International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 1-8 (2026)

CYTOGENETIC ANALYSIS OF THE PROTECTIVE POTENTIAL OF SUBCRITICAL WATER EXTRACTS FROM *ROSA DAMASCENA* MILL. AND *ROSA ALBA* L

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.101

ABSTRACT

The extraction approach for obtaining biologically active phytocomplexes from medicinal plants extends from classical methods for obtaining essential oils to modern highly efficient subcritical extracts. Subcritical water extraction is one of the most promising "green" methods, having serious advantages: (i) only pure water, which is non-toxic, cheap, widely available and environmentally friendly; (ii) the need for expensive, toxic and potentially hazardous organic solvents is eliminated; (iii) high yields and speed. This study assessed the anti-cytotoxic and anti-genotoxic potential of subcritical water extracts from *Rosa damascena* Mill. and *Rosa alba* L. in two test systems: *Hordeum vulgare* root meristems and human lymphocytes *in vitro*. Both rose extracts applied in non-toxic concentrations demonstrated well expressed defense potential against direct mutagen N-methyl -N'-nitro -N-nitrosoguanidine (MNNG) applied in co-treatments with mutagen- a 4-hour recovery pre-treatment and immediate co-treatment in both used test systems. The results showed that subcritical water extracts from both roses reduce MNNG-induced mitotic suppression, chromosomal aberrations and micronuclei, which is probably due to their ability to modulate genomic instability induced by the mutagen, with good agreement between the results obtained in both test systems. *R. alba* L. and *R. damascena* Mill. extracts, obtained by the eco-friendly method of subcritical water extraction, demonstrate low cyto- and genotoxicity. This result is a key competitive advantage, confirming the absence of damaging effects on cells and DNA, making them an ideal and safe component for high-quality products. The study of their potential protective activity against DNA-damaging factors can be an important advantage, especially when used in industries with high safety standards.

Keywords: subcritical water extracts, *R. damascena* Mill. and *R. alba* L., anti-cytotoxicity, anti-genotoxicity, cytogenetic tests.

Vol. 16 (1): 9-14 (2026)

ENVIRONMENTAL SUSTAINABILITY, TOURISM, MARITIME TRANSPORT, RENEWABLE ENERGY: EMERGING PILLARS OF ALBANIA'S BLUE ECONOMY

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.102

ABSTRACT

This study examines the evolving pillars of Albania's blue economy, focusing on tourism, maritime transport, and renewable energy as drivers of sustainable growth and climate resilience. Tourism, particularly in coastal and lake regions, has emerged as one of the country's largest economic sectors, generating over €4 billion in revenues and supporting nearly one in five jobs by 2023. Maritime transport, centered on the Port of Durrës but complemented by Vlorë, Sarandë, and Shëngjin, has expanded significantly in freight and passenger flows, reflecting Albania's role as a regional hub and gateway to European markets. At the same time, Albania's energy sector is undergoing diversification beyond hydropower, which currently supplies almost all electricity but exposes the country to climate variability. Solar capacity has grown rapidly in recent years, though wind energy deployment remains absent despite ambitious 2030 targets. By analyzing statistical data, policy frameworks, and infrastructure trends, this paper highlights the synergies among these sectors and their collective role in strengthening Albania's economic resilience, environmental sustainability, and regional integration within the Western Balkans and the wider European context.

Keywords: Blue economy; coastal tourism; lake tourism; maritime transport; port infrastructure; renewable energy; hydropower; solar energy; wind energy; climate resilience.

Vol. 16 (1): 15-18 (2026)

THE IMPACT OF FOOD COMPOSITION AND HYGIENE ON MILK COMPOSITION IN TWO DAIRY FARMS: A CASE STUDY IN LIVESTOCK ECOLOGY

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.103

ABSTRACT

The physicochemical and microbiological quality of cow's milk plays a central role in its nutritional value and suitability for processing. This study evaluated the influence of feeding practices and hygienic conditions on milk quality in two dairy farms in Kosovo. Fresh milk samples were collected over three months (January, March, and May 2023) and analysed for fat, protein, lactose, and ash content. Feed samples were examined for fat, protein, and ash according to ISO 19662:2018 and AOAC standards. Milk hygiene was assessed through total bacterial count (TBC) using the BactoScan method. Farm 2 demonstrated superior milk composition (4.65% fat, 4.66% protein, 4.76% lactose, 0.72% ash) compared with Farm 1 (4.25% fat, 4.20% protein, 4.60% lactose, 0.66% ash). Feed analysis likewise showed higher protein and fat levels in Farm 2. TBC results indicated that Farm 2 achieved "extra class" quality in two of three samples, whereas Farm 1 met this standard only once. These findings suggest that mixed, nutrient-rich feed and improved hygienic management contribute significantly to enhanced milk composition and microbiological quality.

Keywords: Milk quality, physicochemical properties, feeding practices, hygiene, dairy cows.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 19-26 (2026)

USE RAD-7 TECHNICAL TO DETERMINE RADON CONCENTRATIONS IN DIFFERENT LIQUID SAMPLES IN THI-QAR MARKETS, IRAQ

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.104

ABSTRACT

The study aims to determine radon-222 (^{222}Rn) concentrations in the four types of liquid samples that are collected in Thi-Qar Governorate, Iraq. Samples were classified into four groups, including bottled water, juice liquid, Coca-Cola, and milk liquid. The measurements were done using a RAD-7 detector manufactured in the USA. As well as the annual effective dose (AED) and the cancer risk (CR) due to ingestion of radon-222 from all liquid samples of the present study. The average values of radon-222 concentrations for bottled water, juice liquid, Coca-Cola, and milk liquid in unit mBq/L were 42.209, 82.100, 89.808, and 130.922, respectively. Moreover, the average values of AED for four samples in unit μSv/y were 0.141, 0.052, 0.057, and 0.042, respectively, while $CR \times 10^{-6}$ were 0.094, 0.199, 0.218, and 0.161, respectively. The measured radon-222 concentrations and AED with CR due to ingestion of four liquid samples of the present study were within the global average safe limits. Therefore, liquid samples in Thi-Qar markets that were investigated in this work do not pose a radiological risk to adult humans.

Keyword: radon-222, RAD-7, effective dose, liquid samples cancer risk, and Thi-Qar.

Vol. 16 (1): 27-36 (2026)

MAPPING THE SCIENTIFIC LANDSCAPE OF BLUE TOURISM: DIGITAL MARKETING, SUSTAINABILITY, AND RESEARCH TRENDS

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.105

ABSTRACT

Technology has changed our lives in many ways, including in an important sector worldwide, blue tourism. Online marketing and e-commerce have transformed how tourists plan and experience their vacations, influencing how they "consume" tourism and the impact on climate and sustainability through artificial intelligence-based information dissemination and awareness-raising. This paper explores this phenomenon through a bibliometric analysis of the literature on blue tourism. There are many academic papers on narrow topics, although not as many as expected, related to blue tourism. The analysis revealed that sustainability and marketing are the two most studied topics, with a relatively wide range of cooperation networks worldwide. The findings on the impact of technological development in e-commerce and digital marketing on individual time management in Blue Tourism and on awareness of its importance and sustainability will help researchers in the field, marketers, other stakeholders, and policymakers give the topic the attention it deserves.

Keywords: Blue Tourism, Online Marketing, E-Commerce, Sustainability, Bibliometric Analysis.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 37-44 (2026)

ART EDUCATION THROUGH ENVIRONMENTAL PROTECTION PROJECTS FOR STUDENTS IN VIETNAM

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.106

ABSTRACT

In the context of increasing environmental challenges and the demand for sustainable development, education plays a vital role in shaping students' awareness, attitudes, and behaviors toward environmental protection. Among various educational approaches, art education offers unique potential to integrate creativity, cultural values, and environmental responsibility. This study examined the role of art education through environmental protection projects in enhancing environmental awareness, creativity, and sustainability-related competencies among students in Vietnam. A mixed-method research design was employed, involving a survey of 245 students and semi-structured interviews with 15 teachers from a secondary school specializing in arts education and a university offering fine arts and cultural studies programs in Hanoi. Quantitative data were analyzed using descriptive statistics, while qualitative data were examined through thematic analysis. The results indicated that art-based environmental projects significantly improved students' environmental awareness, creative engagement, learning motivation, and collaborative skills. Teachers also reported positive changes in classroom dynamics, interdisciplinary learning, and the integration of cultural values into artistic practices. Despite challenges related to time constraints and resource availability, the findings suggest that art education through environmental protection projects represents an effective interdisciplinary approach for promoting sustainable development education in the Vietnamese context. Practical implications are proposed for curriculum design, teacher professional development, and educational policy.

Keywords: Art education, environmental protection projects, sustainable development, project-based learning, environmental awareness, Vietnam.

Vol. 16 (1): 45-54 (2026)

NURSES' JOB SATISFACTION IN THE PUBLIC HEALTH SYSTEM IN ALBANIA AND KOSOVO

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.107

ABSTRACT

Job satisfaction among nurses is a key determinant of healthcare quality, workforce retention, and professional performance. In Albania, data on the work-related experiences of nurses remain limited. This study aimed to explore the workplace factors influencing their satisfaction. A cross-sectional study was conducted between January and November 2024 among 73 nurses employed in public healthcare institutions across Albania and selected health centers in Kosovo, using convenience sampling. The Healthcare Environment Survey (HES), composed of 76 items grouped into 14 categories, was administered. Overall job satisfaction was high, with 93% of participants expressing agreement. Regression analysis highlighted role clarity, scheduling, unit manager support, and physician relationships as significant predictors, while autonomy, professional growth, and resources were positive but non-significant. Qualitative responses emphasized communication, leadership engagement, infrastructure, and access to training as areas for improvement. Nurse satisfaction is multidimensional, shaped by leadership dynamics, role expectations, and organizational support. Managers and policymakers should focus on strengthening communication, team collaboration, and professional development opportunities to improve satisfaction and retention. Limitations include the modest sample size and cross-sectional design. Future studies should use larger and more diverse samples with mixed-methods approaches.

Keywords: Nurse Job Satisfaction, Workplace Environment, Healthcare Management, Leadership Support.

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COMBINING HIGH ENERGY PHOTONS WITH DOXORUBICIN AND CYCLOPHOSPHAMIDE DRUGS TO REDUCE RADIATION THERAPY SESSIONS FOR BREAST CANCER PATIENTS

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.108

ABSTRACT

Radiotherapy and chemotherapy are methods for breast cancer treatment. Chemotherapy involves giving the patient a toxic drug that works to stop cancer cell growth or prevents the spread of the tumor. Radiotherapy involves using high energy photons produced from a radioactive source or linear accelerator. Because the limited tolerance of human organs to radiation appears to be a need to enhance radiotherapy by increasing the absorbed dose inside human target. One of those methods to enhance radiotherapy is to enhance cross section of tumor by adding a contrast agent into tumor during radiotherapy session. Since breast cancer second ranks follows lung cancer in the world so that the research deals with breast cancer radiotherapy sessions. The research is based on two variables, first adding Doxorubicin and Cyclophosphamide as chemo-drugs during radiotherapy sessions. Second increase the energy that is used in radiotherapy sessions. By using a simulation program to apply radiotherapy session with chemo-drug the research found out there is an enhancement in the radiotherapy session represented by a reduction from 30 sessions (60 Gy) to 13 sessions (26 Gy) or 15 sessions (30 Gy) depending on the energy of photon beam that is used in the radiotherapy sessions. This, in turn, provides a speedy recovery for breast cancer patients with the least possible exposure to ionizing radiation and a shortened exposure time, meaning the fewest possible side effects for patients exposed to radiation.

Key words: radiotherapy sessions, Doxorubicin, Cyclophosphamide, mass energy absorption coefficient, breast cancer.

Vol. 16 (1): 63-70 (2026)

TREATMENT AND REHABILITATION OF A CASE WITH HIP CORRECTION ENDOPROSTHESIS AFTER BILATERAL NEONATAL OSTEOMYELITIS, RIGHT-SIDE PROSTHESIS: A CASE STUDY IN APPLIED BIOLOGY AND HEALTH CARE

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.109

ABSTRACT

Neonatal osteomyelitis of the hip is a rare but severe condition that often leads to long-term musculoskeletal deformity despite successful infection control. This case study presents the surgical management and multidisciplinary rehabilitation of a 26-year-old male with bilateral postinfectious hip deformities and a 6 cm limb-length discrepancy, who underwent right total hip arthroplasty (THA) combined with femoral osteotomy and limb lengthening. Postoperative complications included traction-related sciatic nerve injury resulting in foot drop, persistent knee extension deficit, and restricted ankle mobility. A structured rehabilitation protocol was implemented over twelve months, incorporating progressive strengthening, neuromuscular electrical stimulation (NMES), proprioceptive training, manual therapy, targeted stretching, orthotic support, and a percutaneous Achilles tendon lengthening procedure to address equinus deformity. Hip mobility demonstrated significant improvement, with active flexion increasing from 90° preoperatively to 125° at one year, and abduction from 35° to 65°. EMG findings confirmed ongoing reinnervation of the peroneal nerve, consistent with clinical recovery. This case highlights (1) the long-term consequences of neonatal hip infections, (2) the surgical complexity of THA in postinfectious deformities, (3) the challenges of postoperative nerve injury, and (4) the critical role of prolonged, individualized rehabilitation. The findings contribute valuable insight into managing severe, infection-related hip deformities requiring endoprosthetic reconstruction in young adults.

Key words: Total Hip Arthroplasty, Neonatal Osteomyelitis, Sciatic Nerve Injury, Foot Drop, Rehabilitation.

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SYNERGISTIC EFFECT OF SPRING BARLEY EXOMETABOLITES IN COMBINATION WITH THE GROWTH STIMULATOR ORACUL MULTICOMPLEX AND THE MICROFERTILIZER VYMPEL 2

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.110

ABSTRACT

One of the current priorities in agricultural biotechnology is to identify mechanisms of action of fungicides of natural origin. Among such mechanisms, plant exometabolites play a crucial role by neutralizing toxins and exoenzymes released by phytopathogenic fungi into the environment, as well as by inhibiting fungal sporulation. The aim of the present study was to investigate the synergistic effect of the interaction between spring barley (*Hordeum vulgare* L.) exometabolites and two environmentally safe preparations – the growth stimulator *Vympel 2* and the microfertilizer *Orakul Multicomplex* – on the growth and development of the phytopathogenic fungus *Fusarium oxysporum*. To evaluate the synergistic action of plant exometabolites with these preparations on fungal development, several parameters were measured, including the rate of radial colony growth, mycelial biomass accumulation, and sporulation intensity. The study showed that exometabolites of the spring barley varieties «Sebastian» and «Helios» strongly inhibited *Fusarium oxysporum*, reducing radial growth, mycelial biomass, and sporulation. The greatest antifungal effect occurred when exometabolites were combined with *Vympel 2* + *Orakul Multicomplex*, which lowered spore viability by 5–6 times compared with the control. The «Sebastian» variety exhibited stronger biochemical inhibition, while «Helios» provided consistent suppression throughout pathogen development. These results highlight the potential of the *Vympel 2* + *Orakul Multicomplex* mixture as an effective bioregulatory component for improving the phytosanitary stability of barley in organic and sustainable farming systems.

Keywords: phytosanitary condition, agrocenosis, mycelium biomass, sporulation intensity, colony growth rate, environmentally safe preparations.

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STEPWISE FIELD MONITORING OF OLIVE RIPENESS: NON-DESTRUCTIVE ASSESSMENT OF KALINJOT, LECCINO, AND FRANTOIO CULTIVARS IN ALBANIA

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.111

ABSTRACT

Olive cultivation is a cornerstone of Albania's agricultural sector, encompassing both native and introduced cultivars that contribute to rural livelihoods and high-quality extra virgin olive oil production. This study evaluated the ripening dynamics and key quality parameters of three olive cultivars—native Kalinjot and introduced Leccino and Frantoio—using both destructive and non-destructive techniques across nine harvest intervals during the 2024 season. Non-destructive methods, including colorindex (CI), DA-Meter, and Kiwi-Meter measurements, were integrated with traditional assessments such as maturity index (MI), flesh firmness, detachment index (DI), oil content, and total phenolic compounds to monitor ripening directly in the field. Results revealed cultivar-specific maturation patterns: Leccino ripened earliest (late October), Frantoio exhibited intermediate timing (early November), and Kalinjot matured latest (mid-December), reflecting differences in pigmentation, firmness, and detachment dynamics. Kalinjot demonstrated the highest oil accumulation and phenolic content, confirming its potential for late-season harvest and high-quality oil production. Non-destructive indices closely mirrored destructive measurements, validating their utility for real-time, field-based monitoring of fruit ripeness. These findings highlight the importance of cultivar-specific harvest strategies and demonstrate that integrating rapid, non-destructive assessment tools can optimize harvest timing, support efficient orchard management, and enhance olive oil quality under variable environmental conditions.

Keywords: Olive ripening, non-destructive assessment, maturity index, oil content, phenolic compounds, field monitoring,

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MARINE POLLUTION AND SEAFOOD SAFETY IN ALBANIA: A TOXIC METAL RISK PERSPECTIVE FOR ENVIRONMENTAL MANAGEMENT

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.112

ABSTRACT

The accumulation of toxic metals in marine biota poses a significant environmental and food safety concern, particularly in coastal regions exposed to increasing anthropogenic pressures. In present paper, the concentrations metals, (Hg, Pb, Cd, Ni and (Al) was determined in selected marine species collected along the Albanian coastline. Measured concentrations were evaluated against international regulatory limits and Predicted No Effect Concentration (PNEC) values to determine potential ecological and human health risks. Pollution and risk assessment indices—including Contamination Factor (CF), Bioconcentration Factor (BCF), Target Hazard Quotient (THQ), Hazard Index (HI), and Carcinogenic Risk (CR)—were applied in characterizing metal bioaccumulation and associated exposure risks. Elevated concentrations of Cd, Ni, and Hg were detected in several species, notably *Pagellus erythrinus*, *Merluccius merluccius*, and *Sparus aurata*, with higher accumulation observed in gill and liver tissues. In several cases, calculated HI and CR values exceeded recommended safety thresholds, indicating potential non-carcinogenic and carcinogenic risks for consumers. Multivariate tests, including Principal Component Analysis (PCA) and Cluster Analysis, revealed distinct metal accumulation patterns among species and highlighted site-specific pollution influences. These findings emphasize the necessity for continuous coastal monitoring and integrated risk-based assessments to ensure seafood safety and to inform evidence-based environmental management and regulatory policies in Albania.

Keywords: marine biota, toxic metals, bioaccumulation, risk assessment.

Vol. 16 (1): 101-108 (2026)

AWARENESS OF NITRITE AND PHOSPHATE PRESERVATIVES IN PROCESSED MEAT PRODUCTS: A QUANTITATIVE ASSESSMENT IN ALBANIA

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.113

ABSTRACT

Processed meat is consumed on a regular basis in the urban Albanian diet, and yet it is not clear how well consumers comprehend the preservation methods of such products. Nitrite and phosphate salts are commonly used in meat processing to enhance microbiological safety, product appearance or texture. While they have received more scientific interest concerning their possible health effects, documentation on the general evidence of these preservatives by the Albanian public is limited, emphasizing the need to provide evidence for consumer awareness in food. This study quantitatively investigates for the first time consumer behavior related to nitrite/phosphate additives in processed meat. An online survey carried out in Tirana from 2024 to 2025 provided 86 valid responses by the adult or parents who were responding for children. The survey included items on frequency of consumption, purchasing behavior, products and ways processed meat is usually used in meals, habits of reading package labels and knowledge about certain preservatives. Processed meat consumption is high, with 58% of participants reporting frequent use and mainly purchasing these products from supermarkets or local butchers for quick meals, snacks, or children's lunches. Awareness of preservatives was relatively lower: 35% accurately identified nitrites as additives common in processed meat, whereas just 22% did the same for phosphates. Only 23% of the survey participants regularly read food labels, and several stated that labels were not always plain or straightforward. Younger consumers around 60% showed the highest use of meat products containing additives and the lowest awareness, revealing a clear gap between consumption and knowledge. In general, the findings reflect a considerable discrepancy between use of preservatives in these products and people's knowledge about them in Albania. Better labeling practices, increased public information and consumer-oriented training in food safety might be expected to contribute to more informed purchasing decisions.

Keywords: nitrites, phosphates, processed meat, food additives, consumer awareness, Albania.

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EFFECTS OF CARBON DIOXIDE GAS ON BREAD WHEAT

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Received September 2025; Accepted November 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.114

ABSTRACT

This study investigates the effects of air pollution and climate change on agriculture, focusing specifically on the "Taner" variety of bread wheat (*Triticum aestivum L.*) grown in Konya, Turkey. In Konya, where industrial, traffic, and heating-related emissions are intense especially during winter CO_2 levels rise significantly, negatively impacting both environmental and agricultural health. In the research, wheat seeds were exposed to varying concentrations of CO_2, and their germination and growth processes were monitored. Seeds exposed to CO_2 showed significantly lower germination rates, reduced shoot length, and decreased biomass. Moreover, when these wheat samples were used as food for the model organism *Drosophila melanogaster* (fruit fly), the survival rates decreased, and development periods were extended. These findings indicate that air pollution adversely affects not only plant development but also the health of organisms that consume these plants. The results reveal that increasing CO_2 levels threaten wheat yield and quality, posing serious risks to food security and environmental health. The study emphasizes the need for promoting renewable energy sources, adopting sustainable agricultural practices, and developing effective policies to combat air pollution.

Keywords: air pollution, agriculture, CO_2, Drosophila melanogaster, Konya, wheat

Vol. 16 (1): 121-130 (2026)

ANALYSIS OF HUMAN HEALTH RISK INDICES AND EVALUATION OF METALLOTHIONEIN AS PRIMARY BIOMARKERS OF EXPOSURE OF HEAVY METALS IN ALBANIAN MUSSELS, 2024

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.115

ABSTRACT

Assessment of human health risk indices resulting from mussel consumption *and* biomarkers evaluation represents a critical component in evaluating potential hazards associated with exposure to heavy metals and other contaminants accumulated in aquatic organisms. Mussels, as filter-feeding bivalves, readily bioaccumulate pollutants from their surrounding environment, making them reliable sentinels for monitoring marine and lagoon ecosystems. This research was conducted within the scope of a continuing project. *"Innovative evaluation of the role of biomarkers and bioindicators in the quality of seafood products",* made possible through the financial and institutional support of "National Agency for Scientific Research and Innovation" and "Academy of Sciences" in Albania. A total of four field campaigns were organized between April and August 2024 at two mussel aquaculture sites in Albania: the Butrint lagoon and the Shengjin coastal zone. To evaluate the human health risk through heavy metal levels, we calculated *dietary intake estimates* (Estimated Daily Intake – *EDI* and Estimated Weekly Intake – *EWI*) and *hazard quotients* (Target Hazard Quotient – *THQ*; Hazard Index – *HI* and Carcinogenic Risk - *CR*) to determine both non-carcinogenic and carcinogenic risks for consumers. This research study provides compelling evidence that consumption of the analysed mussel species entails negligible non-carcinogenic and carcinogenic health risks, thereby affirming their safety and suitability for human consumption across the three evaluated age groups. In the present study, also an innovative spectrophotometric method was developed with stringent precautions to ensure complete precipitation of metallothioneins, while simultaneously preventing sulfhydryl group oxidation (-SH), soluble low-molecular-weight thiol contamination, and enzymatic degradation of proteins throughout sample preparations under standard laboratory conditions.

Keywords: Mussel aquaculture sites, Butrint lagoon, Shengjin coastal zone, heavy metals, dietary intake estimates, hazard quotients, biomarker, metallothionein

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 131-140 (2026)

UNDERSTANDING CONSUMER ATTITUDES TOWARD EGG SAFETY AND CHEMICAL RESIDUES

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Received November 2025; Accepted December 2025; Published January 2026;

DOI: https://doi.org/10.31407/ijees16.116

ABSTRACT

Eggs, while a global dietary staple, are at risk of contamination from banned substances such as nitrofurans, posing a significant health risk. This study aims to rigorously assess how knowledge of nitrofurans, educational attainment, and professional background influence the perceived importance of consuming eggs free from hazardous substances. A total of 284 respondents were surveyed, employing both descriptive and inferential statistical analyses via SPSS (version 16). The participants had a mean age of 29.1 years (Standard Deviation (SD) = 10.6), with 45.1% of the participants aged 18–25. Our findings indicate that 86.6% of respondents consider egg safety to be very important, with 90.1% aware of the hazards of nitrofurans and 82.4% seeking additional information on the topic. However, despite this high awareness, about one-third still purchased uncertified eggs, revealing the clear gap between knowledge and behavior that underscores the need for targeted interventions addressing not only information but also consumer trust and access to certified products.

Keywords: Egg consumption, nitrofurans, food safety, descriptive statistics, consumer awareness, education.

Vol. 16 (1): 141-146 (2026)

ECOLOGICAL PHILOSOPHY AND LIBERAL EDUCATION IN MODERN UNIVERSITIES

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Received October 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.117

ABSTRACT

The accelerating environmental crisis has raised fundamental questions about the ethical foundations, educational purposes, and social responsibilities of modern universities. In response to these challenges, this paper examines the role of eco philosophy in enriching liberal education within higher education. Drawing on environmental philosophy, deep ecology, and ecological ethics, the study conceptualizes eco philosophy as a normative framework that challenges anthropocentric assumptions and emphasizes ecological interconnectedness, intrinsic value of nature, and moral responsibility. Methodologically, the study employs a bibliometric approach combined with qualitative content analysis of academic publications indexed in Scopus and Web of Science. The analysis identifies major research trends, thematic clusters, and intellectual orientations related to sustainability, education, and higher education. The results indicate a sustained growth of sustainability oriented educational research, with increasing emphasis on ethical reflection, institutional responsibility, and holistic educational models. However, explicit integration of eco philosophy within liberal education remains limited and conceptually fragmented. The paper argues that integrating eco philosophical principles into liberal education can strengthen the capacity of universities to cultivate critical thinking, ecological awareness, and ethical responsibility among students. This integration supports the vision of the ecological university and contributes to reorienting higher education toward sustainability and long term societal wellbeing. The study offers a conceptual foundation for future research and educational practice aimed at addressing the ecological challenges of the twenty first century.

Keywords: eco philosophy, liberal education, environmental ethics, ecological university, higher education, sustainability, ecological responsibility.

Vol. 16 (1): 147-156 (2026)

EVALUATION OF THE MECHANIZATION LEVEL: A CASE STUDY OF DIVJAKA MUNICIPALITY

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.118

ABSTRACT

The study of the current level of mechanization is essential because it provides a realistic picture of the technical capacity of the area, identifies gaps and investment needs, improves productivity and sustainability, supports evidence-based policies and enables planning for long-term agricultural development. Agricultural mechanization is a key factor in food production, and its effective application depends on understanding the indicators that influence its performance. The objective of this study was to evaluate the main mechanization indicators in the Municipality of Divjaka. The research was conducted in two stages. In the first stage, quantitative information was gathered on total and cultivated agricultural land, farm and parcel sizes, the existing machinery and tractor fleet, maintenance and repair practices, and production levels. In the second stage, the mechanization indicators were calculated following methodological guidelines provided by several authors. The value of Mechanizations Indicators in study area are: Farm Power Availability, 2.51 kW/ha, Density of the tractor 74.89 tractor/1000 ha, Workload per tractor 13.53 ha/tractor, Average power per tractor 48.76 kW/tractor, the Machinery ratio per Tractor 3.08 and the Degree of Mechanization according to processes, crops and area were used to determine the level of mechanization. In conclusion, the level of mechanization in the Municipality of Divjaka, using the indices determined for this purpose, was assessed as high compared to developing countries. However, mechanization is not balanced in relation to crops and work processes. The transition to a high level of mechanization compared to developed countries requires not only an increase in the number of tractors but also an increase in the average tractor power above 50 kW and the number of machines 5-7 machines for each tractor, starting with existing tractors. Improving these indicators will directly affect the increase in the level of mechanization and the possibility of using new modern technologies.

Keywords: Indicators, degree of agricultural mechanization, level of agricultural mechanization.

Vol. 16 (1): 157-170 (2026)

THE LEGAL ALIGNMENT OF ALBANIA WITH THE EU ACQUIS: SUSTAINABLE RAW MATERIALS, GREEN MARKET DEVELOPMENT, AND THE CIRCULAR ECONOMY

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.119

ABSTRACT

The alignment of Albania's legal and institutional framework with EU acquis on sustainable raw materials, industrial processing, and environmental protection is essential for advancing a circular and green economy. While Albania has made substantial progress in legislative approximation, effective implementation remains limited due to institutional fragmentation, limited coordination among competent authorities, and gaps in enforcement. This study conducts a comparative legal analysis of Albania's legislation with EU's 2024 regulatory package on circular economy, sustainability, waste management, and raw materials security. The research identifies key legislative and institutional gaps, evaluates the degree of harmonization, and proposes actionable reforms to facilitate the development of a green market and sustainable raw materials exchange. The findings emphasize the importance of strengthened institutional cooperation, digital environmental monitoring, fiscal and regulatory incentives, and technical support for enterprises. By addressing these areas, Albania can enhance compliance with EU standards, support environmentally responsible industrial practices, and promote a functional circular economy, ultimately contributing to the country's EU integration and long-term sustainable development goals.

Keywords: sustainable development; raw materials; green market; circular economy; acquis Communautaire, Albanian legal harmonization.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 171-178 (2026)

BIOMECHANICAL LOAD AND ANTIOXIDANT DEFENSE: BIOCHEMICAL MECHANISMS OF EXERCISE-INDUCED OXIDATIVE STRESS IN ATHLETES

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.120

ABSTRACT

Exercise-induced oxidative stress has traditionally been attributed to increased metabolic activity and oxygen consumption during physical activity; however, accumulating evidence indicates that biomechanical loading plays a fundamental role in shaping redox responses in skeletal muscle. Mechanical factors such as force magnitude, contraction type, movement velocity, and cumulative tissue strain substantially influence reactive oxygen species (ROS) production and the activation of antioxidant defense systems. The aim of this manuscript is to examine the biochemical mechanisms underlying exercise-induced oxidative stress in athletes while emphasizing the contribution of biomechanical load characteristics to ROS generation and antioxidant adaptation. This article adopts a narrative and integrative approach, synthesizing findings from experimental and mechanistic studies in exercise physiology and biomechanics to conceptually analyze the interaction between biomechanical load parameters and established biochemical markers of oxidative stress and antioxidant defense. The reviewed evidence indicates that mechanically demanding exercise modalities particularly those involving high-force output, rapid force development, and eccentric-dominant contractions elicit greater acute ROS production compared with metabolically similar but mechanically less intense activities. Repeated exposure to such biomechanical stimuli promotes upregulation of key antioxidant enzymes, including superoxide dismutase and glutathione peroxidase, thereby enhancing redox homeostasis and tolerance to repeated stress. Fiber type–specific responses further demonstrate that biomechanical recruitment patterns influence the magnitude and localization of oxidative stress and adaptive signaling. Collectively, these findings support a hermetic model in which biomechanical stress acts as a critical driver of redox-sensitive signaling and training adaptation. Excessive suppression of ROS or insufficient mechanical stimulus may attenuate beneficial adaptations, whereas appropriately prescribed biomechanical loading optimizes antioxidant defense, recovery, and long-term performance. Exercise-induced oxidative stress should therefore be understood as a coupled biochemical–biomechanical phenomenon, highlighting the importance of integrating biomechanical considerations into training design for athletic development.

Keywords: antioxidant defense, biomechanical load, exercise-induced oxidative stress, reactive oxygen species, skeletal muscle, training adaptation.

Vol. 16 (1): 179-186 (2026)

DESIGNING ENVIRONMENTAL PROTECTION TEACHING TOOLS THROUGH PROJECT-BASED LEARNING FOR PRE-SERVICE TEACHERS

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Received October 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.121

ABSTRACT

This study examines the application of Project Based Learning in designing environmental protection teaching tools for pre service teachers in teacher education institutions in Hanoi, Viet Nam. The research was conducted at Hanoi Metropolitan University, the National Academy of Education Management, and Hanoi University of Education during the academic year 2024 to 2025. A mixed method research design was employed, combining quantitative survey data from 186 pre service teachers with qualitative analysis of 42 teaching tools, reflection reports, and feedback from 12 lecturers. Quantitative results indicate high levels of pedagogical competence in teaching tool design, strong environmental awareness, and positive perceptions of Project Based Learning effectiveness. Qualitative findings reveal that most teaching tools demonstrated clear pedagogical coherence, environmental relevance, learner centered design, and feasibility for classroom implementation. Reflection reports and lecturer feedback showed strong convergence in emphasizing professional confidence, instructional creativity, and responsibility toward environmental protection. The findings suggest that Project Based Learning provides an effective framework for integrating environmental education into teacher preparation programs by supporting the development of practical teaching skills and environmental responsibility. The study contributes empirical evidence to the field of teacher education and offers implications for enhancing environmental protection education through project oriented pedagogical approaches.

Keywords: Project Based Learning, environmental protection education, teaching tool design, pre service teachers, teacher education, environmental awareness.

Vol. 16 (1): 187-198 (2026)

THE IMPACT OF FINANCIAL SUPPORT SCHEMES ON THE AGRICULTURAL SECTOR: A CASE STUDY IN KOSOVO

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.122

ABSTRACT

The agricultural sector is one of the most important components of the Kosovo economy, accounting for approximately 7.5 percent of GDP. Since 2010, the Government of Kosovo has implemented two main instruments to support this sector: the Direct Payments Program and the Rural Development Program. The purpose of this paper is to assess the impact of these programs on the development of the agricultural sector in Kosovo. To achieve this, several main objectives have been defined: a) presenting the main theories related to direct payments and grants; b) presenting the current situation of these programs and analyzing their progress; c) measuring their impact on the development of the agricultural sector in Kosovo; and d) providing recommendations for the Government of Kosovo to increase the effectiveness of direct payments and grants. To meet these objectives, statistical data from relevant institutions were analyzed using graphical methods and econometric techniques. The findings indicate that the implementation of these programs has produced positive results in some sub-sectors; however, the intended outcomes for the agricultural sector as a whole have not been fully achieved.

Keywords: Direct Payments, Grants, Rural Development, Wheat Production.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 199-206 (2026)

INVESTIGATION OF RADIONUCLIDE UPTAKE BEHAVIOR AND TRANSFER FACTORS IN AGRICULTURAL SOILS AND VEGETATION OF AL-KIFIL, IRAQ

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.123

ABSTRACT

This study aimed to evaluate the activity concentrations of ^{238}U, ^{232}Th, ^{226}Ra, ^{228}Ra, and ^{40}K in soil and plant samples collected from different sites with varying physicochemical properties. Transfer factors (TF) from soil to plants were calculated and correlated with soil characteristics such as pH, salinity, and organic matter content. The results revealed that the highest concentrations of ^{238}U and ^{226}Ra were associated with lower pH values and higher organic matter content, while ^{40}K showed moderate variations between sites. These findings provide valuable insight into the behavior of radionuclides in soils with different properties and highlight the influence of soil physicochemical factors on radionuclide transfer from soil to plants.

Keywords: agrıcultural soıls, vegetatıon, transfer factors, radionuclide transfer.

Vol. 16 (1): 207-214 (2026)

THE IMPACT OF FINANCIAL INSTITUTIONS AND SERVICES ON THE FINANCIAL INCLUSION OF FARMERS AND THE SUSTAINABILITY OF AGRICULTURAL FARMS IN ALBANIA

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.124

ABSTRACT

Agriculture sector in Albania remains one of the most important sectors of the country economy because of its contribution in GDP (currently over 16%) and the total number of employed people in the sector (34.89% in 2023 according to the World Bank data). Since 2010, all European countries have started focusing on financial inclusion as a key determinant to economic growth. Financial inclusion of farmers in Albania is key to a sustainable development of the Agriculture Sector in Albania. Financial inclusion is related to the opportunities for Albanian farmers to access financial market, financial institutions and financial services and products. To assess the existence of specialized financial services for farmers in Albania and the attitude of financial institutions toward farmers, we conducted 60 interviews with staff of the financial institutions in Albania that are responsible to provide financial services for farmers. Results of this study show different attitudes of financial institutions toward farmers depending on the category of the financial institution. Banks appears to be very indifferent to farmers in Albania, on the other hand non-bank financial institutions and savings-credit institutions are being closer to farmers and are offering more specialized financial services to them.

Keywords: financial literacy, financial inclusion, sustainable agriculture, financial services.

Vol. 16 (1): 215-224 (2026)

NATURE-BASED RECREATION IN LAKE SEBU AND PSYCHOLOGICAL WELL-BEING OF UNIVERSITY STUDENTS: A PHOTO-ELICITATION ANALYSIS

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.125

ABSTRACT

In this study, the relationship between university students' perceptions and experiences of nature-based recreation and their psychological well-being was examined. Photo-elicitation and content analysis methods, one of the qualitative research methods, were used in the study. Students were selected through a purposive sampling technique. The study was conducted on 23 university students studying in the Philippines. As a result of the study, it was determined that participating in nature-based recreation activities has a positive effect on psychological well-being. In addition, in this study, the effects of nature-based recreation activities on the dimensions of Nature and Peace, Connectedness and Community, Memory and Emotionality, Exploration and Adventure, and Cultural and Spiritual Experience were explained.

Keywords: nature-based recreation, well-being, photo-elicitation analysis, students, Lake Sebu.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 225-230 (2026)

EVALUATION OF URANIUM CONCENTRATION IN BLOOD SAMPLES OF GAS POWER PLANT WORKERS IN BABIL GOVERNMENT, IRAQ: A CASE STUDY IN THE FIELD OF HEALTH CARE AND ENVIRONMENTAL PROTECTION

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.126

ABSTRACT

This study measured uranium concentrations in human blood from 72 samples, including 36 electric gas station workers and 36 controls aged 20–59 years, collected in Babil Governorate, Iraq. Uranium-235 concentrations were determined using the FTA method with CR-39 detectors and the droplet technique (35 µL blood per detector). Results showed higher uranium levels in workers (mean: 1.75 ± 0.52 ppb; range: 0.458–2.424 ppb) compared to the control group (mean: 0.74 ± 0.28 ppb; range: 0.231–1.329 ppb). Uranium concentrations increased with age, smoking, and daily and cumulative working hours.

Keywords: Uranium concentration, CR-39 detector, blood samples, Nuclear Track Detectors (SSNTDs).

Vol. 16 (1): 231-238 (2026)

TECHNOLOGY-RELATED ENTHUSIASM AND ANXIETY AND eHEALTH LITERACY AMONG NURSING STUDENTS

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.127

ABSTRACT

Background: As healthcare increasingly integrates digital systems, preparing nursing students to effectively engage with these tools has become vital. Examining the interplay between technology-related attitudes, perceived digital competence, and eHealth literacy is essential for understanding students' preparedness for digitally mediated healthcare, particularly in higher education contexts undergoing digital transformation.Methods: A cross-sectional study was conducted among undergraduate and postgraduate nursing and health sciences students at the University of Shkodra "Luigj Gurakuqi", Albania. Data were collected using validated instruments assessing technology-related enthusiasm and anxiety (TechPH), perceived digital skill, frequency of technology use, and eHealth literacy. Descriptive, inferential, correlation, and multiple linear regression analyses were performed. Results: Students reported moderate-to-high technology enthusiasm alongside moderate technology-related anxiety, as well as adequate levels of eHealth literacy and perceived digital skill, with frequent technology use. No significant differences were observed by gender or academic year. Perceived digital skill and technology enthusiasm were the strongest predictors of eHealth literacy, whereas frequency of technology use showed a weaker association. Conclusions: Digital readiness among nursing students appears to be shaped more by perceived competence and attitudes toward technology than by frequency of use alone. Within the Albanian higher education context, these findings underscore the relevance of educational approaches that support the development of digital skills, confidence, and reflective engagement with technology.

Keywords: Attitudes toward technology; Technophilia; eHealth literacy; Digital competence; Digital health; Nursing education; Health informatics education.

Vol. 16 (1): 239-246 (2026)

DETECTION OF CARVACROL COMPOUND IN THREE TYPES OF OREGANO OILS (IRANIAN, AMERICAN AND FRENCH) AND EVALUATION OF ITS EFFECTIVENESS AGAINST CERTAIN PATHOGENIC BACTERIA

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.128

ABSTRACT

This study was conducted to determine the phytochemical content of three types of *Origanumvulgare*oil, namely the Iranian, American and French types, in addition to extracting and purifying the carvacrol compound and evaluating its biological activity against certain pathogenic and biofilm-producing bacteria. The results of the chemical analysis of the compounds identified in the oil of the Iranian type of *Origanumvulgare* using chromatographymass spectrometry showed the presence of only three compounds: Durene at 38.05% at retention time R. Time was 4.898, Carvacrol at 60.90% at a retention time (R-Time) of 9.620, and the third compound was 1-Azabicyclo, which was the least abundant compound at 1.05% at a time of 14.281. The results of the analysis of oregano oil in the American variety revealed the presence of eight compounds, with the fifth compound, 2-Ethyl-1-methoxy-4-methylbenzene, having the highest percentage at 75.26% at a R-Time of 9.905, while the compound Carbonic acid, 6-chlorohexyl 2,2,2-trichloroethyl ester was the least abundant compound, with a percentage of 0.06% at a R-Time of 14.356. The results of the analysis of oregano oil in the French variety showed the presence of seven compounds, with 3,6-Dimethylbenzene-1,2-diamine, N-methyl having the highest percentage of occurrence at 75.24% and a R-Time of 9.906. The results also demonstrated the effectiveness of carvacrol by showing high inhibitory activity against *Staphylococcus aureus* and *Escherichia coli*. This compound also inhibited biofilm formation in these bacteria. The study also showed that the minimum inhibitory concentration (MIC) of the compound was 62.5 µg/ml for *S. aureus* and 125 µg/ml for *E. coli*.

Keywords: medicinal plants, *O. vulgare,* carvacrol, GC-Mass, Antibacterial.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 247-254 (2026)

INNOVATION AND DIGITALIZATION AS DRIVERS FOR SUSTAINABLE RURAL DEVELOPMENT: THE CASE OF AGRICULTURAL AND AGRITOURISM FARMS IN ALBANIA: A STATISTICAL EXPLORATORY ANALYSIS

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Received December 2025; Accepted January 2026; Published February 2026;

DOI: https://doi.org/10.31407/ijees16.129

ABSTRACT

The rural sector plays a significant role in Albania's economy, contributing substantially to gross domestic product and employment, yet it faces structural challenges such as limited finance, low productivity, inefficient resource use, and slow adoption of innovation and digital technologies. This study examines the role of innovation and digitalization as drivers of the performance and productivity of agricultural and agritourism farms. Data was collected from 672 questionnaires across all 12 regions. Descriptive and inferential statistical analyses are used to assess the relationship between the adoption of innovation and digitalization and key farm performance indicators. Results indicate a strong positive impact of innovation and digitalization on management efficiency and overall performance. The study also identifies economic, technical, and institutional barriers affecting the implementation of innovative practices and digital technologies. The findings highlight the critical role of innovation and digitalization in enhancing farm competitiveness and sustainable rural development in Albania.

Keywords: innovation, digitalization, drivers, agricultural transformation, productivity, statistical analysis.
JEL Code: *O13, O31, Q01, Q16.*

Vol. 16 (1): 255-266 (2026)

PROSPECTS FOR PHYTOREMEDIATION OF MILITARILY DEGRADED SOILS OF UKRAINE USING SAND SAINFOIN (*ONOBRYCHIS ARENARIA* KIT.)

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.130

ABSTRACT

In today's conditions of increasing anthropogenic pressure, climate change and military-induced land use violations in Ukraine, a significant deterioration in soil quality indicators is observed, which is manifested in the intensification of degradation processes, in particular, humus loss, erosion development, changes in acidity and accumulation of toxic elements. In this context, the search for environmentally safe and biologically sound approaches to soil cover restoration is becoming more urgent, among which the use of perennial legumes as a phyto-ameliorative factor occupies an important place. This study is devoted to determining the impact of agrocenoses of sand sainfoin (Onobrychis arenaria Kit.) of different duration of use (two and four years) on indicators of agroecological condition, agrochemical and agrophysical properties of gray forest soils, as well as on the level of their contamination with mobile forms of heavy metals. Experimental studies were carried out during 2021–2025 in the characteristic hydrothermal conditions of the Right-Bank Forest-Steppe of Ukraine, which made it possible to comprehensively assess the influence of the studied factors on the formation of crop productivity. During the research, the main agrochemical and physicochemical indicators of the soil were determined, in particular the content of humus and hydrolyzed nitrogen, the amount of available forms of phosphorus and potassium, the parameters of the acid-base regime and hydrolytic acidity, the features of the structural and aggregate composition, the water resistance of soil aggregates, bulk density, as well as the level of accumulation of mobile forms of lead, cadmium, copper and zinc. The results obtained indicate that the cultivation of sand sainfoin has a positive effect on the formation of soil fertility, contributes to the improvement of its physical properties and stabilization of chemical indicators. During four years of using the crop, positive changes in the agrochemical state of the soil were noted, in particular, an increase in the content of organic matter and basic elements of mineral nutrition, a decrease in the level of acidity and an improvement in its structural indicators. An important result of the research is the revealed tendency to a decrease in the content of mobile forms of heavy metals, primarily lead and cadmium, which indicates the ability of sainfoin to perform a phyto-ameliorative and detoxification role. The results obtained confirm the feasibility of using sainfoin as an effective biological tool for the restoration of degraded and technogenically polluted soils, as well as increasing the ecological sustainability of agricultural landscapes of Ukraine.

Keywords: phytomelioration, sand sainfoin (Onobrychis arenaria Kit.), soil degradation, gray forest soils, soil fertility, heavy metals, agroecological condition.

Vol. 16 (1): 267-270 (2026)

DETERMINATION OF RADON GAS ACTIVITY LEVEL IN DRINKING WATER FROM DIFFERENT COMPANIES AND LOCATION IN ALBANIA

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.131

ABSTRACT

This research aimed to determine the level of radon gas activity in bottled drinking water consumed in Albania. Bottled water is an important part of daily consumption for the population, so its radiological safety needs to be assessed, particularly for public health purposes. Samples from some private companies within different countries' geographic regions were examined in the present research as an effort to attempt and pick up potential differences that are linked with geological background. For each brand, two duplicate measurements were made as an effort towards ensuring reproducibility and reducing statistical uncertainty. Findings revealed that activity levels of radon gas in all the samples of bottled water studied were significantly lower than the national and international standard reference level of 100 Bq/L, confirming their safety in terms of current standards. These findings are valuable baseline data and are indicative of the necessity for continued monitoring, especially against the backdrop of natural variability and in terms of the potential health effects of long-term exposure to radon.

Keywords: radon gas, drinking water, Rn-222, radioactivity.

Vol. 16 (1): 271-280 (2026)

MAPPING THE IMPACT OF FINTECH INNOVATIONS ON THE FINANCIAL SECTOR: A MULTIPLE CORRESPONDENCE ANALYSIS APPROACH

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.132

ABSTRACT

Technology has changed a lot nowadays and so has the financial sector too. This has led to a lot of new FinTech products that combine finance with digital technologies. Blockchain, digital payments, artificial intelligence, robo-advisory services, peer-to-peer lending, and crowdfunding are some new technologies that have changed the way people get and use financial services. These new ideas have made services easier to use, more accessible, more open, and less expensive. Even so, academic research doesn't do a good job of putting together the complicated and different ways that FinTech advances have affected the financial industry. This study uses a bibliometric approach and Multiple Correspondence Analysis (MCA) to look at all the ways that FinTech innovations have changed the financial sector. The study uses a structured dataset of scientific publications from the Scopus database to look at how FinTech-related studies have changed over time, find the most important authors, institutions, funding agencies, and countries, and figure out which journals, documents, and thematic keywords have had the biggest impact in the field. MCA is a tool that helps you find connections between different types of variables, such as research topics, technology fields, and financial uses. This lets you see the FinTech literature's conceptual structures and knowledge clusters. The results show that the number of publications about FinTech has grown a lot over time. This means that academics are more interested in new ways to make money and digital transformation. The results also show that some research topics, like financial inclusion, digital payments, regulatory technology, and artificial intelligence, are very important. A small number of countries, institutions, and important publications make most of the important contributions. The various ways in which FinTech technologies are integrated into conventional banks are also shown by the MCA-based mapping. The interplay between norms, institutions, and technology can be better understood in light of this. Full, data-driven analysis of the FinTech sector is provided by this study by integrating bibliometric indicators with MCA. Also, it identifies unexplored fields of study. Researchers, regulators, and banks that want to learn more about the FinTech world, which is always changing, and what it could entail for the global financial industry can use the results.

Keywords: FinTech, financial innovation, bibliometric analysis, multiple correspondence analysis, digital transformation.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 281-288 (2026)

PROMISING TECHNOLOGIES FOR GROWING HIGH-QUALITY WINTER WHEAT SEEDS IN UKRAINE: APPLICATION OF BREEDING, AGROTECHNICAL AND CHEMICAL ACHIEVEMENTS

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.133

ABSTRACT

Due to the negative effects of climate change, when growing winter wheat, prerequisites are created for the development and spread of the most harmful diseases of leaves and ears of plants: powdery mildew, septoria, pyrenophorosis, brown and yellow rust, fusarium, which significantly reduce the production of food grain in Ukraine. To solve this problem, it is proposed to introduce promising technologies for growing high-quality winter wheat seeds using a complex of breeding, agrotechnical and chemical achievements for effective plant protection. Such technologies include the creation and use of high-yielding varieties of winter wheat that are resistant to diseases and other adverse environmental factors; scientifically substantiated saturation of crop rotations with different groups of crops – grain, technical, fodder, vegetable; placement of winter wheat after the best predecessors; compliance with the periods of return to the previous place of cultivation; use of a balanced fertilizer system; timely tillages with plowing of plant residues and the use of stubble destroyers; sowing at optimal times with observance of the seeding rate; use of healthy seed material and seed treatment before sowing; observance of spatial isolation; use of fungicides. The practical implementation of such promising technologies will contribute to increasing yields and production volumes, increasing the overall level of food reserves and seed insurance funds, and will also ensure the needs of the domestic market and stable exports of high-quality grain products while simultaneously protecting the environment from pollution, especially in conditions of climate change.

Keywords: winter wheat, promising technologies, resistant varieties, crop rotations, crop protection products, fungicides.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 289-294 (2026)

FLORISTIC DATA AROUND THE SHEGANI SPRING AREA, LAKE SHKODRA

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.134

ABSTRACT

The Shegani Spring, located on the northeastern part of Lake Shkodra in the Malësia e Madhe region of Albania, is a karstic source of ecological and floristic significance. This study provides the first detailed inventory of plant species in the areas surrounding the spring, aiming to document local biodiversity and classify species according to families, life forms, chorology and taxon origin. Field surveys conducted from May to September 2025 recorded 79 plant species belonging to 33 families. The *Poaceae*, *Lamiaceae* and *Asteraceae* are the most represented, while the genera *Mentha* and *Clematis* include the highest number of species. Life form analyses show dominance of Hemicryptophytes (41%), followed by Therophytes (18%) and the Phanerophytes (17%). Chorogical analyses indicate the predominance of Mediterranean and Euro-Mediterranean species. Almost all species are native. Notably, *Lenontodon taxatilis* Lam. is reported for the first time in Northen Albania, specifically in this area. The results show high floristic richness providing a valuable baseline for future research within the Lake Shkodra region.

Keywords: floristic survey, Shegani spring, biodiversity.

Vol. 16 (1): 295-304 (2026)

COMPLICATIONS AND SHORT-TERM OUTCOMES AFTER TIBIAL TUBEROSITY ADVANCEMENT WITH A POROUS TITANIUM SCAFFOLD IN DOGS

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.135

ABSTRACT

Tibial tuberosity advancement (TTA) is an operative technique for the treatment of cranial crucialte ligament (CCL) rupture in canines. Recent advancements have resulted in the utilization of porous Ti6Al4V titanium scaffolds, designed to promote osteointegration and osteoconduction while maintaining structural stability during repretive loading. The study aimed to evaluate the perioperative complications and short-term clinical performance of TTA utilising a Ti6Al4V titanium scaffold in dogs ranging from small to large breeds. A retrospective cohort study was conducted on 82 dogs (body weight 12-75 kg; age 1-11 years) treated with TTA using porous titanium scaffold. Clinical outcome assessment used a multimodal approach including radiographic assessment, gait analusis using a pressure-sensitive walkway system and completion of the Liverpool Canine Osteoarthritis (LOAD) questionnaire. Radiographs were analyzed to assess postoperative patellar tendon angle, implant positioning, osteotomy healing, and complications. Follow-up assessments were performed up to 24 weeks postoperatively. Of the 82 dogs included in this study, only sixty-nine (84.1%) completed the 24-week follow-up period. Major complications occurred in 21 dogs (30.4%), including six intraoperative tibial tuberosity fractures stabilized with pins and 15 postoperative distal crest fractures identified radiographically that healed without intervention. Minor complications were noted in nine dogs (13.0%), most commonly incisal dehiscence, swelling, serous effusion, and surgical site infection. The median time to osteotomy union was 10 weeks and was significantly longer in dogs experiencing major complications. LOAD score and TPI % on the pressure-sensitive walkway analysis exhibited significant improvement over time, with less improvement observed in dogs with major complications. Satisfactory results were achieved in 93.8% of procedures at 12 weeks and in 94.2% of dogs at short-term follow-up.

Key words: Cranial Cruciate Ligament, tibial tuberosity advancement (TTA), porous titanium cage, Stifle.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 305-320 (2026)

EVALUATION OF ENVIRONMENTAL SENSITIVITY OF ACCOMMODATION BUSINESSES IN SAKARYA PROVINCE WITHIN THE SCOPE OF SUSTAINABILITY

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.136

ABSTRACT

It is inevitable for people to use natural resources to sustain their lives. As a result of intensive use, resources are depleted and environmental problems occur. Pollution and deterioration caused by the consumption of natural resources faster than the process of renewing themselves affects all living things, ecosystem, population and habitat. For this reason, sustainable use of natural resources is important in the tourism sector as in all sectors. The tourism sector plays an important role in global development processes. Environmental communication is inevitable due to the use of natural resources in the supply formation of the tourism sector. In tourism activities, environmentally friendly practices and projects such as blue flag, white star, green star, green marketing, green product and slow city are carried out within the scope of sustainable tourism. Sakarya province stands out in tourism with its natural, cultural, historical and social values. In the study, interviews were conducted with an interview form consisting of semi-structured questions in order to evaluate the environmental awareness of accommodation establishments in Sakarya province within the scope of sustainable tourism. According to the data obtained from the study, it is seen that the participants have information about the projects implemented on environmental awareness, implement training seminars in their businesses, care about customer sensitivity, and are more careful in the use of water and energy resources with the emphasis on reducing costs. While the participants carry out the necessary practices on recycling with sensitivity, it is stated that environmental awareness is left in the background due to the fact that costs come to the forefront in product supply. As a result of the study, results are obtained regarding water and energy saving practices, recycling activities and the use of environmentally friendly products by accommodation establishments. As a result, according to the analysis of the data obtained, various suggestions are presented to the tourism stakeholders of Sakarya province within the scope of sustainable tourism by eliminating and managing the deficiencies.

Keywords: Tourism, Sustainable Tourism, Environment, Sakarya.

Vol. 16 (1): 321-326 (2026)

CARBON DIOXIDE EMISSION AT PORTO ROMANO COMPLEX DURRËS, ALBANIA

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.137

ABSTRACT

Global warming has become a major problem in our days, which is contributing to the increase in air temperatures every year, bringing climate change and consequences for living organisms. Among the main factors for the increase in temperatures are gases released into the atmosphere by factories, industry, vehicles, ships, indiscriminate waste burning, etc. In this work, monitoring was carried out to assess air quality (CO_2 concentration) in the premises of the Durrës Porto Romano complex. The period during which the measurements were carried out is in the winter, spring, summer and autumn seasons of 2024. This work was supported by the National Agency for Scientific Research and Innovation as well as the Durrës Port Authority. Two standard measuring devices Testo 435-2 and 435-4 were used for the measurements. The points selected for measurement were: the general cargo processing terminal, the passenger (ferry) terminal, the container processing terminal, the freight cargo processing terminal and the oil and gas terminal in Porto Romano. The measurements were carried out in the morning or lunch hours and during the afternoon hours. As a conclusion of this work, we can say that the average CO_2 concentration values each month, in the terminals of Durrës Porto Romano complex, exceed 350 ppm, a limit set in legislation in Albania, EU-27, WHO; Referred to USA EPA standard there are terminals that have a very high average value of CO_2 concentration, above the limit set by this agency (450 ppm). The two highest average CO_2 values evidenced, were at container terminal in July with 528.58 ppm and at the oil and gas terminal in Porto Romano in August with 522.24 ppm.

Keywords: Durrës Porto Romano complex, average CO_2 concentration, Port terminal.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 327-336 (2026)

ARTIFICIAL INTELLIGENCE–DRIVEN DESTINATION MANAGEMENT SYSTEMS FOR PROTECTED AREAS: A SOCIO-ECOLOGICAL SYSTEMS FRAMEWORK FOR SUSTAINABLE TOURISM GOVERNANCE IN THE SHKODRA REGION, ALBANIA

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.138

ABSTRACT

Protected areas are increasingly exposed to complex pressures arising from rapid tourism growth, climate change, and institutional limitations in monitoring and governance. In environmentally sensitive destinations, traditional management approaches based on fragmented data and reactive decision-making are proving insufficient to balance conservation objectives with sustainable tourism development. This study develops a conceptual framework for an Artificial Intelligence–Driven Destination Management System (AI-DMS) designed for protected areas and grounded in a socio-ecological systems (SES) perspective. Using the Shkodra region of Albania as a case study, the paper integrates insights from smart destination theory, socio-ecological governance, and international best practices in AI-based environmental management. The proposed framework combines real-time data collection, predictive analytics, digital twin technologies, and participatory governance mechanisms to support evidence-based decision-making, visitor flow regulation, and ecosystem protection. The analysis demonstrates that AI-enabled destination management can enhance institutional coordination, improve adaptive capacity, and reduce environmental pressures in protected areas. The study contributes to the growing literature on intelligent tourism governance by positioning AI-DMS as a strategic tool for strengthening the resilience and sustainability of socio-ecological systems in nature-based destinations.

Keywords: Artificial intelligence; destination management systems; socio-ecological systems; protected areas; sustainable tourism governance; Shkodra region

Vol. 16 (1): 337-344 (2026)

A STUDY TO DETERMINE THE COFFEE QUALITY PERCEPTIONS OF GUMURS AND GASTRONOMY WRITERS AND THEIR EFFECTS ON CONSUMPTION BEHAVIORS

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.139

ABSTRACT

This study aims to examine how coffee gumurs and gastronomy writers perceive coffee quality and to investigate how these perceptions influence their coffee consumption behaviors. In this context, through the prepared survey, it was tried to determine the opinions of the participants by reaching the gurus and gastronomy writers who participated in the "coffee" themed "events, workshops, panels, etc." events organized in different destinations of Türkiye in 2024. The data were obtained using a questionnaire composed of two sections and a total of 26 items. The research data collection process consists of the participants who could be reached between January 1, 2024 and September 31, 2024. To achieve a sufficient sample size representing the target population (384 respondents), the questionnaire was administered to participants using face-to-face data collection. Based on the analyses performed using SPSS 24.0, it was found that most participants were between 25 and 60 years of age, predominantly female, held a bachelor's degree, and reported a monthly income ranging from 50,001 TL to 100,000 TL. Statistically significant differences were observed between the study dimensions and participants' age, gender, educational level, and monthly income. In addition, the participants' agreement with the research scale dimensions; impact on consumption behavior (x=4.60), perception of coffee quality (x=4.56) and reason for drinking coffee (x=4.48) is high and positive.

Keywords: tourism, gastronomy, coffee quality, perception, Türkiye.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 345-352 (2026)

BIOMECHANICAL, PHYSIOLOGICAL AND ENVIRONMENTAL DETERMINANTS OF JUMPING AND SPIKING PERFORMANCE IN COMPETITIVE VOLLEYBALL PLAYERS

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.140

ABSTRACT

Volleyball performance relies on repeated explosive movements such as jumping and spiking, which are determined by the interaction of biomechanical efficiency, neuromuscular coordination, physiological fitness, and body composition; however, comprehensive investigations integrating these determinants remain limited. This study aimed to examine the biomechanical and physiological determinants of jumping and spiking performance in competitive volleyball players, with particular emphasis on the influence of body composition on force–time characteristics and mechanical efficiency. Twenty-four competitive volleyball players participated in a cross-sectional design and were classified into lower and higher skinfold groups based on the median value of six skinfold measurements. Anthropometric assessments were conducted, while biomechanical performance was evaluated using force-platform analysis during countermovement and volleyball-specific spike jumps. Performance variables including jump height, peak force, and peak power, expressed in both absolute and relative terms, were analyzed using independent samples t-tests, effect size calculations, and Pearson correlation coefficients. Athletes in the lower skinfold group demonstrated significantly greater countermovement and spike jump heights, along with superior absolute and relative force and power production, compared with players presenting higher subcutaneous fat mass. The largest between-group differences were observed in relative mechanical variables, highlighting the importance of normalizing performance outputs to body mass. Additionally, subcutaneous fat thickness showed strong negative associations with all biomechanical performance indicators, particularly relative peak power. Considering athletic performance within a broader human ecology perspective, environmental factors such as indoor training conditions, air quality, and thermal comfort may further influence neuromuscular efficiency and fatigue resistance during high-intensity volleyball activities. Overall, the findings indicate that lower subcutaneous fat mass is strongly associated with improved explosive performance and biomechanical efficiency in volleyball-specific movements. This study provides an integrated biomechanical and anthropometric framework linking body composition to force-platform derived performance variables and supports the systematic integration of body composition monitoring and biomechanical assessment in volleyball training and performance optimization.

Keywords: Keywords: biomechanics, environmental conditions, human ecology, jump performance, power output, volleyball.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 353-366 (2026)

MODELING AND ASSESSMENT OF WATER EROSION IN THE AGGAY WATERSHED: A MACHINE LEARNING-BASED APPROACH

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.141

ABSTRACT

In this article, we investigate the susceptibility to water erosion in the Aggay watershed, located in the southeastern Sebou basin region, with a spatial area of approximately 405 km². The goal herein is to identify the soil erosion risk in our area according to two ML classification techniques: Extreme Gradient Boosting (XGBoost) and Random Forest (RF). The models were built using 12 predictor variables that represent environmental, climatic, and topographic aspects. The sites classified as the fourth class with very high soil loss rates (>32.18 t/ha/year), belonging to the RUSLE model, have been inventoried, which are used as reference data in erosion susceptibility modelling. Using the sample over 70–30%, we performed 10-fold cross-validation with three repetitions to test the model's robustness and reliability. The average improvement in model accuracy computed during decision tree splits was used to identify the relative importance of each variable to the prediction of the erosive zones. Using the ROC (Receiver Operating Characteristic) curve for model analysis with data on Kappa index, sensitivity, specificity, and overall accuracy statistical indices, AUC values reached the average of 0.86 for XGBoost and 0.92 for RF, indicating better predictive performance of the Random Forest model, and the models provide the best compromise in precision, stability, and ability to predict. Both results underline the applicability of machine learning techniques for spatial modelling of water erosion susceptibility and their relevance for sustainable land usage and environmental planning.

Keywords: Aggay watershed, Erosion, Susceptibility, Machine learning, XGBoost, Random Forest, RUSLE model.

Vol. 16 (1): 367-372 (2026)

THE ROLE OF GEOGRAPHICAL INDICATION PRODUCTS IN BUILDING THE IDENTITY OF A GASTRONOMIC TOURISTIC DESTINATION IN ALBANIA

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.142

ABSTRACT

In an increasing competitive market, the identity of territorial products has become a key factor for sustainable development. Geographical Indications (GIs) are increasingly seen as strategic tools for rural development and the promotion of tourist destinations. Geographical Indications strengthen the connection between the product and its place of origin, giving the product an added symbolic and economic value. Despite the relevance of the tourism sector, there is s limited quantitative research that explores tourists geographical Indication Schemes affecting gastronomic tourism demand in Albania. The purpose of this study is to analyze in depth the impact that local foods and products certified with Geographical Indications (GIs) have on the development of gastronomic tourism, with a particular focus on Albania. As one of the countries with a rich culinary heritage, high biodiversity, and a strongly rural structure, Albania possesses exceptional potential for developing sustainable tourism models that are closely connected to territory, culture, and food experience. Geographical Indications (GIs) serve as a guarantee of quality, origin and tradition, as a way to help them differentiate from industrial products. In Albania, there is a legal framework for protecting GIs (Law No. 9977-2008 on Industrial Property) the awareness level among producers remains low. So far, Albania has registered a limited number of products as GIs, but assessments indicate that dozens of other products — including fruits, vegetables, livestock products, olive oil, wine, and honey — have potential and meet the criteria for certification (Ministry of Agriculture and Rural Development, 2022). The research is quantitative and was conducted in Albania, a country that are rich in distinctive products that preserve cultural identity and connection with territory, offering strong foundations for enhancing culinary tourism and fostering economic development. The authors aim to identify the importance of local foods in the tourist experience, their exposure to and consumption of GI-certified products and their perceptions of the role of these products in understanding local culture. These findings offer a precise understanding of the impact of Geographical Indication Schemes in developing gastronomic tourism destinations and provide a strategic basis for designing policies aimed in maximizing the profits of local products.

Keywords: Geographical Indications, local food producers, local recourses, tourism.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 373-378 (2026)

HIGH-GRAVITY BREWING AND CONTROLLED DILUTION: EFFECTS ON FERMENTATION PERFORMANCE AND PHYSICOCHEMICAL QUALITY OF LAGER BEER

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.143

ABSTRACT

High-gravity (HG) brewing is an established industrial strategy aimed at increasing production efficiency by fermenting wort with elevated extract concentrations followed by controlled dilution to the desired product strength. This study evaluates the technological implementation of high-gravity brewing and its impact on fermentation performance and physicochemical quality parameters of lager beer produced at an industrial scale. Wort with an initial extract of approximately 15.0 ± 0.5% was fermented under controlled conditions and subsequently diluted to a final extract of 10.5 ± 0.5% using deoxygenated and microbiologically safe water. Key fermentation parameters, including temperature, oxygen management, and extract concentration, were carefully monitored to minimise yeast stress and ensure process stability. Physicochemical analyses were conducted at different production stages, including extract content, pH, colour (EBC), alcohol content (% v/v), and both apparent and real degrees of fermentation, using standard laboratory methods and an Anton Paar beer analyser. Comparative statistical evaluation (ANOVA) was applied to assess differences between beers produced via high-gravity brewing with dilution and those fermented directly at normal gravity. This study provides industrial-scale validation of high-gravity brewing under real production conditions, demonstrating the reproducibility and technological reliability of controlled dilution using comprehensive physicochemical and statistical evaluation. The results demonstrated that both original and diluted beers remained within technological and quality specifications. Dilution resulted in a significant reduction in beer colour ($p < 0.01$), while no statistically significant differences were observed in pH and the real degree of fermentation. Alcohol content and extract levels decreased proportionally following dilution, confirming the accuracy and reproducibility of the dilution process. Overall, high-gravity brewing combined with controlled dilution proved to be an efficient and reliable method for increasing production capacity without compromising key quality attributes, provided that strict control of fermentation parameters and dilution water quality is maintained.

Keywords: Beer dilution, Fermentation control, High-gravity brewing, Lager beer, quality, Physicochemical properties.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 379-388 (2026)

INTEGRATED GIS-BASED EVALUATION OF SOIL LOSS AND SEDIMENT YIELD IN THE AUDOUR CATCHMENT, NORTHWESTERN MOROCCO

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.144

ABSTRACT

Water erosion is a major geomorphological process that contributes to soil degradation, impacting not only water quality but also ecosystems and socio-economic structures. In the current study, we conduct a study on the Erosion Yield Model of sediment production of the Audour watershed (towards a sustainable watershed) in northwestern Morocco using the Revised Universal Soil Loss Equation (RUSLE) and Sediment Delivery Ratio (SDR), as well as a GIS-based Geographic Information System to analyze land cover and sediment yield in this study. According to our analysis, the sediment delivery ratio (SDR) ranges from 0.135 to 0.307, with an average sediment delivery ratio of 0.221, which indicates that merely 22.1% of eroded sediments are transported downstream while 77.9% remain stored upstream before being redistributed across hillslopes and lower areas. The total sediment yield ranges from 0 to 207.17 t/ha/yr (average ~1.17 t/ha/yr), and we estimate the overall system total to be around 416,331.55 t/yr. Besides, zones that feature steep slopes and vulnerable soils provide higher sediment outputs, confirming the latter two as major erosion hot spots. This data reinforces the spatial diversity of sediment connectivity and the potential impacts of landscape topography, vegetation coverage, and soil properties on erosion capacity and is crucial for both informing mitigation actions and promoting sustainable watershed management.

Keywords: Aoudour watershed, Erosion, RUSLE, Sediment Delivery Ratio (SDR), Sediment yield (SY), Northwestern Morocco.

International Journal of Ecosystems and Ecology Science (IJEES)
https://doi.org/10.31407/ijees ISSN: 2224-4980

Abstract
Volume 16, issue 1, 2026
https://doi.org/10.31407/ijees16.1.

Vol. 16 (1): 389-394 (2026)

COMPARISON OF NUTRITIVE, CHEMICAL AND SENSORY PARAMETERS OF DOMESTIC AND IMPORTED BISCUITS TARGETED FOR CHILDREN: A CASE STUDY IN NUTRITIONAL QUALITY, HEALTH CARE AND HUMAN ECOLOGY

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Received January 2026; Accepted February 2026; Published March 2026;

DOI: https://doi.org/10.31407/ijees16.145

ABSTRACT

Given that children are the most frequent consumers of cookies, the purpose of this study was to evaluate the nutritional, chemical, and sensory qualities of domestic biscuits compared to imported biscuits for children and to offer potential alternatives. The results show that domestic biscuits present qualitative and nutritional properties comparable to those of imports, representing a suitable and safe alternative for consumption. All biscuit samples showed moisture values within the recommended limits, guaranteeing technological stability and good storage. In terms of nutrition, domestic biscuits generally resulted in higher protein content, while fat content was variable. The cellulose content did not show significant differences between the samples, while imported biscuits were characterized by a higher content of minerals, and statistically significant differences in energy values were also evident. Chemical parameters, including acidity and pH, were within acceptable limits. Sensory evaluation showed a slight superiority of the overall acceptance of imported biscuits; some local biscuits exhibited similar qualities to imported biscuits. In conclusion, domestic biscuits meet the basic quality criteria and have the potential to increase competitiveness in the market through further improvement of formulations and technological processes.

Keywords: Domestic biscuits, acidity, nutritional values, sensory qualities.