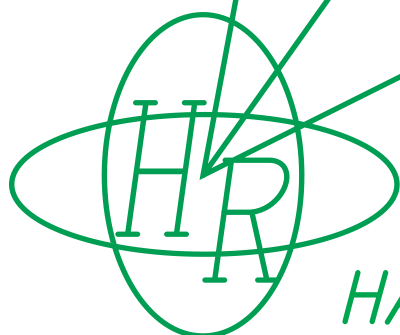


*POLISH*

*JOURNAL OF ENVIRONMENTAL  
STUDIES*



*HARD OLSZTYN*

**Vol. 33, No. 2, 2024**  
**PART I**

**POLISH JOURNAL OF ENVIRONMENTAL STUDIES**  
**Vol. 33, No. 2 (2024)**  
**PART I**

ORIGINAL RESEARCH

1. Utilization of Fermented Sago Pulp and Effect on the Performance of Broiler Ducks  
ALLAILY ALLAILY, SAMADI SAMADI, MUHAMMAD DAUD,  
TANIA APRILIA, EMENDA NINTA DWINA, ZULFAN ZULFAN,  
MUHAMMAD AMAN YAMAN, MUHAMMAD NASIR ROFIQ ..... 1001
2. Prediction of *Wedelia trilobata* Growth under Flooding and Nitrogen Enrichment Conditions  
by Using Artificial Neural Network Model  
AHMAD AZEEM, MAI WENXUAN, TIAN CHANGYAN,  
MUHAMMAD UZAIR QAMAR, NOMAN ALI BUTTAR ..... 1007
3. Who Holds the Keys to the Management of Municipal Waste and Which Locks  
of Municipal Sustainability do they Fit Into?  
MONIKA BUMBALOVÁ, ALEXANDER FEHÉR, MARTIN PRČÍK,  
ELEONÓRA MARIŠOVÁ ..... 1017
4. Determination of Yield Parameters of Barley (*Hordeum vulgare* L.) Inoculated with  
Phosphorous-Solubilizing and Nitrogen-Fixing Bacteria  
ÖZCAN ÇAĞLAR, SANCAR BULUT, ALI ÖZTÜRK ..... 1033
5. Effects of Petrochemical Industry Agglomeration and Green Technology Innovation  
on Eco-Efficiency: an Analysis Based on Provincial Data in China  
MINGMIN CUI, XIAOMING WU ..... 1043
6. Economic Policy Uncertainty and Carbon Emission Intensity: Empirical Evidence  
from China Based on Spatial Metrology  
WENYUEYANG DENG, ZENGLIAN ZHANG, HONGJIE ZHANG, LIPING WANG ..... 1057
7. Research on the Spatial-Temporal Pattern Evolution and Driving Force of Ecological  
Environment Quality in Kunming City Based on Remote Sensing Ecological  
Environment Index in the Past 25 Years  
XUE DING, XIN SHAO, JINLIANG WANG, SHUANGYUN PENG,  
JUNCHENG SHI ..... 1073
8. Perceptions of Social Responsibility, Resource Integration Ability and Sustainable  
Development of Family Grain Farms – Evidence from China  
WEI DUAN, GUANGQIANG LUO ..... 1091
9. Strength Characteristic of Unsaturated Moraine Soil at High-Plateau Airport  
JUN FENG, ZIKANG CHEN, JIAN WU, JIZHE HE, ZHUOYA ZHAO,  
YANJUN LIU, XIAOMEI LU ..... 1101
10. Engineering Characteristics of Unsaturated Cohesive Foundation Soil at High-Plateau  
Airport with Considering the Embankment Filling Interval  
JUN FENG, YANJUN LIU, XIAOMEI LU, ZIKANG CHEN, JIAN WU, JIZHE HE,  
ZHUOYA ZHAO ..... 1111

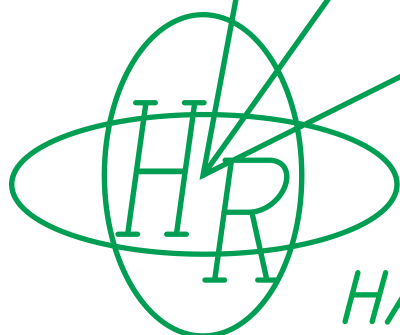
11. Hybrid Climate Forecasting: Variational Mode Decomposition and Convolutional Neural Network with Long-Term Short Memory HUIMIN HAN, SIBGHAT ULLAH BAZAI, MUGHAIR ASLAM BHATTI, ABDUL BASIT, ABDUL WAHID, UZAIR ASLAM BHATTI, YAZEED YASIN GHADI, ABDULMOHSEN ALGARNI .....	1121
12. Temporal-Spatial Dynamic Characteristics and the Determinants of Agricultural Eco-efficiency in Fujian Province, China XIAOYAN HONG, QINGXIA PENG, KAI SU .....	1135
13. Effect of Combinations of Green Roof Substrate with Vegetation Coverage on Rainwater Quality Improvement XUE HU, XINYI SONG, SHANSHAN SONG, XIAOYAN LI, CHENG LI, ZHI ZHANG, GUIRONG LI, QIANG CHEN .....	1149
14. Hydrodynamic Behavior Simulation of Flow Performance over Labyrinth Side Weir BSHKOJ S. HUSSEIN, SHAKER A. JALIL .....	1159
15. Reckonings of Environmental Efficiency and Convergence in Asian-Pacific Region: A Malmquist- Luenberger Approach ATIF KHAN JADOON, MARIA FAIQ JAVAID, AMBREEN SARWAR, SYEDA AZRA BATOOL, SARVJEET KAUR CHATRATH, SAIMA LIAQAT, BUSHRA PERVAIZ .....	1173
16. Second Life Multimedia Online Platform in Landscape Design: How do Multiverse Technologies Help Designers in Creating Environmentally Safe Projects? LEI JIN, YANLI SONG, XUN LIU .....	1183
17. ‘Our Planet, Our Health’ - Impact of Health Consciousness and Environmental Concern on Green Purchase Behavior: Role of Reference Groups BALWEEN KAUR, VEER P. GANGWAR, GANESH DASH, NUSRAT KHAN, ABDULLAH ABDULAZIZ ALKHORAIF .....	1191
18. Impacts of Forest Farmers Management on <i>Lepironia articulata</i> Retz.: Conservation Based on Utilization of Peat Ecosystem Biodiversity in South Kalimantan KISSINGER KISSINGER, AHMAD YAMANI, RINA MUHAYAH NOOR PITRI, AMAR VIJAI NASRULLOH .....	1203
19. The Reaction of Maize and Sorghum to Fertilization with Granulated Fertilizer Obtained from Digestate LESZEK KORDAS, AGNIESZKA LEJMAN, PIOTR KUC, JÓZEF SZLACHTA, MAŁGORZATA FUGOL, HUBERT PRASK .....	1215
20. Thermal Decomposition Behavior of Polylactic Acid-Based Polyurethane Resin XUEFENG LEI, YIWEI OU, YUEHUI WANG, JUNXIAN MA, QIULIAN LIN .....	1225
21. Eco-Efficiency and Influence Factors of Main Ports in Yangtze River Delta under Carbon Peaking and Carbon Neutrality Target JIAZENG LI, XIANG SU, YUXUE YANG, SHUANGLIANG YAO .....	1237
22. Digital Technology and Green Total Factor Productivity YAN LI, RUI SUN, YITONG RAO .....	1251

23. Strength Characteristics and Mechanism of CMK Cement Soil in a Na <sub>2</sub> SO <sub>4</sub> Solution Environment JIANPING LIU, JIANJUN XU, GUOSHUAI XIE, XIANGQIAN XIE, JIXIA ZHANG, XIAOHONG BAI .....	1267
24. Differentiation of Mountainous Soil pH and Its Influencing Factors in Guizhou Province, China XIAOHUI LU, QINGXIA CHEN, YANG AO, LONGBO LI, CHENGLONG TU .....	1277
25. How Reference Dependence and Network Embeddedness Shape Residents' Food Waste Behavior? Evidence from China MINGXING LUO, YUE SUN, QIANTING YANG, XIU CHENG .....	1287
26. Increasing the Efficiency of Recovery and Finalization of Plastic Waste in a Company PETER MALEGA, NAQIB DANESHJO, PETER DRÁBIK, MONIKA HUDÁKOVÁ .....	1299
27. Assessment and Predictions of Air Traffic Noise at Mitiga International Airport in Tripoli, Libya AYOUB A. NASR, MIRJANA PUHARIĆ, IVANA ILIĆ, IVICA STANKOVIĆ, ENES SUKIĆ .....	1309
28. Testing the Effect of Resolution on Species Distribution Models Using Two Invasive Species SERKAN ÖZDEMİR .....	1325
29. Contribution of Legume-Derived Biological Nitrogen Fixation in Reducing Greenhouse Gas Emissions Originating from Agriculture in Türkiye ABDULLAH ÖZKÖSE .....	1337
30. Characteristics of Bed Profiles Due to Sediment Transport in a Debris River I GEDE TUNAS, MUHAMMAD GALIB ISHAK, SAPARUDDIN SAPARUDDIN, RUDI HERMAN .....	1347
31. Experimental Studies on the Performance of Geo-Polymer Reinforced Concrete Beams Subjected to Accelerated Corrosion PANNEERSELVAM V., PAZHANI K.C. ....	1357
32. Decoupling Analysis between Carbon Emissions, Sewage Emissions, and Fishery Production in China YUDAN WANG, MUHAN LI .....	1365
33. Research on Carbon Allowance Price Non-Linear Structure Characteristics and Regime Switching Mechanism in China's Carbon Market JIA WEI, JIAHE CHEN .....	1375
34. Evaluation of Ecological Efficiency of Water Resources: A Case Study in Henan Province WENQUAN XIE, BINGQIAN SUN, YONGHUI HU, YIYAN LIU, XUEYAO MA, YANBO LIANG, HUIMIN ZHAI .....	1391
35. The Changing Roles of the Local Government in Environmental Governance in Guangzhou, China JIANGMIN YANG, GENGZHI HUANG, DESHENG XUE .....	1401

36. Comparative Analyses of Carbon Footprints and Economic Benefits: Rice-Shrimp Co-Cropping, Rice-Crab Co-Cropping and Rice Monoculture Models MEI YANG, LINGYUN SHAO, JIN CHU, ZHIQIANG LI, CHUNHUI TIAN, FUYU SUN, FENGQUAN YU .....	1413
37. The effect of H <sub>3</sub> BO <sub>3</sub> and 2,4-D on <i>in vitro</i> Callus and Somatic Embryo Formation of Bitter Melon ( <i>Momordica charantia</i> L.) SEVIL SAĞLAM YILMAZ, KHALID MAHMOOD KHAWAR .....	1421
38. Sustainable Influence Mechanism of Technological Innovation Diffusion on Intelligent Transformation of Manufacturing Enterprises Based on Competitive Advantage and Value Chain Can Regulate Mediation Effect Analysis YANNA YIN, ZIWAN ZHANG, KENING DA, XIN WEN .....	1429
39. Concentrations, Sources, and Correlation Analysis of Polycyclic Aromatic Hydrocarbons in Atmospheric Particulate Matter and Organic Film from Shanghai, China YINGPENG YU, MIN LIU, FENG LIANG, WENLEI NIU, XUE ZHU, JING TAO ....	1443
40. Mild Acid-Alkali Modification of Ceramsite: a Low-Cost Adsorbent for Lead Removal XINGBO YUAN, ZIQIU WANG, CHUAN WANG .....	1455
41. Optimization of Pb Biosorption from Aqueous Solution Using Genetically Engineered <i>Saccharomyces cerevisiae</i> by Response Surface Methodology RUIGANG ZHANG, HUILAN YI .....	1467
42. The Causal Relationship between Long-Term PM <sub>2.5</sub> Exposure and the Risk of Depression: A Two-Sample Mendelian Randomization Study XUEMIN ZHAO, LINFEI LIU .....	1477
43. Role of Coconut Shell Biochar on Soil Properties, Microbial Diversity and Nitrogen Mineralization in Tropical Latosol GANGHUA ZOU, FENGLIANG ZHAO, XUECHENG LAN, MUHAMMAD NAWAZ, JAHIDUL ISLAM SHOHAG .....	1487

*POLISH*

*JOURNAL OF ENVIRONMENTAL  
STUDIES*



*HARD OLSZTYN*

**Vol. 33, No. 2, 2024**  
**PART II**

# POLISH JOURNAL OF ENVIRONMENTAL STUDIES

Vol. 33, No. 2 (2024)

## PART II

### REVIEW

1. Selective Identification of Ferric Ions in Ecological and Biological Samples  
Using Rhodamine Chemosensors  
SANTOSH DUMBARE, ASHISH DOSHI, SELVAN RAVINDRAN ..... 1497
2. Genesis 1:26 in Times of Environmental Crisis in the University of Nigeria, Nsukka  
FAVOUR C. UROKO, PEACE N. NGWOKE, GLADYS N. AKABIKE ..... 1511
3. Drought-Induced Changes in Leaf Morphology and Anatomy: Overview, Implications  
and Perspectives  
ILKAY YAVAS, MUHAMMAD ASIF JAMAL, KALEEM UL DIN, SAFDAR ALI,  
SADDAM HUSSAIN, MUHAMMAD FAROOQ ..... 1517

### ORIGINAL RESEARCH

1. Oxidative Stress, Erythropoietin, and Some Physiological Parameters of Workers  
Exposed to Heavy Metals Pollution  
EDREES AMEEN ..... 1531
2. Total-Factor Energy Resilience in the European Union  
MING-CHUNG CHANG ..... 1543
3. The Distribution of *Fusarium* in Barley Crops: PCR  
NIKOLAY CHEBYSHEV, ASSIYA ANSABAYEVA, EKATERINA MIRONOVA,  
ANASTASIA KAZAK ..... 1559
4. Does Rural Industrial Integration Promote the Green Development of Agriculture?  
– Based on Data from 30 Provinces in China from 2010 to 2021  
CHEN CHEN, JINGJING WANG, XIAOJIE WANG, WEI DUAN, CHAOYING XIE ..... 1569
5. Impacts of Ion Adsorption Type Rare Earth Mining Techniques on Topsoil in Mining Area  
HAIBIN CHEN, ZHIBIAO CHEN, HAIMEI CHEN ..... 1585
6. Analysis of the Spatio-Temporal Evolution Characteristics and Driving Factors  
of the Coupled and Coordinated Development of China's New Urbanization  
and Ecological Environment  
SHUAITONG CHEN, HONGJUN MU, KAI ZHAO, JUNJIE CAO ..... 1595
7. Spatial-Temporal Evolution Characteristics and Influencing Factors of PM<sub>2.5</sub>  
in the Yangtze River Basin  
TAO CHEN, PENG ZHOU, WANQING XU, YATING LIU, SIWEI SUN ..... 1611
8. Valorization of the Red Wine Yeast Waste  
NATALIA CHISELIȚA, OLEG CHISELIȚA, NADEJDA EFREMOVA,  
ALINA BEȘLIU ..... 1623

9. The Responses of Nutrient Uptakes in Different Organs of <i>Narcissus tazetta</i> (L.) Grown under Saline Conditions to Mycorrhizal Inoculation ARZU ÇIĞ, FÜSUN GÜLSER, EFDAL GÜLSER .....	1631
10. Zoonotic Health Hazards in the Practice of Emergency Medical Service Teams – a Three-Year Observation ŁUKASZ DUDZIŃSKI, ŁUKASZ CZYŻEWSKI, MARCIN WEINER .....	1643
11. Estimation of Forest Biomass and Absorbed CO <sub>2</sub> by Remote Sensing in Can Gio, Vietnam NGA THI THUY DUONG, TRANG THI CAM TRUONG, HA MANH BUI .....	1651
12. PacBio Sequencing Reveals Microbial Community Diversity in Man-made and Natural Habitats MAHMOUD GAD, MOHAMMED YOSRI, ABDULMOHSEN HUSSEN ALQHTANI, TAREK A. TEMRAZ, OLFAT A. MOHAMED, ANYI HU .....	1659
13. The Efficiency of Agricultural Land Use in Mountainous Areas: Mathematical Modeling SHENGYU GU, EUGENY KOLPAK, SVETLANA MAKAR, MAXIM PALIIVETS, DMITRY GURA .....	1669
14. The Effect of Environmental Information Disclosure on Carbon Emission BINGNAN GUO, YU FENG, XU WANG .....	1681
15. Health Benefit Impact Relationship and its Health Benefit Assessment of Greenspace in Yangtze River Delta Cities YANLONG GUO, PENGYU CHEN, HAN ZHANG .....	1693
16. High Energy Consumption or Dirty Energy Using? The Driving Factors Behind Carbon Emission in National Supercomputing Centers YANG HAODONG, WANG GAOFENG .....	1709
17. Effect of Grazing and Mowing on Soil Physiochemical Properties in a Semi-Arid Grassland of Northeast China NAZIM HASSAN, IRAM ABDULLAH, WAQIF KHAN, ADNAN KHAN, NAVEED AHMAD, BABAR IQBAL, IFTIKHAR ALI, AHMED M HASSAN, DONG-QIN DAI, KHALED EL-KAHTANY, SHAH FAHAD .....	1725
18. Research on Ecosystem Service Supply, Demand and Ecological Resilience in the Context of Agriculture-Forestry-Animal Husbandry Composite System in Dibei Zagana, China TANG HONG, YANG CHONGJIAN .....	1737
19. The Effect and Mechanism of ESG Performance on Corporate Debt Financing Costs: Empirical Evidence from Listed Companies in the Heavy-Polluting Industries QIAOYU HOU, QIANG ZHANG .....	1753
20. Structural Evolution and Policy Orientation of China's Rare Earth Innovation Network: A Social Network Analysis Based on Collaborative Patents FENG HU, XIAOJIAO SHI, SHAOBIN WEI, LIPING QIU, HAO HU, HAIYAN ZHOU, BINGNAN GUO .....	1767
21. Soil Enzyme Activity and Stoichiometry in an <i>Illicium verum</i> Plantation Chronosequence in Southern China GANG HU, CONG HU, CHAOFANG ZHONG, CHAOHAO XU, ZHONGHUA ZHANG .....	1781

22. Positive Effects of Perennial Wheat on Soil Fertility, Carbon Stocks and Microbial Biomass in South-Eastern Kazakhstan MERUYERT KURMANBAYEVA, ADIL KUSMANGAZINOV, ZHAKSYLYK MAKHATOV, DINA KARABALAYEVA, NURGUL YEREZHEPOVA, BOLAT MURZABAYEV .....	1791
23. Can CO <sub>2</sub> Emission and Economic Loss Drive Forestry Productivity in the Context of Low Carbon Economy in China XIAOHONG LIU, MIN TAO, JIAO ZHOU, RONG WANG .....	1801
24. A Study on the Evolutionary Characteristics of Soil Properties and Their Drivers in Central Subtropical Forests: the Case of Fanjing Mountains in Southwest China WENMIN LUO, YINGYING LIU, YUPENG LIU, GUITING MU, XIANLIANG WU, ZHENMING ZHANG .....	1813
25. Network Embeddedness and Disruptive Green Technological Innovation: The Mediating Role of Resource Orchestration RUIYI MURONG, MIN CHANG, WEI HUI, YANXI YUAN, HAO DONG .....	1823
26. Evaluation of Rainwater Quality in Some Polluted Locations within Erbil Province ZHIAN SALIH, JANAN TOMA, ABDULLA AZIZ, TARA HASSAN, FARHAD AZIZ .....	1839
27. The Impact of Export on the Development of Green Industries for Sustainability in DI Yogyakarta Region, Indonesia: an Extended Input-Output Analysis UGAY SUGARMANSYAH, NUGRAHENI SETIASTUTI, HERI APRIYANTO, HERU MULYONO, NOORISH HELDINI, DHITA AYU PRADNYAPASA, IRFAN PRATAMA PUTERA, MEDTRY, AGUSTA SAMODRA PUTRA, SYAEFUL KARIM, WENNY OKTAVIANI, YANUAR IMAN DWIANANTO, WARSENO WARSENO, SUHETI LUSIANA, IWAN GUNTORO .....	1849
28. The Impact of Farmland Transfer on Agricultural Production Efficiency: Scale Effect or Selection Effect? CHUANGJIANG WANG, YI ZHANG, XIAOMING LI, RONG LI, HAO DONG .....	1861
29. Ideal Point Interval Recognition Model for Dynamic Risk Assessment of Water Inrush in Karst Tunnel and Its Application SHENG WANG, HAO DING, FENG HUANG, QIN WEI, TAN LI, TAO WEN .....	1875
30. Plant-Soil Stoichiometric Characteristics and Their Influencing Factors in the Pisha Stone Area WEIHUA WANG, XIAOKANG GE, GUOQUAN OU, ZHENZHOU SHEN, BINBIN LI .....	1887
31. Simulation and Analysis of Land Use Change in Jianghuai Hilly Area Based on PLUS Model LIUYANG XU, WEILING GUO, JIANG JIA .....	1899
32. Diversity of Soil Microbial Community in <i>Juglans mandshurica</i> Plantation in Eastern Liaoning Mountains LIJIE ZHANG, GUANGWEI WU, ZHIXIN SU, RUI ZHU, QIANG ZHOU, CHUNPING LIU .....	1915

33. Evaluation and Obstacle Degree Analysis of Sustainable Utilization of Water Resources in Hotan Area  
 QI ZHAO ..... 1925
34. Analysis of the Behavioral Intention and Influencing Factors of Farmers Replacing Coal with Electricity in the Context of Carbon Neutrality: the Case Study in Yulin City  
 YUTONG ZHAO, ZENGGUANG XU, YANGYANG LIU, TIANQING CHEN ..... 1937
35. Analysis of Water-Sand Changes and Influencing Factors in the Ganjiang River Basin from 1958-2019  
 SIYU ZHENG, JIAWEI CHEN, JIANBO QIAO, XIAOTING PAN,  
 XIAOJUAN XU, LI ZHANG, GUIHUA LIU, XINCHEN GU ..... 1949
36. Ecological Risk Assessment and Spatial Distribution of Heavy Metal in an Abandoned Mining Area, a Case Study of Liaoyang Pyrite Mining Area in China: Implications for the Environmental Remediation of Mine Sites  
 DAIWEN ZHU, QUAN LI, BINZHOU YAN, ZHENSHI ZHANG, YUJIN LI ..... 1965
37. Speciation Characteristics and Contamination Degree of Trace Elements in Coal Gangue Hill of a Mining Area in Huainan Coalfield, China  
 YIXING ZHU, LIUGEN ZHENG, XING CHEN, YONGCHUN CHEN ..... 1981

#### SHORT COMMUNICATION

38. Analysis of the Effect of Magnetic Separation Processing Parameters for the Treatment of Mining Waste  
 JUANA GUADALUPE HERRERA-PÉREZ, FELIPE LEGORRETA-GARCÍA,  
 MARTÍN REYES-PÉREZ, VICTOR ESTEBAN REYES-CRUZ,  
 EDGAR ARTURO CHÁVEZ-URBIOLA,  
 LUIS EDUARDO TRUJILLO-VILLANUEVA ..... 1991