GOALS AND CLIMATE POLICIES IN LOCAL GOVERNMENTS: A PARTICIPATORY APPROACH

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ABSTRACT

The United Nations 2030 Sustainable Development Goals (SDGs) have made combating climate change a global priority. In this regard, SDG 11 “Sustainable Cities and Communities” and SDG 13 “Climate Action” particularly emphasize the critical role of cities and local governments in this process. This study aims to reveal how sustainable development goals and climate policies are harmonized within local governments through an integrated and participatory approach, based on expert opinions (survey study). By measuring the level of integration between SDGs and climate policies in local governments, the study seeks to identify strengths and areas for improvement, and to propose a participatory and applicable governance model.

The research consists of two stages. In the first stage, the theoretical relationship between sustainable development goals and climate policies is presented. In the second stage, a survey was conducted with expert groups working in local governments in Osmaniye province, which was selected as the study area. The survey, designed to determine the priorities and implementation levels of local governments regarding these goals and policies, was evaluated under five main themes. Likert-scale questions and matrix evaluations were used to obtain both quantitative and qualitative data, thereby revealing the strengths and weaknesses in the integration of SDGs and climate policies by local governments.

Based on the findings, a holistic and participatory governance model is proposed for local governments. This model promotes social participation while ensuring climate justice, and provides policymakers with feasible recommendations. Thus, the study makes an empirical contribution at the intersection of sustainable development goals and climate policies by assessing the institutional capacities of local governments.

Keywords: Local governments, sustainable development goals, climate policies, climate action, sustainable cities and communities

THE TRANSFORMATION OF CLIMATE POLICIES IN TURKEY: GLOBAL INFLUENCES AND NATIONAL STRATEGIES

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ABSTRACT

Climate change has moved to the center of scientific, political, and social agendas since the last quarter of the 20th century. Globally, environmental issues began to gain significant attention with the 1972 Stockholm Conference, while the 1987 Montreal Protocol, focusing on the protection of the ozone layer, emphasized the importance of recognizing the potential impacts of emissions on the climate. Climate change negotiations intensified from the 1990s onward. For instance, the 1992 UN Conference on Environment and Development in Rio opened the United Nations Framework Convention on Climate Change (UNFCCC) for signature, marking the beginning of a systematic process in climate diplomacy. Milestones such as the Kyoto Protocol (1997) and the Paris Agreement (2015) have shaped the global climate regime, focusing on emission reduction, adaptation, financing, and technology transfer. These international processes have increasingly influenced national climate strategies, emission targets, and local adaptation plans, particularly since the 2000s.

This study examines the development of Turkey's climate policies from their emergence to the present within the framework shaped by global processes. In the case of Turkey, the institutionalization and visibility of climate policies began later compared to the global agenda. Turkey signed the Kyoto Protocol in 2009, accepted the Paris Agreement in December 2015, and ratified it in the Turkish Grand National Assembly in 2021. A party to the UNFCCC since March 25, 1994, Turkey has taken steps in adaptation strategies and Nationally Determined Contributions (NDC) planning in subsequent years. In 2021, Turkey announced its net-zero emission target for 2053, later published its "Long-Term Climate Strategy" documents, and in 2025, the country’s first Climate Law was adopted by the Turkish Grand National Assembly.

In this context, the study systematically investigates the periods during which Turkey’s climate policies have evolved, the themes shaping these policies, their positive and negative impacts, and compares them with the global climate agenda.

Keywords: Climate change; climate policies; Turkey; sustainable development planning

PARATRANSIT SYSTEM DESIGN FOR TRANSPORTATION REQUESTS OF DISABLED PASSENGERS IN CENTRAL İZMİR

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ABSTRACT

Transportation is an indispensable need for all members of society. However, developing special solutions for individuals who cannot use traditional scheduled public transportation due to physical or mental disabilities is essential. People with disabilities face major challenges in the existing public transportation system, particularly in terms of accessibility barriers, lack of ramps, and excessive travel times. Demand-responsive solutions addressing this issue are generally defined in the literature under the “paratransit” concept.

In this study, we propose a system designed to meet the transportation requests of disabled passengers in central Izmir, based on individual addresses, aiming to reduce travel times and maximize the efficiency of limited fleet capacity. While providing fair and tailored services for individuals, the system also ensures more effective management of urban resources.

The study focuses on the Dial-a-Ride Problem (DARP), extended with a transfer mechanism to improve service quality. During the solution process, metaheuristic optimization methods were applied to handle both pre-planned static and real-time dynamic demands. Route planning was performed using the Adaptive Large Neighborhood Search (ALNS) algorithm due to its flexibility and strong performance. The results demonstrated cost savings of 67–77% with respect to the initial solutions obtained for the districts of Karşıyaka, Bayraklı, and Çiğli, validating the feasibility of the model with high assignment rates.

By underlining inclusivity in urban mobility, the proposed model expands access to public transportation for individuals with disabilities, supports sustainable urban planning and efficient use of city resources. Furthermore, the study introduces a scalable and adaptable framework that aligns with global sustainable development goals (SDGs) related to resilient cities, reduced inequalities, and innovative transport systems. Consequently, it contributes to both academic literature and practical implementation by offering a socially responsible and sustainable mobility solution.

Keywords: Urban Mobility, Paratransit Systems, Inclusive Transportation, Dial-a-Ride Problem (DARP), Adaptive Large Neighborhood Search (ALNS), Accessible Transportation, Meta-heuristic Optimization, Sustainable Urban Planning, Resilient Cities, Dynamic Routing.

ARTIFICIAL INTELLIGENCE FOR SMARTER LOGISTICS IN ALBANIA: A QUALITATIVE EXPLORATION

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ABSTRACT

This paper examines the integration of Artificial Intelligence (AI) technologies in logistics companies in Albania, highlighting both the current state and the challenges of digital transformation in this sector. AI applications in logistics are diverse, including demand forecasting, shipment planning, warehouse optimization, and real-time visibility into routes, cargo conditions, and potential disruptions. By leveraging advanced algorithms, companies can predict transit times, identify the most suitable carriers and pricing models, and suggest alternatives in cases of transport interruptions. AI also enhances customer service, with chatbots capable of addressing routine inquiries and analytical tools that process customer feedback to improve service quality. The study adopts a qualitative methodology, combining semi-structured interviews and document analysis. The results show that while these companies see the value of AI, they face several problems. These include weak digital infrastructure, not enough training for employees, and limited funds to invest in new technologies. In addition, many companies lack a clear long-term vision for digital change, which makes adoption even slower. Because of these issues, the paper recommends stronger support from institutions, better training programs, and clear strategies to help companies move toward AI-based logistics. The findings offer useful insights into how digital change is happening in Albania's logistics sector and suggest ways to support innovation and growth in this important part of the economy.

Keywords: Artificial Intelligence, Logistics, Digital Transformation, Albania, Supply Chain Optimization, Innovation

HİBRİT GÜNEŞ-RÜZGÂR YENİLENEBİLİR ENERJİ TESİSLERİNİN MEKÂNSAL OPTİMİZASYONU: BOOLEAN MANTIĞINA DAYALI KARAR VERME YAKLAŞIMI

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ÖZET

Küresel iklim değişikliği ve fosil yakıtlara dayalı enerji üretiminin çevresel etkileri, yenilenebilir enerji sistemlerini sürdürülebilir kalkınma politikalarının merkezine yerleştirmektedir. Bu bağlamda, güneş ve rüzgar gibi birbirini tamamlayan kaynakların birlikte değerlendirildiği hibrit yenilenebilir enerji sistemleri (HRES), enerji arz güvenliği, sistem verimliliği ve karbon salımının azaltılması açısından stratejik bir çözüm sunmaktadır. Bununla birlikte, bu sistemlerin başarısı yalnızca enerji potansiyeline değil, aynı zamanda doğru mekânsal yer seçimine de bağlıdır. Bu çalışmanın amacı, hibrit yenilenebilir enerji sistemlerinin yer seçimi süreçlerinde mekânsal uygunluk analizlerinin rolünü değerlendirmek ve rüzgâr-güneş enerji kaynaklarının bir arada kullanılabileceği en uygun alanları çok kriterli bir değerlendirme sistemiyle belirlemektir. Çevresel ve mekânsal sürdürülebilirlik boyutunun önemi göz önüne alınarak güneş ışınımı, rüzgâr hızı, eğim, bakı, yükseklik, koruma statüleri, arazi kullanımı, altyapı erişimi ve yerleşimlere uzaklık gibi göstergeler, raster tabanlı analizlerle bir araya getirilerek uygunluk haritaları oluşturulmuştur. Mekansal uygunluk değerlendirmesi güneş ve rüzgar enerji potansiyelinin yüksek olduğu Başyayla ilçesinde (Karaman) gerçekleştirilmiştir. Değerlendirmeler, Coğrafi Bilgi Sistemleri (CBS) uygulama araçlarından ArcGIS Pro yazılımı kullanılarak, Boolean AND operatörü yaklaşımıyla gerçekleştirilmiştir. Çalışmanın bulguları, çok kriterli sürdürülebilir mekânsal enerji planlaması kapsamında çalışma alanının %6,3'ünün güneş enerjisi tesisi, %4,5'inin rüzgâr enerjisi tesisi ve %1,74'ünün ise güneş-rüzgâr hibrit yenilenebilir enerji tesisi için uygunluk gösterdiğini ortaya koymaktadır. Bu sonuçlar, yerel ölçekte karar vericiler ve politika yapıcılar için önemli bir mekânsal destek sistemi sunmaktadır. Ayrıca, önerilen mekânsal yaklaşım ve modelin ölçeklenebilir ve transfer edilebilir yapısı, farklı yenilenebilir enerji kaynaklarına yönelik yer seçiminde rehber niteliğinde kullanılabilir.

Anahtar Kelimeler: hibrit yenilenebilir enerji, güneş enerjisi, rüzgar enerjisi, mekansal karar verme, Boolean AND

SPATIAL OPTIMIZATION OF HYBRID SOLAR–WIND RENEWABLE ENERGY FACILITIES: A DECISION-MAKING APPROACH BASED ON BOOLEAN LOGIC

ABSTRACT

Global climate change and the environmental impacts of fossil fuel–based energy production have placed renewable energy systems at the center of sustainable development policies. In this context, hybrid renewable energy systems (HRES), which integrate complementary sources such as solar and wind, offer a strategic solution for ensuring energy supply security, enhancing system efficiency, and reducing carbon emissions. However, the success of these systems depends not only on energy potential but also on appropriate spatial site selection. The aim of this study is to evaluate the role of spatial suitability analyses in the site selection process of hybrid renewable energy systems and to identify, through a multi-criteria assessment framework, the most suitable areas where solar and wind resources can be utilized together. Considering the importance of environmental and spatial sustainability, indicators such as solar radiation, wind speed, slope, aspect,

elevation, protection status, land use, infrastructure accessibility, and distance to settlements were integrated through raster-based analyses to generate suitability maps. The spatial suitability assessment was carried out in Başyayla district (Karaman), where solar and wind energy potential is high. The analyses were conducted using the ArcGIS Pro software, one of the Geographic Information Systems (GIS) tools, based on a Boolean AND operator approach. The findings reveal that, within the framework of multi-criteria sustainable spatial energy planning, 6.3% of the study area is suitable for solar power plants, 4.5% for wind power plants, and 1.74% for hybrid solar–wind renewable energy facilities. These results provide an important spatial decision-support system for local-level decision-makers and policymakers. Moreover, the scalable and transferable structure of the proposed spatial approach and model can serve as a guideline for site selection of different renewable energy sources.

Keywords: hybrid renewable energy, solar energy, wind energy, spatial decision-making, Boolean AND.

RISK IDENTIFICATION AND INTERACTION ANALYSIS IN HUMANITARIAN LOGISTICS PROCESSES

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ABSTRACT

Disasters are unpredictable and devastating events that profoundly impact societies' social and economic fabric. Humanitarian logistics, which refers to the planning, implementation, and coordination of the delivery of humanitarian aid to those in need, is the most fundamental element of post-disaster humanitarian aid efforts. It aims to deliver essential supplies to disaster victims quickly, effectively, and equitably. However, this process faces numerous uncertainties and risks.

The risks inherent in humanitarian logistics activities are multidimensional and constantly evolving due to the dynamic nature of the process. These include damage to transportation infrastructure, inadequate food and water resources, capacity limitations in healthcare services, limited shelter, and communication disruptions. Furthermore, the magnitude of the disaster, geographical conditions, the number of personnel and volunteers, and the distribution of resources are among the factors that directly impact the success of the process. However, it should be noted that risks are not independent of one another; on the contrary, they can interact and trigger one another. Therefore, risks should be evaluated individually and from a holistic perspective, encompassing their interrelationships.

This study presents the key risks encountered in humanitarian logistics processes and their interactions using causal loop diagrams. It discusses their importance in disaster management and the potential for improvement. The findings demonstrate that a risk-based approach should be considered not only in the post-disaster response phase but also throughout the entire preparedness and recovery process. Within this framework, mitigating risks and accurately assessing their interactions can significantly improve disaster response and strengthen the resilience of societies in the long term.

Keywords: Humanitarian Logistics, Disaster Management, Risk Assessment, Causal Loop Diagrams

BIBLIOMETRIC MAPPING OF ELECTRIC VEHICLE BATTERY THERMAL MANAGEMENT AND COOLING TECHNOLOGIES: TRENDS AND FUTURE DIRECTIONS

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ABSTRACT

This study was conducted to reveal research trends in the field of lithium-ion battery thermal management systems (BTMS) for electric vehicles. Publications from 2000 to 2025 were retrieved from the Web of Science and Scopus databases. The data were processed using Bibliometrix (R) and VOSviewer; annual publication trends, the most influential journals, countries, institutions, and authors were identified. Co-authorship, co-citation, bibliographic coupling, and co-word analyses were performed, and thematic clusters (liquid cooling – microchannel/cold plate, heat pipes, phase change materials, nanofluids, jet impingement, hybrid/active-passive solutions, artificial intelligence, and topology optimization) were mapped. The findings indicated that research activity accelerated after 2015; cold-plate/microchannel and PCM-based approaches were located at the citation core; and machine learning (ML)-based optimization and low-global-warming-potential (GWP) refrigerants emerged as rising themes. Distinct hubs and regional clusters were observed in country–institution collaboration networks. The study synthesizes BTMS research from a sustainability perspective (energy efficiency, safety, cell life, environmental impacts) and highlights technology roadmaps and future research gaps to inform policy-making and research and development (R&D) priorities.

Keywords: BTMS, Cooling Technologies, Bibliometric Analysis.

IMPLEMENTATION OF DIGITAL PRODUCT PASSPORT IN LOW-TECH ELECTRICAL PRODUCTS: A CASE STUDY ON AN ELECTRICAL SOCKET

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ABSTRACT

The Digital Product Passport (DPP) is a strategic traceability tool that enables the collection and dissemination of environmental and technical data throughout a product's life cycle, thereby supporting sustainability and transparency objectives. The European Green Deal and the Eco-design for Sustainable Products Regulation (ESPR) place the DPP at the center of sustainable product policies, while the Batteries Regulation (EU) 2023/1542 represents the first mandatory implementation. This study develops a QR code–based DPP model for an electrical socket.

The proposed model is structured with a two-layer access architecture: QR-1 provides publicly available data for consumers and recycling operators, while QR-2 delivers authorized data for manufacturers and market surveillance authorities. The content covers material composition, energy consumption, carbon footprint, compliance documentation (CE, RoHS), and recycling instructions. Technically, the model ensures accessibility through machine-readable QR codes compliant with ISO/IEC 18004. This approach, with its user-friendly and low-cost structure, offers a practical roadmap that is also feasible for small and medium-sized enterprises (SMEs).

In conclusion, the study demonstrates the applicability of the Digital Product Passport even in low-tech products, highlighting its potential to enhance transparency, regulatory compliance, and the advancement of circular economy goals across diverse industrial sectors. The proposed framework can also serve as a reference model for future standardization efforts and regulatory road maps on Digital Product Passports.

Keywords: Digital Product Passport, QR code, Sustainability, Circular Economy, Compliance.

OPTIMIZING SOLAR ENERGY FORECASTING THROUGH MACHINE LEARNING WITH REAL-TIME DATA FOR SUSTAINABLE ENERGY USAGE

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ABSTRACT

In this study, production data obtained from a photovoltaic power plant with a capacity of 5.23 MW were used to compare and analyze various deep learning and machine learning methods. The results indicate that artificial neural network (ANN)-based models, particularly the Min-Max scaled version, provided the closest predictions to actual production values. This model achieved the lowest MAE, RMSE, and MAPE values, while the positive R^2 value further demonstrates that it is the method that best explains the variance in the data.

Although LSTM models were successful in capturing temporal dependencies, the error rates between the real-time data and the actual production values remained higher compared to ANN models. Methods such as LightGBM and K-Means, while suitable for predicting general production trends, were found to be inadequate for short-term forecasting accuracy.

In conclusion, this study has demonstrated that the ANN (Min-Max) model is the most successful method for solar energy production forecasting, generating results closest to actual production values. This finding can be considered a significant decision support tool for energy planning, maintenance strategy optimization, and grid management.

Keywords: Solar, Renewable Energy, Machine Learning, Sustainability

CONCEPTUALIZING SUSTAINABLE SOCIAL ENTREPRENEURSHIP: INTEGRATING COMMUNITY VALUES AND SUSTAINABILITY PRINCIPLES IN SOCIAL ECONOMY MODELS

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ABSTRACT

The sustainability of social entrepreneurship represents a crucial dimension for the evolution of the social economy, being anchored in foundational values such as solidarity, equity, responsibility, and democratic participation. Recent research highlights that the performance and resilience of social enterprises are directly influenced by the degree of integration of these community values into their organizational and operational structures. This article conceptually addresses sustainable social entrepreneurship by analyzing key principles of sustainability—social, economic, and sometimes ecological—that ensure the long-term viability of social initiatives.

The proposed paper aims to develop a multidimensional analytical framework for identifying, classifying, and assessing sustainable social entrepreneurship models, focusing on how community values are incorporated, and the impact these have on economic and social performance. The theoretical approach draws on recent literature (Putnam, Schwartz, Battilana & Lee, Defourny & Nyssens) and synthesizes diverse organizational models such as nonprofit social enterprises, hybrid models, social businesses, and cooperative structures. The analysis also explores the factors that facilitate or hinder the sustainable scaling of these models, emphasizing the synergy between blended value, social capital, and institutional support from public policies.

Drawing on empirical data from Romania, as well as international policy benchmarks, the article underlines the strategic importance of sustainable social entrepreneurship for local development, inclusion, and innovation. The research offers rigorous analytical tools for practitioners, impact investors, and policymakers seeking to integrate sustainability principles at the heart of social enterprise, thus generating lasting value for communities and maximizing social impact.

Keywords: social entrepreneurship, sustainability, community values, blended value, social economy.

NAVIGATING THE COMPLEXITIES OF DIGITAL TAXATION IN GLOBAL ECONOMIC GOVERNANCE: EVALUATING THE IMPACT OF OECD'S TWO-PILLAR FRAMEWORK AND EMERGING NATIONAL DIGITAL SERVICE TAXES ON DEVELOPING ECONOMIES

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ABSTRACT

The rapid growth of the digital economy has posed significant challenges to traditional international tax frameworks, necessitating innovative legal and economic solutions. This study critically examines the evolving complexities of digital taxation within global economic governance, focusing on the implementation and impact of the OECD/G20 Inclusive Framework's Two-Pillar Solution and emerging National Digital Service Taxes (DSTs). The research addresses a pressing gap in the literature concerning the effectiveness and equity of these reforms, particularly in relation to developing economies that historically face disadvantages in international tax regimes. The study's objective is to evaluate how Pillar One reforms seek to redefine taxing rights by shifting focus to user location and how Pillar Two introduces a global minimum corporate tax rate to curb base erosion and profit shifting. Concurrently, it analyzes how unilateral DSTs implemented by jurisdictions including France, India, and the UK interact with these multilateral reforms, including compliance challenges and legal compatibility with WTO and international tax law. The research employs a qualitative methodology, combining doctrinal analysis of international tax treaties with empirical review of recent implementation status reports, policy documents, and case studies focusing on developing countries.

Key findings reveal that while the OECD's Two-Pillar model presents a promising framework for addressing the tax challenges posed by digitalization, its adoption faces hurdles such as divergent national interests, implementation delays, and administrative capacity constraints in developing countries. Moreover, emerging DSTs have created both conflict and complementarity with multilateral efforts, contributing to legal uncertainties and potential double taxation risks. The study concludes with policy recommendations emphasizing the need for enhanced international cooperation, capacity-building support for developing nations, and the harmonization of national and international tax laws to foster a fair, consistent, and sustainable digital tax regime.

Keywords: Digital Taxation, OECD Two-Pillar Framework, Digital Service Tax, Developing Economies, International Tax Law, Global Economic Governance

THE POLITICAL ECONOMY OF ENVIRONMENTAL SUSTAINABILITY AND ITS IMPLICATIONS FOR AFRICAN DEVELOPMENT: A REFLECTION ON A JUST TRANSITION TO A CIRCULAR ECONOMY

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ABSTRACT

Contemporary discourses on marital relations and gender roles within the institution has been a contentious one within the Nigerian social landscape. These discourses, shaped by differing views and perspectives, not only determine what is expected of each gender within the union, but also the overall determinant of what constitutes a fulfilling and unfulfilling marriage. Using an analytical approach, this presentation will reflect on the concept of coloniality of gender and its relevance to the construction and negotiation of gender roles in contemporary marriage in Nigeria. Coloniality of gender which is a view of how persistent colonial system of power relations among genders, imposed during colonial times still shapes social interactions in former colonies, has a lot of implications for Nigerian socio-cultural institutions, particularly marriage. The paper explores how these colonial imprints shape contemporary expectations, behavior, and power dynamics in Nigerian marriages. The paper aims to show how colonial practices and views reinforces patriarchal constructs that affects women's agency, gender equality and sustainable existence, in the hope to contribute to efforts to reframe gender roles in marriage beyond colonial-hegemonic paradigms.

Keywords; Coloniality, Decoloniality, Gender, Marriage, Gender Role.

ENERGY TRANSITION IN ALGERIA: CHALLENGES, OPPORTUNITIES, AND PATHWAYS TO SUSTAINABILITY

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ABSTRACT

Algeria is at a critical point in its energy trajectory, with rising domestic demand and dwindling hydrocarbon export capability threatening long-term energy security. Currently, hydrocarbons account for roughly 93% of export revenues and 60% of the state budget, while national energy demand grows at a 6-7% annual rate. Algeria has one of the world's highest solar potentials, with yearly irradiation of 2,500-3,000 kWh/m², creating enormous chances for renewable energy.

This study investigates Algeria's energy transition, including its progress, hurdles, and prospects, with a special emphasis on solar power, energy efficiency, and emerging green hydrogen options. It evaluates the gaps between the Renewable Energies 2030 Programme objectives, of 22 GW of renewable capacity and current achievements, which remain below 1% of the energy mix.

The study suggests that Algeria's transition is both an economic and an environmental imperative. Regulatory reforms, foreign investment, private sector participation, and technology transfer are all key facilitators.

In contrast, fossil fuel subsidies, funding constraints, and institutional inertia continue to be significant barriers. This study adds to the broader discussion on sustainable energy paths in North Africa by addressing both potential and challenges, emphasizing the importance of a just, inclusive, and well-sequenced transition.

Keywords: Energy transition; Renewable energy; Solar power; Sustainability; Algeria.

SUSTAINABLE PACKAGING AS A CATALYST FOR GREEN TRANSFORMATION IN THE CIRCULAR ECONOMY

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ABSTRACT

Sustainable packaging plays a crucial role as a catalyst for green transformation within the circular economy framework. As environmental concerns and regulatory pressures intensify globally, industries are shifting from traditional packaging methods to more sustainable alternatives that prioritize resource efficiency, waste reduction, and recyclability. This paper examines how sustainable packaging—through innovations such as compostable materials, recyclable mono-materials, lightweight fibre-based designs, and reusable systems—enables businesses to reduce environmental impact while supporting circular economy principles that keep materials in use as long as possible.

By embracing sustainable packaging, companies respond to increasing consumer demand for eco-conscious products and align with regulatory frameworks such as Extended Producer Responsibility (EPR), which require producers to manage the life cycle impacts of their packaging. The study highlights key benefits of sustainable packaging, including reduced carbon footprints, lower solid waste generation, and enhanced resource conservation, all of which contribute to global climate action goals.

Moreover, sustainable packaging offers commercial advantages by improving brand reputation, fostering consumer trust, and reducing logistics costs through lightweighting and efficient design. Technological advancements in materials and processes further support scalability and functional performance, making sustainability economically viable.

This paper demonstrates that sustainable packaging is not merely an environmental imperative but a strategic driver for green transformation. It accelerates industries' transition to circular business models that promote regeneration, resilience, and long-term value creation. Ultimately, this research argues that advancing sustainable packaging practices is essential for achieving a regenerative economy that balances ecological health with economic growth and social well-being.

KEYWORDS: Sustainable Packaging, Circular Economy, Green Transformation, Eco-friendly Packaging, Packaging Innovation

ECONOMIC FRONTIERS OF THE HERBAL-PRODUCTS MARKET: HEALTH, TRADE, AND SUSTAINABILITY

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ABSTRACT

The global herbal-products sector is developing fast, pushed by consumer interest in natural remedies, an increase in integrative health care, and international trade in botanical raw materials and finished herbal formulations. This analysis synthesizes existing knowledge on three interrelated dimensions—health, trade and economic dynamics, and sustainability with special reference to Nigeria and sub-Saharan Africa. A recent Nigerian study highlights both opportunity and risk: more than 80% of the country's 10,000 medicinal plant species remain economically untapped, yet heavy-metal and microbial contamination are widespread in indigenous herbal treatments. Globally, the herbal supplements market was valued at roughly USD 115 billion in 2021 and is predicted to exceed USD 210 billion by 2028. India and China dominate exports, but African nations, particularly Nigeria, are emerging sources of raw botanicals and essential oils, but poor processing capacity inhibits value capture. Sustainability remains a key challenge: wild harvesting of medicinal species, combined with climate change and habitat degradation, threatens biodiversity across West Africa. Innovations such as community-based cultivation and FairWild certification show promise but require governmental and financial assistance. This approach blends health, economic, and ecological views to reveal recurring gaps: standardized clinical trials, equitable value-chain governance, and scalable sustainable production strategies. Policymakers should increase safety regulation, invest in processing infrastructure, and support conservation programs to ensure that market expansion coincides with public health and environmental goals.

Keywords: Herbal products, Nigeria, global trade, sustainability, natural health, economic growth

TURNING CRISIS-INDUCED CHALLENGES INTO OPPORTUNITIES FOR BUILDING SUSTAINABLE SHORT FOOD SUPPLY CHAINS: THE CASE OF THE COVID PANDEMIC

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ABSTRACT

Over recent decades, short food supply chains (SFSCs) have gained increasing attention from governments and the public due to their potential to address sustainability challenges inherent in conventional, globalized, and production-intensive food systems. Crises—such as the coronavirus disease 2019 (COVID-19) pandemic—have placed unprecedented pressure on food supply systems worldwide, creating a unique opportunity to evaluate their resilience and performance. This study conducts a scoping review of the academic literature to assess the implications of the COVID-19 pandemic for SFSCs across different economies. Following the PRISMA-ScR framework, the SCOPUS and Web of Science databases were systematically searched. After applying predefined inclusion criteria, 46 relevant articles were selected for in-depth analysis. The findings suggest that, in addition to the direct disruptions caused by the pandemic, the indirect consequences of public policies aimed at containing the virus have significantly affected all dimensions of sustainability. Furthermore, the impacts appear to be more severe in the SFSCs of low-income countries compared to those of high-income countries. The review identifies key challenges and opportunities for advancing the sustainable development of SFSCs and provides recommendations to guide future research in this field.

Keywords: COVID-19; pandemic, food; sustainability, short supply chains

UNCERTAINTY MANAGEMENT IN BUSINESS STRATEGY

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ABSTRACT

In an era marked by rapid globalization, geopolitical volatility, and technological disruption, organizations face an unprecedented range of challenges that demand adaptive responses and innovative approaches. Based on a narrative literature review methodology, this research aims to examine how uncertainty is managed within business strategy. Results indicate that managing uncertainty is vital for strategic resilience, innovation, and long-term performance. Organizations may reduce uncertainty through information gathering, data analysis, and market research, or tolerate it by fostering flexibility and resilience. Effective strategies rely on understanding and monitoring both internal and external factors through feedback loops that enable continuous learning and adjustment. Tools such as scenario planning, risk analysis, and agile frameworks help anticipate disruptions and respond proactively. This paper advances theoretical understanding by integrating perspectives from strategic management, dynamic capabilities theory, and organizational learning to explore how to manage uncertainty in corporations. Also, the paper identifies several opportunities for future research. Practically, the papers offers actionable insights for managers seeking to enhance resilience and adaptability. It suggests that uncertainty can be mitigated or leveraged through data-driven decision-making, scenario planning, and agile frameworks. By fostering a learning-oriented, flexible culture, organizations can transform uncertainty into a strategic opportunity, reconfiguring resources, anticipating disruptions, and continuously aligning strategies with environmental shifts.

Keywords: Uncertainty, Management, Business, Strategy.

DIGITAL CHANGE AGENTS: SOCIAL MEDIA INFLUENCERS AND THE SHIFT TOWARD SUSTAINABLE CONSUMPTION

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ABSTRACT

Sustainable consumption has become an urgent priority as societies confront the challenges of climate change, environmental degradation, and social inequities. While governments and organizations continue to promote eco-friendly practices, individual behavioral change often remains inconsistent. Social media influencers (SMIs) have emerged as powerful actors capable of bridging the gap between awareness and action by shaping consumer preferences, values, and lifestyles through digital platforms. This paper examines the role of SMIs in advancing sustainable consumption by synthesizing insights from existing studies and highlighting the mechanisms of influence. Particular attention is given to factors such as influencer credibility, authenticity, message framing, and the importance of community engagement. The review also considers barriers such as perceived greenwashing, affordability of sustainable products, and challenges to long-term behavior adoption. Findings suggest that SMIs are uniquely positioned to make sustainability relatable by embedding eco-friendly practices into everyday life narratives and fostering parasocial relationships that drive trust. Their ability to translate complex sustainability issues into accessible messages has strong potential to mobilize younger generations, particularly Gen Z, toward eco-conscious choices. However, ensuring authenticity and addressing structural barriers remain crucial for maximizing impact. By exploring these dynamics, this paper underscores the potential of influencers as digital change agents and identifies pathways for future research and practice in leveraging their influence for global sustainability.

Keywords:- Social Media Influencers, Sustainable Consumption, Green Marketing, Consumer Behavior

INTERNATIONAL GLOBAL SUSTAINABILITY AND DEVELOPMENT

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ABSTRACT

The International Global Sustainability and Development Congress offers a prominent forum for discussion, research, and partnerships on sustainable development issues in a transforming world. It brings together policymakers, researchers, business executives, community organizations, and young individuals to tackle intertwined environmental, social, and economic challenges. Main topics encompass climate actions, renewable energy, ecosystem diversity, circular economy, urban durability, and approaches toward the UN Sustainable Development Goals. Highlighting innovation, fairness, and worldwide collaborations, the congress promotes the sharing of knowledge and effective solutions. The goal is to strengthen communities, involve young people, and promote transformative initiatives that connect development with environmental care and sustainable wealth.

Keywords: Sustainability, Sustainable Development Goals (SDGs), Climate Change, Renewable Energy, Biodiversity Conservation, Circular Economy, Urban Resilience.

MANAGING INNOVATION FOR SUSTAINABLE DEVELOPMENT IN NIGERIAN UNIVERSITIES: A TRIPLE HELIX PERSPECTIVE

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ABSTRACT

Background: Innovation in a university setting encompasses the development and application of new ideas, technologies, pedagogical approaches, and research outputs that contribute to societal progress, economic growth, and institutional competitiveness. In Nigerian universities, effective innovation management is vital for enhancing research productivity, promoting entrepreneurship, and strengthening collaboration with industry. However, persistent challenges such as inadequate funding, weak university-industry linkages, and obsolete infrastructure impede the realization of these goals.

Objective: This study investigates how innovation (application of new ideas, pedagogical approaches, and research output) is managed within Nigerian universities, identifies institutional and systemic barriers, and proposes strategic pathways for fostering innovation-led sustainable development. It also explores how universities can better translate academic research into practical, industry-relevant applications.

Methodology: A convergent mixed-methods design was employed. Quantitative data were collected through structured surveys administered to 450 respondents, including faculty members, administrative staff, and postgraduate students across five federal and private universities. Qualitative data were gathered through semi-structured interviews with 25 key stakeholders, including innovation center directors and industry partners. Data were analyzed using descriptive statistics and thematic analysis.

Findings: While some institutions have established innovation hubs, business incubation centers, and digital learning environments, systemic constraints remain. These include limited and unstable research funding, fragmented policy implementation, low levels of industry engagement, and administrative bottlenecks.

Conclusion/Novelty: The study proposes a context-specific, stakeholder-informed model for innovation ecosystems in Nigerian universities. This highlights the need for integrated strategies that involve increased funding, policy coherence, and active industry partnerships. Unlike previous research, this study uniquely synthesizes multi-stakeholder perspectives and applies the Triple Helix framework to present a comprehensive roadmap for sustainable innovation in the Nigerian higher education sector.

Keywords: Innovation Management, Sustainable Development, Triple Helix Model, University-Industry Collaboration, Nigeria.

POSSIBILITY OF ACTUALISATION OF THE SUSTAINABLE DEVELOPMENT GOALS: IMPLICATION FOR INDIGENOUS LANGUAGE MEDIA

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ABSTRACT

The implementation report provided by the United Nations on SDG II portrays that the realisation of the goal is in doubt in terms of achieving it by 2030 which is just five years away. According to UN, global hunger continues with almost 1 in 10 of the world's population and 2.4 billion people experienced moderate to severe food insecurity. The UNO therefore called for intensified efforts to transform the food system if zero hunger will be achieved. It is against this backdrop that this paper argues and advocates for intensified efforts in respect to communication engagement for the actualisaion of the SDGs and specifically the indigenous language media. Hence, the paper delved into the unique place of indigenous language communication engagement for achieving SDGs I and III and buttressing this with Salawu's Model of Indigenous Language for Development Communication and practical examples of the use of indigenous language for development purposes. The advantages of indigenous language media and the model included the connection between the media and the language users, the model is in tune with the cultural realities and the model is culturally sensitive. This therefore provides a situation in which the receivers will understand the message better and also have a robust interaction with the source. More so, the use of indigenous languages strengthen the capacity of message recipients, in particular people living in rural areas, for early warning, risk reduction, management of health risks and bumper production of food.

Keywords: SDGs, Indigenous Language, Development Communication, and Indigenous Language Media

EMBEDDING ESG IN SMES: PATHWAYS TO SUSTAINABLE INNOVATION AND CLEAN ENERGY ADOPTION

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ABSTRACT

The principles of Environmental, Social, and Governance (ESGs) have taken center stage in promoting sustainability and hastening the process of the world becoming a net-zero society. As big companies integrate ESG activities into their strategies, SMEs (the core of world economies) can find it more challenging to implement ESG promises. This article examines how ESG orientation can impact SMEs to adopt clean energy technologies and innovate sustainably in the conditions of technological, market, and regulatory uncertainty. Based on an interdisciplinary approach combining sustainability management, digital transformation, and business model innovation, the study uses mixed-methods research to examine how SMEs can overcome resource limitations through ESG-oriented goals. It is confirmed that ESG commitment not only determines the organizational resilience but also increases the credibility and competitiveness of SMEs in green markets. The paper has added to the existing debates on sustainable innovation and provided valuable recommendations that can be used by policymakers and practitioners aiming to increase the pace of the green transition by linking ESG implementation with clean energy adoption. Finally, the study highlights the importance of ESG as a strategic facilitator of sustainable development and a guiding framework.

Keywords: ESG, sustainability, SMEs, clean energy adoption, digital transformation, business models, green transition

HOW DOES GREEN HUMAN RESOURCE MANAGEMENT PRACTICES ENHANCE SUSTAINABLE PERFORMANCE? THE ROLE OF GREEN AWARENESS AND GREEN KNOWLEDGE

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ABSTRACT

The study investigates the influence of green human resource management (GHRM) on sustainable performance through mediation role of green knowledge and green awareness in Pakistani textile sector. This study also examines the moderating role of green mindfulness on employee green awareness and green knowledge. This study uses time lagged research design to collect data from 391 employees and their managers working in textile companies. Structural equation modeling used to analyze the hypothetical relationships. The findings indicate that GHRM positively influence green awareness and green knowledge, which leads towards the sustainable performance in the textile companies. Additionally, our results suggest that high green mindfulness strengthens the effects of GRHM on green awareness and green knowledge. These results suggest that GHRM practices and green mindfulness by setting goals in line with green agenda in the company promoting green mindfulness textile companies can enhance employee green awareness and green knowledge to improve sustainable performance. This study underlines the importance of GHRM and green mindfulness in promoting sustainable performance and helps practitioners establish sustainable human resource strategies to achieve sustainable goals.

Keywords: Green human resource management, green mindfulness, green knowledge, green awareness and sustainable performance.

FROM FORESTS TO RESORTS: GOVERNMENTAL INACTION, BIODIVERSITY LOSS, AND THE CHALLENGE TO ACHIEVING SDGS IN THE CHITTAGONG HILL TRACTS

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ABSTRACT

Chattogram is full of natural forest resources and well-known as a tourist spot in Bangladesh. The Chattogram Hill Tracts (CHT) include hill tracts forests, coastal and mangrove forests, reserved forests, and community and private forests. It contains almost 40% of the total national forest of Bangladesh. Now, it is seen as the most environmentally critical region in Bangladesh due to the deforestation, lack of governmental intervention, extensive resort building, increase of poachers, extensive resource collection, and so on. These directly lead to biodiversity loss and environmental degradation. In addition, these raise the challenges to achieve Sustainable Development Goals (SDGs) in Bangladesh. The main purpose of the study is to examine the forest conversion to the resort or commercial place, explore the impacts of biodiversity and ecosystem loss, and analyse the role of government and their policy towards achieving SDGs goals. This study used a mixed-methods approach to analyse forest conversion to the resort, its impacts, and governmental policies towards achieving SDGs goals in the CHT region, where quantitative methods were used through stratified and cluster sampling. Primary data were collected from local communities and focus on the specific district, like CHT. Furthermore, an online survey from (n=200) participants and a face-to-face interview (n=30). On the other hand, qualitative methods focus on the purposive sampling. It includes secondary data from news articles, NGO reports, prior studies, and governmental policy reports. Findings of the study indicate that extensive infrastructure in forests and resource collection lead to biodiversity loss, which creates natural imbalance and directly affects the local communities. It also shows that impractical policies of the government lead to the natural distraction of the CHT region, and it creates the barriers to achieving SDGs goals. Overall, the study provides the cases and consequences of the environmental degradation and barriers to the attainment of SDGs goals.

Keywords: SDG goals, biodiversity, CHT, deforestation

SYSTEMATIC REVIEWS ON SUSTAINABILITY EFFORT IN THE HOSPITALITY INDUSTRY IN NIGERIA

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ABSTRACT

In the tourism industry, the term "sustainability" has been defined in a variety of ways. As a result, many business owners are unsure of what the term actually means and what it includes. Unfortunately, this uncertainty has made them reluctant to start any efforts to accept it in their hotel doors and in their business plan. The purpose of this study is to give a sense of a roadmap for sustainability initiatives in the tourism sector (globally); to give hoteliers a variety of options for new and creative sustainability initiatives; and to investigate the sustainability initiatives that are currently being implemented in the sector. After doing a statistical analysis of twenty-five publications and journals, the author selected fifteen that were most pertinent to the subject of the study. The findings demonstrate that sustainability is not only highly relevant in the tourism industry, but that there are also numerous innovative ways (through technology, construction, etc.) that tourism organizations are making sustainable efforts a priority in their business strategies. This is demonstrated by the expansion of their clientele and customer satisfaction, the decrease of their carbon footprint, and an improvement in their overall corporate rating among travelers worldwide. The review's findings also revealed a deficit in the body of knowledge regarding sustainability in the travel and tourism sector.

Keywords: sustainability, eco-innovation, sustainability challenges, green practices, systematic literature review**.**

SUSTAINABILITY THROUGH STORYTELLING: ECO-LITERACY IN BIJAL VACHHARAJANI'S *A CLOUD CALLED BHURA*

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ABSTRACT

Bijal Vachharajani's *A Cloud Called Bhura: Climate Champions to the Rescue* (2019) exemplifies how children's literature can serve as a powerful medium for promoting sustainability and environmental awareness. By blending humor, storytelling, and graphic illustrations, the text simplifies complex issues of climate change, pollution, and ecological imbalance, while positioning children as active participants in shaping a sustainable future. Through the lens of ecocriticism, the novel reveals how unchecked industrial growth and anthropocentric attitudes contribute to ecological crises, with the smog cloud Bhura symbolizing the destructive consequences of unsustainable development. At the same time, eco-pedagogy provides a framework to understand how the book functions as an educational tool that transforms awareness into action, encouraging young readers to become climate champions through small yet meaningful steps. The narrative not only critiques exploitative models of progress but also redefines development as a process that must align with ecological balance and intergenerational responsibility. By situating children at the center of environmental discourse, *A Cloud Called Bhura* demonstrates the transformative role of graphic storytelling in cultivating eco-literacy, fostering resilience, and inspiring collective responsibility for sustainable development, thereby affirming literature's potential as both a critical and pedagogical force in addressing the climate crisis.

Keywords: Children's Literature, Eco-pedagogy, Ecocriticism, Development**,** Graphic Storytelling, Sustainability

EVALUATING THE IMPACT OF MICROFINANCE ON SUSTAINABLE LIVELIHOOD OUTCOMES IN LOW-INCOME SETTINGS: A SYSTEMATIC REVIEW

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ABSTRACT

Microfinance is widely acknowledged as a developmental instrument designed to alleviate poverty and bolster social and economic resilience among excluded groups. Although its impact on income enhancement, empowerment, and financial inclusion is well-documented, the degree to which microfinance fosters sustainable livelihoods is debated across many contexts. This systematic review seeks to consolidate existing evidence regarding the impact of microfinance on fostering sustainable livelihoods in low-income areas. The assessment examines the efficacy of microfinance initiatives in enhancing household income, financial stability, female empowerment, social inclusion, and long-term resilience. A comprehensive search will be performed across prominent databases (Scopus, Web of Science, PubMed, JSTOR, and Google Scholar) for papers published from 2000 to 2025. Eligible studies will comprise peer-reviewed publications, case studies, and program evaluations that evaluate microfinance treatments in low-income contexts. The data will undergo thematic analysis and, when feasible, meta-analysis to discern patterns in outcomes, problems, and best practices. The review aims to underscore the mixed evidence regarding microfinance outcomes—although numerous studies indicate enhancements in income generation, women's empowerment, and credit accessibility, others identify issues such as over-indebtedness, restricted scalability, and disparate effects across gender and regional contexts. The findings will elucidate the role of microfinance in promoting sustainable livelihoods, providing evidence-based insights for policymakers, practitioners, and development organizations. The assessment will identify knowledge deficiencies and propose avenues for future research to enhance the sustainability results of microfinance programs.

Keywords: Microfinance, Sustainable Livelihoods, Low-Income Communities, Poverty Reduction, Systematic Review

EXCHANGE RATE VOLATILITY, THE BANE OF NIGERIA INDUSTRIAL PRODUCTIVITY

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ABSTRACT

This study investigate the effects of exchange rate volatility on Nigeria's industrial productivity, employing Structural Vector Autoregression (SVAR) and System Generalized Method of Moments (GMM) models on annual data from 1981–2023. Johansen cointegration tests confirm a long-run equilibrium, with a 12% annual adjustment speed toward stability. Results reveal a significant negative relationship between exchange rate volatility (ERV) and manufacturing capacity utilization (MCU), with ERV explaining 32% of MCU's variance long-term. A 1-standard-deviation ERV shock reduces industrial productivity by 1.2% initially, cumulating to 6.3% over five years. Inflation (INF) and forex reserves (FXS) further exacerbate and marginally mitigate industrial decline, respectively. The findings align with Aliyu (2020) and Adelowokan et al. (2015), highlighting systemic vulnerabilities from Nigeria's oil dependency and import reliance. Policy recommendations include harmonizing exchange rate windows, boosting forex liquidity for critical industries, and implementing import substitution strategies under the National Development Plan 2021–2025.

Keywords: Exchange rate volatility, industrial productivity, forex reserves, error correction model, Nigeria.

ESG INTEGRATION AND CORPORATE SUSTAINABILITY REPORTING IN NIGERIA: CHALLENGES AND PROSPECTS

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ABSTRACT

Globally, Environmental, Social, and Governance (ESG) reporting has become an imperative structure for driving responsible business practices and sustainable development. In Nigeria, regulations, growing investor interest, and transparency demand by stakeholders have prompted a slow shift toward ESG adoption. The Nigerian Exchange Group (NGX) presented its Sustainability Disclosure Guidelines in 2019, and the Financial Reporting Council has stressed alignment with global sustainability standards. Nonetheless, challenges remain in entrenching ESG into corporate strategy and reporting practices. This looks at the state of ESG sustainability reporting and integration among Nigerian firms, with a focus on listed companies in key sectors such as financial services, energy, and manufacturing. It discovers barriers, which include frail data infrastructure, inadequate technical capability, high compliance costs, and uneven regulatory enforcement. Recent case studies show both achievements, such as Nigeria's issuance of sovereign green bonds and first adopters of ESG disclosure, and the cracks in mainstreaming ESG. The paper argues that improving ESG integration in Nigeria requires solidification of regulatory frameworks, aligning reporting standards with international yardsticks, building corporate capacity, and incentivizing ESG-driven investments. It also stresses the role of civil society, investors, and international partnerships in accelerating the transition toward sustainable corporate principles and practice. This offers concrete recommendations for policymakers, leaders in business, and investors seeking to improve ESG adoption as a path to sustainable development in Nigeria.

Keywords: ESG, Corporate Sustainability, Disclosure, Nigeria, Sustainable Finance

SUSTAINABILITY AND DEVELOPMENT: BUILDING A BALANCED FUTURE

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ABSTRACT

Sustainability and development are two inseparable concepts that define the pathway toward a secure and equitable future. Sustainable development refers to progress that meets the needs of the present without limiting the ability of future generations to meet theirs. It involves a delicate balance of three dimensions—economic growth, social equity, and environmental protection. In today's world, challenges such as climate change, deforestation, resource depletion, pollution, and widening social inequalities highlight the urgent need to rethink traditional models of development. A sustainable approach emphasizes renewable energy, eco-friendly technologies, waste reduction, and sustainable agriculture to protect natural resources. At the same time, development must focus on reducing poverty, improving healthcare, expanding education, and promoting equality across communities. Achieving this dual goal requires innovation, global cooperation, and the adoption of policies that integrate sustainability into industries, governance, and daily human practices. True development cannot be considered successful if it comes at the cost of environmental degradation or social injustice. Therefore, sustainability acts as the guiding principle for inclusive and resilient growth. By aligning human progress with ecological preservation, we can ensure a healthier planet, fairer opportunities, and a better quality of life for both present and future generations.

Keywords: sustainable development, economic growth, future generation, environment protection, global cooperation

TECHNOLOGY INOVATION AND DIGITAL SUSTAINABILITY

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ABSTRACT

Monitoring systems that incentivize, track and verify compliance with social and environmental standards are widespread in food systems. In particular, digital monitoring approaches using remote sensing, machine learning, big data, smartphones, platforms and blockchain are proliferating. The impact of the COVID-19 pandemic has increased the search for solutions to social problems associated with the Sustainable Development Goals conducted a systematic review based on a sample of 45 peer-reviewed articles published from 2010 to 2022, combining a bibliometric study Digital technology can have lasting impacts on health workers, patients, and the health system, through improving data management for decision-making, the standard of maternity service delivery, Nigeria has one of the worst health and development profiles globally. A weak health system, poor infrastructure, and varied socio-cultural factors are cited as inhibitors to optimal health system performance and improved maternal and child health status. EMicro- and nano-plastics (MNPLs) can move along the food chain to higher-level organisms including humans. promoting and sustaining the chronic development of intestinal inflammation, mainly in high-risk populations such as IBD patients. contribute to the chronic development of inflammation and CRC development. Successful centres of excellence should promote public-private business partnerships, clustering and global collaborations based on excellence, smart strategies and innovation if they are to remain sustainable in the longer term. Depending on the context, “quantitative change before qualitative change” describes the dynamic development process of green innovation fueled by digital finance The non adoption, abandonment, scale-up, spread, and sustainability (NASSS) framework was developed to help study complexity in digital innovations. The harnessing of technology was key in supporting the COVID-19 response in Uganda gaps existed in access, adoption, harmonisation, evaluation, sustainability and scale up of technology options. Three international case studies of technological innovation are analyzed to demonstrate use of the framework and model.

Keywords: Circular economy, green deal, strategy, sustainability inhibitors, sustainability supply chain, human exposure, nano plastics, digital science, genomics, green technology innovation quality.

ECONOMICS OF SUSTAINABLE RISK MANAGEMENT IN MINING COMPANIES IN KAZAKHSTAN

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ABSTRACT

In the context of digitalization and global transformations, risk management has become a key tool for ensuring the sustainable development of enterprises. The article examines risk management methods and their practical application on the example of a company, where internal audits reveal both the effectiveness and the limitations of the existing system. The COSO model is analyzed, with emphasis on its shortcomings in covering operational and environmental risks. The need to adopt the more flexible FERMA model, which takes into account modern challenges such as climate change, environmental standards, and digital transformations, is justified. The study presents quantitative indicators of ecological and production-related risks and provides methodological recommendations for improving risk management systems within the framework of sustainable development goals.

Keywords: economic, risk management, sustainability, internal audit, environmental risk, corporate resilience.

THE RISE AND FALL OF JUTE: ECONOMIC CHALLENGES AND FUTURE PROSPECTS OF BANGLADESH'S GOLDEN FIBER

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ABSTRACT

Traditionally, jute, being a long-established and genuinely ancient fiber used in Bangladesh and known as the golden fiber, has been the backbone of the national economy, supporting livelihoods and making a significant contribution to the export revenue. However, in the 1970s, the industry has experienced a long period of decline because of poor management, the use of obsolete technology, poor governance, threats of synthetic substitutes, as well as being subjected to market volatility and climate risks. This research aims at evaluating the economic issues that the jute sector is facing and also to determine its future survival amidst sustainability and world market changes. It is proven that state-owned mills were especially limited by ineffectiveness and corruption, whereas poor marketing efforts and a lack of support of the policy aggravated the competitiveness even more. These obstacles notwithstanding, the industry still has high chances of recovery. The emerging opportunities are due to growing global demand of eco-friendly products, technological advances in fiber processing and introduction of value-added products like composites, textiles, paper, and bio-plastics. The lesson provided by the regional competitors is the need to reorganize the policies of the region in strategic ways, investing in research, and engaging the smallholders into the value-added markets. The future of Bangladesh jute industry hinges consequently on the need to tackle the undisrupted economic and governance shocks and to take advantage of sustainability based demand, innovation, and inclusive development path.

Keywords: Jute, Economic Challenges, Sustainability, Industry, Bangladesh

RENEWABLE ENERGY AS A CATALYST FOR SUSTAINABLE ECONOMIC GROWTH

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ABSTRACT

Renewable energy has become a cornerstone in driving sustainable economic growth, offering a viable pathway to address global challenges such as climate change, fossil fuel dependency, and environmental degradation. The adoption of clean energy sources—including solar, wind, hydro, geothermal, and biomass—provides not only environmental benefits but also significant economic and social advantages. By reducing greenhouse gas emissions and enhancing energy security, renewable energy contributes directly to achieving the Sustainable Development Goals (SDGs). Economically, it stimulates innovation, generates employment opportunities across multiple sectors, and promotes inclusive growth by expanding energy access in underserved regions. For developing economies, renewable energy is particularly transformative, as it reduces reliance on costly fuel imports, strengthens local industries, and fosters resilience against global energy market fluctuations. Investments in renewable energy infrastructure also attract foreign capital, encourage public-private partnerships, and accelerate the transition toward a low-carbon economy. Moreover, the sector drives technological advancements in storage, smart grids, and efficiency, enabling more reliable and sustainable energy systems. Despite these opportunities, several challenges persist, including financing gaps, policy and regulatory barriers, and the need for advanced technological integration. Addressing these issues requires strong political commitment, supportive policy frameworks, and international cooperation. In the long term, renewable energy is not only a response to environmental concerns but also a catalyst for sustainable economic transformation, offering a balanced approach that integrates environmental stewardship with economic prosperity and social well-being.

Keywords: Renewable energy, sustainable development, economic growth.

IS THERE ANY NON-PRICE INCENTIVE FOR BORROWERS IN SUSTAINABLE CORPORATE LOAN CONTRACTS?

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ABSTRACT

This paper examines whether sustainable corporate loans (SCLs) receive more favourable non-price contract terms than conventional loans, and whether such effects vary across different dimensions of contract structure. Prior studies in sustainable finance have largely focused on loan pricing, yet little is known about how sustainability influences structural features of debt contracts that govern borrower–lender relationships. To address this gap, we analyse a global sample of syndicated loan facilities issued between 2016 and 2024, focusing on five key non-price terms: loan amount, loan maturity, performance-based pricing, term loan structure, and collateral requirement.

The results indicate that SCLs are systematically associated with more accommodative contractual arrangements. On average, sustainable loans are significantly larger in size, longer in maturity, more likely to include performance-pricing provisions, and less likely to require collateral or rigid structural formats. Economically, SCLs are approximately USD 52 million larger and 13 months longer in maturity compared to comparable conventional loans. The likelihood of including performance-based pricing is nearly five times higher, while the odds of collateralisation fall by more than 80%.

Robustness tests—including borrower fixed effects, propensity score matching, exclusion of the COVID-19 period, and regional subsamples for Europe and the U.S.—confirm the consistency of these findings. Importantly, the effects are not uniform across all dimensions. The strongest associations are observed in capital allocation and incentive-based terms, namely loan size, maturity, and performance-pricing, while enforcement-based features such as collateral requirements and term structures exhibit weaker or sample-dependent effects.

These findings suggest that lenders incorporate ESG signals selectively when structuring corporate loan contracts, consistent with theories of financial contracting and reputational signalling. By highlighting how borrower sustainability shapes loan agreements beyond pricing, the study contributes to both the financial contracting and sustainable finance literatures and underscores the governance implications of ESG integration in credit markets.

Keywords: Sustainability, sustainable loans, loan contract terms, financial contracting

FACTORS INFLUENCING CARBON EMISSION DISCLOSURE IN INDONESIAN SHARIA BANKS

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ABSTRACT

This study aims to investigate the factors influencing carbon emission disclosure in Indonesian Sharia Banks. The independent variables examined are profitability, firm size, and firm age. A quantitative approach with multiple linear regression analysis was applied using 33 observations from 11 Indonesian Sharia Banks during the 2022–2024 period. The findings reveal that only firm size has a positive and significant influence on carbon emission disclosure, whereas profitability and firm age have no significant influence. These results indicate that larger banks are more likely to disclose carbon-related information, likely due to higher stakeholder expectations and greater organizational capacity. In contrast, profitability and the length of operation do not appear to drive disclosure practices. This study has limitations, including a relatively small sample size and a short three-year observation period, which may limit the generalizability of the findings. Future research should consider expanding the observation period, incorporating additional variables such as corporate governance, environmental performance, or stakeholder pressure, and employing qualitative methods to gain a deeper understanding of the motives behind carbon disclosure. The findings carry practical implications for regulators and policymakers, suggesting that disclosure requirements should consider firm size as a key determinant and provide incentives or support for smaller banks to improve transparency. This research offers new empirical evidence on carbon emission disclosure within the sharia banking sector in Indonesia and highlights firm size as the main driver of disclosure practices.

Keywords: carbon emission disclosure, firm size, firm age, profitability, sharia bank.

SUSTAINABLE INVESTMENT AND MARKET STABILITY: PERFORMANCE AND VOLATILITY DYNAMICS OF SUSTAINABLE STOCK INDICES AMID MARKET TURBULENCE

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ABSTRACT

This paper investigates the performance and volatility of sustainable stock market indices and compares them with the benchmark and broad market indexes using daily data from November 30, 2012, to December 26, 2023. For the detailed analysis, the study divides the sample period into a whole sample period and a COVID-19 sub-sample period. The performance is estimated using different traditional and regression-based performance evaluation models, while volatility is modelled using symmetric and asymmetric GARCH family models. The results showed that sustainable stock market indices outperformed the benchmark indices during the selected sample period. Significant volatility clustering was found in selected indices. Further, benchmark indices achieved high volatility and leverage effect persistence during the study period. The findings support the diversification strategy and are crucial for retail investors and portfolio managers seeking to make an optimum portfolio to maximize profits. The empirical findings of this study may equip policymakers, stakeholders and regulatory bodies to make well-informed decisions such as ensuring the allocation of scant resources in sustainable theme-based projects, enforcing CSR law and pushing financial reforms in the direction of sustainable investment. Investors may invest their money in sustainable options to earn high returns without being concerned about underperformance.

Keywords: Sustainable investment, volatility clustering, diversification, COVID-19

ROLE OF RAJSHAHI UNIVERSITY IN LOCAL AND REGIONAL DEVELOPMENT

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ABSTRACT

Rajshahi University (RU), one of the oldest and most influential higher education institutions in Bangladesh, serves as a dynamic hub for learning, innovation, and socio-economic transformation in the country's northern region. As a large public university with thousands of students and staff, RU's activities extend far beyond education, influencing the local economy, social structures, and regional development. This study examines how RU functions as a catalyst for innovation-driven growth, with particular attention to its role in generating knowledge, fostering entrepreneurship, and addressing regional disparities. Using a mixed-methods approach, data were collected through surveys, stakeholder interviews, and analysis of secondary sources, including university reports, government statistics, and development plans. Findings reveal that RU contributes significantly to the regional economy through direct employment, business creation, and student-driven spending, which supports local markets and services. Beyond its economic footprint, RU plays a critical role in advancing social progress by expanding access to higher education, promoting gender equality, and leading community-based initiatives in health, education, and poverty alleviation. Innovation emerges as a key driver of RU's developmental impact. Research initiatives in agriculture, biotechnology, and renewable energy have begun to translate into practical solutions for local industries and rural communities. However, barriers such as inadequate infrastructure, limited technology transfer, and weak university-industry linkages hinder the full realization of this potential. The study concludes by emphasizing the need for strategic investment in research facilities, entrepreneurship programs, and digital infrastructure, alongside policy reforms that encourage innovation partnerships. Strengthening RU's capacity to generate and apply knowledge can accelerate sustainable development and reduce regional inequalities. By positioning itself as a leader in research and innovation, RU has the potential to drive inclusive growth and contribute significantly to Bangladesh's long-term vision for equitable and sustainable regional development.

Keywords: Rajshahi University, Regional development, Innovation, Socio-economic transformation, University-industry linkage, Bangladesh.

FINANCIAL INCLUSION AND ECONOMIC EMPOWERMENT: THE ROLE OF YOUTH ENTREPRENEURSHIP IN DEVELOPING ECONOMIES

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ABSTRACT

Youth entrepreneurship has emerged as a critical driver of inclusive economic growth in developing economies. As financial inclusion becomes a global priority, young entrepreneurs are uniquely positioned to transform challenges into opportunities by leveraging innovation, technology, and community-based initiatives. This paper explores the role of youth entrepreneurship in advancing economic empowerment, particularly through expanding access to financial services, fostering job creation, and reducing inequality. Drawing on recent studies and case examples, it highlights how digital finance, microcredit, and entrepreneurial ecosystems can support youth-led ventures in overcoming structural barriers such as limited capital, skills gaps, and regulatory constraints. The discussion emphasizes that empowering young entrepreneurs not only stimulates local economic development but also contributes to broader goals of poverty reduction and sustainable development. The paper concludes with policy recommendations aimed at strengthening financial inclusion frameworks and creating enabling environments for youth entrepreneurship in developing countries.

Key Words: Youth Entrepreneurship, Financial Inclusion, Economic Empowerment, Developing Economies, Digital Finance, Sustainable Development

GREEN SHARIA BANKING AS A CRITIQUE OF THE ILLUSION OF SUSTAINABILITY IN THE GLOBAL ECONOMY

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ABSTRACT

The discourse of sustainable development in the global economy is often promoted as a solution to ecological and social crises, but in reality it is often trapped in an illusion of sustainability that is symbolic and profit-oriented. Green banking has emerged as a modern financial instrument to support the environmental agenda, but its implementation in many countries still shows greenwashing practices that emphasize image over substance. This research examines Sharia Green Banking as a critique of the global sustainability paradigm, using a qualitative approach through a literature review of regulations, policies, and the principles of maqashid sharia. The results of the study show that Sharia Green Banking is able to offer a more authentic sustainability model by emphasizing the integration of values of justice, ecological sustainability, and socio-economic balance. Sharia Green Banking is not only an environmentally friendly financial instrument but also a representation of an alternative paradigm that can correct the weaknesses of the global development system based on green capitalism.

Keywords: Green Sharia Banking, Islamic Economics, Sustainable Development, Maqashid Sharia, Criticism of Green Capitalism

ENHANCING ACADEMIC ENGAGEMENT IN THE ERA OF DIGITAL SUSTAINABILITY: A CROSS-DISCIPLINARY APPROACH

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ABSTRACT

In today's rapidly evolving digital landscape, integrating sustainability into academic initiatives is no longer optional but essential. This paper explores the intersection of digital transformation and sustainability in higher education, emphasizing cross-disciplinary collaboration as a key driver for impactful outcomes. The study investigates how digital tools and platforms can enhance student engagement, foster collaborative research, and promote sustainable practices within university settings. Utilizing a qualitative approach, this research gathers insights from multiple disciplines including economics, engineering, and environmental studies to highlight the value of integrated strategies for sustainability education. Findings reveal that digital innovation not only improves accessibility and efficiency in academic processes but also empowers students to participate in solving real-world sustainability challenges. Additionally, this study underscores the importance of faculty development, institutional support, and policy alignment in implementing successful digital sustainability initiatives. The conclusions aim to provide practical recommendations for universities looking to create sustainable learning ecosystems through technological innovation and interdisciplinary collaboration. This paper contributes to the ongoing discourse on global sustainability by positioning higher education institutions as active agents of change in the digital era.

Keywords: Digital Sustainability, Academic Engagement, Higher Education, Interdisciplinary Collaboration, Technology Integration

SUSTAINABLE BANKING PRACTICES AND THEIR IMPACT ON THE REAL SECTOR

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ABSTRACT

The increasing demand for sustainability in financial systems has shifted the role of banks from being purely profit-oriented institutions to becoming key drivers of long-term economic resilience. Sustainable banking emphasizes not only financial performance but also social responsibility, environmental stewardship, and ethical governance. This study examines how sustainable banking practices influence the real sector, particularly in emerging economies where banking institutions serve as the backbone of development. Using a qualitative descriptive approach with secondary data from regulatory reports, academic literature, and industry publications, the study highlights the mechanisms through which sustainable banking channels capital into productive sectors such as small and medium enterprises (SMEs), renewable energy, and infrastructure development. The findings suggest that banks adopting sustainability principles contribute significantly to real sector growth by fostering inclusive financing, reducing systemic risks, and ensuring long-term value creation. Furthermore, sustainable practices enhance public trust, attract socially responsible investors, and improve overall financial stability. However, challenges remain, including the lack of standardized sustainability frameworks, limited green financial instruments, and the need for capacity building within banking institutions. The study concludes that sustainable banking is not only an ethical imperative but also a strategic necessity for achieving balanced economic development. Strengthening collaboration between regulators, financial institutions, and the private sector is essential to maximize the impact of sustainable banking on real sector growth.

Keywords: Sustainable Banking, Real Sector, Economic Development, Ethical Finance, Financial Stability

EFFECTIVENESS OF AGRICULTURAL EXTENSION SERVICES IN ENHANCING MARGINAL AND SMALLHOLDER FARMERS' PRODUCTIVITY IN RURAL AREAS OF HIMACHAL PRADESH

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ABSTRACT

Background: In Himalayan states like Himachal Pradesh, where over 87% of farmers are categorized as marginal or smallholders, agricultural productivity is significantly constrained by fragmented landholdings, limited market access and climate-induced vulnerabilities. In this context, agricultural extension services act as a critical vehicle for transferring technologies, building capacity and improving livelihoods. However, the effectiveness of these services depends on their ability to reach diverse agro-ecological zones and address localized challenges through inclusive and adaptive approaches.

Purpose: This study aims to assess the effectiveness of agricultural extension services in enhancing farm productivity and resilience among marginal and smallholder farmers in rural areas of Himachal Pradesh. It will evaluate the extent to which institutional interventions contribute to sustainable agricultural practices, income generation and reduced livelihood risks. The study aligns with SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action).

Methodology: A mixed-methods approach will be employed. Primary data will be collected through household surveys, focus group discussions and interviews with farmers, extension professionals and community stakeholders across selected development blocks in Shimla, Solan and Kangra districts of Himachal Pradesh. Stratified sampling will be used to ensure representation of different agro-climatic zones. The study will also analyze secondary data from state agriculture reports, ICAR publications and academic sources. In particular, the research will examine the extension models and outreach programs of related educational and research institutions like Agriculture University (CSKHPKV) Palampur, Horticulture University (Dr.YSPUHF) Solan (Nauni), CSIR–IHBT (Palampur), CPRI Shimla (Bemloe), ICAR-IARI, Regional Station, Shimla. Quantitative analysis will be conducted using statistical tools (e.g., SPSS) while qualitative responses will be coded thematically using NVivo.

Results: The study is expected to reveal that targeted and participatory extension interventions will lead to a significant improvement in agricultural productivity for marginal and smallholder farmers. It is anticipated that integration of traditional knowledge with modern practices—such as the promotion of natural farming, off-season vegetable cultivation and climate-resilient technologies—will enhance both income and sustainability. The institutional programs of CSKHPKV Palampur and UHF Nauni are likely to emerge as key drivers of agricultural and horticultural transformation, while CSIR–IHBT's skill-building in aromatic plant farming is expected to open new value chains. Similarly, CPRI's improved seed dissemination and IARI's technology demonstrations are projected to address crop failures and enhance input efficiency.

Conclusion: The study will conclude that agricultural extension services, when supported by research-led institutions and localized delivery mechanisms, will significantly contribute to improving smallholder productivity in hilly regions. It is expected that convergence between the Universities, ICAR institutes and Government Schemes such as ATMA and PM-Krishi Sinchai Yojana will strengthen the outreach and

effectiveness of services. The research will recommend a multi-institutional, decentralized and ICT-enabled extension model to address the structural challenges faced by farmers in the Himalayan context.

Keywords: Agricultural Extension, Marginal Farmers, Smallholders, Himachal Pradesh, Farm Productivity, Rural Development, Climate-Resilient Agriculture, Sustainable Livelihoods

THE VITAL ROLE OF AGRICULTURE IN SUSTAINING HUMAN CIVILIZATION ECONOMY, AND ENVIRONMENT

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ABSTRACT

As the primary source of food, raw materials, and economic growth for countries worldwide, agriculture is the cornerstone of human civilization. The transition from hunter-gatherer to settled communities was made possible by its emergence thousands of years ago, which led to significant technological and social developments, population increase, and the creation of cities. In addition to preventing famine and ensuring nutritional security through the production of crops, livestock, and aquatic resources, agriculture also promotes economic stability by creating jobs and supplying raw materials and supply chains to other businesses. In addition to providing food for billions, agriculture maintains ecosystem balance by preserving biodiversity, conserving water, and purifying the air. It also upholds social order by promoting collaboration and interdependence. The continual innovation in agricultural operations, including genetic engineering and sustainable techniques, has further increased productivity. Agriculture is now essential not only for survival and prosperity but also for environmental health and the basic structure of society due to continuous innovation in agricultural practices, such as genetic engineering and sustainable techniques, which have further increased productivity and environmental stewardship.

Keywords: Food Security; Economic Development; Environmental Sustainability; Cultural Heritage

ENERGY CONSUMPTION IN HOUSEHOLD AND AGRICULTURAL PRODUCTION OF RURAL HOUSEHOLDS IN SOUTHEAST ASIAN COUNTRIES

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ABSTRACT

This review investigates the factors driving consumption, consumption patterns, mitigation technologies, and sustainable impacts of energy use in household living and agricultural production among rural households in Southeast Asia (SEA) from 2020 to the present. Analysis based on academic literature reveals significant energy consumption dispersion in residential use, with household income and educational level identified as the two most significant influencing factors. The consumption gap between the rich and the poor has increased sharply, partly due to inefficient fossil fuel subsidy structures, which primarily benefit higher-income households. In agricultural production, indirect energy inputs—primarily chemical fertilizers, diesel fuel, and irrigation—are the main energy consumers, with low measured Energy Use Efficiency (EUE). Effective mitigation solutions include the adoption of Precision Agriculture (AgriTech) and Decentralized Renewable Energy (DRE) solutions like solar-powered irrigation and biogas digesters. This energy transition not only improves EUE but also yields substantial socio-economic benefits, aligning with the Water-Energy-Food (WEF) Nexus framework. The report recommends reforming energy subsidies, promoting customized DRE financing models, and adopting social norm-based policy strategies to achieve more equitable and sustainable energy consumption reductions in rural SEA.

Keywords: agricultural production**,** energy consumption, rural households, Southeast Asian countries

GENERATIVE ARTIFICIAL INTELLIGENCE FOR SUSTAINABLE AGRICULTURE: A DATA-DRIVEN FRAMEWORK FOR ENVIRONMENTAL ADAPTATION

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ABSTRACT

The increasing impact of climate change on food security is driving an urgent need for advanced technologies to promote sustainable and adaptive agriculture. Generative Artificial Intelligence (GenAI) represents a new frontier capable of generating synthetic, high-quality data that complement scarce or incomplete agricultural datasets. This study introduces a generative diffusion-based framework designed to simulate and forecast environmental and agricultural processes such as soil moisture, crop development, and water stress under varying climatic conditions. The model integrates multi-source data satellite imagery, IoT sensor readings, and agronomic indicators to create realistic artificial samples that enhance predictive accuracy and reduce uncertainty in data-poor regions. The proposed framework contributes to precision agriculture by improving yield prediction, optimizing irrigation scheduling, and supporting evidence-based policy decisions for sustainable resource management. Preliminary results highlight the potential of GenAI to augment datasets, capture nonlinear relationships between environmental variables, and enhance model interpretability through feature visualization and uncertainty quantification. Beyond simulation, this approach offers an innovative way to bridge the gap between artificial intelligence and environmental sciences, paving the way for more resilient and climate-aware agricultural systems. Furthermore, this research demonstrates how diffusion-based generative models can be integrated with machine learning pipelines to advance early warning systems and sustainable planning under future climate scenarios. The findings emphasize that generative models, when combined with transparent data governance and open-access frameworks, can significantly accelerate the digital transformation of agriculture and enable smarter, resource-efficient farming for future generations.

Keywords: Generative Artificial Intelligence, Diffusion Models, Sustainable Agriculture, Environmental Simulation, Data Augmentation

CULTIVATING SUSTAINABILITY: AGRICULTURE AND ENVIRONMENTAL GOVERNANCE IN GLOBAL LEGAL PERSPECTIVE

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ABSTRACT

The relationship between agriculture and environmental protection has become one of the most pressing legal and policy concerns in the twenty-first century. At the global level, agriculture is both a driver of environmental degradation and a crucial component of sustainable development. Legal frameworks across nations are therefore increasingly focused on reconciling food security with ecological integrity. International instruments such as the Paris Agreement (2015), the Convention on Biological Diversity (CBD), and the United Nations Framework Convention on Climate Change (UNFCCC) establish the normative foundation for environmentally responsible agricultural practices. These frameworks encourage member states to reduce greenhouse gas emissions from the agricultural sector, promote soil health, and preserve biodiversity through sustainable land management.

However, translating global commitments into effective domestic legislation remains uneven. In many developing countries, weak enforcement, inadequate institutional capacity, and conflicting economic interests undermine sustainability goals. The European Green Deal and its Farm to Fork Strategy (2020), by contrast, illustrate how regional legal frameworks can integrate environmental principles into agricultural policy by promoting organic farming, reducing pesticide use, and ensuring fair trade practices. Similarly, the African Union's Malabo Declaration emphasizes climate-resilient agriculture and regional cooperation in combating land degradation. A major area of contemporary debate involves the intersection of agricultural biotechnology and environmental ethics, where the use of genetically modified organisms (GMOs) challenges conventional legal definitions of environmental risk and food safety. International law, through instruments like the Cartagena Protocol on Biosafety, seeks to balance innovation with precaution, yet differing national standards complicate trade and regulatory harmonization.

Emerging global discussions also highlight the role of climate justice and equity, particularly for smallholder farmers and indigenous communities whose livelihoods are most affected by environmental change. Sustainable agriculture is now recognized not only as an economic and ecological issue but also as a question of human rights and intergenerational justice. In conclusion, the global legal perspective on agriculture and environmental studies underscores the urgent need for coherent, inclusive, and enforceable governance structures. A sustainable future depends on integrating environmental law, agricultural policy, and social equity within a unified legal framework that respects both planetary boundaries and human development goals.

Keywords: Climate Justice, Environmental Law, Food Security, Global Governance, Sustainable Agriculture

PHARMACEUTICAL CONTAMINANTS IN THE ENVIRONMENT: IMPACT OF AGRICULTURAL PRACTICES AND STRATEGIES FOR SUSTAINABLE MANAGEMENT

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ABSTRACT

Pharmaceutical contamination has emerged as a growing environmental concern, particularly due to its interaction with agricultural systems. The improper disposal of drugs, runoff from pharmaceutical industries, and the use of veterinary medicines in livestock farming contribute to the accumulation of pharmaceutical residues in soil and water. These contaminants can disrupt microbial ecosystems, affect crop growth, and enter the food chain, posing risks to human and animal health. In agricultural fields irrigated with wastewater or treated sewage, persistent pharmaceutical compounds such as antibiotics and hormones can alter soil fertility and lead to antibiotic-resistant bacteria. Addressing this issue requires an integrated approach involving environmental monitoring, the development of eco-friendly pharmaceuticals, and sustainable agricultural practices such as phytoremediation and precision irrigation. This interdisciplinary link between pharmacy, agriculture, and environmental science highlights the urgent need for responsible pharmaceutical management to ensure ecological balance and public health safety

Keywords: Pharmaceutical pollution, agriculture, environmental sustainability, antibiotic resistance, eco-friendly management

GENDER EQUITY IN AGRICULTURE: ANALYZING THE CONTRIBUTIONS AND CONSTRAINTS OF WOMEN IN ENHANCING FOOD SECURITY AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

This study critically examines the multifaceted role of women in global agricultural systems, elucidating both their substantial contributions and the systemic barriers that impede their productivity. Women represent approximately 43% of the agricultural labor force worldwide, yet their involvement is often marginalized due to pervasive socio-economic disparities, including restricted access to land ownership, financial resources, and decision-making power (Doss, 2009). These inequities not only compromise women's individual productivity but also diminish the overall efficacy of agricultural systems, with the Food and Agriculture Organization estimating that closing the gender gap could increase global food production by 20-30%.

Employing a qualitative framework, this paper analyzes diverse case studies from regions including Turkana, Kenya, and Bangladesh, revealing innovative strategies that women utilize to overcome challenges. In Turkana, women have established community organizations that facilitate resource sharing and collaborative labor, thereby enhancing resilience in the face of climate change and restrictive land tenure systems.

Bangladesh, female farmers engage in mutually beneficial economic exchanges with Rohingya refugees, enhancing food security while generating critical income to reinvest in their agricultural practices. Additionally, the establishment of water usage associations in Tajikistan has enabled increased female participation in water resource management, addressing historical disparities in access and decision-making authority.

This research underscores the imperative for targeted policy interventions aimed at dismantling structural barriers to women's full participation in agriculture. Recommendations include securing land tenure rights, improving access to credit and agricultural training, and implementing comprehensive measures to combat gender-based violence and discrimination within agricultural contexts. By prioritizing gender equity in agricultural policy and practice, this study posits that significant advancements in agricultural productivity can be achieved, thereby contributing to broader objectives of food security and sustainable development.

Keywords: Women, Gender Equity, Agriculture

ECO-ANXIETY AS A CATALYST FOR ENVIRONMENTAL MOVEMENTS

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ABSTRACT

Environmental degradation is frequently regarded as an unavoidable outcome of economic growth, urbanization, and industrialization. However, its widespread consequences, ranging from soil, air, and water pollution to ecosystem disruption, have profound effects on both ecological balance and human psychological well-being. As awareness of these environmental threats intensifies, many individuals experience eco-anxiety, a form of emotional distress linked to fear and concern for the planet's future. Rather than being merely a psychological burden, eco-anxiety can function as a motivational force, fostering collective engagement and social mobilization. Environmental movements often emerge as a shared response to this anxiety, transforming individual emotions into collective action toward ecological protection and sustainability. This study examines the psychological mechanisms underlying environmental activism, emphasizing the role of eco-anxiety as a key driver of contemporary environmental movements and its implications for environmental management and policy.

Keywords: environmental psychology, eco-anxiety, mental health, environmental activism, sustainability

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Sayı : E-62637355-903.07-938429 02.10.2025
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DAĞITIM

Üniversitemiz Sürdürülebilirlik Koordinatörlüğü ve İktisadi Kalkınma ve Sosyal Araştırmalar Enstitüsü (IKSAD) iş birliği ile 15-16 Ekim 2025 tarihleri arasında bu yıl ilki düzenlenmesi planlanan "Uluslararası Küresel Sürdürülebilirlik ve Kalkınma Kongresi"nin ÜAK doçentlik kriterlerini sağlayabilmesi adına kongrenin düzenleme kurulunda Üniversitemiz Sürdürülebilirlik Koordinatörü ve Mühendislik Fakültesi öğretim üyesi Doç. Dr. Şükrü Taner AZGIN, Sürdürülebilirlik Koor. Yrd. ve Eğitim Fakültesi öğretim üyesi Doç. Dr. Esra KIZILAY, Sürdürülebilirlik Koor. Yrd. ve Mimarlık Fakültesi Dr. Öğr. Üyesi Selman SEVİNDİK'in Akademisyen Temsilcisi olarak görevlendirilmeleri; Sürdürülebilirlik Koor. Temsilcisi olarak ise anılan Birim personeli Melike YAZMAN'ın görevlendirilmesi Sürdürülebilirlik Koordinatörlüğünün 29.09.2025 tarihli ve 935998 sayılı yazısı ile teklif edilmektedir.

Adı geçen öğretim üyelerinin, söz konusu kongrenin düzenleme kurulunda "Akademisyen Temsilcisi" olarak görevlendirilmeleri ve Sürdürülebilirlik Koor. Temsilcisi olarak ise anılan Birim personeli Melike YAZMAN'ın görevlendirilmesi Rektörlüğümüzce uygun görülmüştür.

Bilgilerinizi ve gereğini rica ederim.

Prof. Dr. Muammer Hakan POYRAZOĞLU
Rektör V.

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Erciyes Üniversitesi Sürdürülebilirlik Koordinatörlüğü ve İktisadi Kalkınma ve Sosyal Araştırmalar Enstitüsü (IKSAD) iş birliği ile 15-16 Ekim 2025 tarihleri arasında bu yıl ilki planlanan **"Uluslararası Küresel Sürdürülebilirlik ve Kalkınma" kongresi düzenlenecektir. İlgili kongrenin ÜAK doçentlik kriterlerini sağlayabilmesi adına** kongrenin düzenleme kurulunda aşağıda unvan ve isimleri yazılı olan öğretim üyelerinin akademisyen Temsilcisi olarak görevlendirilmesi, hususunda gereğini arz ederim.

Doç. Dr. Şükrü Taner AZGIN
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Ek-1

Doç. Dr. Şükrü Taner Azgın	Sürdürülebilirlik Koordinatörü	Mühendislik Fakültesi
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Dr. Öğr. Üyesi Selman Sevindik	Sürdürülebilirlik Koor. Yrd.	Mimarlık Fakültesi
Melike Yazman	Sürdürülebilirlik Koor. Temsilcisi	-

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Ek-2

BAŞVURU

Kongreye özet göndererek başvuruda bulunmanız gerekmektedir. Özet değerlendirme süreci en fazla 5 gün sürmektedir. Değerlendirme sonucu yazara gecikmeksizin bildirilmektedir

KONULAR

Kongremiz, sürdürülebilirliğin çevresel, sosyal, ekonomik ve yönetişimsel tüm boyutlarını kapsayan disiplinlerarası çalışmalara açıktır.

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29 Eylül 2025

Kongre Programı Duyurusu:
06 Ekim 2025

Tam Metin Son Gönderim Tarihi:
25 Ekim 2025

Bildiri Özet Kitabı Yayını:
25 Ekim 2025

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Prof. Dr. Oktay ÖZKAN - Bilim Kurulu Başkanı
Doç. Dr. Şükrü Taner AZGIN - Düzenleme Kurulu Başkanı
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