“Alexandru Ioan Cuza” University of Iași
Faculty of Geography and Geology
Department of Geography
Environmental Collective

The 19th Edition of

Present Environment and Sustainable Development International Symposium

BOOK OF ABSTRACTS

Iași
2024

Contents

WATER RESOURCES OF SMALL AND MEDIUM RIVERS OF THE SOUTHERN DEVELOPMENT REGION OF THE REPUBLIC OF MOLDOVA

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The Southern Development Region (RDS) of the Republic of Moldova represents one of the most important country's regions, its surface being 9.29 ths. km^2 or about 27.4% of the total. About 1170 rivers with a length of 4124.7 km flow within the region. Large ones are transbondary rivers Dniester and Prut with length of 189 km and 256 km. Other rivers are Ialpug with a length of 113 km but also its tributaries Lunga of 81 km, Ialpugel of 53.2 km, Salcia Mare of 45.2 km. Also, within the RDS the lower course of the Botna river is located with a length of 55.8 km as well as the middle course of the Cogalnic river with a length of 55.8 km and the upper and middle course of the Cahul river of 48 km, both continue in Ukraine. Monitoring on small and medium rivers was performed since 50s-60s of the last century on Botna, Cogalnic and Taraclia, and from the end of 70s on Salcia Mare and Lunga. Most of observation stations were closed 10-15 years ago, except the one on Botna. Basing on monitoring data, main hydrological characteristics were evaluated. Thus, the Botna River has an average water flow of 0.77 m^3/s, water volume of 24.3 mil. m^3, runoff of 20 mm at the Causeni. The tendency is stable, no increase of decrease is observed. Main water resources are formed in spring with a share of 36%, followed by summer, winter and autumn. The hydrological characteristics of Cogalnic are 0.26 m^3/s, 8.26 mil. m^3, 46.1 mm at Hancesti station. The annual flow dynamic is evaluated by a very slow decreasing trend. Seasonal distribution is the same as in case of Botna river. The flow of two tributaries of the Ialpug river: the Salcia Mare and the Lunga river, has a strong decreasing trend, the multiannual flow hydrograph being clearly divided in two parts, approximately at year 1994. Thus, the averages for two periods of the Salcia Mare are 0.4 m^3/s and 0.2 m^3/s, 28.9 mm and 14 mm, 12.6 mil. m^3 and 6.22 mil. m^3. In case of Lunga river the averages are 0.2 m3/s and 0.07 m^3/s, 16.7 mm and 6.2 mm, 6.2 mil. m^3 and 2.22 mil. m3. Seasonal flow of the two rivers does not show any high differences in flow formation; about 30% of runoff is generated in spring, 25 % in summer and winter each, 20% in autumn. The Taraclia river flow dynamic differs from the others, the tendency being visibly increasing. The averages of hydrological characteristics of this river are 0.18 m^3/s, 5.76 mil. m^3, 55.9

mm at Taraclia station. Also, in case of Taraclia, the highest share of flow is formed in summer - 38%, being followed by winter and spring - 23% each, and autumn - 17%. Overall, at the regional level, analysis of the monthly runoff shows that the most important water resources are formed in the spring period followed by the summer and winter period. The smallest resources are formed in autumn. The climate changes of the last decades have determined the reduction of water resources, and in case of the southern rivers, this reduction is about 50%.

EXPANSION OF URBAN AGGLOMERATIONS (1980-2020). GLOBAL PERSPECTIVES IN A FACTORIAL CONTEXT

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The problem of the relationships between demographic growth, urban expansion and global changes is extremely complex and has become in recent decades one of the most frequently addressed in contemporary research given its interdisciplinary nature, as evidenced by the one million entries in a simple search on Google Scholar. The theoretical debates surrounding this issue are not conclusive, given the variability of specific processes, the gaps in manifestation in the spatial profile and the difficulty of taking into account all the decisive driving factors. Our study comprises a multivariate analysis of a range of factors that guide the dynamics of global urban agglomerations over a four-decade period (1980-2020). The agglomerations were defined from the perspective of spatial relationships, using a unitary delimitation model for all 2015 cases integrated in the analysis based on the principle of demographic size (minimum 500,000 inhabitants). The observed correlations and highlighted typologies demonstrate the existence of regional patterns of evolution that are closely related to geographic position, demographic growth, the level of economic development and the presence of risks. The study highlights the increasingly strong contradictions that manifest themselves from one decade to the next between the expansion of urban agglomerations and the manifestation of natural or anthropogenic risks that call for urgent solutions for sustainable development. Without going into the topic of the relationship between urbanization and the environment, models of sustainable adaptation are also highlighted, in the most different geographical contexts. If the relationships between population growth and

urban expansion appear to be dependent, those regarding global change are less conclusive.

IRINA UNGUREANU, DESCHIZĂTOR DE DRUMURI ÎN GEOGRAFIA ROMÂNEASCĂ

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Romani Doamna Profesor Irina

Prezentarea de față este un scurt excurs privind viața și opera uneia dintre marile personalități ale geografiei românești. Doamna Profesor Irina-Brândușa Ungureanu a fost un om de o mare noblețe sufletească și un geograf complet cu o gândire profundă și o viziune integratoare, care a adus contribuții valoroase de-a lungul unei cariere îndelungate dedicate Geografiei. Îi datorăm punerea unor baze științifice solide și sănătoase ale Geografiei mediului în România, încă din anii '1970, când s-a numărat printre fondatorii acestui domeniu. Cursul de Geografia mediului, predat de decenii la Facultatea de a Geografie și Geologie din cadrul Universitatea ”Alexandru Ioan Cuza” din Iași, specializarea cu același nume, dar și masterul Mediul actual și dezvoltarea durabilă, care dă și numele prezentului simpozion, sunt doar câteva dintre roadele muncii asidue, concentrate și minuțioase, uneori în condiții dificile, ale unui Om și Profesor care a marcat destine și a deschis noi direcții de cercetare în cadrul Școalii geografice ieșeane.

CASE STUDY - ENVIRONMENTAL PSYCHOLOGY: FROM AGGRESSION AND ARROGANCE TO PRO-ENVIRONMENTAL BEHAVIOR

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The case study within the broad interdisciplinary area of environmental psychology and generated from narrative coaching sessions with a regional manager of a company in the Moldova area, in Romania, describes the invitation of the person in the centre to once again become the "author of an alternative, desirable story" of life, starting from difficulties and problematic identities that were the subject of the consultation request, initially. One can observe the transfiguration, the migration of the identity

of the protagonist of the narratively supported conversations, over the course of 17 sessions, towards a pro-environmental identity and behavior.

ENGAGEMENT FOR TRANSFORMATION AND CLIMATE CHANGE: REVIEW AND CASE STUDIES

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While society is intended to be sustainably transformed for a more secure future, addressing environmental challenges and participating in climate/sustainability planning impose specific requirements, including the need for situationally engaged people. Based on expertise or previous experience, all actors that affect and/or are affected by different environmental issues should be integrated into all stages of the decision-making process, with a focus on the most vulnerable ones and their engagement. However, one essential question concerns what represents a meaningful engagement in the context of transdisciplinary sustainability research. The main aim of this study was to propose a framework for analyzing transdisciplinary initiatives from the perspective of engagement in the context of transformation and climate change and to apply it to three such projects. This facilitates observing how engagement was implemented, comparing the projects among them, and extracting some best practices to be used in future initiatives. The study incorporates three approaches: (i) a bibliometric analysis fed by the Web of Science database, (ii) the subject-based review to identify the main particularities of a meaningful engagement, and (iii) three case studies on transdisciplinary sustainability projects based on the engagement framework proposed in this work. Concerning the main findings, firstly, it was observed that the topic of engagement for transformation and climate change is not very largely discussed across the literature, with certain gaps especially related to best practices and practical recommendations validated through implemented initiatives. Secondly, values and principles like leave-no-one-behind, freedom of expression, transparency, confidence in science, or active listening appear to be essential for the mission of engaging stakeholders, highly depending on the aim of each initiative like communication, consultation, or participation and implying main steps of

engagement such as a clear definition of the endeavor, establishment of roles and responsibilities, identification of priorities, etc.

PRESERVING THE LANDSCAPE DIVERSITY OF VOLODYMYR DISTRICT OF VOLYN OBLAST

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The territory of Volyn Oblast is characterized by the presence of two distinct landscape types within its borders: Polissia and forest-steppe. Within the study area, ten landscape areas can be identified. Volodymyr Raion is situated in one Polissia (Turiisk) and two broadleaf (Lutsk and Ivanychiv) natural landscape zones. Consequently, the Turiisk landscape area is the most economically developed in Polissia, leading to the preservation of natural landscapes in small patches, primarily composed of broadleaf and mixed forests. On the upland areas, economic development is particularly high, resulting in limited remnants of natural landscapes. The remaining forests consist of small patches of oak-hornbeam formations, while pine-dominated forests are also common. The Ivanychiv landscape zone is characterized by the lowest forest cover in the entire oblast. Volyn Oblast is one of the regions with a high percentage of protected areas, accounting for 10.92% of its total area. This percentage continues to increase annually, as the natural conditions in the oblast allow for the creation of new protected areas. Considering the goals of sustainable development in the oblast, it is projected that the protected area in Volyn Oblast should reach 14.1% of its total area. The majority of the protected areas in Volodymyr Raion are of local significance, with only one reserve holding national status. There are no national nature parks or nature reserves in the area. Concerning the ecological network in the oblast and Ukraine, there are no international or national elements, only regional eco-core areas and wildlife corridors. However, among the reserves in the area, some are classified as Emerald Valley sites, which protect the habitats of rare flora and fauna species that are subject to special protection in Europe. Overall, there are 35 protected areas spanning a total area of 13594.57 hectares dispersed across the raion. The level of protected areas in Volodymyr Raion is relatively low, accounting for only 5.27% of the total area, which is almost half of the regional indicator. The distribution of protected areas within the raion is particularly uneven, with certain territorial hromadas having no protected areas, while others have protected areas spanning multiple territorial hromadas. Corrected: It should be noted

that valuable natural areas in the region have been identified for the creation of new nature reserves or the expansion of existing ones, such as the prospective Western Pobuzhzhia National Nature Park. This park aims to protect Polissia and forest-steppe landscapes and will stretch along the valley of the Western Bug River and its tributary, Luha. Keywords: landscape, protected area, protected natural objects.

THE FIRST DETERMINATION OF THE ABSOLUTE AGE OF THE DEPOSITS OF THE 3RD TERRACE OF TRANSILVANIA, USING OPTICALLY STIMULATED LUMINISCENCE METHOD

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For determining the absolute age of the terrace deposits, a geomorphosite located on the left side of Someșul Mare river, southeast of Rebrișoara was selected, which includes a fragment of the tread of the 3rd terrace (20 m relative altitude) and the cuesta slope, facing north, of the Făgetului Hills. Since the beginning of the 20th century, the question of the fluvial terraces age has been long debated in Romanian geomorphological literature. Many geomorphologists have carried out studies where the question of the age of the terraces both inside the Carpathian curvature and outside, was raised. Most of the studies carried out for the terraces on the rivers of the Transylvanian Basin indicated the age of the 3rd terrace as Wurmian (Brătescu, 1941; Dragoman, 1955; Posea, 1961; Fuchs and Konya, 1967; Jakab and Sipos, 1970). Moreover (Savu, Mac and Tudoran, 1970 states that the 3rd terrace was formed in the Middle Weichselian (Wűrm II). Until recently, most assumptions related to the age of the terraces were based on the correlation between them and/or by dating the paleontological fossils discovered in the terrace deposits. Recent studies, on the other hand, use high-precision methods to determine the ages of terrace formations. Researchers as Bălescu, 2003, Necea et al., 2013, Armaș, 2018, uses methods as the Infrared-stimulated luminescence dating (IRSL) and SAR-OSL (Optically Stimulated Luminescence). The present study focuses on the attempt to determine the age of the 3rd terrace in the corridor of the Someșul Mare river. In the alluvial formations of this terrace, two geologic drilling operations were carried out from where several samples were collected. They were subjected to OSL analysis at the Luminescence Dating Laboratory, Department of Geoinformatics, Physical and Environmental Geography, University of Szeged, Hungary. The results showed an older age of 3rd terrace than was believed until now.

TOURISM AXES AND SUSTAINABLE DEVELOPMENT. THE POTENTIAL OF TÎRNAVELOR AXIS IN MUREȘ COUNTY

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Tourism represents an instrument of globalization and economic development with considerable benefits for a territory. The current trends in tourism determine the increase in competitiveness and it can be noted the need to adapt development strategies in accordance with the requirements and in compliance with the local specifics. Geographical axes represent lines of force and useful means for the sustainable development of a territory and for tourism through touristic axes. The link between tourism and geographical axes is in line with current trends, i.e. those of moving from the "spot approche" to an axial or integrative approach that decongests hot spots and directs flows towards areas considered peripheral in terms of positioning or the potential. The Târnavelor axis, a double geographical axis, represents an area with ample tourist potential that stands out at the county level and whose touristic importance can be proven by means of indicators specific to the tourism field. The purpose of this paper is to demonstrate the tourist potential of the Târnavel axes through their common treatment and by outlining the "Târnavel Axis" as a tourist destination at the level of Mureș County. The research methodology is based on three pairs of hypotheses and objectives necessary to demonstrate the axial tourist potential of the study area and its place within the county.

ANOTHER APPROACH TO SPATIAL MODELING AND TEMPORAL ANALYSIS OF LATE SPRING FROSTS FOR REPUBLIC OF MOLDOVA TERRITORY

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According to international climate studies, the states that have a geographical location at temperate latitudes have been facing the consequences of climate change in recent decades, in response to changes in the atmospheric composition. For example, Easterling in his 2002 study found that for most of the US the frost-free period is longer, with the first frost in fall occurring later and the last frost in spring occurring earlier. In this study, we analyze the spatial and temporal variations of dangerous frosts, on the territory of the Republic of Moldova for the period 1991 -

2020, a period, which we divided into two sub-periods of 15 years each for comparison, using several methods of analysis. We calculated statistical parameters such as mean, min, max, standard deviation for the date and intensity of dangerous frosts. We used the Mann-Kendall statistical test to evaluate the trends of the set of data values. Obtaining valid final models of the analyzed climate phenomenon requires the correct choice of mapping techniques. Since the global methods are inaccurate interpolators (the predicted value of the climatic data z(x) does not coincide with the real one recorded at the weather stations, the best approach is the mixed one, combining global and local interpolators. In a first step, the spatial trend of the analyzed variable is determined by applying multiple regression, with the help of Statgraphics 15 software, after which it is extracted from the initial values. The residuals are interpolated by applying the kriging methodology (ordinary kriging), after which the interpolated residuals were added to the spatial trend, resulting in the spatial representation of the analyzed variable. In accordance with the warming in the last decades, during the study period we find statistically significant increasing trends of the intensity of dangerous frosts in the northern part (w.s. Briceni, Cornești - for the period 2006 - 2020) and an advance of the last frost in the air towards the period warm of the year (w.s. Fălești and Ceadîr Lunga) On the territory of the Republic of Moldova, the intensity of dangerous frosts, in the spring, can be between -0.1 and -4˚C, and this manifestation takes place during the period of active vegetation, which leads to the damage of agricultural crops and the reduction of productivity.

RAINFALL VARIABILITY IN NORTH AFRICA (MOROCCO, ALGERIA, TUNISIA): STATISTICAL ANALYSIS OVER JUST OVER HALF A CENTURY OF OBSERVATION (1970 - 2023)

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The Mediterranean area is recognized today as a climate change hot spot. According to the IPCC, IPCC (IPCC, 2023), by 2100 it should experience an average increase in temperatures of 3 to 4˚C, a drop-in precipitation and an increase in extreme events. The Maghreb countries (Morocco, Algeria and Tunisia) are located on the southern shore of the Mediterranean basin. The climate of this large geographical area is characterized in summer by marked drought and high temperatures. During autumn and winter, rains are more abundant and temperatures reach minimums and rarely extreme

values. In order to determine the rainfall trend and analyze rainfall variability over the long term, we use the chronological graphical information processing method (MGCTI) of the "BERTIN Matrix" type. The rainfall data used to carry out this study concerns 29 climatic stations over a period from 1970 to 2023 (12 stations for Algeria, 9 for Morocco and 8 for Tunisia). These data were collected from the meteorological services of the countries concerned by this study and some missing data were found on "TuTiempo.net". This site uses the National Climatic Data Center (NCDC) global database. All this data is freely accessible and comes from the various meteorological stations of the Sahelian observation networks. Isolated gaps were filled by averaging the previous and following monthly values. The statistical analysis shows clearly marked rainfall cycles. A long drought characterized the period 1980 - 2003 in Morocco, it lasted less long in Algeria and Tunisia (1986 - 2003). The resumption of rains is noted for the three countries from the year 2003. Unfortunately, this favorable period is not confirmed since from 2010 (for Morocco) and 2013 (for Algeria and Tunisia) the entire region is facing a new cycle of drought. This study also shows a close relationship of rainfall with the North Atlantic Oscillation (NAO).

THE MANIFESTATION OF DRYING AND DROUGHT PHENOMENA AT THE BEGINNING OF THE 21ST CENTURY AND IMPACT IN THE REPUBLIC OF MOLDOVA

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The aridification of the climate at the regional-european level led to the intensification and increase in the frequency of dryness and drought phenomena, including in the Republic of Moldova. Multiannual observations, documented in the database of the State Hydrometeorological Service, highlight the fact that in the Republic of Moldova, on average, a drought occurs once every five years in the north of the country and once every three years in the southern and central regions. The article characterizes the droughts that occurred between 2000 and 2020 and the impact of more devastating cases on the national economy. The phenomena of dryness and drought are meteorological and climatic phenomena of risk and are considered the most complex climatic phenomena, because several factors participate in their triggering, such as: atmospheric precipitation,

the reserve of soil water accessible to plants, air humidity and temperature, evapotranspiration, wind speed, etc., these being the main climatic parameters that define the condition of dry or droughty weather. Dryness and drought are classified as weather-climatic phenomena that cause the greatest damage to the economy and the environment.

EXTINDEREA PLAJELOR PRIN ÎNNISIPAREA ARTIFICIALĂ - O MODALITATE DE COMBATERE A EROZIUNII COSTIERE. STUDIU DE CAZ LITORALUL ROMÂNESC AL MĂRII NEGRE

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Această lucrarea își propune să prezinte problema eroziunii costiere și una din metodele prin care se dorește contracararea acestui fenomen, și anume înnisiparea artificială a plajelor. Astfel, vor fi explicate cauzele apariției eroziunii costiere, atât naturale cât și antropice dar și consecințele acestui fenomen, precum reducerea atractivității peisajului costier, distrugerea infrastructurii, relocarea populației și afectarea faunei și florei locale. De asemenea, vor fi discutate metodele de combatere a eroziunii costiere, de la utilizarea de structuri grele cum ar fi digurile, până la metode mai puțin invazive, precum înnisiparea artificială, subliniindu-se avantajele și dezavantajele acestor abordări. În continuare, este descris detaliat procesul de înnisipare artificială, cu puncte forte, impact, limitări dar și exemple din alte țări pentru a ilustra diversele efecte și provocări asociate cu înnisiparea artificială a plajelor. Lucrarea mai analizează și situația litoralului românesc. Se arată că plajele din sudul României sunt vulnerabile din cauza deficitului de sedimente și a influenței lucrărilor hidrotehnice care au afectat transportul sedimentar. Pentru a contracara aceste efecte, au fost inițiate proiecte de înnisipare și reabilitare a litoralului românesc, atât în perioada comunistă, cât și în perioada post aderare cu ajutorul fondurilor europene. Deși au fost critici și probleme întâlnite pe parcursul implementării proiectelor, înnisiparea artificială a continuat pe întreaga zonă a litoralului românesc, contribuind la stabilizarea plajelor și la creșterea suprafeței teritoriului țării. Așadar, lucrarea va pune în evidență diversele efecte și provocări asociate eroziunii costiere evidențiind importanța înțelegerii mai profunde a efectelor pe termen lung ale înnisipării artificiale a plajelor și necesitatea realizării unor cercetări mai detaliate pentru a gestiona eficient acest fenomen și a minimiza impactul asupra mediului și comunităților locale.

LATEST CHANGES IN HEAT INDICES OF EXTREMES IN ROMANIA

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Based on daily mean and maximum air-temperatures observed during the 1990-2020 period, the annual and seasonal variations of extremely high air-temperatures and of some relevant indices of extreme heat, as defined by the CLIMPACT Project, have been investigated at eight weather stations located in Romania's southern plain region (Bucharest Baneasa, Turnu Magurele, Giurgiu, Calarasi, Rosiori de Vede, Grivita, Calafat and Urziceni). These stations were selected because they recorded more daily absolute maximum air-temperature values during summer, throughout the entire period of reference. For instance, daily maximum air-temperatures exceeding 42˚C were recorded for repeated times at all eight meteorological stations in the area. The corresponding indices of heat (ETCCDI indices) that have been calculated are: the multiannual monthly averages and annual averages of daily maximum air-temperatures, monthly absolute minima of daily maximum temperatures and annual absolute maxima of daily maximum temperatures, lowest values of monthly maximum temperatures (Txn) and highest values of monthly maximum temperatures (TXx), annual and monthly mean number of summer days (SU), annual and monthly mean number of tropical days, percentage of days when TX>90th percentile (TR), annual number of heat waves (WSDI) (a heat wave being considered to last for six 6 consecutive days on end) and the maximum number of consecutive days with temperatures above 25˚C (CSU). A synoptic and mesoscale analysis of heat wave events over a most recent period (2021-2023) has also been performed, in order to identify the most frequent air circulation pattern that might favour the advance and persistence of tropical air masses over the Romanian territory. The results being obtained reveal an ongoing and intensifying warming process at all eight meteorological stations; with Calafat, Calarasi and Giurgiu recording some monthly absolute air-temperature maxima during the whole period (Calarasi in autumn and winter, Calafat in winter and Giurgiu in all the spring, summer and autumn months). The highest mean value of daily maximum air-temperatures over the entire period has been recorded at Giurgiu meteorological station (18,48˚C), followed by Calarasi and Calafat; the corresponding value over the entire period varying between 17 and 18 oC at all the other analysed stations. One can also notice

that the highest value was recorded at Turnu Magurele meteorological station, followed by Calafat and Giurgiu. By analyzing the number of heat days adding up into heatwaves, the greatest number was reached in 2023 and by analyzing the number of consecutive days with air-temperatures above 25˚c (CSU), an important increase can also be noticed in the same year (2023). Besides, the number of heat waves in 2023 was twice greater as compared to the average annual value calculated for the last 32 years.

EXPLORING THE EFFECTS OF FOREST PRIVATISATION ON FORESTLAND DYNAMICS IN THE POST-COMMUNIST ERA. A COMPARATIVE CASE STUDY OF ROMANIA AND LITHUANIA (1986-2018)

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The dynamics of both landscapes and land use are contingent upon political and social transformations that also act as proxies of different socio-economic development paths. In Central and Eastern Europe, the fall of the communist regime acted as a catalyst for transitions of different natures. These included substantial changes in forest ownership restitution/privatisation, with implications for forestry and land use. This study aims to estimate i) historic and contemporary land covers by performing a quantitative gap analysis on the natural potential vegetation vs. current land cover, and ii) forest canopy loss as a proxy for management intensity. The analysis is grounded in a multi-temporal framework that includes periods of time under the socialist regime (1986-1988), specific to post-communist transition (1989-2000, 2001-2005), and specific to the new democratic regime (2006-2010, 2011-2015, 2016-2020) in Romania and Lithuania. In terms of forest management intensity, the forest canopy loss/year index fluctuated until the beginning of the 21st century and then constantly increased in Lithuania. Conversely, the values of the index specific to Romania show a more erratic evolution, marked by alternative

ups and downs. Both countries registered the maximum values of the index in 2016-2020: 1.61 in Lithuania and 1.33 in Romania. Such findings are relevant for the heated debates that surround questions regarding the privatisation of forestland and how publicly and privately-owned forests should be managed. These insights can guide smoother and less environmentally destructive transitions between forest management types in the future.

THE FIRST AIR QUALITY OBSERVATIONS IN ROMANIA USING THE REXDAN RESEARCH VESSEL ON DANUBE DELTA

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This work presents the first observations on air quality performed on the Danube Delta using the REXDAN research vessel. The observations were performed on the Danube river in the winter of 2024. The expedition started from Galati city and reached the city of Sulina on the same day in a trip that lasted about 10 hours. Throughout the expedition, observations were made on the following trace gases: nitrogen dioxide, sulfur dioxide, ozone, carbon monoxide, carbon dioxide, suspended particles (PM1, PM2.5, PM4, PM10) and weather parameters. The observations obtained were compared to air quality forecasting models.

ASSESSMENT OF URBAN AIR POLLUTION UTILIZING REMOTE SENSING TECHNIQUES AND COST-EFFECTIVE SENSOR TECHNOLOGIES

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Air pollution in urban areas has become one of the most important issues due to the intensification of urbanization, car traffic, inbound industry, infrastructure work, etc. Due to these emissions sources, it is important to know on the one hand the level of pollution and on the other hand the spatial identification of air pollution sources using emerging low-cost technologies and equipment. In our study we present the results of mobile measurement inside one of the largest cities in Romania, Galati city, using a remote sensing system called UGAL MDOAS along with the

measurements of a low-cost sensor Sniffer 4D, both instruments mounted on the same car. The study aims at measuring the air pollution level, and identification of emission sources in Galati city by performing measurements on 18.04.2024 on the main street of the city. The UGAL MDOAS system utilizes differential optical absorption spectroscopy(DOAS) techniques to record the density of trace gases in the troposphere, whereas SNIFFER 4D uses electrochemical sensors to quantify the air pollution concentrations of trace gases. The study aims to comparison of the data gathered with both equipment for the following trace gases: NO2, O3, SO2, and PM. The measurement tracks include paths near the local air quality stations to do some comparison of the data with the air quality station (AQS) measurements to see if the emissions sources identified by mobile measurements influence the emissions of air pollution recorded at stationary points with respect to the AQS specifications.

INTERACTIVE TOOL FOR ESTIMATING ABUNDANCE OF WILDLIFE POPULATIONS (WILDPOP)

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Wildlife species' presence and abundance are ecological parameters of critical importance when making conservation decisions. Two survey methods are widely used to obtain wildlife presence or abundance data: capture-mark-recapture, whereby individuals can be uniquely identified, and occupancy-type methods, whereby individuals cannot be uniquely identified (species is detected/non-detected or counts of detections). Data for occupancy-type analyses can be obtained by sign surveys and camera traps analyzed via hierarchical methods, which separate the state process (e.g., occurrence or abundance) from the observation (detection) process. Hierarchical modelling is a powerful and flexible approach to generating occupancy or abundance estimates; however, it requires good programming skills and a thorough understanding of hierarchical analysis of population data. To facilitate wildlife population estimation in Romania we developed a Shiny app based on unmarked R package, allowing non-coders to explore their data and generate hierarchical modelling. The app,

available at https://wildpop.ccmesi.ro/, allows the users to: 1) simulate the behavior of single season single species and single-season N-mixture models under various parametrizations (e.g., sites, visits, occurrence / abundance / detection probabilities, with or without covariates for detection or occurrence/abundance) - simulation module; 2) data preparation module, an app allowing users to prepare their data to fit the unmarked framework - data module; 3) estimate occupancy and detection probabilities using demo or user data by including covariates for occurrence or detection - single-season single species module; 4) estimate the relative abundance and detection probabilities using demo or user data by including covariates for abundance or detection - N-mixture single-season single species module. The app is completed by a web page for training, a wildlife monitoring guideline and examples of standalone R code for more complex hierarchical modelling. Wildlife practitioners now have a reliable framework for planning and deploying robust animal monitoring programs and producing practical conservation measures with minimal associated costs.

This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS-UEFISCDI (https://uefiscdi.ro/), PN-III-P2-2.1-PED-2021-1965.

CERCETĂRI PRIVIND UTILIZAREA INOVATIVĂ A UNOR EXTRACTE VEGETALE ÎN VEDEREA OBȚINERII DE PRODUSE DESTINATE CONSERVĂRII ACTIVE ȘI PREVENTIVE A PIEILOR DE PATRIMONIU

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Scopul acestei lucrări este acela de a identifica, analiza și utiliza în compozițiile de tratare a pieilor de patrimoniu extracte vegetale de sulfină (*Melilotus officinalis*), busuioc (*Ocimum basilicum*) și lavandă (*Lavandula officinalis*) datorită proprietăților antimicrobiene și antifungice. Extractele vegetale au fost utilizate alături de agenți de emoliere - conservare - nutriție pentru colagen (ceara de albine), hidratare -emoliere (lanolina), conservare - lubrefiere - emoliere - strălucire (ulei de cedru și de copită), conservare - antimicrobiană (propolis).

Ocimum basilicum face parte din familia Lamiaceae, prezintă un miros aromat caracteristic, plăcut și gust ușor iute, aromat și sărat. Specia este

cultivată frecvent și la noi, iar în țările mediteraneene se poate întâlni și în flora spontană. În compoziția chimică fracțiunea volatilă este fără îndoială componenta cea mai cunoscută, conținutul de ulei volatil variind între 0,04% - 0,70%. Cei mai importanți componenți ai uleiului sunt: estragolul, linaloolul, eugenolul, ocimenul, cineolul, alți compuși terpenici și fenilpropanici. Produsul vegetal conține și derivați flavonici, acid cafeic, taninuri, fitosteroli și unele saponine. În general, speciile genului Ocimum sunt lipsite de toxicitate și pot fi utilizate în farmacie, cosmetică, alimentație (conservare, aromatizare) dacă dozele sunt corespunzătoare.
Melilotus officinalis face parte din familia Fabaceae iar produsul vegetal conține derivați cumarinici alături de flavonoide, acizi fenolici, componente volatile și polizaharide.
Lavandula officinalis sunt subarbuști care cresc spontan în Franța, Spania, Italia, fiind cultivate inclusiv în România dar, Franța, Serbia, Bulgaria reprezintă cele mai importante centre de cultură și export a produsului vegetal. Principiul activ al florilor de lavandă este uleiul volatil al cărui conținut chimic diferă în funcție de specie, varietate, soi, moment de recoltare sau forma de condiționare. Din punct de vedere cantitativ componentele principale care imprimă mirosul de bază al produsului sunt linaloolul (20-35%), acetatului de linalil (30-35%), însă aroma este determinată și de aportul cineololului, camforei sau geraniolului. Alți compuși identificați în produsul vegetal sunt: flavonoide, cumarine, fitosteroli și nu în ultimul rând taninuri (5-10%).
Extractele vegetale au fost obținute în laboratoarele INCDTP Sucursala ICPI București și utilizate în compoziții naturale, originale pentru conservarea activă și preventivă a pieilor de patrimoniu. Eficiența tratamentelor s-a evidențiat prin evaluări organoleptice și fizico-chimice înainte și după procesul de îmbătrânire termooxidantă. Relevanța rezultatelor cercetărilor a fost validată prin obținerea unui brevet de invenție (RO 127958B1) datorită avantajelor pe care le conferă aplicarea invenției:
- compoziția propusă pentru conservarea activă și preventivă a pieilor de patrimoniu este aproape eminamente naturală,
- se poate produce în țară la un preț de producție mai scăzut decât al produselor similare din import,
- se respectă normele ce se impun produselor care se utilizează la conservarea obiectelor de patrimoniu din piele,
- compoziția nu conține grupări chimice care s-ar putea scinda sub influența factorilor de mediu, preintâmpinându-se apariția radicalilor liberi foarte dăunători grupărilor peptidice ale colagenului din piele,

- componenții produsului multifuncțional au efect sinergetic asupra pieilor de patrimoniu asigurându-le un grad corespunzător de emoliere concomitent cu un puternic efect antibacterian și antifungic influențând totodată în mod pozitiv aspectul și tușeul lor fără a le modifica și culoarea.

LEVERAGING GIS FOR INCLUSIVE URBAN RENEWAL: A CASE STUDY OF BOUBSILA, ALGIERS

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Urban renewal plays a pivotal role in shaping modern cities, aiming to enhance living conditions, foster social cohesion, and drive economic growth. In the context of rapid urbanization and socio-economic shifts, urban planners face both challenges and opportunities. Balancing global trends with local needs, they strive to create functional, aesthetically pleasing, and sustainable urban spaces. This delicate dance involves understanding various influences while devising innovative solutions to enhance residents' quality of life.

The Informal Neighborhoods of Algiers: Challenges and Opportunities

Algiers, like many cities, grapples with informal urban planning. Self-construction has significantly shaped housing production, often surpassing state-led efforts. The liberalization of land markets has further propagated informal practices. Despite changes in slum structures, their persistence remains. The tumultuous political and economic climate of the 1990s facilitated urban access for both the poor and middle classes.

The Boubsila District: A Microcosm of Informal Urbanization

Boubsila, situated in Bourouba - the poorest commune in Algiers - exemplifies self-built informal neighborhoods. Its diverse population, predominantly low-income families, has witnessed rapid development fueled by resident-led construction. However, challenges persist, necessitating strategic interventions.

Transforming Boubsila: Urban Renewal Strategies

To transform Boubsila into a sustainable and inclusive urban space, we propose a multifaceted approach:

1. Spatial Techniques and GIS: Leveraging Geographic Information Systems (GIS) and cartography, we delve into Boubsila's spatial configuration. Field surveys reveal residents' needs, informing targeted interventions. By superimposing georeferenced data layers, we gain insights into the neighborhood's physical state.

2. Quantitative and Qualitative Aspects: Our methodology integrates data continuously within maps, offering fresh perspectives for preliminary urban renewal studies. We explore both quantitative metrics (such as building density and infrastructure distribution) and qualitative aspects (residents' perceptions, social dynamics, and cultural significance).
3. Classification Maps and Interpretations: Through GIS, we create classification maps of informal constructions. These reveal patterns, vulnerabilities, and potential areas for improvement. Interpretations guide decision-makers toward effective strategies.
Structuring Our Research Our article follows a logical structure:
1. Context and Issues: We introduce the context and highlight the challenges faced by Boubsila.
2. Methodology: Detailed descriptions of our GIS creation, Land Use plan updates, and field surveys.
3. Results and Analysis: We present and analyze the classification maps, shedding light on Boubsila's spatial dynamics.
4. Conclusions and Recommendations: Synthesizing our findings, we propose actionable recommendations for urban planning practitioners. In conclusion, our work contributes valuable insights to the field of urban renewal, emphasizing the need for context-specific strategies. By addressing Boubsila's unique challenges, we aim to improve the quality of life for its residents, fostering a more sustainable and inclusive neighborhood.

THE USEFULNESS OF P-GUY AND WALTER-LIETH CHARTS IN THE QUANTITATIVE EVALUATION OF DROUGHT AND DRYNESS PHENOMENA. CASE STUDY: MAINLAND DOBRUJA

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The present study offers the reader a quantitative assessment of the drought and dryness phenomenon specific to mainland Dobruja. For that purpose, type Ch. P-guy and Walter-Lieth charts were created and analyzed. It is also intended to be a synthetic image through which the of quantitative analysis of climatic indexes is properly highlighted. Meteorological data from existing meteorological stations on the mainland surface Dobruja (Adamclisi, Medgidia, Corugea, Tulcea) were used. For that purpose, we used climatological data from meteorological stations gathered between 1981-2010. In this study, were used monthly values of climate parameters

of air temperature and atmospheric precipitation. Charts representations and comparative analyzes for this territory indicate a moderate increase in the intensity and frequency of drought and dryness phenomena. I found the increase is evident from the west of the territory to the east (from the Danube to the Black Sea). The appearance and the manifestation of these phenomena over the years represents a climatic risk. Climatic risk has mainly with a harmful influence on vegetation and negative consequences on agriculture.

DISTINCTIVE FEATURES OF WATER RESOURCE USE AND MANAGEMENT IN THE DANUBE-BLACK SEA HYDROGRAPHICAL SPACE (REPUBLIC OF MOLDOVA SECTOR)

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The Danube-Black Sea hydrographical space (DBS HS) has a total area of 6.5 thousand km2 which is about 19.3% of the total area of the Republic of Moldova and includes the rivers Cahul, Ialpug, Kitai, Cogâlnic, Sarata and Hadjider. The surface water resources of the Danube-Black Sea Hydrographic Space are quite modest. The region concentrates only 1% of the available surface water resources of the Republic of Moldova. The Danube-Black Sea hydrographical area makes an insignificant contribution of about 1.12% to the water supply of the Republic of Moldova. In the MND HS, more than 3/4 of the water is abstracted from the hydrographic basins (HB) of the Ialpug (49%) and Cogâlnic (30%) rivers, due to the larger surface area and the presence of the urban centres Hincesti and Cimislia - in the Cogâlnic HB; Comrat, Ceadâr-Lunga and Taraclia - in the Ialpug HB. The other rivers in the DBS HS, because of their smaller size, are of local importance, being used more for agriculture and fish farming. In the context of reduced access to surface water resources, about 85% of the water used in the DBS HS is abstracted from groundwater sources. According to the data of "Waters of Moldova" Agency, in the analyzed period (2010-2022), the total volume of water used in DBS HS was, on average, 8.44 million m^3, including 4.11 million m^3 in Ialpug HB, 2.53 million m^3 in Cogâlnic HB, 490 thousand m3 in Cahul HB, 572 thousand m3 in Hadjider HB, 528 thousand m3 in Sărata HB and 212 thousand m3 in Kitai HB. The largest amount of water (5.6 millions m3 or 67%) is used in agriculture, for domestic purposes an average of 2.44 million m^3 (30%) was used, and for technological purposes - only 250 thousand m^3 or 3% of

the volume of water used in the study region. During the period under analysis (2010-2022) the dynamics of the total volume of water used in the DBS HS shows an oscillating trend caused both by the annual trend of atmospheric precipitation and by demographic and economic developments, with a slight upward trend (+9%). In the period 2010-2017 there is a decrease of more than 10% in the volume of water used in the DBS HS, which is due to social and economic instability during that period, bankruptcy and reorganization of large agricultural enterprises, as well as the decline of the population. In the years 2018-2022, an increase of 13% in the volume of water used is expected.

EVALUATION OF THE ANALYSIS OF THE PERCEPTION OF THE OPINION OF THE TOURISTS REGARDING THE TOURIST REGION OF THE CIUCAS MOUNTAINS. CASE STUDY: THE YEAR 2012 VERSUS THE YEAR 2023

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The most dynamic field of economic activity, seen on a global scale, turns out to be the tourism sector. This article aims to focus on the lesser known issues related to the impact of tourism on destinations. The authors will analyze this impact from the perspective of sustainable development. The current study brings the tourist region of the Ciucas Mountains back to the reader's attention. Regarding the imposition on the tourist market, Total Quality Management (TQM) is oriented towards satisfying the customer's requirements, increasing sales of the tourist product and reducing costs. Studying the needs and opinions of tourists is a condition for providing quality services. The study is logically structured according to of research directions, as follows: the evaluation of the tourist potential by analyzing the opinion of the tourists with the help of survey methods (two types of questionnaires); the evaluation through the calculation model of the tourist attractiveness; the comparative analysis of the results obtained following the electronic centralization of the questionnaires applied in the two years of analysis, the year 2012 and the year 2023, etc. The motivation of the research consisted in the desire to deepen and understand tourist behavior regardless of generation. The transformation of the tourism into a catalyst for sustainable development is conditioned by the identification of a state of equilibrium.

CADRU DE ANALIZĂ A CARACTERISTICILOR INITIAȚIVELOR DE *CITIZEN SCIENCE* PROMOVATE PENTRU ADAPTAREA LA SCHIMBĂRILE CLIMATICE ÎN ROMÂNIA

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Inițiativele de citizen science au cunoscut o dezvoltare semnificativa in ultimii ani, pe măsură ce s-a recunoscut importanța considerării și a altor sisteme de cunoștințe asociate, inclusiv a acelora asociate cetățenilor. Practic, cetățenii au devenit o parte integrantă a producerii de informație științifică, participând la designul studiilor, colectarea, prelucrarea si diseminarea datelor, co-crearea si co-producerea unor produse și servicii. Lucrarea realizează un cadru de analiză al acestor inițiative promovate pentru adaptarea la schimbările climatice în România. Sunt considerate informații referitoare la proiect, la modul de implicarea a cetățenilor și oamenilor de știință, impactul generat și provocările identificate. Cadrul de analiză este utilizat în cadrul proiectului ScienceUs - ″Integration of citizen SCIENCE best practices to Upscale and maximise projects impact related to Green Deal and EU missions″, finanțat de Comisia Europeană prin Programul Horizon Europe.

FROM STRATEGY TO ACTION: JUST TRANSITION FUND IN ROMANIA

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Thanks to the adoption of the Territorial Just Transition Plan (TJTP), Romania will receive almost ~2 billion from the European Union's Just Transition Fund (JTF) to support the transition to a more attractive and greener economy. The JTF targets the regions most affected by Romania's commitment to phase out coal from economic activities by 2032. Support will be given to workers to find new skills and new jobs, as well as to small and medium-sized enterprises and some large companies in need of modernization and upgrading. The funds have been earmarked for six counties: Gorj and Hunedoara (with active coal mining, especially in the Jiu Valley), and Dolj, Galați, Prahova and Mureș, where there are industries with a high environmental impact (steel, cement, chemical fertilizers, etc.) and where coal-fired energy is used for heating. Our paper aims to review the steps Romania has taken in this project in comparison with other

Central and Eastern European countries, as well as analysing the use of European funds in the six selected counties. For this purpose, we have used official data provided by Eurostat and the Ministry of Investment and European Projects. The conclusions show that, although the benefits of the project are clear (creation of green jobs, improvement of air quality, creation of a sustainable and clean economy, etc.), we cannot deny that the absorption rate of the funds is moderate, often below the European average, and Romania risks losing important amounts that could be used to modernize the economy.

URBAN SPRAWL AND OCCUPATION OF FLOOD PRONE AREAS IN YAOUNDE-CAMEROON (CENTRAL AFRICA)

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Urbanisation is one of the major drivers of human-induced floods worldwide. The rapid urbanisation in the city of Yaounde, characterised by increasing population growth, difficult living conditions in both urban and rural areas, rural exodus, difficult access to land and housing, and above all poverty, is leading to urban sprawl with severe encroachment on floodplains. This situation is exacerbating flood disasters occurrence owing to the reduction in the floodplain's capacity to mitigate flooding. This study therefore aimed at assessing the urban sprawl rate and modification of floodplains likely to increase flooding in Yaounde. To achieve this objective, satellite data of the area of Yaounde for the period 1990-2022 were obtained from SRTM, DEM, Landsat MSS, ETM+ and Landsat Eight, and their treatment and analysis permitted to depict the land use/cover change maps, showing the dynamics in vegetation cover, relief, and hydrography as well as flood associated maps. These analyses were done with the help of remote sensing and Geographic Information System Software (ArcGIS, QGIS, and Open Street Map). Data on land occupation were obtained from the National Institute of Statistics, and direct observation on the field was equally applied in the methodology. Results

show that the built-up area in Yaounde has increased significantly within the last thirty years, moving from 6,837ha (23.55%) in 1990 to 17,200ha (59.26%) in 2022, with intermediate increase rates of 31.38% in 2000 and 49.68% in 2013. This indicates that built up area
has increased at 7.83%, 18.31%, and 9.57% from 1990-2000, 2000-2013, and 2013-2022, respectively, with of decadal average increase rate of 11.90%. The number of inhabitants in Yaounde reached in the years 2017, 2022 and 2035 at 3.0 million, 3.6 million and 5.6 million respectively. Urbanisation continued with some phenomena being accelerated. It is observed that there is occupation of ridges, colonisation of slopes and exposed land, conquest of floodplains, backfilling of lowlands and deepening of the bed of watercourses, narrowing of the bed of the watercourse and uncontrolled and illegal urban sprawl.

QUALITY EDUCATION AS A SUSTAINABLE DEVELOPMENT GOAL (SDG) IN THE CONTEXT OF MARGINALIZED COMMUNITIES AT THE LOCAL LEVEL. CASE STUDY: PATA RÂT, CLUJ-NAPOCA

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Our study focuses on Goal 4 (SDG 4): "Quality Education" within the framework of the 2030 Agenda for Sustainable Development. The research is conducted at a very local level, specifically focusing on neighborhoods in Cluj-Napoca, in order to direct attention to the educational situation of marginalized communities. Although Cluj-Napoca is on average a "green" administrative-territorial unit (ATU) in terms of Goal 4, i.e. it is the closest to achieving it, educational disparities at such a low level cannot be statistically highlighted and are "lost" through averaging. Therefore, the research will not rely on education indicators or indices (which are difficult to calculate at such a low level due to data scarcity and can be limited in providing information), but rather on a qualitative, empirical approach that takes into account the factors that have led to the precarious educational situation in Pata Rât marginalized community. The study aims to capture how the situation is perceived both inside and outside the community, by collecting the opinions and needs of those in Pata Rât regarding the educational situation of children through face-to-face interviews. In order to reduce inequalities in education, it is also of interest to understand the

level of awareness among the population of the ATU, but also its level of tolerance and receptivity towards students from disadvantaged backgrounds, for the purpose of their integration. This was done using an online questionnaire, followed by standardizing the values obtained by scoring the intensity of responses, and ultimately mapping the level of receptivity for each neighborhood. Additionally, a statistical validation of these answers was conducted, analyzing whether there is a correlation between the information obtained through the content analysis of responses and those obtained statistically. These will allow us to analyze and compare the two perspectives: from the inside vs. outside the community, finding commonalities, but also discrepancies in people's perceptions. The results show that, in this case, the community theoretically finds itself in a society that is quite tolerant regarding the integration of children in schools, with quite a few common points in the way of viewing the situation. Moreover, from an exploratory research perspective, certain more accurate sample categories are identified, which, as a result of the survey, have proven to be relevant factors in the educational situation of Pata Rât, and would require further investigation in future studies. Finally, the qualitative analysis will continue by studying the main factors leading to difficulties in the education of children in the community and proposing some solutions that take into account both categories of opinions. Identifying educational deficiencies in the Pata Rât area, as well as the aspects with the lowest degree of tolerance and receptivity on the part of Cluj-Napoca people, represent exactly the topics that require more attention at the local level.

APRECIEREA POTENȚIALULUI ECONOMIC REGIONAL ȘI IDENTIFICAREA OPORTUNITĂȚILOR DE DEZVOLTARE A REGIUNII DE SUD DIN REPUBLICA MOLDOVA

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Rezultatele cercetărilor prezentate în acest rezumat au fost obținute în cadrul Proiectului Instituțional "Sporirea securității ecologice și rezilienței geo-ecosistemelor la modificările actuale de mediu". Scopul studiului este aprecierea potențialului economic din Regiunea de Sud a Republicii Moldova. Obiectivele cercetării sunt: Analiza evoluției PIB-ului regional, evaluarea structurii PIB-ului Regiunii de Sud, identificarea oportunităților de dezvoltare economică a regiunii de studiu.

Regiunea de Sud a Republicii Moldova ocupă o suprafață de 9.227 km^2, reprezentând astfel 27% din teritoriul național. Această regiune cuprinde 8

centre raionale și 310 localități, dintre care 13 sunt orașe, iar 297 sunt localități rurale grupate în 200 de comune. Contribuția Regiunii de Sud la PIB-ul național este de aproximativ 9,3% anual, inclusiv 7% din Regiunea de Dezvoltare Sud (RD Sud) și 2,3% din Unitatea Teritorial Administrativă (UTA) Găgăuzia. În 2021, comparativ cu 2020, PIB-ul Regiunii de Sud a crescut de circa 1,24 ori, prezentând o rată de creștere mai mare decât cea a PIB-ului total național, care a crescut de aproximativ 1,21 ori. Structura PIB-ului regional este dominată de valoarea adăugată brută (86,3%) și impozite nete pe produse (13,7%), similară cu cea a altor regiuni. Analiza structurii PIB pe sectoare economice relevă că Regiunea de Sud contribuie semnificativ la PIB-ul național în agricultură, silvicultură și pescuit, cu 27,1% (inclusiv 22,1% RD Sud și 5% UTA Găgăuzia). Industria extractivă din această regiune contribuie cu 7% (6,5% RD Sud și 0,5% UTA Găgăuzia), iar industria prelucrătoare cu 7,9% (4,5% RD Sud și 3,4% UTA Găgăuzia). Sectorul activități profesionale, științifice și tehnice are cea mai mică contribuție, de doar 1%, cu 0,6% din RD Sud și 0,4% din UTA Găgăuzia. În structura PIB-ului regional, bazată pe valoarea adăugată brută, sectorul servicii și comerț are cea mai mare pondere, reprezentând 49,3%. Deși regiunea are un caracter agrar și rural pronunțat, sectorul agricultură, silvicultură și pescuit contribuie cu 35,9% la PIB-ul regional. Agricultura de subzistență este predominantă, iar majoritatea producției agricole din gospodăriile țărănești sau casnice este destinată autoconsumului sau schimbului, nefiind înregistrată în statisticile naționale. Sectoarele industrie și construcții contribuie cu 14,8% la PIB-ul regional.

Regiunea de Sud dispune de o varietate largă de oportunități de dezvoltare. Sectorul agricol este susținut de numeroasele fabrici de prelucrare a fructelor și de o importantă pondere a întreprinderilor vitivinicole din țară. Dezvoltarea sectorului zootehnic, în special creșterea ovinelor și caprinelor, prezintă un potențial înalt. Potențialul industrial al regiunii este susținut de fabrici vinicole, de produse lactate și de prelucrare a cărnii, care sunt direct legate de sectorul agricol. Sectorul servicii și comerț este semnificativ pentru PIB-ul regional, datorită expansiunii activităților comerciale. Regiunea are, de asemenea, un potențial turistic ridicat, datorită diversității peisagistice, etnice și culturale. La fel, un rol important îl joacă cele 3 zone economice libere din regiune: “Portul Internațional Liber Giurgiulești”, “Taraclia” și “Tvardița”, care oferă regimuri fiscale și vamale speciale pentru agenții economici ce produc bunuri destinate exportului.

SUSTAINABLE WATER MANAGEMENT STRATEGIES IN THE CONTEXT OF CLIMATE CHANGE: CASE STUDY - ZĂBALA RIVER IN THE PUTNA CATCHMENT

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This paper aims to highlight the importance of regulating water uses in the context of sustainable water resources management. This approach is based on a coherent policy and an appropriate strategy, adapted to the current socio-economic conditions of Romania and to the requirements of European policy in this field. The latter is dominated by the implementation in national legislation of the provisions of the Water Framework Directive 60/2000/EEC. In recent years, in the catchment of the Zăbala stream, there has been particularly heavy rainfall, which has led to a significant increase in the flow rates. These peak flows have caused significant damage, including the formation of floods on the Zăbala watercourse. These floods caused erosion, endangering individual households, annexes, agricultural land, access roads and communal roads near the watercourse. To significantly reduce the risk of flooding, investment in defence works is needed. These works aim to stop bank erosion and optimise the flow of water into the riverbed, thus giving stability to the bank.

SEASONAL VARIATION OF THE PHYSICO-CHEMICAL PARAMETERS AND THEIR INFLUENCE ON THE PLANKTONIC ALGOFLORA IN THE RĂUT RIVER, BĂLȚI CITY, REPUBLIC OF MOLDOVA

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Physico-chemical parameters play a major role in determining the density, diversity and occurrence of phytoplankton in a freshwater body. Algae represent important biological indicators of water quality, being very sensitive to changes in physical and chemical parameters over time. The current study evaluated the physicochemical parameters and dominant algal phyla in the Răut river, the largest and most important watercourse that crosses the Bălți urban ecosystem, Republic of Moldova. Quarterly, during the year 2022, water and phytoplankton samples were collected from 4 sampling sites located on the river course, in different sectors of the city, taking into account the anthropogenic activities in the study area. The

water samples were analyzed for 11 physico-chemical parameters (pH, mineralization, chemical oxygen demand, biochemical oxygen demand, total suspended solids, ammonia nitrogen, nitrite nitrogen, nitrate nitrogen, total phosphorus, chlorides, total hardness), along with the identification of algae species, following standard methodology. The correlation between the planktonic algoflora and the physico-chemistry of the water was carried out using the Pearson correlation test. Spatial variability exists both in the number of algoflora species and in the values of the physico-chemical parameters, with clear differences between the sampling sites. In turn, the concentrations of physico-chemical parameters deviated from the natural background of water quality, especially at S2, S3, S4. The planktonic algoflora was represented by 68 species from 4 phyla: Cyanophyta, Chlorophyta, Bacillariophyta and Euglenophyta. The dominant complex was represented by Chlorophyta and Bacillariophyta (74%). Therefore, strong and moderate correlations between the quality parameters measured were recorded. Negative correlations dominate in the present study, therefore algal diversity is closely related to physical and chemical factors of water such as pH, mineralization, chemical oxygen demand, biochemical oxygen demand, total suspended solids, nitrate, total phosphorus. Analysis of the correlation between physico-chemical parameters and planktonic algoflora is necessary to identify certain key relationships, therefore ensuring a sustainable management of aquatic ecosystems. However, the present study represents the first attempt in the Republic of Moldova to demonstrate the correlations between the diversity of planktonic algae and the physico-chemical parameters in an urban river.

ASSESSING THE QUALITY OF LIFE IN MOUNTAIN SOCIAL-ECOLOGICAL SYSTEMS: A CASE STUDY FOR THE CONNECTION BETWEEN WELLBEING AND WATER RESOURCE QUALITY IN THE CĂLIMANI MOUNTAINS, ROMANIA

Ruxandra IONCE

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The ecological state of water bodies has a fundamental influence on the quality of the ecosystem services provided and is a vital natural capital upon which populations within mountain social-ecological systems depend. Aquatic resources in mountain areas are crucial reservoirs for downstream utilities. It is essential to consider how populations living in

the upstream areas of watercourses, where water is both a source of income and energy, benefit from related facilities. Despite general awareness around the importance of both the quality and quantity of freshwater resources, ongoing pressures and lack of foresight add to the innate susceptibility of high elevation mountain regions to natural risk factors. In order to evaluate the quality of life in mountain human communities, a systemic understanding of the strength of relationships and dependencies between the elements of the system is necessary. In this paper, the northern slope of the Călimani Massif as part of the Siret River Basin is taken as a case study. The provisioning ecosystem services provided by water resources are identified and quantified, assessing their ecological, economic, and social value and in the context of climate change and known anthropogenic pressures. The paper examines how mountain communities benefit from these resources, while identifying the main factors and processes that affect the quality of life and wellbeing of communities, while highlighting the importance of a sustainable management of water bodies in mountain social ecological systems, while maintaining their ecological state.

CONNECTING NATURE AND TECHNOLOGY: USING ARTIFICIAL INTELLIGENCE TO PLAN GREENER CITIES

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The field of spatial planning uses digital technologies as support for planning and decision-making activities. Recently, artificial intelligence technologies started to be used also in green infrastructure planning to allow better decisions and to find solutions to mitigate climate changes especially in urban areas. Optimization algorithms are used to plan green infrastructure at all scales, from the level of a tree to residential and other urban green and natural spaces. Therefore, the main objective of this study is to outline the necessity of implementing AI technology in urban areas to improve the life of inhabitants and to increase the sustainability of the city. Besides optimization algorithms as AI tools, the study presents a large

range of tools that can be used in the management of urban green infrastructure. In the urban context, these new technologies that can be connected to the nature of the city in the form of a digital network containing collected information from different sources. The conclusion is that the digital progress must include the nature of the city. The research comes in the context of the opportunity to plan green belts around Romanian cities and finding their optimal locations using the new digital technologies.

SUSTAINABILITY OF GREEN INFRASTRUCTURE IN BISKRA: ASSESSMENT AND PROSPECTS FOR IMPROVEMENT

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This article explores the dynamics of green infrastructure in the city of Biskra, Algeria, emphasizing their crucial role in the past, particularly with the presence of palm groves, in urban sustainability. The constant expansion of urban areas, at the expense of ecological potential, has posed an imminent threat to urban ecosystems and has led to environmental, socio-cultural, and economic challenges. This leads us to focus on evaluating the sustainability associated with green infrastructure in the city of Biskra. To achieve this, a methodology based on the use of a quantitative method using a questionnaire, allowing to collect opinions and perceptions of residents on various aspects of green infrastructure. In parallel, the evaluation will also be conducted using a sustainability barometer, providing a quantitative measure of relevant environmental, socio-cultural, and economic indicators. By integrating qualitative data from the questionnaire with quantitative measures from the barometer, the study aims to provide a holistic assessment of the sustainability of green infrastructure in Biskra. The preliminary results of this evaluation highlight its vulnerability in Biskra, exposing issues that compromise its sustainability. The study will seek to identify improvement opportunities and formulate recommendations to strengthen the sustainability of green infrastructure in the city.

DYNAMICS AND MIGRATION OF MICROELEMENTS-METALS IN THE WATER-SOLID SUSPENSIONS SYSTEM OF THE PRUT RIVER

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The dynamics and migration of microelements-metals in aquatic ecosystems are determined by geological factors (the composition and structure of rocks, soils and groundwater in the hydrographic basin), hydrological factors (water flow, level, speed and temperature, the amount of solid suspensions and the characteristics of silts), climatic parameters (seasonal peculiarities, intensity and composition of atmospheric precipitations), biological (bioaccumulation and biomagnification processes in food chains) and physico-chemical properties of metals. The ratio of the dissolved and suspended forms of metals in the river runoff represents a geochemical criterion of the intensity of different erosion processes in the hydrographic basin of the river. The work is based on the results of the investigations carried out in 2020-2023 on the microelements-metals (Ag, Al, Ba, Be, Bi, Cd, Co, Cr, Cu, Hg, Li, Mn, Mo, Ni, Pb, Sr, Te, Ti, V, Zn) in the water-solid suspensions system in the Lower Prut downstream the Costesti-Stanca reservoir till the confluence area with the Danube River, at Giurgiulesti station. The water samples were filtered in situ through membrane filters with a pore diameter of 45 microns, in order to separate dissolved metals from those in solid suspensions. Under laboratory conditions, the filters with suspensions were digested in the Berghof SPEEDWARE system. Inductively coupled plasma atomic emission method was used for determination of metals, with the assistance of the ICP OES iCAP 6000 spectrometer. In most cases, the lowest concentrations, especially in suspensions, were recorded in the Costești-Stânca-Brânișteriver section, while the highest - downstream of the confluence of the Jijia River with the Prut River or at the Giurgiulești station. A visible correlation was observed between the amount of suspensions and the concentration of metals, which denotes the influence of human activity, erosive processes and the penetration of waters from agricultural and urbanized lands on the river ecosystem, this being reflected in the migration of metals. As rule, most metals in the rivers of the region migrate predominantly in suspension and less in the soluble form. Last

years, in conditions of hydrological droughts, this regularity has been maintained in the Prut River only for Al, Mn, Bi, Cd, Co, Pb, Ti, Tl, V and only in the case of four metals (Al, Mn, Ti, Tl) the concentration in suspensions was permanently visibly higher than in the water along the entire course of the river.

Acknowledgments: The research was carried out in the framework of the national project 20.80009.7007.06 AQUABIO and subrogramme 010701 ZOOAQUATERRA, and international projects BSB 27 Monitox and BSB 165 HydroEcoNex (Joint Operational Programme Black Sea Basin 2014-2020 funded by the European Union).

FOCUSED SNAPSHOTS ON DROUGHT VULNERABILITY AND SELF-REPORTED PREPAREDNESS AMONG LIVESTOCK FARMERS IN THE MOLDAVIAN PLATEAU

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Vulnerability and preparedness are two critical concepts in Disaster Risk Management research. In the context centred around the impactful drought hazard that affected the Moldavian Plateau in recent years, both of these wield significant power in determining potential hazard impacts and in shaping drought management. Such aspects are particularly relevant to the farming system, and even more to small or medium farmers, who stand at the forefront in terms of vulnerability to drought and also struggle to cope with its effects. This study examines the convergences and divergences between drought vulnerability and self-reported preparedness, zooming in on 1) the spatial patterns of vulnerability and preparedness, and 2) the relationships between these key elements, local landforms, and farm settings. The selected farming stakeholders (i.e., livestock farmers in the Moldavian Plateau, Iasi and Botosani counties) are highly representative due to their year-long exposure to drought. This analysis focuses on agricultural drought over the past decade, employing a downscaled, index-based approach.

The construction of Drought Vulnerability and Self-Reported Preparedness Indexes is based on survey data collected in situ on 141 livestock farmers in May-July 2023. The vulnerability index includes both indicators of sensitivity (e.g., access to water resources, diversity of farming activities) and adaptive capacity (e.g., basic infrastructure, availability of reserves, networking level, farming education background, and experience of farmers), while the preparedness index is conceptualised using a dichotomic approach that combines proxies of both objective and subjective preparedness. Drought vulnerability levels are juxtaposed with self-reported preparedness to identify spatial patterns in the study area. Additionally, statistical tests (e.g., t-test, Spearman correlation) are conducted to investigate significant relationships between drought vulnerability, preparedness, local topography, and farm settings.

The statistical tests indicated that drought vulnerability is negatively correlated with self-reported preparedness. The cross-correlations show that both of these are shaped by farming educational background, availability of fodder and financial reserves, basic infrastructure, and access to water. In the study area, despite the absence of evident spatial patterns in drought preparedness levels, there is a discernible northward increase in drought vulnerability. Another highlight concerns the significant variation in both drought vulnerability and preparedness between different farm sizes, with smaller farms having higher vulnerability and lower preparedness.

This study substantially enhances our understanding of drought vulnerability in Europe, particularly in an area that has received limited attention in this regard. The results provide a foundation for the development of drought management plans tailored to the downscaled realities of livestock food systems.

A REVIEW OF WATER POLLUTION IN THE ISRAEL-PALESTINIAN CONFLICT REGION

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Water pollution is a daily risk with a major impact on both populations and ecosystems. An analysis of water pollution types is essential to determine the affected regions and the magnitude of its impact on various components of the geosystem. This study aims to conduct a thorough analysis of water pollution in the Israel-Palestine conflict region, focusing on the three main

types of pollution: physical, chemical, and biological. The methodology of this article is based on the critical review of 22 scientific papers published between 1972 and 2023, addressing various aspects of water pollution in the analyzed region, from generating sources to their impact. Most studies are authored by researchers affiliated with institutions located in the conflict region, with many samples collected directly from the field and processed in laboratories or GIS environments. The study results highlight chemical pollution often exceeding recommended limits for various analyzed parameters. Biological pollution subjects' aquatic ecosystems to significant pressures, including eutrophication and harmful algal blooms. Wastewater is discharged into watercourses in the region, affecting their physical properties. Areas subject to water pollution include the Gaza Strip, the coastal zone, the northern aquifer in Israel, and lakes in the western part of the analysis region, posing potential risks to the health of the populations in Israel and Palestine.

ENVIRONMENTAL IMPACT ASSESSMENT OF UNCONTROLLED URBAN SPRAWL IN A PERI-URBAN AREA: A CASE STUDY OF CLUJ-NAPOCA MUNICIPALITY, ROMANIA

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This paper aims to investigate the environmental impact of uncontrolled urban sprawl on the peri-urban Făgetul Clujului wooded area. This area is a partially conserved peri-urban forest and a ROSCI Natura 2000, located in the southwestern part of Cluj-Napoca Municipality in Romania. To assess the environmental impact, a standardized checklist based on national regulations and a modified rapid impact assessment matrix (RIAM) were used to obtain environmental scores for 30 key points in the area. The QGIS and IDW (Inverse Distance Weighting) methods were used to combine the main assessment scores to create a general impact map. The assessment outcomes confirm that there are significant negative impacts on environmental components in this peri-urban wooded area, such as abiotic and biotic components, in those peripheral areas that are recently built, developed, or expanding. This study provides an effective, transparent, and integrated methodology for assessing the impact of uncontrolled urban sprawl on the environment. It can help local decision-makers and experts

in designing and developing sustainable strategies for environmental management and urban planning.

SUSTAINABLE DEVELOPMENT - APPLIED TO INHABITED MEDIEVAL TOWNS

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This paper aims to present a vision based on specialized literature and own observations regarding the concept of heritage in the context of the current requirements for the transformation of medieval cities into sustainable cities. I started by defining the concept of sustainable city and presenting ways of integrating the medieval town into the category of cities undergoing such a transformation. I preferred to develop the concepts of heritage and sustainability through the lens of specialized literature and came up with proposals of rethinking the use of traditional building materials, with a highlight upon some successful policies implemented in several cities in Europe. Different skills are needed in the process of conservation and rehabilitation of the built heritage, as well as a specific vision in planning and putting into practice modalities of turning the medieval city into a sustainable one. I brought up examples of successful experiments in Europe, and interesting points of view. The reference made to Sighisoara as the only medieval city still inhabited in south-eastern Europe seemed-suitable for the study. I strongly believe that these cities have the right to overcome their testamentary destiny and join the family of sustainable cities with a promising future.

STATE OF THE DUBOSSARY RESERVOIR OXYGEN REGIME UNDER CONDITIONS OF RIVER FLOW REGULATION AND CLIMATE CHANGE

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The Dubossary Reservoir was created in 1951-1954 as a result of damming the Dniester River near the Dubossary town on the territory of the Moldavian Soviet Socialist Republic. In 1981, the creation of the Dniester Reservoir, more than 200 km long, was started on the territory of the Ukrainian SSR, which became an integral part of the Dniester Hydropower Complex (DHPC). The dam of the Hydropower Plant No. 1 of this complex

currently serves as the border between Ukraine and Moldova. The creation of the DHPC and regulation of the Dniester flow has fundamentally changed its hydrological regime on the territory of the Republic of Moldova, as well as the thermal regime of the river at the Naslavcea-Camenca section upstream of the Dubossary Reservoir. The aim of the presented work was to analyse the state of the oxygen regime in the Dubossary Reservoir under conditions of the Dniester River flow regulation, aggravated by climatic changes of the last decades. The results of the 2021–2023 scientific expeditions were used. The following parameters of the Dniester River oxygen regime were analyzed: dissolved oxygen (DO, mg/L), biochemical oxygen demand (BOD5, mgO/L) and bichromate chemical oxygen demand (COD-Cr, mgO/L). By calculating the BOD5/COD-Cr ratio, the river sections with a low level of microbiota adaptation were identified. The analysis of oxygen regime parameters demonstrates that their fluctuations in the Dubossary Reservoir in most cases do not have natural seasonal dynamics. The retrospective analysis of the obtained results with data from 50-years ago shows that the anthropogenic load on the reservoir ecosystem has remained actual for the present. During 2021–2023 vegetation periods, the spatial dynamics of oxygen regime parameters revealed the presence of a tendency to decrease this load in the direction from the upper section of the reservoir (Camenca station) to its lower section (Cocieri station). This trend is also demonstrated by the change in the ratio between the BOD and COD parameters: the value of BOD5/COD-Cr index ranged from 0.04 (Camenca) to 0.22 (Cocieri). According to the dissolved oxygen concentration and BOD5 parameter, the water quality of the Dubossary Reservoir during the analyzed period varied within the classes I and II, and according to the COD-Cr parameter it dropped down to the class III. It was in such cases that the BOD5/COD-Cr ratio decreased to 0.04 (Camenca station, July 2023). It can be concluded that conditions for effective biochemical activity of microbial communities are more favorable in the lower section of the Dubossary Reservoir. The upper section is affected by different anthropogenic factors, including regulation of the Dniester flow, discharge of insufficiently treated wastewater, shoaling of the Dniester and its tributaries due to hydrological droughts, unauthorized discharges that provoke local pollution.

Acknowledgments: The investigations were carried out within the project 20.80009.7007.06 "AQUABIO" (2020-2023) of the State Program "Environment and Climate Change", implemented by the Laboratory of Hydrobiology and Ecotoxicology of the Institute of Zoology as the research department of the Moldova State University.

ASPECTS REGARDING THE QUALITY OF WATER FROM THE ARTESIAN WELLS OF THE CITY OF CEADÂR-LUNGA, REPUBLIC OF MOLDOVA

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The provision of water of adequate quality for human consumption is one of the indicators of a good life. People depend on water for drinking, cooking, washing, waste disposal and other household needs. The potability of water, including underground sources, is constantly affected by chemicals resulting from anthropogenic activities, natural toxic substances and various pathogenic organisms. In the Republic of Moldova, most of the groundwater does not meet the drinking quality requirements. Therefore, this research focuses on the assessment of the physico-chemical and bacteriological quality of water from artesian wells located in the southern region of the Republic of Moldova, the city of Ceadâr-Lunga. The laboratory analyses to determine the water quality parameters were carried out in the water samples taken from the 9 artesian wells, which represent the public drinking water supply system of the entire city. According to the results of the laboratory analyses, it was found that no artesian well corresponds to the admissible limit values for drinking water, established by the legal framework of the Republic of Moldova (Law 182/2019). Thus, the following quality parameters were exceeded: ammonium, sodium, fluorides, total hardness and iron, being the main pollutants of groundwater. All water sources are characterized by a very low total hardness (< 1.5dH) and a high sodium content (338 - 584 mg/l). Ammonium values vary from 0.52 to 3.28 mg/l, the limit value being 0.5 mg/l. The fluoride concentration in the investigated water sources ranges from 1.35 to 3.72 mg/l, the permissible limit is 1.5 mg/l. In 5 wells, iron excesses were found, the values (0.40 mg/l) being twice higher than the admissible value (0.2 mg/l). On the other hand, it is worth noting that only at S4 is the limit value of the enterococci bacteriological parameter exceeded. Thus, there is an urgent need to take measures to treat the water captured from the investigated sources, as it does not represent a risk to public health. It is necessary in the studied area, to monitor and apply a proper management of groundwater, to protect the population from various diseases caused by poor water quality.

RESEARCH ON THE DEGRADATION OF SHORE DEFENCE WORKS BY HYDRODYNAMIC EROSION

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Shore defence works operate in an environment where natural risk factors collaborate with anthropogenic risk factors. The main action that determines the partial and even total degradation of shore defences is represented by hydrodynamic erosion. The paper presents a series of results regarding the degradation of the bank defence works on the Tazlaul Sarat River generated by floods with maximum flows produced at small type intervals. The flood produced in June 2016 was generated by a torrential rain that accumulated a volume of precipitation of 80.20 l/m2 in 24 hours. The flood generated by the torrential rain presented a maximum flow 342 m3/s at the Lucacesti Hydrometric Station. The flow increased about 50 times in a time interval of about six hours. The probability of exceeding the maximum flow rate was 3% in the control section. The flood of June 2016 produced flooding of the riparian area with significant damage to the natural, economic and social environment along a large length of the Tazlaul Sarat River. On the upper course of the Tazlaul Sarat River, on the river section that crosses the localities of the commune of Zemes (Zemes and Bolatau) in Bacau county, significant morphological transformations of the river bed and the riparian area have occurred. Important lengths of the shore defence in the Bolatau locality (points Toderas, Hartopanu, Chiosa, Maxim Forestry Canton) were degraded in a percentage of 40 - 100%. The research carried out in the area affected by the flood (watercourse and riparian zone) revealed local erosions in the river bed and bank. Local erosion caused the bottom of the bed to drop below the level of the foundation of the shore defence works. The degradations recorded and analyzed took the form of: removal of the rock layer from under the foundation of the shore defence, breaking of the structural elements of the defence work (foundation, support beam, concrete slabs), sliding of the concrete slabs on the slope, etc. The degradation of the bank protection also determined the erosion of the DC 180A communal road over a cumulative length of 200 m in the Bolatau locality. The degradation of the coastal protection works was also favoured by a number of anthropogenic factors present in the last period of time (absence of maintenance and repair works for long periods of time at the coastal defence works). The research carried out indicates the use of bank defence solutions that can more effectively resist the erosive action of high-flow water.

STUDIES AND RESEARCH ON THE CHARACTERISTICS OF THE MINOR BED IN SEMI-REGULATED RIVERS

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The morphology of minor river beds is influenced over time by a complex of natural and anthropogenic factors. The studies and research carried out on a series of minor riverbeds in the eastern part of Romania (Bahlui, Jijia, Moldova, Tazlaul Sarat) have highlighted the increasingly strong influence of anthropogenic factors on the morphology of the minor riverbed. A series of sections in the minor riverbed present at the current stage a transformation of the natural type geometry towards an anthropic type geometry. This transformation responds to economic, administrative and social requirements. The tabulation of meandering water courses, according to the current legislation, produces great dysfunctions in the general cadastre system. A case study was carried out on a stretch of the Bahlui River bed located in the metropolitan area of the Iasi city. The river bed on the research section is semi-regularized. The regularization of the minor bed is a predominant anthropogenic factor, which in many cases contributes to a morphological change of the bed in cross section and longitudinal profile. The research of the morphological change phenomenon of the minor river bed was carried out for the following anthropogenic factors: the regularization of the river bed, the presence of constructions in the river bed and the riparian area, the inundation zone, ownership parameters of the river bed and the riparian area and others. On the basis of topographical, geotechnical, hydrological and hydraulic studies, situation plans, transverse and longitudinal profiles, digital land map, digital land model, etc. were drawn up. By processing the data, the line of the banks of the minor bed was obtained where sudden changes in the slope of the land are identified immediately adjacent to the line of the valley of the water course. The Numerical Terrain Model was made with a minimum accuracy of 4 points/m2. The raster of the slopes was obtained by processing in the GIS system, and then the bank line was determined by the automatic generation of slope break lines. The validation of the results was achieved by transposing the shoreline generated by the model on situation plans at a scale of 1:25000, or on older aerial photo-plans. Thus, it was checked whether the researched river sector is part of the mobility space of the Bahlui River over a longer period of time.

DEVELOPMENT OF AN ORIGINAL POLY-STRAIN BACTERIAL INOCULUM FORMULATED FROM MICROORGANISMS SELECTED FOR THE BIOAUGMENTATION OF SOIL CONTAMINATED WITH PETROLEUM HYDROCARBONS

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The article presents the experimental results aimed to develop the new bacterial biopreparations from indigenous strains isolated from sites contaminated with petroleum hydrocarbons, located in contrasting, but representative for Romania, pedoclimatic zones. In order to produce biological material with the necessary qualities for the bioaugmentation of soils contaminated with petroleum hydrocarbons and boost the effectiveness of their bioremediation process, a series of sequential experimental sequences had to be realized. Two soil types were selected from contrasting, but representative, pedoclimatic regions for Romania: Haplic Chernozem and Stagnic Luvisol, both polluted with petroleum hydrocarbons. From the two selected profiles, soil samples were collected and subjected to laboratory analysis according to soil classification/characterization units. A screening of heterotrophic bacteria was carried out to identify and isolate dominant/resistant species to pollution. The dominant colonies were isolated and purified using specific techniques, selecting 32 strains to test their petroleum hydrocarbons degradation capabilities. These strains were coded according to their genus/species and the type of soil from which they were isolated. The bacterial cultures were incubated at 28˚C and monitored daily to capture the occurrence of turbidity in the liquid culture media, as an indicator of the bacterial multiplication. By degrading petroleum hydrocarbons, the only source of carbon in the culture media, the bacteria extracted the carbon needed for cellular synthesis. The bacterial strains were identified and classified according to their development in the mineral culture media: in active and less active strain, after which, they were preserved in tubes with nutrient culture media constituting the original collection of microorganisms sectioned for the degradation abilities of petroleum hydrocarbons. From these tubes, the biomass required to produce

inoculants for the bioaugmentation of the contaminated soil in order to enhance its bioremediation, will be grown. Bacterial biopreparations were made for the production of inoculants by harvesting the biomass obtained by cultivating selected bacteria.

EXPERIMENTAL ASSESSEMENT OF THE EFFECTIVENESS OF BACTERIAL BIOPREPARATIONS IN THE BIODEGRADATION OF PETROLEUM HYDROCARBONS IN SOIL

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The article presents laboratory tests on bacterial biopreparations' capability to break down petroleum hydrocarbons in soil. Two contrasting soils types were used: Haplic Chernozem and Stagnic Luvisol, were artificially contaminated with two types of crude oil (light and heavy) at concentrations of 2%, 5%, and 10% for experimental purposes. Bacterial strains were identified and classified based on their growth in mineral culture media. Active strains were cultivated to obtain biomass for producing inoculants used in soil bioaugmentation experiment with polluted soil to evaluate the effectiveness of the bioremediation process. Two variants of inoculants were obtained from the combination of individual bacterial strains selected for their ability to grow in a mineral environment with a single source of carbon represented by the petroleum hydrocarbons. At intervals of 5, 30 and 60 days after the artificial pollution of the two soil types, quantitative and qualitative determinations of heterotrophic bacterial microflora in the experimental variants were carried out. These determinations allowed to observe the behavior of the two contrasting soils in terms of artificial pollution with different doses of crude oil, the effect of the application of inoculants from the selected bacteria on the native soil populations, and the level of adaptation of microorganisms inoculated in the two soils. The data obtained were processed and analyzed to determine the most effective inoculation formula for each of the two contrasting soils. Experimental data have shown that a soil with native characteristics favourable for supporting abundant and diverse populations of microorganisms will also be able to provide better conditions for

adapting micro-organisms with metabolic abilities in degrading pollutants, even in situations of severe pollution. The success of bioaugmentation with selected microorganisms in a polluted soil depends on the native resilience of that soil. The 10% crude oil concentration was toxic to microorganisms. After 60 days of experimental pollution, both native and inoculated bacterial communities in the Haplic Chernozem soil exhibited evidence of adaptability, enabling the most resistant component to initiate soil recolonization. When contaminated with 10% crude oil, the bacterial populations in Stagnic Luvisol were around one order of magnitude fewer than those in Haplic Chernozem, highlighting the advantage of soil decontamination with superior native properties.

EVALUATION OF THE CARBON DIOXIDE SEQUESTRATION POTENTIAL IN ARABLE SOILS OF THE ROMANIAN PLAIN

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The assessment of the carbon dioxide (CO_2) sequestration potential in arable soils of the Romanian Plain is a subject of major interest, considering the importance of this process in the context of climate change and agricultural sustainability. Carbon sequestration in soils refers to the long-term storage of CO_2 in the form of stable organic matter, thereby reducing its concentration in the atmosphere and contributing to the mitigation of the greenhouse effect. The purpose of this investigation was to estimate the size of the soil carbon storage potential (SOCpot), the soil organic carbon sequestration deficit (SOCdef) and the organic carbon sequestration potential for the soils studied in the Romanian Plain (SOCpot) under arable use, to help explain and improve land use management and climate change mitigation. The study focused on three different locations in the Romanian Plain. Each of these locations was analyzed in detail, with two soil profiles each, to obtain a thorough understanding of soil variability and their carbon storage potential. The investigated areas were: Facaeni locality, Ialomita county, Sahateni locality, Buzau county and Cazanesti locality, Ialomita county. The soil profiles studied belong to Cernisols class: Profile 1 Făcăeni - Silty calcareous chernozem, Profile 2 Făcăeni - Silty calcareous chernozem, weakly eroded, Profile 3 Săhăteni - Cambic argillic chernozem, Profile 4 Săhăteni - Calcareous chernozem argillic, Profile 5 Căzanesti - Silty cambic chernozem, Profile 6 Căzanesti - Silty cambic chernozem, strongly compacted. The results obtained showed that the actual organic

carbon stock in the first 50 centimeters ranged between 88 and 130 t/ha. Then the storage potential of organic carbon in the analyzed soils was calculated depending on the soil content of silt and clay. The organic carbon sequestration potential (SOC sequestration potential) was defined as equal to SOCdef, but considered as a stock (t/ha), as a reserve, resulting from multiplying the size of SOCdef (g/kg) with soil bulk density (DA, g/cm3) and with thickness of the soil horizon (cm), then subtracting the skeleton value (of particles > 2 mm). The positive values obtained for SOC sequestration potential show that the respective soil horizons have a relatively high SOC sequestration capacity, while its negative values show the fact that SOC has been sequestered in excess and that it can be easily lost through decomposition, greenhouse gas emissions, erosion, etc. The highest carbon sequestration potential was recorded in the 2 profiles from Cazanesti, followed by the second profile from Sahateni.

LOCAL CLIMATE CHARACTERISTICS OF AGIGEA SAND DUNE ENVIRONMENT

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The presentation summarizes the climatic assessment conducted as part of the project "The implementation of active conservation measures on the territory of the Natura 2000 site ROSCI0073 Marine Dunes of Agigea". Firstly, the general climate conditions are described using data from nearby weather stations and local observations collected in 2023. Secondly, mobile meteorological observations were conducted to outline the thermo-hygrometric characteristics of the Black Sea coastline near the Agigea Natural Reserve. Finally, the microclimatic features of the sand dunes are highlighted through a full year of sand temperature measurements and five meteorological observation campaigns conducted during 2022-2023. These efforts aimed to detail the thermo-hygrometric characteristics of the sand dune environment and its associated vegetation.

Aknowledgement: Activitate de cercetare desfășurată în cadrul proiectului "Implementarea de măsuri active de conservare pe teritoriul sitului Natura 2000 ROSCI0073 Dunele marine de la Agigea și a ariei naturale protejate de interes național Dunele Marine de la Agigea - cod 2,366., cod SMIS 152393".

M**ONITORING MERCURY BIOACCESSIBILITY IN FISH SAMPLES**

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Aquatic ecosystems are severely damaged by direct discharging of agricultural pesticides, untreated industrial effluents, and municipal waste into rivers. Due to expanding human activity, heavy metal contamination is seriously affecting aquaculture systems and natural water sources. Heavy metals are widely recognized due to their toxicity, persistence in the environment, and bioaccumulation characteristics. The fish are a key component of the human diet because they provide multiple health benefits. Nevertheless, metals frequently accumulate in fish bodies, which can later be consumed by humans and cause serious health problems. For example, consuming contaminated fish is the primary cause of human mercury exposure. Living organisms exposed to high concentrations of mercury can cause illness or even death. Notwithstanding, the total concentration of pollutants may not always accurately represent the quantity of toxic substances absorbed through food. Because of some interactions between elements in the gastrointestinal system, only a percentage of these dietary components are absorbed and further used. The maximum concentration soluble in the simulated gastrointestinal tract that is accessible for subsequent processes of absorption into the intestinal mucosa is defined as bioaccessibility. The present study focuses on the determination of bioaccessible mercury from shad. Found in the Danube River and the Black Sea, the pontic shad is an extremely valuable fish species, which cannot be produced in an aquaculture system. This study's primary goal was to model the circumstances of the gastrointestinal system in order to examine how they affect the shad's mercury composition. Firstly, the shad were subjected to different cooking methods specific to our regional eating habits to determine if different thermal treatments had an impact on the levels of

mercury in fish tissues before digestion. The bioaccessibility study was carried out by the in vitro digestion method, which involves exposing the fish food sample to three sequential stages: oral, gastric, and intestinal. Moreover, this study was also carried out in complex matrices formed by both shad and other dietary products. It seems that the antioxidant activity of various food ingredients can help to decrease mercury bioaccessibility and interfere with its toxicity. The studies carried out in this research lead to the conclusion that both the use of certain cooking techniques and the consumption of foods rich in nutrients have a positive impact on minimizing mercury bioaccessibility in fish samples. According to these results, it can be stated that some food nutrients and cooking methods could be useful in lowering the bioaccessibility of other chemical pollutants that are often found in many food sources.

WATER QUALITY MONITORING USING SENTINEL 2 FOR SDG 6 INDICATOR

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Water quality monitoring is critical for achieving Sustainable Development Goal (SDG) 6, which aims to ensure availability and sustainable management of water and sanitation for all. Traditional monitoring methods often face limitations in terms of spatial coverage, temporal resolution, and cost-effectiveness. The purpose of this study, was to propose a new approach utilizing Sentinel-2 satellite data for water quality monitoring. Sentinel-2 is equipped with multispectral sensor MSI capable of capturing high-resolution imagery with different spectral bands of 10, 20 and 60 m resolution, allowing for the detection of water quality parameters such as turbidity, chlorophyll-a concentration, and total suspended matter. Sentinel-2 data can be processed to derive quantitative measures of water quality indicators. This study demonstrates the feasibility and effectiveness of using Sentinel-2 data for water quality monitoring, focusing on SDG 6 indicator related to water quality. The study area for which was applied the water quality monitoring was Tansa lake, that was commissioned in 1975 and has a surface area of 352 hectares, with

a useful volume of water of 10 million cubic meters, located on the Bahlui river. The Bahlui catchment, of which it is a part, is located in the north-eastern part of the country, occupying a central-north-eastern position in the Moldavian Plateau. The Sentinel-2 data water quality parameters was correlated with in-situ measurements to enhance the accuracy and reliability of water quality assessments. The findings highlight the potential of Sentinel-2-based water quality monitoring as a valuable tool for water basin administration, environmental agencies, and researchers in advancing efforts towards achieving SDG 6 targets. By providing timely and spatially comprehensive information on water quality, this approach contributes to informed decision-making and sustainable management of water resources on a global scale.

BIBLIOMETRIC ANALYSIS OF WATER QUALITY AND VEGETATION INDICES DERIVED FROM SENTINEL 2 IMAGES

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Remote sensing technology, particularly satellite imagery, has revolutionized the monitoring and assessment of environmental parameters such as water quality and vegetation dynamics. Sentinel-2 has appeared as a powerful tool, offering high-resolution multispectral imagery ideal for studying Earth's surface. This bibliometric analysis aims to provide a comprehensive overview of research trends, key contributors, and used themes in the utilization of Sentinel-2 images for deriving water quality parameters and vegetation indices. The analysis includes a broad spectrum of literature, ranging from foundational studies to the latest research publications, taken from the internation databases. Using bibliometric techniques such as citation analysis, co-authorship analysis, and keyword co-occurrence analysis, this study systematically examines almost all research in this domain. The results show a substantial growth in publications related to Sentinel-2 imagery and its applications in assessing water quality and vegetation indices over the past decade. The analysis identifies prominent research clusters focusing on various aspects of water quality assessment, including chlorophyll-a concentration, turbidity, and total suspended matter. Furthermore, significant attention is observed

towards vegetation indices such as Normalized Difference Vegetation Index (NDVI), Enhanced Vegetation Index (EVI), and Leaf Area Index (LAI), reflecting the wide-ranging applications of Sentinel-2 imagery in terrestrial vegetation monitoring. The bibliometric analysis provides valuable information on research conducted on the use of Sentinel-2 imagery for water quality and vegetation indices. By synthesizing the existing knowledge, this study highlights the potential of such a tool for the future research.

VISITORS' PERCEPTIONS OF BUCOVINA ON INSTAGRAM: WHICH PLACES GENERATE MORE SOCIAL MEDIA ENGAGEMENT?

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This research investigates the spatial distribution and social media engagement of Instagram posts tagged with the label #discoverbucovina. We used a dataset of 6,472 Instagram posts collected with the Apify application and we examined the user-generated geolocation data, as well as the the number of likes and comments in order to analyze visitor behaviour patterns. The main research goal was to identify the boundaries of Bucovina as a tourist destination according to people's subjective perceptions reflected on their Instagram posts. Secondarily, we wanted to verify the differences of visibility and social media engagement between rural and urban areas, or natural and anthropic sites. The data was processed and analyzed using ArcGIS Pro to create Kernel density maps that highlight the most popular spots associated with Bucovina on Instagram. We also used the PhilCarto software to analyze other indicators such as the average and total number of likes and comments per posts, the spatial distribution of the most appreciated and most engaging posts about Bucovina. The results show a strong concentration of the posts in the most important cities such as Cîmpulung Moldovenesc, Gura Humorului, Suceava, Vatra Dornei, but also in very popular rural destinations with major tourist attractions such as Vatra Moldoviței, Sucevița, Mănăstirea Humorului, Putna, Arbore etc. The posts made from urban destinations with important tourist attractions gathered the highest number of likes (e.g. Cîmpulung Moldovenesc, with the Rarău Massif). As for the average number of likes

and comments gathered by the posts about Bucovina, these values are higher in the western and northwestern part of the Suceava department, where most of the UNESCO heritage monasteries are located. The most liked destinations are cities and popular tourist sites, especially near the Rarău and Călimani Mountains. Overall, the results don't reveal a major distinction between urban and rural areas in the distribution of Instagram posts linked to Bucovina. The concentration of the main tourism services and facilities and their active presence on social media and tourism platforms seem to be more influential on visitors' behaviour. The posts made from natural sites do not generally attract the highest number of likes or comments. Notable exceptions are the posts of well-followed accounts or those featuring giveaways. The most liked posts per commune often involve aesthetic landscapes or high-quality photos of cultural heritage, while the most commented posts mainly include promotional content. This study provides a unique exploration of the social media engagement patterns associated with Bucovina, revealing some key tourist attractions and visitors' preferences. The findings can inform local or regional tourism strategies, highlighting the need to promote less known tourist attractions, either natural or cultural, as well as to better promote and integrate the eastern part of the Suceava department.

EVALUATING LIDAR-UAS POINT CLOUD CLASSIFICATION ACCURACY FOR URBAN APPLICATIONS: A CASE STUDY

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Light Detection and Ranging (LiDAR) technology, when combined with Unmanned Aerial Systems (UAS), provides a fast and accurate means of collecting data in urban environments. This data is important for generating detailed and parameterized buildings 3D models. The point clouds classification streamlines the organization and utilization of this data, supporting a range of applications including urban planning, construction monitoring, architectural design, structural analysis, and risk assessment. This study rigorously evaluates the performance of several widely used classification algorithms for point cloud data, including three ground point filtering approaches-hierarchical robust filtering, volume-based filtering, and cloth simulation filtering-alongside a random forest machine learning

algorithm. The assessment focuses on their effectiveness in classifying point clouds into multiple distinct categories. To assess these algorithms, a flight over an urban area was conducted at an altitude of 100 meters using a DJI Matrice 300 RTK UAS equipped with a Geosun GS-130X LiDAR sensor. Covering approximately 8.6 hectares, the study area encompasses a section of the "Gheorghe Asachi" Technical University of Iasi campus, located in Iasi city, and includes 14 buildings, a water tower, and the Rectory building, with structure heights ranging from 5.2 meters (dean's office) to 40 meters (water tower). As evaluation method, the precision and overall accuracy of the classification algorithms was examined, along with a confusion matrix for a clear visualization of classification errors for each class.

STUDIES REGARDING THE RISKS ON THE SOILS, WATER AND AIR GENERATED BY THE SANTÂUL MIC CLAY AND ASH DEPOSITS AND THE PREVENTIVE MEASURES

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The investigations carried out in order to determine the impact of the activity carried out within the thermal power station that ensured the supply of the thermal agent in Oradea. The assessment of the environment in an area at a given time is given by the quality of air, water, soil, the health. The waste disposal activity carried out at DZC Santâul Mic was and is a potential source of soil pollution due to ash discharges or accidental leakage of infiltrations.

Soil is the environmental factor that integrates all the pollution requirements, with the lowest variability over time. The gases exhausted through the chimney, due to the combustion of coal, are deposited on the soil in the form of sedimentary powders. Slag and ash holes also produce pollution by shattering the ash (the phenomenon of deflagration), comparable and even exceeding the pollution produced by the ash evacuated to the chimney. It can be said that the slag and ash pollutants pollute not only the soil but also the atmosphere, by entrapping dust particles (dry ash) on the surface of the deposit and driven by the wind at considerable distances

Research conducted so far has shown that in Romania, the ash plants have been used in various fields such as construction, soil stabilization, earthworks, asphalt mineralogical filling, etc. The cooling water discharged

to the emissary, the Crișul Repede river, was monitored for the following indicators: temperature, filtered residue at 1050C, chlorides, sulfates, CCO-Cr, extractable organic solvents, pH, suspended matter. The results of technological investigations regarding the quality of waste water in the emissary concluded that no negative effects on the water were during the activity. The research carried out so far has shown that in Romania, ash plants have been used in various fields such as construction, soil stabilization, embankments, etc.

The results of the technological wastewater quality investigations into the emissary (Crișul Repede) concluded that during the activity no negative effects on the water were revealed. We can say that the monitored indicators at the discharge of the water from the installations were within the maximum admissible limits according to NTPA 001/2005.

The study was being done at the INTERDISCIPLINARY RESEARCH CENTER IN Bioeconomy of the University of Oradea, Faculty of Environmental Protection.

ELEMENTS OF INTEGRATED ECOLOGICAL MONITORING WITHIN SOME HYDROGRAPHIC BASINS IN THE CODRII PLATEAU OF THE REPUBLIC OF MOLDOVA

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In promoting of Sustainable Agriculture today it is necessary to combine complex research in terms of: knowledge of the economic production system; characteristic and enhancement of the natural and energy resources used; surveillance of valuable ecosystems influenced by anthropogenic/agricultural activities; qualitative assessment of environmental factors; highlighting ecological stability and sources of agricultural and rural impact; recommending agricultural activities appropriate to traditions and available resources and, last but not least, caring for the health of the population.

The complex agroecological characteristic of rural resources gives greater precision and safety to the expected economic activities, allows the forecasting of sustainability indicators by: assessing the state of the environment (water, air, soil, biodiversity, landscape, product quality); examination of the pressure of anthropogenic activities on environment and agrolandshaft (through management practices and resource use); application of agroecological monitoring elements, according to the applicative needs. Suitability of soils for irrigation, qualitative highlighting

of soils, irrigation water, sources of natural and anthropogenic pollution, which will significantly influence natural resources and quality of agricultural crop development, product quality are very current and necessary in sustainable agriculture. Currently, the informational role of soil cover quality in avoiding risks of water use in sustainable agriculture is poorly applied. During 2010 - 2024, various localities, multiple areas and lands with various soil cover were investigated, practically in all 12 geomorphological districts (after I. Gorbunov, 1961, cited after A. Ursu, 2011), agricultural areas - North, Center and South.

In order to qualitatively assess the drinking water and for irrigation purposes, water from various sources – mine wells and artesian wells, springs, surface waters were collected and evaluated qualitatively, simultaneously with the assessment of the soil cover for the foundation of sustainable agroecosystems. The researches were carried out on polygons of the hydrographic basins: large rivers – Prut (Grozeşti; Valea Mare) and Dniester (Slobozia Dușca; Vadul lui Vodă); small rivers – Răut (Mălăieşti; Clișova), Bâc (Truşeni; Roșcani; Gura Bâcului); Işnovăţ (Suruceni); Ichel, Cula, Culişoara (Hârceşti); Cula (Morozeni; Ghetlova) and others. Given that the research was carried out on a diverse spectrum of soil cover, types of water, which differed qualitatively both by sources of origin and by chemistry, including research within background monitoring (Scientific Reserve "Codrii), it was possible to highlight some specific ecological laws of water quality within the Prut and Dniester river basins, of small rivers in Moldova: Bâc (districts Călărași, Strășeni, Anenii - Noi); Işnovăţ (Ialoveni, Suruceni); Răut (Orhei, Mălăieşti); Cula (Hârceşti, Ungheni) and others. There were highlighted some factors of natural and anthropogenic influence on water chemistry, there were evaluated the possibilities of irrigation of soils in concrete conditions of soil cover structure, according to irrigation indices determined and recommended in the Republic of Moldova, soil quality at the level of type, subtype, gender, morphometric, physico-chemical characteristic and others. Research has shown a significant differentiation of water quality in Ungheni district: mineralization (820-2040 mg/dm3); sodium content (50-221 mg/dm3); calcium (54-299 mg/dm3), magnesium (37-166 mg/dm3); hardness (8.8-21.8 me/dm3). The greatest variability in water quality in mine wells was highlighted in Hârceşti, Ungheni district. The village is crossed by three small rivers - Cula, Culişoara and Ichel. Here the soil cover (total 4378.02 ha) includes 55 contours, very diverse pedogenetically, including soils with different degree of erosion (33.6%, arable), salinization (12%), landslides (24.8ha) and others. Grozești Microdistrict, Nisporeni district is a specific Microdistrict, the warmest and most arid in the central area of the Republic

of Moldova, being a relative depression, weakly dismembered, with quaternary, clay-clayey rocks. The soil cover of the microdistrict consists of ordinary chernozems - 28.9%, carbonate chernozems - 12.7%, including medium and heavily eroded ones - 13%, destroyed by landslides - 14.4%, alluvial soils occupy 11.2%. In Grozeşti microdistrict are registered 158 areas of soils, with an average surface of approx. 47,1ha. Waters with favorable irrigation coefficients for application are highlighted. The water of the first terraces of the Prut River in the Grozești Microdistrict is suitable for irrigation and of a better quality, compared to the water of the terraces of small rivers. The characteristic of the soil cover, influenced by the quality of rocks of solification, relief and microrelief, the factors of stability and ecological instability of lands and geomorphological units in the Republic of Moldova significantly influence the quality of water from mine wells, surface waters and groundwater too. Elements of integrated ecological monitoring regarding agroecological monitoring were highlighted.

PER- AND POLY-FLUOROALKYL SUBSTANCES (PFAS) IN EDIBLE FISH SPECIES FROM THE LOWER DANUBE RIVER

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Per- and poly-fluoroalkyl substances (PFAS) represent a class of thousands of synthetic compounds that present high levels of chemical, thermal and biological stability also known as "forever chemicals". This group of compounds is used worldwide on a large scale of consumer goods and in industrial processes due to their excellent properties. Therefore there was a rapid adoption in consumer goods manufacturing. On the down side, their extensive use was followed by a growing accumulation in the environment, leading to an increasing number of studies. This study aims to investigate the presence of 18 PFAS in 8 edible fish species that inhabit the Danube

River, namely wels catfish (*Silurus glanis*), perch (*Perca fluviatilis*), asp (Leuciscus aspius), pontic shad (Alosa immaculata), vimba bream (*Vi*mba *vimba*), common carp (*Cyprinus carpio carpio*), zander (*Sander lucioperca*) and common roach (*Rutilus rutilus*). The fish tissue, respectively muscle, liver and gill, was submitted to sample preparation using the QuEChERS extraction technique and analyzed using Ultra-High-Performance Liquid Chromatography coupled with High-Resolution Mass Spectrometry (UHPLC-HRMS). Qualitative analysis shows the presence of the most studied PFAS compounds in every single analyzed sample, namely perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexanesulfonic acid (PFHxS). This study clearly indicates the occurrence of PFAS in the aquatic environment of the Danube River which could represent a health hazard for the adjacent population.
Keywords: Per- and poly-fluoroalkyl substances (PFAS), fish, QuEChERS, persistent organic pollutants, UHPLC-HRMS
Acknowledgements: The technical support was provided by the Rexdan Research Infrastructure, created through the project An Integrated System for the Complex Environmental Research and Monitoring in the Danube River Area, REXDAN, SMIS code 127065, project co-financed by the European Regional Development Fund through the Competitiveness Operational Programme 2014–2020, contract no. 309/10.07.2020.

THERMAL ANOMALIES IN THE WARM PERIOD OF THE YEAR - INDICATOR OF CLIMATE CHANGE IN THE SOUTHERN PART OF THE REPUBLIC OF MOLDOVA

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In this study is proposed an analysis of the thermal anomalies from the summer period as a whole and for the months of June, July, August from the period 1991-2020, specific to the southern part of the Republic of Moldova, resulting from the influence of oceanic, Scandinavian-baltic, continental-excessive, pontical and submediterranean air masses. A hierarchy/classification of the obtained values is presented and some aspects of the induced changes in the climate regime and the increasingly frequent manifestation of risk phenomena are outlined. In this context, it is appropriate to mention, that although probability is a characteristic of individual events, it then becomes apparent, when subjected to observation a large number of random events of the same kind, which manifest themselves independently of each other. Mutual independence and disorder

of individual events in an ensemble make a certain proportion of events in this ensemble to be in the same or similar situation, which lead to the same result (it is carried out in the same way).

ANALYSIS OF THE PM2.5/PM10 RATIO IN THREE URBAN AREAS OF NORTHEASTERN ROMANIA

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The PM2.5/PM10 ratio can provide relevant information about the sources and nature of pollution, which can help in the assessment of health effects. This study analyzes the PM2.5/PM10 ratios and their potential relationships with temperature and humidity for the period 2019-2023 at three urban background stations in northeastern Romania (SV-1, IS-2, and BT-1). The variation of PM2.5/PM10 ratios was interdependent with PM10 and PM2.5 concentrations. The annual PM2.5/PM10 ratios were consistently decreasing, with the most significant decrease recorded at SV-1, from 0.77 to 0.61. Seasonal variation analysis of PM2.5/PM10 ratios showed that in all three areas, the highest values occur in winter, with PM2.5 contributing 75-83% of PM10, indicating the contribution of anthropogenic sources. In summer, the PM2.5/PM10 ratios are the lowest, close to 0.5, indicating a reduced presence of anthropogenic emissions, probably due to better dispersion of pollutants. At BT-1, in 2019, a ratio of 0.33 indicates a predominance of emissions from natural sources.

At IS-2, there is a downward trend in the ratios in each season, indicating a reduction in anthropogenic emissions. At BT-1, the ratios show little variation throughout the year, except in winter, indicating a constant emission source. At SV-1, the PM2.5/PM10 ratios are close in spring and fall. The PM2.5/PM10 ratio showed a negative correlation with temperature and a weak correlation with humidity. A strong positive correlation was found between PM10 and PM2.5 (R=0.8-0.9), indicating a common emission source. At SV-1, an increase in the frequency distribution of high ratios (in the range of 0.7 - 0.9) was observed in 2021 and 2022, followed by a decrease in 2023, especially in winter. The frequency of ratios in the range of 0.5-0.7 and 0.7-0.9 increased in 2021 and 2022 in the spring and fall seasons.

RIVERSIDE AREA PLANNING: BARRIERS TO URBAN WATERFRONT ACCESSIBILITY

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UAUIM

Accessing urban waterfronts, particularly rivers, plays a pivotal role in the development of modern communities. These waterfronts offer a plethora of benefits, ranging from recreational amenities to transportation hubs, economic opportunities, and enhancements to urban life quality. Nevertheless, numerous cities grapple with multifaceted barriers that impede the efficient utilization and accessibility of these invaluable resources. This article undertakes an in-depth examination of the primary obstacles encountered in accessing urban waterfronts and explores potential strategies for integrating these waterfront areas. The study adopts a comprehensive and multidisciplinary approach, enhancing the precision of its findings in identifying and analyzing the barriers prevalent in accessing urban waterfronts. Methodologies employed encompass:

Literature review: A meticulous analysis of scientific literature, encompassing books, academic articles, and reports pertinent to waterfront development.

Case Studies: Scrutiny of revitalization endeavors undertaken in diverse urban locales such as Seoul, Los Angeles, or Antwerp, facilitating a nuanced understanding of the challenges encountered and the myriad solutions proffered.

Interviews and field observations: On-site visits to a variety of urban waterfronts to conduct firsthand assessments of infrastructure conditions and accessibility parameters.

The study delineates a gamut of barriers, both physical and psychological, which can be categorized as follows:

Inadequate or insufficient infrastructure: A preeminent barrier identified is the dearth of adequate infrastructure. Many waterfront locales lack essential amenities such as access roads, pedestrian walkways, and public facilities like parks and promenades, thereby impeding broad-based access and utilization.

Physical and natural barriers: Urban rivers are often ensconced amidst steep embankments, dense foliage, or man-made structures such as dikes and dams, obstructing direct access to water bodies. Additionally, industrial infrastructure lining the riverbanks may curtail public ingress, relegating only scant areas for recreational endeavors.

Real estate development and intensive land use: Riverfront areas frequently teem with commercial and residential edifices, thereby constricting available public spaces. This encroachment not only constrains accessibility but also compromises environmental quality through pollution and habitat degradation.
Pollution: Water and soil contamination pose significant barriers.
Psychological barriers: In addition to physical impediments, psychological barriers dissuade waterfront utilization. Negative perceptions pertaining to personal safety, visible pollution, or inadequate maintenance may deter public patronage. Moreover, the absence of emotional attachment to the river, stemming from past adverse experiences or deficient environmental education, may diminish community interest in riverside activities.
Lack of funding and political will: The execution of waterfront revitalization initiatives necessitates substantial investments. Scarce financial resources and wavering political commitment can stymie project implementation, leaving many endeavors unrealized.
Conflicting interests: Divergent interests among landowners, real estate developers, local authorities, and community stakeholders pose another formidable barrier.
In summary, the access to urban waterfronts is invariably encumbered by a constellation of intricate barriers, encompassing both tangible and intangible impediments. To unlock the full potential of these areas, an integrated approach is imperative, predicated upon stakeholder collaboration, infrastructure investments, environmental stewardship, and the formulation of cohesive, sustainable public policies. Only through such concerted efforts can urban waterfronts emerge as vibrant, inclusive, and beneficial spaces for the entire community.

THE REFLECTION OF A CLIMATE HAZARD ON SOCIAL MEDIA: THE SAHARAN DUST STORM OF APRIL 23/24, 2024

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The explosion of information about current climate changes leads to perceptions that take a fake-news turn on social networks, most likely fueled and multiplied by individuals or groups with major interests in maintaining collective psychosis. Our study observes and analyzes the

regional impact in Iași and Chișinău of the Siberian dust storm on April 23/24, 2024. We can clearly conclude that manipulation through social networks is real and that it must be firmly countered by those who observe this new social phenomenon, with researchers being at the forefront of combating the fake-news phenomenon.

THE EVOLUTION OF LAND USE AND CARBON STOCK DISTRIBUTION IN THE BÂRNOVA FOREST REGION

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This study investigates the evolution of land use and carbon stock distribution in the Bârnova Forest area, an ecological focus area located in Romania. The analysis is based on historical and contemporary land use data collected through remote sensing technologies and geographic information systems (GIS). The results show significant changes in land use, from compact forests to fragmented areas, influenced by anthropogenic and natural factors. Soil is a complex natural system that supports forest ecosystems and plays an important role in regulating the functionality of natural cycles, including greenhouse gases and the organic terrestrial carbon cycle. Globally, a systematic assessment of protected areas on carbon storage was not possible due to forest biomass data. In this study we look at the distribution of carbon stock in a protected area, the company said, Sit Natura 2000 - Bârnova Forest. Carbon sequestration is achieved under the best possible conditions by maintaining and preserving forest spaces in a balanced operating state with the ecosystem ensemble and with sustainable forest practices. This study was aimed at calculating and comparing estimated carbon stocks in soil in different types of land use. The carbon stock of the soil depends on the type of forest resorts, the physical-climatic units of forests, the history and management of forests. In conclusion, the largest amount of organic carbon is located in the north and northwest of the studied area, in the respective regions, where deciduous species (*Quercus robur* and *Tilia tomentosa*) are present.

THE CONCEPTUAL-THEORETICAL FRAMEWORK OF CLIMATE-NEUTRAL PEDOREGENERATIVE TECHNOLOGICAL MODELS

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The imperative of climate neutrality implies the need to substantiate the theoretical conceptual framework of the technological models practiced in contemporary agriculture in the sense of sustaining the processes of carbon dioxide sequestration from the atmosphere, its storage in the composition of humic substances and the reduction of greenhouse gas emissions in the atmosphere. This implies the simultaneous achievement of three inter-determined and interdependent objectives:

a) the biological intensification of the production process responsible for the sequestration of carbon from the atmosphere and its storage in the soil in the composition of plant residues;

b) ensuring in soils a pedofunctional environment that contributes to the intensification of the process of formation of humic substances within the integrated process of mineralization-humification of organic residues;

c) sustaining the processes of accumulation and stabilization of the newly formed humus in the structural aggregates.

In the context of these objectives, our research has shown that the duration and speed of accumulation of organic carbon in arable chernozems varies significantly depending on the concrete landscape conditions: the biophysical-chemical, biohydrothermal-bioaerohydric environment of the soils, the productivity of agricultural crops, the anthropogenic pressure and implies the necessity the development of some technological models based on the complex evaluation of the natural resource potential taking into account all the parameters and criteria that fully characterize the particularities of the agro-landscape.The theoretical framework of climate-neutral pedoregenerative technological models is provided by the biophysical concept of chernozemous pedogenesis based on the decisive role of the interdependent and interdetermined functionality of the system [bioenergetic system] ↔ [aggregate system] in its reproductive-unidirectional realization.

This is the product of the evolution of chernoziom pedogenesis at the pedological scale of time in concrete landscape conditions and is manifested in the evolution and interdependent and interdependent

dynamics of the quantitative and qualitative parameters of the bioenergetic system and the quantitative and qualitative parameters of the chernozem aggregate system.The pedogenetic effects of the functionality of the pedofunctional system [bioenergetic system] ↔ [aggregate system] materialize in the storage and stabilization of about 90% of the organic carbon present in the soil in the structural aggregates. Of these, approximately 60-80% are contained in the 0.25-10 mm aggregates.The mechanisms of aggregation-structuring of the soil mass and stabilization of organic carbon in the structural aggregates involve several stages: mineral domain-organic matter-mineral domain → microaggregates (< 0.25 mm) – organic matter – (< 0.25 mm) → fine aggregates (0.25-1.0 mm) – organic matter – (0.25-1.0 mm) → mesoaggregates (5-1 mm)- organic matter – (5-1 mm) macroaggregates (5-10 mm) – matter organic – (5-10 mm) → mega aggregates (> 10 mm). Macro and mega aggregates under the action of the roots that develop in the aggregate pores break down into hydrostable carbon-protective meso aggregates (5-1 mm). The systematization of the research results highlighted a stable tendency to change the ratio between the fractions of structural aggregates in the common agronomically valuable structure (0.25-10 mm) in favor of meso aggregates (5-1 mm) and fine aggregates (0.25-1 .0 mm) with a higher content of organic carbon than aggregates 5-10 mm, > 10 mm and < 0.25 mm. At the same time, they have the maximum carbon-protective capacity and ensure its stabilization in soils on the pedological scale of time (102 – 103 years). In this sense, the quantitative and qualitative parameters of the aggregative system of arable chernozems represent integrative indices of the processes of storage and establishment of organic carbon in arable chernozems, and their monitoring provides the informational framework necessary for the improvement of pedoregenerative technological models in order to ensure climate neutrality.

COMMUNITY ANALYSIS OF WATER BIRDS OF KESHOPUR CHUMB COMMUNITY RESERVE, INDIA

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The Keshopur Chumb Community Reserve, a designated Ramsar Site in the Gurdaspur district of Punjab, India, stands out as a distinctive wetland managed by the local community. This wetland is a source of livelihood for the villagers who harvest lotus stems, water chestnuts, and grasses. It is

a vital ecological site, attracting over 25,000 waterfowl during the winter season.

In the winter of 2023-2024, a comprehensive bird monitoring and community analysis was conducted. The most frequently observed migratory species included the Northern Pintail, Northern Shoveler, Common Pochard, and Eurasian Wigeon. Notably, the Bar-headed Goose and Greylag Goose were also spotted within the reserve. The Sarus Crane, now a resident species, was observed, indicating the reserve's suitability as a habitat. Additionally, a significant number of wader birds such as Sandpipers, Plovers, Redshanks, and Lapwings were recorded.

The diversity of migratory bird species underscores the reserve's importance as a prime birding destination. It holds the potential to support a broader range of avian species. However, impending land-use changes pose a threat to the reserve's future. To safeguard the reserve's ecological integrity, a 1 km buffer zone—where only agricultural activities are permitted—has been proposed to ensure its long-term preservation.

THE RESPONSE OF INDIVIDUAL POLLUTION INDICES TO THE VARIABLES USED. CASE STUDY

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The objective of the study is to evaluate the quality of soils in a cultivated vineyard, an abandoned vineyard, and under forest vegetation using individual pollution indices, employing multiple references. Systematic grid sampling (A horizon) and soil profile samples were collected from worked and abandoned vineyards and local forest. The total concentrations of Cu, Ni, Cr, Fe, and Ti have been performed using portable X-ray fluorescence. Enrichment factor (EF), Geoaccumulation Index (Igeo), and Pollution Index (PI) were calculated based on statistical references and the values obtained from sample analysis. Specific Pollution Index (SPI) is an indicator derived from PI, calculated by the difference between the concentration of an element in vineyard soil and that under forest vegetation, relative to the concentration in the parent material. All indices indicated an anthropogenic accumulation of Cu, which was a higher concentration in the soil of the abandoned vineyard compared to the cultivated vineyard and the forest soil. EF and PI show greater variability in data compared to Igeo. The Specific Pollution Index is highly correlated with the Paired Samples test (0.948) and, unlike the latter, allows for

classification into quality classes. The new index highlights specific pollution for certain crops compared to forest soils.

THE PHYSICAL STATE OF THE ARABLE CHERNOSIUMS FROM THE EAST-EUROPEAN PLAIN IN THE CONTEXT OF THE CURRENT TREND OF CLIMATE CONDITIONS

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The development and evolution of the chernozeomic process under conditions of anthropo-natural pedogenesis are extremely complex and highlight a series of phenomena that allow us to consider that the anthropo-natural chernozeomic pedogenesis remains only partially studied.
In this context, our more recent researches have shown that the current phase of evolution of arable chernozems is determined by two contrary trends - aridization and neohydromorphization - a phenomenon unknown to the theory of pedogenesis, and especially to the theory of chernozem pedogenesis. This involved the conclusion that within the current phase of evolution of arable chernozems, the chernozem process is determined by the intercalated action of the physical degradation of soils and agrogenesis, and its driving force is climatic instability, the significant reduction of the role of the biotic factor in pedogenesis and the increase of the role of the abiotic ones, especially of the climate and soil lithomatrix. The permanent deficit of bioenergetic resources in conditions of agrogenesis led to the disruption of the interdependent and interdetermined functionality of the pedofunctional system [bioenergetic system] ↔ [aggregate system] manifested in the realization of the process of structural-functional organization of the soil ecosystem at a lower energy level and the significant reduction of the self-organization, self-regulation and self-reproduction capacity of the soil ecosystem. In these conditions, the aggregate structure of the soil has the role of an intermediate factor with a decisive impact on the physical condition of the arable chernozems and their evolution. In this context, we mention that apparently the structural-aggregate state falls within the ranges of good and very good values. The content of agronomically valuable aggregates (0.25-10.0 mm) makes up from 70-75% to 80-85%. In their composition, however, 5-7 mm aggregates predominate. the content of mesoaggregates (5-1 mm) more

often makes up < 50% of the total content of aggregates 0.25-10.0, which is caused by the reduction of the role of coagulation, root and coprolitic mechanisms in the formation of the aggregate system. This allows us to consider that under conditions of agrogenesis, the reproduction process of the chernozemous structure is replaced by the processes of mechanical and thermo-compressional reaggregation of the soil mass and leads to the modification of the hydrophysical function of the aggregate structure, which involves the accumulation, the rational conservation of the water resources from from atmospheric precipitation. In this sense, our research has shown that arable chernozems have good water storage capacity, the field capacity (CC) being 31.7-32.3% V/V in carbonate and typical slightly humic chernozems and 36.4-37 .8% V/V in typical moderately humic and leached chernozems. The capillary break moisture (URC) makes up, correspondingly, 23.8-24.2% V/V and 27.3-28.4% V/V in the Am+AmBm layer. in the underlying layer it is reduced, respectively, by 0.9-1.8% V/V and 0.5-1.6% V/V. The range of Useful Water (SAU) varies in the range of 17.4-21.9% V/V in the 0-100 cm layer of typical weakly humic carbonate chernozioms and 19.8-23.9% V/V in that of chernozioms typical moderately humiferous and leached, and the Optimal Range of Useful Water (DOAU) is, respectively, 8.0-9.1% V/V and 8.6-9.8% V/V. At the same time, however, in all cases there is a change in the ratio between capillary-suspended and film-suspended aggregate humidity with a reduced degree of mobility and accessibility for plants, a phenomenon determined by the increasing role of the mineral component in constituting the water adsorption capacity in conditions of organic matter deficiency in the soil and the values of the Withering Coefficient (CO) are correlated with the degree of dehumification of the soil. Another important factor that reduces useful water reserves is the restructuring of the chernozem pore space from practically isotropic in unplowed chernozems to anisotropic in arable ones. Based on what has been specified, we believe that the process of metaaggregation of chernozems induced by agrogenesis is accompanied by a significant reduction of the stabilization mechanism of humic substances in the soil and the degradation of the basic function of humus, which in conditions of atmospheric humidity deficiency requires the provision of an optimal hydrophysical framework for the functioning of the biophysical system of the soil and the "soil-plant" ecological system. At the same time, this is the factor with a decisive role in the aridization but also in the neohydromorphization of arable chernozems under conditions of intercalated impact of climate change and agrogenesis.

NEW RECORD OF COLEOPTERA (INSECTA) FROM THE PLAIUL FAGULUI RESERVE, REPUBLIC OF MOLDOVA

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The result of the study of Coleptera species diversity from the Plaiul Fagului Reserve collected in 2024 were included. The research was carried out on the dead wood, in order to provide new data on the fauna of saproxylic Coleoptera in the Republic of Moldova. Saproxylic beetles are important components of biodiversity and are used for monitoring the quality of old-growth forests. Due to the substantial reduction of forested areas and low availability of dead wood, saproxylic beetles are becoming threatened and many small coleopteran species risks disappearing before they are even discovered. As a rezult of investigation a Coleoptera species *Corticeus unicolor* was identified for the first time in the Republic of Moldova. The Plaiul Fagului Reserve is one of the most representative, well preserved and managed forest ecosystems in the central area, in which the use of new collection methods, such as trunk traps, allows to identify new species for the Republic of Moldova.

A SUSTAINABILITY ASSESSMENT OF BIOGENIC POTENTIAL OF DIGESTATE FROM WASTEWATER TREATMENT PLANT AND GREEN WASTE FROM ECOLOGICAL LANDFILL

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Managing digestate from wastewater treatment plants and green waste from landfills is a challenge in achieving sustainable management at EU level. The objective of this paper is to evaluate the effects of using the digestate from the wastewater treatment plant and the green waste from the ecological landfill from Oradea, Bihor County, on the phenological stage of speciesof: *Lepidium sativum*, *Sinapis alba* and *Sorgum saccharatum*. To determine the germination characteristics, depending on the optimal substrate quality, the experiment was bifactorial: (i) Factor A (species): A1 (Lepidium sativum); A2 (Sinapis alba); A3 (Sorgum saccharatum) and (ii) Factor B (substrate): B1 (sludge); B2 (sludge: compost mixture, 1:3); B3 (sludge: compost mixture, 1:1); B4 (sludge: compost mixture, 3:1); B5 (compost). In order to achieve the established objective, the experiments

were carried out in the Laboratory of Physico-Chemical and Microbiologic Analysis of the Faculty of Environmental Protection, University of Oradea. For each type of substrate, physico-chemical and microbiological parameters were analyzed. According to the results obtained, it is concluded that seed germination and seedling vitality index parameters varied significantly, depending on the species and the type of substrate used. The highest value for seed germination and seedling vitality index was found in the green waste from the ecological landfill of Oradea. The species *Sorgum saccharatum* showed the lowest adaptability to the substrate analysed.

UNESCO VALORIZATION OF (GEO)HERITAGE IN THE MOLDAVIAN PLATEAU (ROMANIA) BETWEEN THE SIRET AND PRUT RIVERS: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT

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Geotourism has been increasingly attracting the attention of the scientific community and tourism authorities worldwide. In Romania, this interest is still emerging, with most geotourism-related research focusing on mountainous areas and lacking a unified approach. One of the least explored regions in terms of geotourism valorization is the Moldavian Plateau, a representative hilly region in Romania. Spanning the entire northeast area of the country (27,158 km²), the plateau is significantly impacted by surface denudation and gully erosion. This study aims to create an inventory of geomorphosites and geosites to establish a thorough profile of the plateau. Transformations of this landform unit highlight the need for an updated profile, which can inform future research on regional geotourism development. The initial step involved corroborating existing data on the location and size of the gullies. Subsequently, a set of evaluation criteria was established and applied during fieldwork. Geomorphosites and geosites were identified and located using a qualitative evaluation process to determine their geomorphological intrinsic value, potential use, and required protection. Furthermore, a GIS-based methodology was implemented to construct the profile of the Moldavian Plateau. The identification of geomorphosites and geosites led to the proposal of

geotrails, forming the basis for geotourism in the study area as an alternative for local economic development. Geoparks have proven to be excellent tools for educating the public about Earth Sciences, serving as important recreational areas and promoting significant sustainable economic development. By valorizing the (geo)heritage between the Siret and Prut Rivers of the Moldavian Plateau, this study underscores the potential for UNESCO recognition and the implications for sustainable development in the region.

CONVECTIVE STORMS AND ASSOCIATED EXTREME WEATHER EVENTS FROM APRIL MONTH IN ROMANIA (2008-2024)

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April is a representative spring month in which, according to climatological data from 1961 to 2023, extreme summer events are infrequent. Under the dominant influence of air circulation from the west and southwest, and as a consequence of changes in the distribution of barometric centers on the European continent, the mean monthly air temperature shows a noticeable increase compared to previous months. However, in recent decades, as the number of people with internet access has increased, reports of extreme weather events have also risen. This study is an exploratory analysis of extreme weather events that occurred in April, related to atmospheric instability in Romania (including large hail, heavy rain, tornadoes, severe wind gusts, and damaging lightning strikes) from 2008 to 2024. The data used included 227 reports from the European Severe Weather Database (ESWD), resulting from 67 events occurring on 31 days within the analyzed period. The most common events were large hail and severe wind gusts, but notably, 7 tornadoes were also recorded, including one classified as an F2 on the Fujita scale. These events caused the death of one person and injured ten others, as well as causing damage estimated at several tens of millions of euros to crops, houses, property, and infrastructure. Forty-two percent of the events occurred in the southern part of Romania, 38% in the intra-Carpathian area, and 20% in the northeast. More than 80% of the

events were caused by Mediterranean cyclones, Atlantic cyclones, or their cold air troughs, in the contexts of western and southwestern circulations. The convective environment was characterized by CAPE values exceeding 500 J/kg for most events. The intensity of convective hazards increases with higher environmental wind shear and instability, especially in the case of large hail events. Tornadoes are supported by lower cloud bases, enhanced low-level wind shear, and 0-3 km CAPE, while severe wind gust events occur in both weak and strong shear regimes. Two of the events (a tornado in the Drajna, Calarasi area on 30.04.2019, and a supercell storm that generated hail in the Calarasi-Tulcea area on 17.04.2024) were analyzed using meteorological radar data. The results revealed that in the Bărăgan-Tulcea area, recognized for the high frequency of extreme convective phenomena, the radar parameters in April can be comparable to those recorded in the summer. The results obtained encourage the continuation of the study by enlarging the database to analyze trends and spatial variability of the described events. The ultimate goal is to integrate the results into weather risk management plans in Romania. We consider April to be a particularly challenging period from this perspective due to the high frequency of both cold and warm weather risks and the high vulnerability of certain crops.

GEODIVERSITY ASSESSMENT IN NATURA 2000 PROTECTED AREAS: APPLICATION TO BÂRNOVA FOREST

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Geodiversity, encompassing the natural variety of geological, geomorphological, and soil features and their associated processes, plays a critical role in shaping the ecological and conservation dynamics within natural protected areas. To characterize geodiversity within these areas, information from GIS databases related to forest management plans can be effectively utilized. The objective of this study was to conduct a quantitative assessment of geodiversity in the Barnova Forest (ROSCI0135), which covers an area of approximately 12.216 ha. The geodiversity index was established by integrating four distinct diversity indices, each specifically addressing the primary aspects of geodiversity: geomorphology, topography, pedology, and hydrology. Additionally, diversity indices commonly applied in biodiversity studies, including Shannon, Simpson's, E-Pielou, Margalef, and Menhinick indices, were

employed to assess the distribution of geodiversity richness across the study area. The results reveal that nearly 72% of the territory within the Barnova Forest exhibits medium to high geodiversity values, predominantly concentrated in the interior regions of the protected area. These areas are characterized by more diverse relief and soil variation. This geodiversity assessment can serve as a valuable tool in land-use planning within the designated area, especially for guiding efforts in protection, conservation, and effective management.

NATURAL DAM LAKES IN ROMANIA: FORMATION MECHANISMS AND POPULATION RISKS

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Natural dam lakes emerge due to the obstruction of river courses by material from slope movements, such as landslides. These lakes, exemplified by the Red Lake and the less-known Cuejdel Lake, represent notable natural phenomena and touristic attractions in Romania. However, they also pose potential hazards to nearby populations. A pertinent example occurred in 2018 in Luncile village (Vrancea), where a landslide significantly obstructed the Râmnicul Sărat River, reducing its 30-meter-wide riverbed to merely one meter. This obstruction led to water accumulation behind the natural dam, threatening 19 downstream households until authorities intervened to remove the landslide.

Romania hosts numerous natural dam lakes, with Red Lake in Harghita being the most prominent. Despite its perceived uniqueness, such lakes are relatively common in the country. This study aims to identify regions prone to the formation of natural dam lakes, map these formations, and create a spatial distribution map. Our analysis identified 68 natural dam lakes formed by landslides, with approximately 20 located within riverbeds and the remainder on landslide bodies. Bacău County exhibited the highest density of these lakes, primarily occurring on Paleocene-Eocene flysch geological formations. The mapped lakes are exclusively within the Siret River basin, with the Berzunți Mountains identified as the most susceptible area for landslide-induced dam lake formation. Most of the lakes assessed do not pose significant threats to local populations due to their remote locations from settlements.

STUDIES ON THE USE OF THERMAL DISPOSED GEOTHERMAL WATER, USED AS A HYDROPONIC SUBSTRATE IN THE CULTIVATION OF *LACTUCA SATIVA*

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This study aims to assess the hydroponic crops of Lactuca sativa (lettuce) by using thermally-wasted geothermal water as a substrate. The general objective of this research is to optimize the composition of hydroponic culture media for the intensive cultivation of lettuce, by using the geothermal water mixed with well water as substrate. The aim is also to identify the pH and optimum temperature of the culture medium with the establishment of amendments adapted to the geothermal water used in mixture with well water, setting the optimum light intensity for the intense cultivation of Lactuca sativa. It also aims at the characterization and comparison of Lactuca sativa cultivated hydroponically that uses the well water, respectively the geothermal water improved with nutrients as a substrate. The hydroponically-cultivated of lettuce was be constantly monitored, both in terms of dry biomass (per volume unit), their quality (mineral and organic compounds), and the quality of the nutritive medium, which was be daily adjusted. The cultivation of lettuce in hydroponic environment was be done at the INTERDISCIPLINARY RESEARCH CENTER IN Bioeconomy of the University of Oradea. Part of the equipment necessary to achieve the aims objectives spectrophotometer without lamps, calcination furnace, Abbe refractometer, etuva laboratory, pH-meter, Chlorophyll meter.

ANALYZING HYDROGEOLOGICAL DROUGHTS: A LOOK AT THE NATURAL RISKS IMPACTING EASTERN ROMANIA OVER THE PAST DECADES

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Drought stands out among natural hazards due to its multi-faceted character, and cumulative effects. Its far-reaching impact is expected to cause even greater concern in the context of climate changes, calling for improved water management strategies grounded in scientific knowledge. This study aims to take an in-depth look at the impact hydrogeological

drought on underground water resources, taking the eastern region of Romania as a case study. The multi-scale assessment was performed through analizing Standardized groundwater index (SGI) computed for 1, 3, 6, 9, and 12 months. The results can support the prognosis of water availability, which is critical in the eastern part of Romania, given the frequent, high-intensity meteorological, hydrological and hydrogeological droughts. This study contributes substantially to our understanding of the propagation of meteorological drought both under and below the ground, as it is one of the few that integrates both of these aspects.

ECONOMIC PERFORMANCE AND LOCATION IN THE METROPOLITAN AREA OF IASI - TOWARDS A POLYCENTRIC MODEL?

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The Metropolitan Area of Iasi (MAI) faced massive changes in its internal organization, during the last four decades. These changes involved a reshaping of its built-up areas functions, the installation of new activities in its perimeter and an economic extroversion of the local productive systems. If the major trends of these dynamics were dictated by the broader shrinking processes of industrial activities, some more subtle mechanisms of urban restructuring of the economic landscapes were discretely put in place, mainly the local emergence of bid-rent functions of land use. These secondary spatial transformations explain why the industrial brown fields were occupied by the tertiary sector and why the vacant urban lots were quickly engaged in real-estate investments, in a metropolitan context that responded quite precisely to the Alonso monocentric model (W. Alonso, 1964, M. Fuijita, 1989). However, the recent data analysis of indicators provided by the Romanian RECOM (Registry of Commerce) suggest that the output of the MAI internal dynamics is far from equilibrium and that it might announce the emergence of a new model of metropolitan organization of the economic activities, a polycentric one. In this research, we evaluate the relation between economic performance, firms' location and urban amenities, using the most up to date (2022) indicators of turnover, profit and number of employees, at the scale of the MAI, using multiple models of urban centrality as predictors. The results of the analysis suggest that the city of Iasi and the contiguous ring of local administrative

units are shifting from a monocentric urban model towards new and sophisticated frames of metropolitan organization.

SPATIAL DISTRIBUTION OF NATURAL HAZARDS AND THEIR PROXIMITY TO CULTURAL HERITAGE IN NORTH-EASTERN ROMANIA

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Cultural heritage contributes to a substantial socio-economic and cultural value, contributing to local identity and spiritual significance. However, heritage objectives are increasingly exposed to natural hazards. The methodology integrates the assessment of natural hazards, exposure and vulnerability of cultural heritage objectives. The steps of the analysis include multi-hazard analysis using multi-criteria analysis (MCDA), exposure and vulnerability assessment of cultural heritage objectives, and calculation of a risk index for cultural heritage objectives in Suceava County. Effective implementation requires access to cartographic databases, hydrological data, landslide information, and detailed characteristics of heritage sites. Suceava County, which is host to numerous cultural heritage sites and UNESCO monuments, is significantly exposed to natural hazards, with approximately 18% of the area being highly vulnerable. This study provides important information for cultural and heritage strategies, highlighting the importance of these sites and increasing public awareness of their vulnerability.

Aknowledgement: This work was supported by a grant of the "Alexandru Ioan Cuza" University of Iași, within the Research Grants program, Grant UAIC, code GI-UAIC-2022-03

TRANSITION AND SUSTAINABILITY OF ORCHARD CULTIVATION IN POST-SOVIET ROMANIA

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Globally, land use and land cover have undergone significant transformations in recent years, with varying impacts across different regions. Countries of the former Soviet Union, including Romania, have experienced pronounced changes. This study aims to elucidate the

evolution of orchard landscapes in North-East Romania, a region with a long-standing tradition in fruit cultivation. The analysis leverages both historical and contemporary literature and cartographic resources to trace the transitions in orchard landscapes over recent decades. Findings indicate that fruit cultivation, documented as a fundamental activity since the 15th and 16th centuries, reached its zenith during the communist era. Contemporary practices, however, reveal a shift in orchard locations towards gentler slopes. Orchards that were predominantly situated on slopes of 10-15% and 15-20% in the 1980s are now largely found on slopes of 1-3% and 3-5%, areas previously utilized for agricultural purposes. This relocation has subjected steeper slopes to intensified geomorphological processes, evident from active landslides in former orchard regions. The study raises critical questions regarding whether these changes signify a trend towards degradation or represent a sustainable adaptation in the current environmental and socio-economic context.

ESTIMATING SLOPE STABILITY THROUGH INVASIVE AND NON-INVASIVE METHODS IN THE CENTRAL AREA OF DOROHOI (BOTOSANI COUNTY)

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The availability of land that is suitable for different types of construction is steadily decreasing and access to areas that are not safe (e.g. sloping areas) has been increasing over the last decade. This has inevitably led to an increase in the risk of landslides in these areas. In this context, the present study proposes a comparison of two land stability estimation models (a probabilistic and a deterministic model), with applicability in the central area of Dorohoi (Botoșani County).

The first probabilistic (non-invasive) method consists in the elaboration of a risk map, starting from the identification of eight main factors that may give rise to massive rock displacement (lithological, geomorphological, hydrological, climatic, structural, earthquake-related and anthropogenic), according to the indications of the norms in force (GT 019-98). The second method, the infinite planar slope model is a deterministic (invasive) method that consists in calculating safety factors using geomechanical parameters which are specific to the rocks in the slope, obtained by geological drilling

and through physical-mechanical analysis in the geotechnical laboratory. The comparison between the two processes aims to improve the non-invasive method as well as its application without reservation, particularly in situations where geological and geotechnical data are missing or are more difficult to obtain in certain areas.
The results obtained from the susceptibility maps indicated a potential for low to high slip, hence high instability for certain regions in the area analysed. As for the deterministic method, the values of the safety coefficient Fs indicate a low to high slip potential, with unfavourable values overlapping those perimeters that have an increasing potential through the previous analysis.
Finally comparing the results obtained based on the risk maps and security factors obtained using the invasive method, significant similarities were found.

ASSESSMENT OF ZOOPLANKTONIC INVERTEBRATE ASSEMBLAGES IN RECONSTRUCTED AND NATURAL ECOLOGICAL SYSTEMS WITHIN THE DANUBE DELTA BIOSPHERE RESERVE

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Zooplanktonic invertebrate assemblages serve as vital indicators of water quality within aquatic ecosystems. This study aimed to evaluate the structure of zooplankton across three ecological systems within the Danube Delta Biosphere Reserve, Romania: the Carasuhat and Zaghen restoration areas, and the Uzlina natural lake. Samples were collected seasonally in March, July, and October from 2021 to 2022, along with measurements of key physicochemical water parameters. The investigation revealed the highest species richness in the Carasuhat area (55 species) under natural flooding conditions, while the Zaghen area, under controlled flooding, exhibited the lowest species richness (27 species). Zooplankton densities varied from 1128.71 ind/L to 2778.80 ind/L in 2021 and from 1659.00 ind/L to 2460.52 ind/L in 2022. Biomass ranged between 15.78 mg ww/L and 319.72 mg ww/L in 2021, and from 24.19 mg ww/L to 58.04 mg ww/L in 2022. These findings highlight the significant role of these aquatic habitats in preserving regional biodiversity through anthropogenic changes. The results emphasize the complex interactions between zooplankton communities and their environments, providing valuable data

for guiding conservation and restoration strategies within the Danube Delta Biosphere Reserve.

URBAN MICROCLIMATE SIMULATIONS DATA TO MITIGATE URBAN THERMAL HOT-SPOTS: TREE AND COOL SURFACES DESIGN SCENARIOS

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Urban areas are characterized by the presence of thermal hot-spots, which pose significant challenges to the well-being and comfort of residents. In this study, we utilize urban microclimate simulations using Envi-Met software to investigate strategies for mitigating these hot-spots. Specifically, we focus on the implementation of tree design and cool surfaces scenarios. Using advanced modeling techniques, we simulate the impact of different tree layouts and surface materials on urban microclimates. Our results demonstrate the effectiveness of strategic tree placement and the use of cool surfaces in reducing thermal hot-spots within urban environments. These findings offer valuable insights for urban planners and policymakers seeking sustainable solutions to improve the thermal comfort and livability of cities.

INNOVATIVE TERRAIN-BASED FLOOD VULNERABILITY MODELING IN ARCGIS

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In response to accelerated urbanization and population expansion, river valleys are increasingly utilized for human habitation, heightening their susceptibility to flooding. Addressing the critical need for precise flood risk evaluation, the scientific community has developed advanced mathematical and spatial models. This study contributes to these efforts by presenting an innovative automated model designed for integration within ArcGIS, which relies exclusively on digital elevation model (DEM) data to swiftly identify flood-prone regions. The primary innovation of this model is its capacity to utilize terrain data alone to detect potential flood zones,

offering significant insights for local governance and planning. The research covered the entirety of Romania, examining drainage basins across all hierarchical levels as classified by the Horton–Strahler system. The outcomes are rendered as a polygonal vector layer in shapefile format, enriched with an attribute table containing numerical fields that represent initial, intermediary, and final calculations. Each parameter was normalized to produce a morphometric flood vulnerability score. Subsequent post-processing involved Principal Component Analysis to assign weights to these morphometric parameters, culminating in a dimensionless score for each drainage basin. This enables straightforward comparisons of flood vulnerability across all drainage basins within Romania.

THE DEPOSITIONAL ENVIRONMENT DESCRIBED BY THE SEDIMENTARY SUCCESSIONS FROM HÂRTOP AREA (SUCEAVA COUNTY - EASTERN CARPATHIAN FORELAND BASIN SYSTEM)

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Two sedimentary successions “Hârtop A and B” from middle Miocene (Sarmatian) deposits of Moldavian Platform were sedimentological analysed in order to reconstruct the depositional environments of the area.
Hârtop A and B sedimentary successions are representing 2 outcrops revealing 9.5 and 6.8 m respectively, formed by predominantly sandy deposits with rare silty intercalations. They are located in the northern part of Hârtop locality (GPS coordinates Hârtop A: N 47˚30'12.06", E 26˚20'48.02"; Hârtop B: N 47˚30'34.23", E 26˚20'30.78").
Given that they are situated relatively close, the distance between them being about 1 km and that they describe mostly similar deposits in lithology, texture and sedimentary structures, we corelated the sedimentary environment and the processes associated within.
Following the field mapping of the openings, 11 sedimentary facies were identified, for which we presented the characteristics and depositional processes responsible for their formation.
Lithological the deposits are predominantly sandy, with thin and isolated intercalations of grey mudstone and less often silted or gritty levels.
The sedimentary facies identified are: (1) unstructured or obliquely laminated grey silts, (2) sand with symmetrical wave ripple cross

lamination, (3) sands with oblique ripple cross lamination, (4) sands with convex hummocky cross stratification, (5) sands with concave swalley cross stratification, (6) sands with trough cross stratification, (7) sands with festooned trough cross stratification, (8) sands with low angle cross stratification, (9) sands with plane-parallel stratification, (10) massive sandstone, (11) unstructured sand with bioclasts. The sedimentary facies were grouped according to genetic criteria into 2 facies associations which were interpreted to describe 2 depositional subdomains: the upper shoreface and the lower shoreface of a non-deltaic marginal marine basin. Regarding the evolution of the depositional environment, based on the vertical stacking of the facies associations in the Hârtop A outcrop, it can be concluded that the shoreline initially had a retrogradational character described by a deepening upward trend (lower shoreface deposits laying over upper shoreface deposits). Subsequently, the behaviour of the depositional domain became progradational, in the sedimentological column having a Shallowing upward trend (upper shoreface deposits are stacked over lower shoreface deposits).

GENTRIFICAREA RURALĂ ȘI AMPRENTA DE CARBON
RURAL GENTRIFICATON AND CARBON FOOTPRINT

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Lucrarea analizează determinarea directă a două fenomene active, prezente în societatea noastră. Pe de o parte este gentrificarea rurală, sintagmă acceptată cu multă dificultate în comunitatea științifică și ignorată total de autoritățile locale și, pe de altă parte, amprenta de carbon o îngrijorare care plutește asupra fiecăruia dintre noi. În privința gentrificării rurale, insistența unor specialiști din tot mai multe țări prin care se semnaleaze noua dimensiune pe care o ia acest fenomen impune a ne alătura acestor eforturi și a contribui la completarea studiilor cu elemente care combină gentrificarea rurală, ca fenomen în plină desfășurare, cu elementele de mediu, ce cunosc modificări ca urmare a gentrificării, și modul în care sănătatea mediului se răsfrânge asupra sănătății omului, inclusiv prin intermediul schimbărilor climatice. Trebuie analizată modalitatea în care, prin gentrificare, crește presiunea pe spațiul rural, unde gospodăriile se bazează pe resursa de apă, pe fertilitatea solului și, nu în ultimul rând, de

clima (de precipitații, de temperaturi, insolație etc.) până nu de mult în echilibru. Schimbările climatice pot fi resimțite mai acut în spațiul rural cu implicațiile pe care le presupune pentru toată comunitatea. Pământul mai puțin fertil, cu sărăcirea resursei de apă, cu o populație locală sărăcită și îmbătrânită. Gentrificarea rurală ar trebui să îmbunătățească caracteristicile comunității rurale și sa creasca nivelul de adaptabilitate la schimbările climatice. Bioxidul de carbon este considerat cel mai important produs antropic dintre gazele cu efect de seră. Este de reținut că durata de viață aproximativă a CO_2 în atmosferă este de la 50 până la 200 de ani. Principala sursă de CO_2 incriminată o reprezintă arderea combustibililor fosili (sursă din perioada preindustrială chiar dacă analizele nu sunt concludente în privința locului prim al acestei surse de CO_2). Emisiile de gaze în spațiul rural reprezintă un fenomen redus în raport cu emisiile zonelor urbane. Spre ce adaptări ne îndreptăm pentru a ne conforma noilor cerințe de mediu?

CONTRIBUTION OF MEDITERRANEAN CYCLONES TO THE SNOWFALL ACCUMULATION OVER ROMANIA

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Snowfall is an important component of the winter climate in Romania, influencing various economic sectors such as transportation, agriculture, and tourism. Previous studies have identified several synoptic patterns that can bring snow in south-eastern Europe, including Mediterranean Cyclones (MCs). However, the contribution of these cyclones to snowfall in Romania has not been thoroughly investigated. This study aims to quantify the contribution of MCs to snowfall accumulation in Romania. Daily snowfall data from ERA5-LAND covering the period 1981-2020 were analyzed, along with the corresponding atmospheric circulation patterns. The MCs trajectory is based on the tracks produced by the 3T initiative of the COST Action, comprising tracks for the 1979-2020 period. This method is based on 10 different cyclone tracks, using an hourly ERA-5 reanalysis data set, at a 0.25 spatial resolution. According to the "best-track" method used in our study, in the water year period (November 1981 to April 2020) 2203

cases of MCs were detected in the Mediterranean Sea Basin. The highest number of MCs (~ 90th percentile) was identified in the following years 1983, 1995, 2002, 2005, 2012, and 2017.The results indicate that, on average, over 50% of the total snowfall can be attributed to MCs. In March and April, the findings indicate that over 50% of the snowfall in the eastern and southern regions can be attributed to the presence of MCs. Particularly, in April snow occurrence is a rare event in the low land of Romania, in the southeastern lowland areas over 90% of these total snowfall events are related to the MCs. In the northern and western parts of Romania, the fraction of snowfall due to the MCs is less than 20%. Snowfall trends due to MCs activity showed a decreasing trend of 4-6% in February, statistically significant (p-value < 0,05) located in the east, center, and northern parts of the country. Notably, the mountainous areas exhibit the most significant decrease trend in snowfall due to cyclonic activity. The presented results showed that, overall, almost half of the snowfalls are related to the MC activity towards Romania domains. This implies a considerable consideration of MC activity to the water management over the territory.

Acknowledgment: This research received funds from the project “Cross-sectoral framework for socio-economic resilience to climate change and extreme events in Europe (CROSSEU)” funded by the European Union Horizon Europe programme, under Grant agreement n°101081377.

THE WATER FOOTPRINT PERCEPTION AMONG THE POPULATION OF IAȘI MUNICIPALITY

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Within the framework of contemporary economic and educational advancements, environmental issues have started to attract more and more attention from both researchers and the general, non-specialized public. The issue of the water footprint receives little attention in Romanian scientific and educational endeavors. The favorable geographical position leads to an indifferent attitude of the population towards water consumption, as this resource is abundantly available in our country. The issue of global warming "manages" to draw citizens' attention to other environmental problems as well, due to the increasingly promoted idea of chain reactions. Most people consider that improved control over

behavioral habits can reduce environmental impact when it comes to environmental protection. The same thinking applies to water consumption; the population tends to focus more on reducing the direct impact on water resources. The perception of the population regarding the water footprint was quantified from the perspective of measures to mitigate it, following the application of a questionnaire to the residents of the city of Iași. We looked at the approaches from two angles, lowering consumption and making technical improvements, based on other specialized researches. One of the conclusions reveals that people with a higher level of education tend to propose technological modernization solutions rather than actual consumption reduction. The water footprint is rarely discussed and, implicitly, poorly understood topic. However, in the context of Earth's resources being in real danger of depletion, we should also focus our attention on water, which for most of us is a commodity we consider to be rightfully ours, without having to make efforts to obtain and manage it.

THE DOMESTIC WATER FOOTPRINT OF THE INHABITANTS OF IAȘI MUNICIPALITY. PRELIMINARY RESULTS

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The water footprint is a social, economic, and educational indicator, composed of the blue water footprint (freshwater, both surface and groundwater), the green water footprint (rainwater), and the grey water footprint (water used to dilute pollutants, as well as water resulting from economic activities). Since water is a resource used in all anthropogenic operations carried out on Earth, the water footprint is an indicator that helps raise awareness and understanding of water consumption (both direct and indirect) and its damaging component. The importance of the water footprint might highlight certain environmental problems for experts. Based on bibliographic analysis, we created and implemented our own methodology; the outcome is a partial footprint of water usage, with an emphasis on its residential component. The results are largely suggestive because the computation was done using the average values of the parameters that were evaluated. For the purpose of this study, we developed and administered a questionnaire with quantitative questions to the

residents and tenants in the metropolitan area of Iași. This paper presents the preliminary results of the research, which were obtained by analyzing 121 responses recorded anonymously and spatially categorized by neighborhood. These results indicate an average water footprint of 58,758.5 liters per week per inhabitant; the highest water footprint (71,607.8 liters per week per inhabitant) is recorded for residents of the Tătărași neighborhood, while the lowest water footprint (47,328.5 liters per week per inhabitant) is recorded in the Mircea cel Bătrân neighborhood. To draw conclusions, we conducted a series of statistical analyses on the relationship between actual water consumption and various educational, demographic, and social characteristics of the respondents. In the spirit of sustainable development, the water footprint is a primary indicator in evaluating the sustainability of water consumption, which affects both the anthroposphere and the biosphere.

DEMOGRAPHIC PARTICULARITIES OF THE IASI METROPOLITAN AREA IN THE POST-DECEMBER PERIOD. CAUSES AND PERSPECTIVES

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The paper aims to analyze the demographic evolution of the Iasi metropolitan area in the period 1990 - 2021 by analyzing a set of indicators such as birth rate, death rate, departure and arrival rate and demographic growth rate. The population is declining in Romania and in the North-East Development Region, but it is important to highlight how demography is evolving in the Iasi metropolitan area, given that the municipality of Iasi is a regional economic and social centre and has an influence on the communes in the metropolitan circle. At European level, the population is facing demographic ageing, and this phenomenon is also felt in Romania, especially in rural areas. In addition to demographic ageing, rural areas are also facing other problems such as falling birth rates, rising mortality rates, labour migration to urban areas or abroad, etc. Socio-economic characteristics influence the development of rural localities and their dynamics, and the evolution of demographic indicators is influenced by the standard of living, the socio-economic development of an area or development opportunities and prospects. Thus, population decline or growth is a complex phenomenon, influenced by several factors, which

may have several causes. By carrying out this study it will be possible to observe the demographic characteristics of the Iasi metropolitan area and whether the development in recent years has played an important role in terms of demography. The demographic peculiarities will be analysed both from the perspective of the evolution in the post-December period and from the perspective of the socio-economic development of the Iasi metropolitan area.

ESTIMAREA POZIȚIEI PÂNZEI FREATICE CU MODFLOW

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Modflow este un program dezvoltat de United State Geological Survey, care permite modelarea apelor subterane precum și estimarea nivelului pânzei freatice prin transpunerea datelor în modele numerice. Este bine cunoscut faptul că în zona de nord-est a României, observațiile la nivel piezometric sunt concentrate de-a lungul rețelelor hidrografice, zonele interfluviale fiind lipsite de astfel de informații. Zona de studiu aleasă este bazinul Bahlui deoarece există măsurători în teren care pot fi folosite pentru calibrarea modelului. În studiul de față s-a încercat crearea unui model de estimare a pânzei freatice. Atribuirea datelor stratigrafice s-a realizat folosind metoda poligonului Thiessen pentru a acoperi întreaga suprafață a bazinului. Datele de intrare în model sunt precipitații (reîncărcare) și lacuri, iar ca date de ieșire avem rețeaua hidrografică, lacuri și evapotranspirație. Calibrarea modelului a fost posibilă prin compararea rezultatelor obținute în urma deplasărilor pe teren cu cele obținute în urma rulării modelului.

THE ROLE OF SOCIO-ECONOMIC DEVELOPMENT IN THE EVOLUTION OF THE SCHOOL DROPOUT RATE IN IASI COUNTY

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School drop-out rates are a topical issue for Romania and internationally. It is influenced by several factors and plays an important role in development, highlighting both the importance of the rural-urban spatial

relationship and the economy. Education underpins the development of society, and the school drop-out rate is an important indicator of the development trend of rural localities and highlights the differences between rural and urban areas in this respect. The North-East Region has one of the highest school drop-out rates, but at European level, Romania is among the top places in terms of school drop-out rates. In this respect it is important to observe how the drop-out rate has evolved in the study area, what factors influence it and whether measures can be taken to curb the increase in the drop-out rate. School dropouts by level of education indicate the various problems that can occur in society, and the lack of schooling accentuates various problems that have an effect on the socio-economic development of the area. The effects of this phenomenon are both short and long term, among which could be listed the increase in unemployment, social exclusion, poverty, etc. In this study will be analyzed a series of indicators that highlight the influence of school dropout on socio-economic development for the post-december period in Iasi county, which will be analyzed from a regional perspective, but also the role of Iasi municipality as a factor of development. Among the indicators analysed will be the number of employees, the average net income, the school population, the number of pupils enrolled in school and the number of graduates. Keywords: school dropout, effects, causes, development, Iasi county.

MĂSURI NECESARE PENTRU REDUCEREA EFECTELOR PRESIUNILOR HIDROMORFOLOGICE: RECONECTAREA ȘI RESTAURAREA MEANDRELOR CURSULUI DE APĂ JIJIA

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Informațiile despre tipurile și intensitatea presiunilor hidromorfologice la care sunt supuse corpurile de apă de suprafață sunt necesare a fi cunoscute și monitorizate în scopul identificării și desemnării corpurilor de apă puternic modificate și artificiale, precum și pentru luarea măsurilor de resaturare sau atenuare a alterărilor hidromorfologice pentru atingerea obiectivelor de mediu. Ca urmare a inundațiilor din anii 1969, 1970, 1975 lunca comună a râurilor Jijia si Prut a fost identificată ca zonă inundabilă. Pentru prevenirea și combaterea acestui risc natural au fost realizate lucrări de regularizare si îndiguire a celor două cursuri de apă, Prut și Jijia.

Totodată, pentru a evita lucrările de îndiguire prin zonele locuite cât și costurile mari ale unor astfel de lucrări, din dreptul localității Cotu Morii traseul râului Jijia a fost modificat, prin execuția unei albii artificiale pana la confluența cu râul Prut, în lungime de 41 km. Partea din râu situată în aval de localitatea Chipereşti și până la vechea confluență cu Prutul, în lungime de 51 km, a căpătat denumirea de Jijia Veche. La Chipereşti s-a realizat un nod hidrotehnic prin intermediul căruia se pot face transferuri de debite în Jijia Veche de maxim 4mc/s, în rest Jijia Veche este alimentată din bazinul propriu prin patru afluenți cu scurgere intermitentă (Tamara, Comarna, Covasna și Cozia). În bazinul hidrografic al Jijiei au fost identificate mai multe areale de interes pentru protecția mediului înconjurător, inclusiv situl RAMSAR RORMS2422 ca zonă umedă de importanță internațională, dar și mai multe situri Natura 2000 precum ROSPA0042 „Elești eiele Jijiei și Miletinului" și ROSCI0222 „Sărăturile Jijia Inferioară - Prut", areale care evidențiază necesitatea asigurării unui cadru de dezvoltare sănătos pentru ecosistemele conexe. La nivelul Uniunii Europene, Directiva Cadru Apă prevede măsuri pentru reducerea efectelor presiunii antropice asupra corpurilor de apă naturale, încurajând astfel refacerea și/sau protejarea ecosistemelor acvatice. Aplicarea unor astfel de măsuri pentru reducerea alterărilor hidromorfologice și pentru restaurarea conectivității laterale si longitudinale a corpurilor de apă identificate ca fiind puternic modificate sau artificiale, contribuie la restabilirea unor valori și funcții importante pentru: creșterea biodiversității, alimentarea acviferului, stabilizarea malurilor, retenția sedimentelor și a nutrimentelor (azot, fosfor) purificarea apei, funcții recreaționale etc.

RISCURILE ȘI DEZASTRELE CA "BINECUVÂNTĂRI DEGHIZATE"

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Trăim într-o societate a riscului în care frecvența și intensitatea hazardelor și a dezastrelor naturale sau antropice a crescut fără precedent, în contextul globalizării și al schimbărilor climatice, astfel încât termeni precum sustenabilitate și reziliență au devenit esențiali nu doar în plan științific, ci și cuvinte cheie ale discursului public sau ale documentelor cu caracter decizional sau strategic. Este nevoie nu doar de mecanisme de a face față acestor provocări, dar, mai mult și mai bine, de soluții de transformare a acestora în oportunități prin dezvoltarea unor practici și comportamente

proactive. Termeni precum antifragilitatea sau prozilienta au apărut recent o reflecție a acestor preocupări ale societății de a crea mecanisme care să utilizeze amenințările și șocurile ca pe un „combustibil" pentru dezvoltare. Prezentarea de față se concentrează asupra ipotezei "binecuvîntării deghizate" reprezentate nu doar de dezastrele în sine, ci și de amenințarea unor dezastre viitoare care constituie, în anumite condiții, un factor esențial pentru masuri structurale și nestructurale care pot avea și consecințe benefice asupra sustenabilității și calității vieții oamenilor la nivel național, regional sau local. Bazată pe o perspectivă sistemică, holistică asupra Lucrarea de față este una de sinteză și se bazează pe indiferent de scara de referință, lucrarea de față este o sinteză a rezultatelor obținute de autor, singur, dar mai ales în colaborare, în ultimii trei ani și concretizate în publicații în diferite jurnale internaționale prestigioase. Prezentarea va pune în evidență și unele perspective de cercetare pentru următoarea perioadă, legate de analiza integrată a orașelor ca poli ai vulnerabilităților, expuși la amenințări dar și având o capacitate importantă de a transforma aceste amenințări în oportunități de dezvoltare durabilă și de bunăstare.

THE GEOCHEMICAL DISTRIBUTION OF SOME HEAVY METALS IN THE MARINE SEDIMENTS ON THE ROMANIAN COAST OF THE BLACK SEA

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This study is based on the distribution and risk assessment of heavy elements pollution of sediments on the Romanian Black Sea coast. Concentrations of the elements Cr, Co, Ni, Cu, Zn, Cd, Pb and As were measured in X-ray fluorescence and the results ranged from 11 to 149 mg/kg for Cr, 2.4 to 4.5 mg/kg for Co, 0.01 to 14 mg/kg for Ni, 1.8 to 9.2 mg/kg for Cu, 1.9 to 25 mg/kg for Zn, 0.4 to 1.3 mg/kg for Cd, 6.8 to 11 mg/kg for Pb and 4.4 to 7.1 mg/kg for As.

The risk of heavy element pollution of sediments of the Romanian Black Sea coast was assessed by calculating the following indicators: pollution degree index (IPL), contamination factor (CF), ecological risk index (IR), and geo-accumulation index (Igeo). The results indicate that the degree of ecological risk for Zn, Cu, Pb, Ni, and Cr is low, suggesting a relatively safe environment. However, the risk for As is moderate, and for Cd, it is

considerable, highlighting the potential ecological risks associated with these heavy metals.

CULTURAL ECOSYSTEM SERVICES - MAIN CHARACTERISTICS AND CHALLENGES. OUTDOOR RECREATION IN BARNOVA FOREST

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Natural environments are known to contribute to human wellbeing, although to date research has largely focused on quantifiable benefits. The less tangible benefits obtained from ecosystems have commonly been referred to as "Cultural Ecosystem Services" (CES). However, challenges persist around the definition and measurement of CES. A short review of literature was conducted to identify key characteristics of CES, challenges to CES research, and lessons learned. Despite ongoing challenges, researchers have applied a range of methods to capture and analyse CES, including non-economic and participatory/deliberative approaches.
Outdoor recreation contributes vitally to human well-being, but spatio-temporal mapping on large scales of this ecosystem service is rarely addressed in a comprehensive manner.
Outdoor recreation in natural and semi-natural environments plays a crucial role for physical and mental health and contributes substantially to human well-being. Especially in areas with high urbanisation rates, land degradation, and growing economic wealth, the demand for recreational environments is growing Green spaces within or close to urban agglomerations with high population density represent important locations for outdoor recreation activities for many residents. Further, the protected areas are attractive destinations for nature-based recreation and tourism due to their appealing landscapes, access to wilderness and wildlife, and opportunities for outdoor recreation activities like hiking, mountain biking, climbing, etc. The Barnova forest is located near a big urban area (Iasi city, being declared a Natura 2000 site since 2007 for protection of habitats and species. The study site is located in the proximity of Iasi (Romania), namely Natura 2000 site Bârnova-Repedea Forest (ROSCI0135), and it spatial

extent is of 12216 ha. Dacian oak-hornbeam forests and Asperulo-Fagetum beech forests are the two habitat types of community interest. The outdoor recreation of this area plays an important role which will be be evaluate in the near future.

PROTECTED NATURAL AREAS - SOURCE OF ECOSYSTEM SERVICES

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Protected areas safeguard species and habitats, but also provide Ecosystem Services (ES) and quite often simultaneously protect landscape character and associated cultural values. The protected areas are globally important environmental management tools against the effects of human activities, as they support the conservation of marine biodiversity, habitats, ecosystems and the processes within them, as well as resources in a broad sense. However, the application of ES research in the environmental management of protected area has not been elucidated and it still has obvious shortcomings. However, the state of nature within protected areas has been deteriorating, mainly due to agriculture, urban sprawl and leisure activities and unsustainable forestry activities. The critical components of protected areas are therefore not only coverage and composition of ecosystems, but also management and threats abatement. Romania's protected areas network currently covers 23 % of the national territory, a significant increase from the 4.1% protected prior to 1989. The increase occurred over the past 20 years with the creation of 27 National and Natural Parks, and recently of 383 SCIs and 148 SPAs as part of the pan-European Natura 2000 network. Currently, the Natura 2000 network covers 18% of the European Union's terrestrial area, Romania being above average of 23% of the territory's territory. Under Natura 2000 network, there are two types of protection: SCI (Sites of Community Importance), SAC (Special Conservation Area) and SPA (Avifaunistic Special Protection Areas). In many cases the surfaces of the two types of protected areas overlap both with each other and with the surface of the natural and national parks.
For increasing the efficacy of protected areas there is need a regional approach to conserving biodiversity based on spatial prioritization,

rigorous scientific documentation, and a real social acceptance in a close relation with ES. What kinds of ecosystem services does a national park or a nature reserve provide?

PARTICULARITIES REGARDING THE DIGITIZATION OF THE POPULATION AND HOUSING CENSUS IN THE REPUBLIC OF MOLDOVA 2024

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Between 08 April and 07 July 2024, the Population and Housing Census is being held in the Republic of Moldova, it is the 3rd census since the declaration of independence, collecting data on the demographic, socio-economic and cultural characteristics of the population, on buildings, homes and households, all of which have a direct impact on regional and national development policies. The purpose of the census is to provide information of public interest on population and housing for the development, monitoring and evaluation of policies, the argumentation of human development decisions, scientific research and the development of the business environment. For the first time for the censuses in the Republic of Moldova, GIS technologies were widely used to prepare the review base at the level of sectors, buildings and homes. The entire territory was georeferenced and sectorized, using modern technologies, satellite map data and their verification. The CSPro application was used for the census, using the methodology recommended by the UN and EU organizations. The review is done on electronic devices (tablets) with direct data storage on the census server through the CAPI (Computer-Assisted Personal Interviewing) method. For this purpose, but also to ensure maximum coverage, the data collection period was extended to 3 months. At the preparation stage, but also for data processing, administrative data were also used. The staff trained in reviewing was reduced to approx. 5000 compared to approx. 14500 in the 2014 census. The ecological impact through the use of digital technologies is including the saving of tens of tons of paper that would have been used for surveys. The development of the census application is carried out in CSPro (Census and Survey Processing System) - a software for digitizing, entering, editing and tabulating survey and census data. CSEntry is the data collection component that can be run on Android and Windows operating systems. CSWEB is a web application that allows users to securely transfer collected

surveys between client devices running CSEntry and a web server. Thus, the Population and Housing Census of the Republic of Moldova 2024 is the first to use GIS technologies, ensuring a better coverage of buildings and housing and excluding overlapping census sectors. The particularities of data collection and monitoring ensure the increase of the quality of the collected data because the data can only be collected on site, at a maximum distance of 150 meters, and the monitoring is in real time. The use of GIS technologies allows the dissemination of data at any level of geographic detail, provided that statistical confidentiality rules are respected. For the 2024 Census, 7857 Census Sectors were delineated and grouped into 3885 tasks for enumerators. Digitization comes to store statistical information at the most practical level of field data, to reduce processing, dissemination as much as possible and to ensure the best possible protection of personal data. From the demographic perspective, the review process represents an extremely important segment regarding the planning and provision of policies and development programs useful to citizens' needs for sustainable development in the context of pre-accession to the European Union.

OPTIMIZING BIOMETEOROLOGICAL COMFORT IN URBAN PEDESTRIAN ZONES: MITIGATION SCENARIOS TO REDUCE BIOMETEOROLOGICAL DISCOMFORT

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Urban pedestrian zones are vital spaces for social interaction and recreation but are often subject to biometeorological discomfort due to factors like heat stress and poor air quality. This study explores strategies to enhance biometeorological comfort in such areas through mitigation scenarios by using Envi-Met software. By employing advanced modeling techniques and urban planning strategies, we evaluate the effectiveness of various interventions aimed at reducing discomfort levels. Our findings highlight the significance of green infrastructure, shading elements, and ventilation strategies in optimizing biometeorological conditions in urban pedestrian zones. These mitigation scenarios offer valuable insights for urban planners and policymakers to create healthier and more comfortable urban environments.

INTERPRETAREA NATURII - INSTRUMENT PENTRU ÎMBUNĂTĂȚIREA GRADULUI DE CONSERVARE A ARIILOR NATURALE PROTEJATE DIN JUDEȚUL IAȘI

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Indiferent de categoria de arii naturale protejate (exceptând rezervațiile științifice - corespondente categ. I. IUCN), printre obiectivele de management ale unei arii protejate, vom regăsi întotdeauna activitățile educative. Într-adevăr, ariile protejate pot deveni și în România și de ce nu și în județul Iași adevărate „unelte" de modelare a caracterelor prin activități de interpretare a naturii. Educația pentru natură și în natură este una dintre principalele activități care pot pune în valoare ariile naturale protejate, ridicând gradul de înțelegere al vizitatorilor și într-un final conducând la sporirea acceptarii acestora, aprecierii și implicării în activități de protecție a mediului, conservare a biodiversității sau chiar și doar la o folosire mai rațională a resurselor și înțelegere a impactului ființei umane pe această planetă. Traseele tematice bine concepute și realizate pot deveni instrumente valoroase de educație pentru mediu, lecții în aer liber și călătorii interactive. Parcurgerea unui traseu tematic este un mod plăcut și totodată educativ de petrecere a timpului liber; interpretarea naturii se poate transforma într-un mic laborator în aer aer liber pentru susținerea unor ore din curricula școlară. Traseele tematice Poiana cu Schit - natură, cultură, spiritualitate, Potecile stejarilor de la Mârzești și Darurile pădurii reprezintă doar primii pași concreți pentru a trece la nivelul următor!

PRINCIPIILE DE ORGANIZARE A ALEGERILOR ÎN REPUBLICA MOLDOVA

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Organizarea alegerilor reprezintă unul dintre pilonii de bază ai democrației, asigurând cetățenilor dreptul fundamental de a-și exprima voința și de a participa activ la procesul politic. În Republica Moldova, ca și în alte state democratice, procesul electoral este reglementat de legislație și se desfășoară conform unor principii fundamentale care urmăresc să

garanteze corectitudinea, transparența și echitatea alegerilor. Principiile de organizare a alegerilor sunt fundamentale pentru menținerea integrității sistemului democratic și pentru asigurarea unui proces electoral legitim și credibil. Aceste principii servesc drept ghid pentru autoritățile electorale și pentru toți actorii implicați în procesul electoral, asigurând respectarea drepturilor cetățenilor și promovând o competiție politică sănătoasă și echitabilă.

THE IMPACT OF INCLUDING GREEN PEAS IN THE DIET OF COMMON CARP CULTIVATED IN RECIRCULATING AQUACULTURE SYSTEM

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Aquaculture is the fastest growing food sector. Since feed represents more than 50% of the total production cost, the aim of this study is to investigate the effect of an innovative diet for carp with a varied pea content on production parameters, meat quality and oxidative stress as well as on quality the water. The study was carried out in a recirculating aquaculture system known for its ability to conserve water and reduce waste water.

INCLUSIVE NATURE-BASED SOLUTIONS. A EUROPEAN PERSPECTIVE

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Nature-based solutions (NbS) have multiple benefits, such as better environmental quality, economic growth, and social cohesion. However, they can create uneven landscapes when the interests of marginalized groups are not considered. This question the issue of NbS's inclusivity, which is underrepresented within the NbS literature. As part of a project that addresses inclusive climate actions for nature-based solutions, this study presents a review of the literature on inclusive NbS in European cities. We searched for academic literature published in Web of Science and Scopus databases and developed a search string that crosses both

environmental and social domains. The revised literature is organized into principles that support inclusive NbS (such as co-design), barriers, and enablers for inclusive NbS. European case studies of NbS are then examined to sketch lessons that can be learned for inclusive urban NbS practices. We further discuss the key parameters that characterize inclusive NbS and their importance in supporting a larger focus on community involvement and institutional resilience.

MANAGING SEDIMENT DYNAMICS IN GHAR EL MELH: USING A NATURE-BASED SOLUTION TO PROTECT THE COAST FROM EROSION

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Coastal erosion is a major and widespread problem affecting many coastal regions around the world, including Ghar El Melh. To combat this phenomenon, nature-based solutions, such as the Rouseauvelle project, offer sustainable and effective alternatives to traditional methods. This study explores the application of the Rousseauvelle solution to strengthen the coastal zone of Ghar El Melh. Using innovative ecological restoration techniques, such as planting stabilising vegetation and building natural structures to dissipate wave energy, Rouseauvelle aims to reduce erosion, restore marine habitats and protect local communities. Preliminary results show a significant reduction in erosion and an improvement in coastal resilience, underlining the importance and effectiveness of natural solutions for coastal zone management.

CORRELATION BETWEEN LAND USE AND GEOMORPHOLOGICAL PROCESSES IN CUBOLTA RIVER BASIN (REPUBLIC OF MOLDOVA)

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The paper claims to evaluate geomorphological processes in the Cubolta River basin, based on data obtained from orthophoto 2016 using ArcGIS 10.4.1 software and ground survey using GPS. As a result, the following maps for Cubolta River basin were created: Landslides, Ravines and Surface erosion. In addition, the density of landslides and ravines for small river basins were determined. As the result of this study, the map of damage gradation of small river basins by geomorphological processes is presented. As well with the help of ground survey using GPS we could determine if the surfaces of geomorphological processes delimited on the orthophoto correspond to the reality in the field.

DREPTUL LA UN MEDIU SĂNĂTOS - DREPT SUI GENERIS ÎN CADRUL CATALOGULUI CEDO

Gheorghe DURAC, Simina-Georgiana DURAC

Alexandru Ioan Cuza University of Iasi

Prezenta lucrare își propune să analizeze în detaliu acest drept fundamental, explorând evoluția consacrării sale juridice, conținutul și caracteristicile specifice, precum și jurisprudența relevantă în domeniu. De asemenea, lucrarea va aborda problematica protecției juridice a principalilor factori naturali ai mediului la nivel internațional și european, ca premisă esențială pentru asigurarea exercitării efective a dreptului la un mediu de calitate. Dreptul fundamental la un mediu sănătos și echilibrat din punct de vedere ecologic poate fi analizat din două perspective principale. Dintr-o perspectivă individuală, "umană", acest drept presupune protejarea vieții, sănătății și dezvoltării omului prin asigurarea unui mediu nepoluant și echilibrat. Dintr-o perspectivă colectivă, "naturală", dreptul la un mediu de calitate impune omului un comportament axat pe protejarea mediului natural, pentru a asigura un mediu de viață favorabil existenței pe planetă. Acest drept fundamental al omului a fost consacrat în mod treptat atât la nivel mondial, cât și la nivel european și național, în recunoașterea importanței cruciale a unui mediu de viață curat și echilibrat pentru existența și evoluția umanității.

MULTIANUAL ASSESSMENT OF VEGETATION IN BÂRNOVA FOREST USING REMOTE SENSING AND GIS ANALYSIS

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This study presents a detailed evaluation of vegetation dynamics in Bârnova Forest, utilizing Sentinel-2 satellite imagery collected over a six-year period (2018-2023). The analysis focused on calculating and interpreting vegetation indices for different seasons (spring, summer, autumn) to assess seasonal and annual variations in vegetation health. GIS data, including information on tree species and land use, were integrated to correlate the satellite data with local vegetation characteristics. The results of this analysis provide a perspective on the dynamics of forest vegetation across seasons, highlighting both areas of dense, healthy vegetation and those with low vegetation. Understanding the spatial distribution of vegetation health in this ecosystem is necessary for informing sustainable forest management practices.

EFFECT OF DROUGHT IN TRIBUTARY STREAMS OF THE ALIBORI AND SOTA RIVERS ON THE STRUCTURE AND DIVERSITY OF THE BENTHIC MACROINVERTEBRATE COMMUNITY IN NORTHERN BENIN

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The aim of this study was to assess the impact of climatic variation on five streams (Bouli, Irané, Tassiné, Sanson and Yassikoga) tributary to the Alibori and Sota rivers in the cotton basin of northern Benin and the structure and diversity of the benthic macroinvertebrate community. Data on benthic macroinvertebrates were collected before and after the beds at

the study stations were dried out. The benthic macroinvertebrate samples collected were identified in the laboratory. Taxonomic abundance, taxonomic richness, the Shannon diversity index and the Piélou equitability index were calculated to determine the structure and dynamics of the benthic population before and after drying. This study collected 2926 benthic macroinvertebrate individuals belonging to 58 families before dewatering and 2133 individuals belonging to 49 families after drying of the study stations. The decrease in taxonomic abundance (number of inviduals), taxonomic richness (number of families) and the low values of the Shannon and Piélou diversity indices after drying up compared with before drying up reflect the effects of drought on the structure and diversity of benthic macroinvertebrate communities in the Alibori and Sota rivers in northern Benin. The high density of Oligochaetes after drying is characteristic of their ability to recolonise the environment and resist drought.

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