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Book of accepted abstracts

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PREFACE

The Book of Abstracts was created based on the free submission of proposals by the corresponding authors and the preliminary acceptance from the scientific reviewers. The authors and coauthors sentfurther, voluntary,the full papers, and the copyright declaration, for final revision, and signed up for the conference program.

Only revised papers are included in the peer reviewed Conference Proceedings (ISBN 978-606-35-0238-5).

By this way, we express the gratitude versus Mrs Carmen MATIUTI, who completed, in a proper form, this Book of Abstracts, and supported thus the Conference organization.

The Book of abstracts is available on line, on the conference web site (http://glorep.upt.ro), but this does not necessary mean that all papers included are also retained for the Conference proceedings. A glossary of all authors is included at the end. The organizers do not assume the content proposed by the authors, by any means.

By this opportunity, we thank all contributors for sending papers based on their research and thus contributing to the success of the Conference, and we appreciate their active participation and personal involvement.

GLOREP2018 Congress Chair

11.06.2018

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IRON OXIDE NANO PARTICLES DOPED MULTIWALLED CARBON NANOTUBES

Thamer Adnan ABDULLAH, Tatjana JUZSAKOVA, Endre DOMOKOS, Ali SALMAN, Mohammed AL-ASADI, Roquia RIZK

Iron oxide nano doped multiwalled carbon nanotubes (MWCNTs) have been consideredas ones of the best adsorbents for hydrocarbon removal from surface waters as compared to parent multiwall carbon nanotube and modified multiwall carbon nanotube. Carbon nanotubes attracted the attention of several researchers in nanoscience because of their high surface area and excellent sorption properties. Many works were done in this field and the authors focused on the hydrocarbon removal efficiency of the surface modified/functionalized MWCNTs and adsorption capacity of the MWCNTs. The functionalization of the MWCNTs has been studied by nano metal oxide deposition onto the surface of the MWCNTs. The surface features were correlated with the hydrocarbon removal efficiencies of the functionalized MWCNTs from surface waters. Iron doped MWCNTs have been tested to adsorb model hydrocarbons and kerosene cuts from waters in this work. XRD, BET techniques were applied for newly prepared adsorbents to characterize the morphological properties of the new preparations. XRF technique was used to identify the nano metal oxide particles on the surface of MWCNTs.

TREATMENT OF OILY WASTEWATER USING ELECTROCOAGULATION METHOD WITH IRON POLES

Thamer Adnan ABDULLAH, Ali SALMAN, Tatjana JUZSAKOVA, Mohammed AL-ASADI, Endre DOMOKOS, Roquia RIZK

The Chemical oxygen demand (COD) removal from oily wastewater has experimentally investigated employ electro coagulation EC operation to consideration the performance of the electrochemical techniques to handle oily wastewater with batch reactor. The oily effluent has been selected in this study because it includes hydrocarbon compounds, suspense solids, sulfides, ammonia, heavy metals, etc. In the EC of oily wastewater, the influences of primary pH, electrolysis time, current density was to be thoughtful. The electrolytic cell consumed 2L cylindrical glass reactor with magnetic stirrer. Iron is applied as anode and cathode. The actual area of the anode is 45 cm2. The batch experimental outcome revealed that COD in watery phase has been effectively removed with Iron as anode. The COD removal efficiencies approach to 86 % with the current density of 9 mA/cm2, electrolysis time of 60 min and pH 7.7.

GREEN ICTS AND GREEN REGIONAL POLICIES: A SUSTAINABILITY APPROACH

Zacharoula ANDREOPOULOU

Throughout the modern world, sustainability has become the focus policies in national, international and global level in the context of environmental protection, quality of life, climate change mitigation and energy sustainability. Natural resources are continually reduced, energy efficiency is not an optimist perspective and climate change has been scientifically proved, therefore, it is important for public stakeholders and policy carriers to enable sustainable environmental management strategies to challenge these issues and further regulate their use. Green Information Communication Technologies, are defined as ICT approaches, such as smart tools, methodologies, services and technologies, in the context of green policies, a combination of green practices of ICTs and green behavior. These green policies can now embrace a dynamic role offering an innovative approach for sustainability. Especially in EU green policies, Internet of Things and ICTs are employed in various solutions and provide motivation in sustainable environmental management, energy strategies, measures and incentives for green energy, bio-electric energy, etc in the roadmap to a green society by 2050. Although harmful themselves, ICTs constitute the tool for sustainability towards a low carbon economy.

CONCENTRATION LEVELS OF PHARMACEUTICALS AND THEIR METABOLITES IN WASTEWATERS AND SURFACE WATERS BY USING LIQUID CHROMATOGRAPHY COUPLED TO HIGH-RESOLUTION-ORBITRAP MASS SPECTROMETRY

Triantafyllos ALBANIS, Christina KOSMA, Christina NANNOU, Vasiliki BOTI

Detection of pharmaceuticals in the environment has raised concerns in recent years. Nowadays, the higher prevalence of psychiatric disorders led to a worldwide increased number of prescriptions for psychiatric pharmaceuticals. After intake, these highly active compounds undergo metabolic transformations, with subsequent excretion of their active metabolites to raw sewage, wastewater treatment plants (WWTPs) and consequently to surface waters [1]. Since WWTP have been pointed out as the main contamination pathway of pharmaceuticals (and consequently for antidepressants) into the environment, it seems that often only partial removal is achieved in biological treatment processes [2]. In the present study, the distribution of nine psychiatric drugs (fluoxetine, sertraline, venlafaxine, olanzapine, quetiapine, mirtazapine, clozapine, bupropion and paroxetine) and four of their metabolites (norfluoxetine, N-Desmethyl Sertraline, O-Desmethylvenlafaxine and N-Demethyl Olanzapine) in surface waters and wastewaters in Greece was determined. More specifically, an off-line solid phase extraction followed by UHPLC-LTQ-Orbitrap-MS methodology, in positive ionization mode, was applied. Isotope dilution was implemented for every analyte using labeled standards (fluoxetine D5 and olanzapine D3). A number of studies have demonstrated that isotope dilution is a preferred approach in order to alleviate matrix interferences as well as SPE losses and instrumental variability [2-3]. In order to optimize the extraction method, three different cartridges were tested, SDB-1, Oasis MCX and Oasis HLB, and the results showed that most of the compounds exhibited higher recoveries using Oasis HLB.

LAND SUITABILITY FOR SLUDGE APPLICATION FROM THE WASTEWATER TREATMENT PLANT OF THE BUZAU CITY

Amelia ANGHEL, Petru IGNAT, Andrei VRINCEANU, Victoria MOCANU

Urban wastewater treatment plants produce large quantities of sludge which were used only very rarely and only after a long storage period. These residual waste materials are largely known as sources of environmental pollution, and not as sources of nutrients for soil and plants. Having a complex composition, according to the activities that produced them: industry, street sewage, households, etc., the use of sludge presents several drawbacks: specific fecaloid odor, high content of pathogens, high content of pollutants, high humidity, etc. The reintegration into the environment of the sludge from the wastewater treatment by applying it to the agricultural land, and protecting the environment, is largely used. For this, there is a strict legal framework both at European level (86/278 / EEC) and at national level (Order 344 / 16.08.2010) regulating the use of sludge in agriculture. Using land-use criteria for the application of sludge, a complex soil survey study was carried out on the study area for the application of the sludge. The results highlight that the studied land area is suitable for the application of sludge from the Buzau wastewater treatment plant.

EUROPEAN EDUCATION THOUGHT PROJECTENDIS

Carmen BALABAN, Elena NECHITA, Dumitru TODOROI

Purpose consists in presentation of theProject RO-MD of European Business Education ENDIS, analysis and substantiation of the objectives assumed by the Republic of Moldova and Romania through the Association Agreement between the Republic of Moldova and the European Union.
The general objective of the project ENDISis to support the economic development on both sides of the Romania-Republic of Moldova border, through building a joint network of educational institutions (universities, high-schools and secondary schools) to pilot a programme on entrepreneurial education and digital education. The network will act as a promoter of a curriculum that includes high-quality, innovative extra-curricular activities, oriented towards entrepreneurial education and digital education. This approach, aiming to provide the young generation with solid entrepreneurial and digital skills, can be considered an investment in education, representing a premise for the economic initiatives that the future graduates will manifest. The final beneficiaries of this programme are secondary school pupils, high-school students and university students, who are going to act on the labour market in the years to come. They are expected to develop new businesses, in the benefit of their own families, communities and regions. The joint educational network will include public universitiesfromn Romania and The Republic of Moldova, high schools, and secondary schools, all of them located in the programme area. The network will be developed within a timeframe of 18 months, and continue to act at least 3 years after the lifetime of the project.Next Specific objective of the project:Setting and development of a joint educational institutions network. To achieve this objective, the following are to be accomplished:A general agreement to include all the educational institutions involved in ENDIS, specifying all the issues to be considered in the framework of the project; Definition of the Charter of the network, by all the educational institutions involved in ENDIS, specifying the terms for the network extension, during and after the lifetime of the project; Promotion of high-quality education, exchanges of

experience, and transfer of good practices during the joint activities developed within the framework of ENDIS and Promotion of the educational network, in order to make its goals known to the academic environment and to other stakeholders.One more Specific objective of the project:Implementation of a programme of extra-curricular activities, oriented towards entrepreneurial education and digital education, in all the member institutions of the network. The programme will trainhigh-school teachers, secondary school teachers, university students, high-school students, and secondary school pupils. To achieve this objective, the following are to be accomplished:Preparation of the support materials for the educational programme; Selection and training of the mentors in the high-schools and in the secondary schools of the network, based on transparent rules and regulations and Implementation of an innovative programme of extra-curricular activities in the educational institutions of the network, meant to provide information and knowledge on entrepreneurship and ICTs, to stimulate the creativity of the participants and their desire to become entrepreneurs in the informational society.Last Specific objective of the project:Connecting the educational network and the educational programme with the business community. To achieve this objective, the following are to be accomplished: Identification of at least 6 project stakeholders (3 in Romania and 3 in Republic of Moldova), such as: local and/or regional authorities, professional associations, NGOs, SMEs; Involving them in providing support to the educational institutions of the network, during the lifetime of the project; Realization of (at least) 6 collaboration agreements between the members of the educational network and stakeholders in the business sector (3 in Romania and 3 in Republic of Moldova)and Identification of the best ways for future collaborations of stakeholders with the network.The submitted Project ENDIS represent a sub-project performed under the Project „Anti-migration management in the rural sector of the Republic of Moldova" that is developed in the period 2015 - 2020 by the team of AESM and supporters.

AN EFFICIENT TECHNOLOGY FOR CONSTRUCTION RECYCLING

Corneliu BOB, Remus CHENDES

Recycling is defined as the process that changes materials into new products for preventing the waste of potentially useful materials, reducing the consumption of fresh raw materials, the energy usage and the air and water pollution. The advantages of using RCA at the fabrication of concrete are of economic values and environmental issues; the wastes from construction and demolition works are of large volume and are still increasing. To prevent this issue, sustainable concrete construction is one of the strategies to be considered by the construction industry.

ESTIMATION OF THE ABSOLUTE CLOUD FRACTION FROM RADIOMETRIC DATA

Sorin BOJIN, Marius PAULESCU

The geometrical properties of an effective cloud field may be described in terms of the absolute cloud fraction and cloud aspect ratio. This paper proposes a simple method for estimating the absolute cloud fraction from radiometric data. Basically, the method is routed on tracking the probability of a clear line of sight. The relationship between the absolute cloud fraction and point

cloudiness is discussed. The study is conducted with high resolution (15 seconds) radiometric data recorded on the Solar Platform of the West University of Timisoara, Romania.

A LONGITUDINAL ANALYSIS ON CUSTOMERS' PERCEPTION ON SOCIAL RESPONSIBILITY

Cristina BORCA, Anca DRAGHICI, Larisa IVASCU, Iudit BERE SEMEREDI

The descriptive analysis (based on a longitudinal analysis of the available data from four surveys developed in 2005-2015) aims characterize the customers' perception on social responsibility dimensions in the case of the water company Aquatim located in Timisoara, Romania. This is the basis for the communication strategy definition for its efficiency increasing from both perspectives: (1) customers, community, and (2) company. The theoretical and experimental approach characterizes aspects of customers' ecological awareness and satisfaction that have impact on redefining social responsibility policies of the company.

CUSTOMERS' PERCEPTION ON SOCIAL RESPONSIBILITY. A PROPOSED APPROACH

Cristina BORCA, Anca DRAGHICI, Larisa IVASCU, Iudit BERE SEMEREDI

Currently, water and sewer companies face the challenge of improving customers' satisfaction, simultaneously with their awareness on environmental issues. Results provided by surveys are essential for environment management and to monitor customer perception on services quality of water companies. However, their activity is strongly linked with social responsibility because they provide vital services to communities. This study proposes an innovative approach based on a longitudinal study that makes possible to compare the customers' perception on the provided services that have been linked with social responsibility dimensions, in the case of a water company Aquatim, Timisoara, Romania. The proposed research scenario is useful for improving the communication strategy when developing social responsibility activities and actions that prompt services quality improvements.

GREEN AIRCRAFT MINIMUM FUEL CONSUMPTION METHODOLOGIES

Ruxandra Mihaela BOTEZ

In this abstract, two sub-projects will be presented in the area of morphing wing for green aircraft technologies development. In both projects, a different morphing wing was designed and manufactured with the aim to reduce drag and to delay the flow transition, therefore the fuel consumption; the morphing wing was equipped in both sub-projects with piezoelectric pressure sensors. The morphing wing shapes were changed using different types of actuation systems, as detailed for each sub-project: 1) classical wing-box equipped with smart material actuators, and 2) regional jet wing equipped with in-house electrical actuators. The multidisciplinary (aerodynamics, structural and controls) research methodologies and results will be presented. Comparison of results obtained on both sub-projects will be compared. The advantages and disadvantages will be highlighted.Both sub-projects are realized in collaboration with Canadian

partners such as Bombardier, Thales, and Ecole Polytechnique teams, while one of them, is international, being realized also in collaboration also with Italian partners from University of Naples and CIRA.

DYNAMIC MEASUREMENT PROCEDURE OF ROAD LIGHTING APPLIED TO STREET LIGHTING IN THE MUNICIPALITY OF RESITA, ROMANIA

Daniel BREBENARIU

This research paper presents a method of measuring road lighting in a dynamic regime using a data acquisition system. The measurements made were the subject of a pilot project initiated by the City Hall of Resita with the support of the URBIO LED Company of Iasi, Romania. The light sources analyzed are two types of luminaires from different manufacturers and are equipped with environmentally friendly and energy-efficient LEDs. Some of the LED lighting units analyzed are equipped with a telemanagement system that represents the City of Resita one of the smart city components. Graphical representations of the variation of the illumination in the dynamic regime were obtained, namely the car's performance, and a comparative analysis of the results obtained with the results of the design with the DIALux specialized software, respectively with the provisions of the international standard for road lighting and adopted in Romania SR EN 13201: 2016, for the lighting class in which the street on which the illumination measurements were made. The maximum values obtained are above the values calculated with the DIALux program, and with a good correlation between the static and the dynamic (automotive) measurements.

COMPARATIVE STUDY OF LUMINANCES IN STREET LIGHTING LUMINAIRES EQUIPPED WITH HIGH PRESSURE SODIUM (HPS) AND LED LAMPS

Daniel BREBENARIU

This research paper presents a comparative study of the results obtained by measurements of luminances made on the Republic Street, which is the most important traffic road in the city of Resita, Caras-Severin County, Romania. The measurements made were the subject of a pilot project initiated by the City Hall of Resita with the support of the "Eftimie Murgu" University of Resita, Faculty of Engineering and Management. Lighting measurements have been carried out in accordance with the provisions of the international standard adopted in Romania SR EN 13201-4: 2016, both for lighting units equipped with HPS and LED lamps. Lighting fixtures equipped with HPS lamps have been the subject of a modernization project built in 2006, and those equipped with LED lamps were installed in 2013 as part of a pilot project to implement intelligent lighting as a component of the smart city. Also, at the initiation of the pilot project, both energy efficiency and pollution reduction were taken in account and in accordance with the current European Union directives. In the study, the results obtained by the luminance measurements were compared with the performance requirements presented in the standard SR EN 13201-2: 2016 for the class of lighting in which the street is located. In conclusion, street-lighting luminaires equipped with LED lamps are much better compared to those equipped with HPS lamps, both in terms of measured luminances.

NITROGEN USE EFFICIENCY AT FARM LEVEL

Irina CALCIU, Monica DUMITRAŞCU, Lavinia BURTAN

Nitrogen is essential for life and plays a key role in food production. Nitrogen is the most important crop-yield limiting factor together with water. That is why farmers apply animal manures, compost and nitrogen based fertilizers to cropland. They grow also nitrogen fixing crops, such as beans, peas, and clover, and/or nitrogen fixing trees in agroforestry systems. With increasing nitrogen input, there is an increase in the risk of nitrogen losses to groundwater, surface water and the atmosphere, which is harmful to biodiversity, the functioning of ecosystems and potentially to human health. Nitrogen may accumulate in crops and soils to toxic levels. The management of nitrogen is therefore important. However, nitrogen management is not easy, because the nitrogen cycle is complex and nitrogen is easily lost from the farm into the environment. Indicators can play a key role in management. Nitrogen use efficiency (NUE) is such an indicator. This indicator is based on the mass balance principle by using nitrogen input and nitrogen output data for its calculation: NUE = nitrogen output / nitrogen input. The paper presents a case study for nitrogen use efficiency indicator calculation at farm level. N input was evaluated by taking into account the soil mineral nitrogen content before sowing and the nitrogen fertilization during the soil tillage works. Nitrogen output was evaluated by taking into account the nitrogen exported with the obtained crop yield. The tested plant was rape for oil. The results obtained showed that the nitrogen use efficiency indicator was low, 15%, in case of organic fertilization (about 180 t/ha/year of fresh pig manure) and mineral fertilization (36 kg N/ha from complex fertilizer 20:20:0) application. This is a result of uncontrolled organic fertilization which led to accumulation of nitrogen in soil in high quantities, apparently with high risks of surface runoff or leaching on the soil profile depth to the groundwater. However the nitrogen leaching is reduced in this case, because of the soil type, which has a compact clayey layer with low water permeability at 40-50 cm depth. The soil mineral nitrogen content after harvesting was 447 kg/ha, from which 50% may be available for the next crop. The nitrogen use efficiency indicator ranged within the optimum values, 48%, in case of mineral fertilization with the same rate but without organic fertilization. The higher value of the nitrogen use efficiency indicator was a result of the lower soil mineral nitrogen content before sowing.

SALMONELLOSIS IN CONSTANTA COUNTY OF ROMANIA – RETROSPECTIVE ANALYSIS OVER 8 YEARS

Simona Claudia CAMBREA, Simona DIACONU, Elena DUMEA, Irina Magdalena DUMITRU, Dalia Sorina CARP, Anca DUMITRESCU, Stela HALICHIDIS, Sorin RUGINĂ

Even water is essential for life on earth sometimes people can acquire waterborne illnesses.[1] Salmonellosis is a common bacterial infection that affects the intestinal tract. Salmonella bacteria live in the gut of humans, animals and birds and is transmitted by feces. People become infected most commonly by contaminated food and water.To evaluate the evolution of Salmonellosis in Constanta County of Romania, region situated in South – East part of the country, in a period of 8 years. In a studied period were hospitalized 335 cases of Salmonellosis. From total, just two cases (0.59%) were with Salmonella typhi in adults who worked abroad, and the rest of 333 were with Salmonella non-typhi. From the total number of cases just 10 cases (2.9%) were with Sepsis the

other 325 cases (97%) were with Enterocolitis. The average age was 25 years and majority of patients were male 172 (51.34%), from urban area 199 (59.4%). From the total of cases, 179 (53.43%) were children aged less than 14 years old. Regarding repartition by years we noticed 54 cases in year 2010, 54 cases in year 2011, 14 cases in year 2012, 23 cases in year 2013, 52 cases in year 2014, 64 cases in year 2015, 39 cases in year 2016 and 35 cases in year 2017.

STUDY ON THE PROPER DESTINATION FOR THE CHAR (FIXED CARBON) FROM WASTE TIRES PYROLYSIS

Xhaklina CANI, Ilirjan MALOLLARI, Xhino HYSENI, Luljeta PINGULI

There has been great interest on alternative treatment processes for waste tyres, amongst which is the use of pyrolysis technology. Pyrolysis is the thermal degradation of the organic components of the tires, at typical pyrolysis temperatures of 500°C to produce oil, gas and char as main co-product. The solid char consists of the carbon black filler and also char produced during the pyrolysis of the rubber. It may be used as a solid fuel, as a carbon black or upgraded to produce an activated carbon. In this paper it is presented the characterization of the solid carbonaceous fraction. We have studied these characteristics such as: total moisture, particle size distribution, ash content, volatile matter, fixed carbon, total sulphur and the net calorific value. The resulted value for the calorific value indicates that this pyrolytic carbon is suitable as an alternative solid fuel. Also, we evaluated the treatment method to transform it into active carbon due to the fact that the most of the actual references in the literature shows that the most immediate uses of the pyrolitic carbon is the production of activated carbon. Other applications can also be as filler in road pavement, printing pigment or as reinforcing filler for low-value rubber goods. Besides the high amount of carbon (> 60%) the pyrolytic carbon continues being a very heterogeneous material regarding the ash content, particle size, etc. This is because the complexity of the pyrolysis process which modify the initial characteristic of the pyrolytic carbon.

INFLUENCE OF AEROSOL ON PV PERFORMANCE IN ROMANIA

Delia-Gabriela CĂLINOIU, Gavrilă TRIF-TORDAI, Ioana IONEL

The paper is focused on influence of aerosol on the photovoltaic (PV) performance in Romania. An aerosol loaded atmosphere has an impact on reducing the amount of solar radiation. The study is based on the aerosol data (such as: aerosol optical depth, Angstrom parameter, size distribution, single scattering albedo, asymmetry factor) measured on the ground, taken from AERosol Robotic NETwork (AERONET) and aerosol data measured from the satellite provided by MODIS (Moderate Resolution Imaging Spectroradiometer). By taking data for photovoltaic energy production from Transelectrica website, several days are analyzed when the aerosol in the atmosphere is present. Also, by running the HYSPLIT model (Hybrid Single Particle Lagrangian Integrated Trajectory), the source of aerosol origin is founded.

THE SYNERGIE OF THE AGRICULTURAL LANDSCAPE AND ARCHAEOLOGICAL HERITAGE AS ANELEMENT OF HISTORICAL URBAN IDENTITY IN IZNIK (TURKEY)

Canan CENGİZ, Bülent CENGIZ

Cities are the expressions of the cultural, social and economic structures of people in space. Anatolian lands that have been selected as settlement areas since the Prehistoric Ages until today have rich historical and cultural data. The reflection of the rich historical structure of our country to the current cultural values increases spatial attractiveness. The town of Iznik that has been selected as the study area is a town under the governorship of the city of Bursa located in the Marmara Region of Turkey that is located to the easts of the lake known by the same name. Served as a capital city to Seljukian, Byzantine and Ottoman states respectively, Iznik bears exceptional testimony to early examples of cultural, architectural and artistic accomplishment of these cultures. It hosted the most important examples of early church in the history of Christianity. In the meantime, the study area is included in the UNESCO World Heritage Temporary List. Iznik has suitable conditions for the public to earn their living off the land thanks to its convenient climate conditions. Its high suitability for agriculture is due to being located on a fertile plain as well as its abundant vegetation. In addition, the city attracts attention today with its olives and vineyards as well as its special climate and fertile agricultural lands.This paper emphasizes the agricultural landscapes features and archaeological heritage sites as urban identity elements in the city of Iznik. As a result, strategies for the sustainable development of the agricultural and archaeological heritage characteristics of the city as an element of historical urban identity were revealed in Iznik.

COASTAL RESILIENT DESIGN FOR THE GÜZELCEHISAR HERITAGE COAST IN BARTIN (TURKEY)

Canan CENGİZ, Bülent CENGİZ, Öner DEMİREL

In the coastal resilient planning and design of the coastal areas which are treated exclusively with their natural and cultural resources; developing strategies suitable for the definition, features and problems of the coast is highly important in terms of their conservation and usage. Alongside with their ecological features, coastal areas own high landscape values that enable multiple spatial solutions like cultural usages for tourism and recreation. Therefore, coastal areas highly contribute to the quality and character of the rural and urban landscape. The geological and cultural significance of coastal areas has led to various national and international designations based on its geology, geomorphology, and landscape and associated habitats. In this context, understanding Geodiversity and Geo-conservation terms has an importance for Coastal Landscape Heritage Project.Turkish coasts are preferred for usage particularly because of their natural beauties, and cultural and historical values; besides, they are face to face with much environmental oppression. Güzelcehisar, which has been chosen as a research area, is within the provincial borders of Bartın located in Western Blacksea Region of Turkey. It is a natural bay in the west of and 17-km away from Bartın city center. Güzelcehisar Bay is a First Degree Archaeological Site (Güzelcehisar Castel), and First Degree Natural Protected Area. Due to its volcanic structure, Güzelcehisar, which stands out with its natural and cultural landscaping features, owns special

80-million-year geomorphologic formations in its coastline which have the characteristic of nature monument called "Lava Columns". In Turkish Tourism Strategy 2023, planning, investment, organization, service quality, improving transportation and infrastructure, diversifying tourism, etc. have been set as 5-year development plan aims. In this scope, a landscape application project has been developed where access to lava columns is possible throughout the land, the tourism and recreational activity infrastructure in the coastline is developed and resilient coastal landscaping with rural characteristic is maintained. In the scope of the project, a wooden platform road that will start with the view terrace on First Degree Archaeological Site on the north side of Güzelcehisar Bay and that will go alongside the beach is connected to a rocky island on the sea and access to the Lava columns in the southern part of the Bay. In this paper, coastal resilient design suggestions have been developed to evaluate the lava columns focusing on sustainable tourism as coastal geological heritage areas.

ASPECTS REGARDING INDUSTRIAL PLATFORM TIMIŞOARA SOLVENT

Cristina CERCELARU, Daniela Ionela CIOLEA

The research took place in February 2018. It is noted that there are no facilities on the site as defined in HG no. 804/2007. The Solventu industrial platform is currently full, loaded with debris, construction waste, vegetable wastes, household waste, rubber wastes, and glass wastes, waste from the septic tank etc. We have identified soil misalignments resulting from chaotic excavations on site in search of underground facilities. From the historic building, (1868) there is a single wall in brick waste, the broken tile, and so on. There are damp areas of precipitation water accumulated between building debris, where aquatic ecosystems develop with aquatic biocenosis (aquatic vegetation, frog silk, frogs, etc.). As far as hazardous substances are concerned, they do not exist in the installations, as the installations no longer exist being demolished and dismantled. But on the platform, on the ground, on the ground, some areas could be observed where there was glass wool resulted from the dismantling of the pipelines, installations, and on the location of the store were identified large degraded bags filled with something "silica". Then, at the former plasticizing stations, oil films, hydrocarbons floating over meteoric water accumulated over time could be observed. Approximately 70% of the platform's surface is predominantly invasive vegetation - shrubs, but also nuts, various trees and perennial vegetation. It is recommended to remove, remove the debris, concrete bodies, etc. and ecological rehabilitation of the area.

STUDIES CONCERNING THE PHYTOREMEDIATION OF SITES DEGRADED BY MINING ACTIVITIES WITH ROBINIA PSEUDOACACIA

Adriana Mihaela CHIRILĂ BĂBĂU, Valer MICLE, Gianina Elena DAMIAN, Ioana Monica SUR

Thepresent study aimed at evaluating, at laboratory scale, the seed germination rates of the Robinia pseudacacia in various solutions and amendments in order to determine its capability to be used in phytoremediation of sterile material taken from the "Radeş" dump from Alba County. Prior the experiments a total of eight amendments were prepared with various types of homogeneous materials that were placed in pots: sterile material from "Radeş" dump, soil from a

non-industrialized mountain area (Cotorăşti village, Alba County) and dehydrated sludge from the Someş wastewater treatment plant from Cluj Napoca County. Some pots were watered with KH_2PO_4 99.5% and others with enzymatic solution. Results indicated a germination rate of 90% in the amendment made of sterile material (500 g) + unpolluted soil (500 g) + enzymatic solution. The smallest seed germination rate was reported in experimental variant of sterile material covered with dehydrated sludge. The control variant with unpolluted soil did not show a germination rate of more than 50%. Also, the roots, stems and leaves of the white acacia have developed much better in variant that were watered with enzymatic solution and potassium monobasic phosphate KH_2PO_4.

USE OF DIFFERENT SOURCES OF PHOSPHORUS IN AGRICULTURE

Traian CIOROIANU, Carmen SÎRBU, Ana Maria STĂNESCU, Mihail DUMITRU, Nicoleta MĂRIN, Adriana GRIGORE

At present, the major source of phosphorus used in fertilizers is phosphate, which we use in large quantities, more than can be replaced by the very slow geological cycle and nearly all phosphate fertilizers are manufactured from naturally occurring phosphorus containing minerals.The actual use of phosphorus is inefficient in several stages of the life cycle, causing water pollution and the wasting of a wide range of associated resources.It was estimated that only 15% to 20% of P in fertilizer is actually taken up by crops because fertilizers are applied far in excess of plant demand and dynamics of phosphate in soil. In Romania, the largest quantities of fertilizers used are those based on nitrogen (nitrogenous) and those based on phosphorus (phosphate) represent only 28% of total nitrogenous, phosphatic and potash fertilizers. This is due to a low supply of phosphorus-containing fertilizers and high marketing prices.In the scientific environment there are researches for finding non-polluting alternative sources to satisfy the need for phosphorus in plants and soil.Hydroxyapatite has multiple uses in agriculture, being used as a source of phosphorus, to obtain slow-release fertilizers as well as for removing and/or immobilizing heavy metals.The use of synthesis hydroxyapatite offers the advantage of using a source free of elements can lead to soil, water and plant pollution.Therefore, in recent years extensive research has been achieved for obtaining and characterization of nano-hydroxyapatite complex subsequently processed by the various processes of addition / substitution with various cations or molecules. The products thus obtained have found their usefulness in various *fields such as medicine, industry, environmental remediation. Thus, agriculture benefits from the results of top research that can be adapted to improve soil fertility and increase agricultural yield.*

COMPARATIVE STUDY OF POOR SOILS ROMANIA – GREECE

Carolina CONSTANTIN, Aurelia MEGHEA, Gabriel ZAINESCU, Joannis KALLITSIS, George SYRIOPOULOS

Poor soils contain low nutrients, high salts and low organic matter content. These soils are either too heavy (clay soil which holds nutrients and water but doesn't drain well, and can be hard for plant roots to push through) or too light (sandy soil which drains very well, but means water and

nutrients can just wash away). Generally, poor soils can be improved by adding more organic matter, such as compost.One of the step of INCOMERA project is the comparative study of poor soils (Silty, Terra Rosa - clayey and Clay - calcareous) in two countries Romania and Greece. The authors propose for improve the quality of soils by SMART agrochemical bio fertilizer. Agrochemical soil evaluation before and after treatment regarding pH, conductivity, N total, humus, P total, K total etc.

HEAT TRANSFER BY CONDUCTIVITY AND CLIMATE CHANGES IN NORRBOTTEN, SWEDEN

Dan CONSTANTINESCU, Magnus AUGNER, Adriana CARLAN

The changing climate of our planet is more and more remarkable. Scientists have projected temperature increases taking into account many scenarios, but the fact is, that we do not know exactly what is happening. The paper refers mainly to the study of the soil temperature evolution in Abisko National Park, in the context of subarctic climate changes. These processes are occurring more intensive on high latitudes and can influence directly the adjacent regions. The researches have implied the usage and processing of data which were monitored in Abisko Research Station since 1982, and also the 'on-land' explorations, in order to find new answers for the global climate modifications. Using the conductive heat transfer theory, the geological and physical properties of the soil in the article there are established some relations between the evolution of the soil temperature at the surface and at different depth and the evolution of the air temperature. After visits and expeditions in the subarctic area Norrbotten, Sweden, in Abisko National Park and studies at Abisko Research Station, between 2006 and 2015, there were obtained more than 540,240 data about the air temperature, air humidity, wind speed and direction, solar radiation, soil temperature. During the visits in 2014 and 2016 the attention was, with priority, focused on the problems of the soil heating.The future objective of the researches is to establish a mathematical model for the heat transfer in the soil and for the heat exchanges between the soil and the atmosphere. Therefore, soil samples and rocks from the shore of the Lake Tornetrask, Lake Trollsjo and the geological reservation where collected and analysed. The conclusion of the article is only the beginning for new researches regarding some aspects of the heat transfer in the subarctic area in the complex system soil – atmosphere.

THE EVOLUTION OF AIR QUALITY IN THE INDUSTRIAL AREA OF ORADEA

Adriana Monica COSTEA, Emilia Valentina PANTEA, Carmen GHERGHELEȘ, Horea GOIA, Ana Cornelia PEREȘ

The industrial area of Oradea was taken into consideration. The air quality is monitored during 2011-2018. The study presents the evolution over time of the main air pollutants in the context in which during this period some industrial objectives were reengineerind, others closed and new ones were opened. For the analyzed period, large combustion plants were identified as the main stationary sources of air pollution, the following burning stations: IMA 1 and IMA 2 from S.C. Electrocentrale Oradea S.A.The impact of atmospheric pollutants on the environment has been

appraised. Emission inventories, emission measurements, by modelling the dispersion of atmospheric pollutants and by measuring the air quality parameters were performed.Finding the amounts of pollutants emitted in the atmosphere was determined monthly/yearly using the EMPOL 2 program, the CORINAIR factors and the "CO2 Emissions Monitoring and Reporting Plan".The "EMPOL" method has been applied to determine the pollutant emissions from power plants using fossil fuels.. This calculation program for the automatic determination of emission values and indicators per day/month/quarter/year compared to a boiler/chimney/central heating system for the assessment, inventory and monitoring of pollutant emissions (SO_2, NO_x, CO_2, CO, powders, heavymetals) from thermal power plants. The calculation program uses as input:general data of the source (central heting station structure: boilers - chimneys);source operation data (fuel types, fuel characteristics, fuel quantities, hours of operation) and data regarding the emission (pollutant emission values, chimney pollutant concentrations, gas buring flow rates on the chimney, combustion gas velocity). The values determined for the concentrations of the pollutants from the combustion gases have shown major pollution in the case of the operation on solid fuel in all the analyzed years. In 2016, large combustion plants were replaced by new natural gas-only plants; The study then shows the emission values measured between 2016-2018 and the differences are very high, the impact on air quality becomes insignificant.

LAB SCALE EXPERIMENTAL INVESTIGATIONS REGARDING THE EFFICACY OF USING HUMIC SUBSTANCES IN HEAVY METALS REMOVAL BY SOIL WASHING

Gianina Elena DAMIAN, Valer MICLE, Ioana Monica SUR

In this study, humic substances originating from German Leonardite was used in an ex-situ soil washing experiment as washing agent for extraction of copper and lead from heavy metal polluted soil nearby "Larga de Sus" mine (Zlatna, Romania). Extraction experiments were performed under batch conditions by single step extraction. The results showed an important decrease in Cu and Pb concentrations in soil after 360 min of stirring at a L/S ratio of 5:1 (mL:g) and at a humic washing solution concentration of 5% indicating the great potential of this alternative washing agent to remove heavy metals from soil.

EVALUATION POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)CONTENT IN MARINE ORGANISMS IN THE ROMANIAN BLACK SEACOASTAL AREA

Nicoleta-Alexandra DAMIR, Valentina COATU, Elisabeta BOTEZ

Marine organisms are able to accumulate large amounts of organic pollutants in their tissues, but this accumulation varies by species and can be transferred to the food chain, sometimes exceeding accepted thresholds for human consumption. Due to their properties and adverse environmental impact, polycyclic aromatic hydrocarbons are included in the list of priority pollutants of concern. The paper presents polycyclic aromatic hydrocarbons content in marine organisms of commercial interest from Romanian coastal area. European legislation set out

maximum admissible concentration only for benzo[a]pyrene as the representative compound for polycyclic aromatic hydrocarbons. Most of the samples had benzo[a]pyrene concentration below maximum admissible value in respect with human consumption.

MANAGEMENT OF SWEET CHERRY TREE LANDS AND ORCHARDS IN EXPERT SYSTEM-CROM

Daniela DANA, Irina Adriana CHIURCIU, Valentina VOICU, Elena SOARE

The expert system-CROM tests a set of criteria and indicators on the basis of climate, land and infrastructure information in order to create an ecologic integrated model for fruit-trees land and orchard. The main objective of this paper was the monitoring of the natural and artificial resources, at Păltiniş farm, in Banat region, in order to establish the recommendations for the improvement of the land and of the sweet cherry orchards. For this study, statistical data from the National Institute of Statistics (INS) were collected and processed and they were used indicators such as: the number of sweet cherry trees; the total sweet cherry production; the average production per sweet cherry tree for the period 2005- 2016, at national level as well as at macro-regional level.

EVALUATION OF LANDSCAPE RESTORATION PROCESS IN DAMAGED AREAS DURING THE CONSTRUCTION OF HYDROELECTRIC POWER PLANTS (HPP) ON TURKEY

Metin DEMİR, Ahmet Mesut CANER.

Evolving industry, technology and the rapid population growth have increased the demand for energy and raw materials in our country. Increasing of electricity need causes the growing importance of Hydroelectric Power Plants in terms of being renewable and cheap. However, the activities cause many changes in the natural environment, so these changes adversely affect the nature. These negative effects can be largely restored by repairing nature and through rehabilitation works. In this way, biological production potential and landscape quality can be improved.In the study, during the construction of hydroelectric power plants made to repair the damage to the environment in Turkey, "Landscape restoration processes" were investigated.In addition, the legal processes and problems of the hydroelectric power plants were evaluated in the context of environment.

AIR QUALITY: ASSESSING NATURAL VENTILATION ON CONTROLLING INDOOR ENVIRONMENTAL PARAMETERS THROUGH SENSORS AND OPEN SOURCE SOFTWARE

Anastasia DENIZOPOULOU, Anastasia MARTZOPOULOU, Zacharoula ANDREOPOULOU, Vassilios FRAGOS

Natural ventilation in livestock buildings is considered a cost-effective and energy - saving ventilation method used to control air pollutant concentrations such as ammonia produced by animal activity and regulate indoor environmental parameters such as air speed, temperature and humidity within the building. For that reason in the present study ammonia concentrations, air speed, temperature and relative humidity were monitored in a naturally ventilated organic laying poultry house in Northern Greece. Measurements for ammonia concentration, humidity and temperature were performed at three sampling points by using open source device technology and compatible sensors. Air speed measurements were also taken using anemometers at the two sampling points adjacent to the openings of the livestock structure during a 12-day period in spring. With the aim to estimate the contribution and the efficiency of natural ventilation in controlling air quality within the poultry house two different days under different outdoors climate conditions were chosen during which the openings were closed for one hour and opened after this short time period. Results identified the efficient function of the openings and indicated that the existing side windows of the poultry house under study provides a suitable environment with consistent interior variation of the studied parameters within minutes after their opening.

SOIL CONSERVATION IN HIGH NATURAL VALUE FARMING: TOWARDS TO A CLOSER SCIENCE-CIVIL SOCIETY COOPERATION

Monica DUMITRAŞCU, Sorin Liviu ŞTEFĂNESCU

An important shift of the European Rural Development Program funds distribution and support payment policies has occurred within the last decade with respect to the growing recognition for the provision of many environmental benefits and public goods delivered by low-intensity farming performed in countryside. In large areas of some Central and East Europe countries (including Romania), the High Nature Value (HNV) farming depends to a significant extent to the conservation of traditional agricultural landscapes and continuation of extensive farming practices. The new HNV concept has been developed and documented in an incipient stage largely by high professional foundations and reputed activist non-governmental environment protection organizations (civil society). But in terms of scientific research, HNV farming is still a very young field and investigations and directions have only recently started to be shaped and pursued, although there is a great potential for its development ahead. Therefore, a better interconnected involvement of different stakeholders (scientists, environmentalists, farmers etc) is needed to collect new and process accurate field HNV data, to understand and substantiate the broad environmental impact and the socio-economic context of the small-scale farming and to explore new or improved ways to achieve real participation of society in research and finally, to decision. Looking to develop a HNV soil data base and to design a national HNV soil monitoring system, a

team of soil scientists and local civil society activists have performed a soil fertility assessment in the HNV support eligible area of Podisul Târnavelor. The collected and processed soil analyticaldata suggest that HNV farming practices carried in the investigated area comply fairly with the soil conservation requirements. Another approach was the implementation of a questionnaire based investigation focused on perception of representatives of environment and agriculture associations, foundations or NGOs (civil society) on soil and soil policy issues, aiming to explore views with regard to soil quality, soil threats as well as the existence and effectives of the national and European policies on soil protection. A decision support system software tool (mDSS version 5) was used, facilitating the involvement of stakeholders (soil experts and activists) in environmental decision processes, in order to prioritize the most relevant/sensible soil indicators to HNV farming and to select the most appropriate type of farm management in a selected eligible support payment HNV area. Since Romania holds a large proportion of the eligible HNV farmland with almost 5 mil. ha, the results of the decision process will be used to feed the design of an expeditious HNV national soil monitoring system.

ECOLOGICAL AND EFFICIENT METHOD FOR THE RECOVERY OF NONFERROUS METALS FROM INDUSTRIAL WASTES BY PROCESSING IN MICROWAVE FIELD

Daniela Violeta DUMITRESCU, Vasile SOARE, Ionuţ CONSTANTIN, Marian BURADA,Victoria SOARE, Beatrice Adriana CÂRLAN,Mihai Tudor OLARU, Tiberiu CIMPAN, Alexandru KOHLER

The recycling of nonferrous metal wastes has a significant impact on the environment through the reduction of energy consumptions and of the emissions, thus contributing to the preservation of the natural resources and the sustainable development of human society.In the European Union, the recovery of nonferrous metals is essential for the rentability of the metallurgical industry. The reintroduction of metallic materials in the economic circuit reduces the EU's dependence on the import of raw materials. Also, the production of metals using secondary sources requires a much lower amount of energy compared to the extraction of same metals from ores.The present paper presents an innovative ecological and efficient method to recover the useful metals from various types of industrial wastes by processing in a microwave field.Compared to the classical methods, microwave melting presents a series of major advantages, such as: i. simultaneous evolution of the heating gradient in the entire volume of material; ii. much higher heating rates that shorten the melting time by 70-85%, thus leading to energy savings and higher processing capacities; iii. superior quality of the obtained materials by reducing the melt impurification through oxidation; iv. remarkable versatility, as wastes with a wide range of shapes, chemical compositions and structures can be processed in the same installation; v. the possibility to neutralize the gaseous emissions also in microwave field.In the present work two types of wastes from the obtaining of aluminium-silicon and respectively antifriction antimony-tin-lead alloys, were melted in a microwave furnace. The values of the metal recovery efficiencies were of approximately 90%. Also, the treatment of the gaseous emissions in microwave field lead to the reduction of the hazardous substances contents to values under the legal limits.

SOIL DEGRADATION PROCESSES IN SANDY SOILS AREAS FROM WESTERN ROMANIAN PLAIN (

Carmen-Alina EFTENE, Alexandrina MANEA, Petru IGNAT, Sorina DUMITRU, Daniela RĂDUCU

Sandy soils cover a very large area (22%) of Western Romanian Plain (Oltenia region), mainly in the large rivers terraces. The main sources of sand are rivers alluvial plains, the transport agent being the wind. In the context of climate change, areas occupied by sandy soils from south Oltenia are directly affected by drought and prone to desertification. The paper aims to asses some aspects of soil degradation in Western Romanian Plain. Five sites have been examined, representing four different land-use types, located in Desa area. The soil profiles were morphologically described, and disturbed soil samples were collected from the diagnostic horizons. Physical and chemical measurements have been done: particle size distribution, pH, calcium carbonate (CaCO3) content, EC-value, exchangeable cations, total N, organic C, and available P contents, according to RISSA Soil Survey Methodology (1987). In Western Romanian Plain, sandy soils are exposed to high (6%) and very high (27%) risk to wind erosion, mainly due to unsuitable land management practices that lead to spread of the uncovered ground areas (bare soil) and to diminution of areas covered with forest (fixing plantations). The analysed soils inherited the textural characteristics from the parent material, having coarse texture, with up to 70% sand content (coarse and fine sand, between 2–0.02 mm). The main limitative factors on the sandy soils in the study area are the moisture deficit, wind erosion, loss of nutrients and compaction.

SYNTHESIS OF CARBON NANO-TUBES, CARBON NANO-ONIONS AND GRAPHENE USING A NOVEL REACTOR AND CARBON NANO-TUBES APPLICATIONS IN ORGANIC SOLAR CELLS

Marian ENĂCHESCU

A review of our achievements in the field of single-walled carbon nanotubes (SWCNTs) synthesis by means of pulse laser vaporization will be presented. AnewlaserablationchamberdesignedforKr-Fexcimerlaser experiments and a new route for target preparation will be reported. Based on our best knowledge, there is no reported data about the possibility of using only graphite cement for target preparation in such experiments. In our experiments, the use of this graphite precursor has eliminated the need for pressing or hot pressing treatments.[1,2] Comparison in between this new route and the classic one in terms of SWCNTs production will be reported. Statistic results about the influence of different technological parameters on the SWCNTs synthesis will be reported. We will report results about the influence of the ablation target composition on the formation of SWCNTs as well as the influence of the carrier gas used in the experiments. Finally, tuning the target composition as well as the ablation parameters we were able to synthesize SWCNTs, carbon nano-onions and graphene using the same reactor. These studies were done on graphite targets undoped or doped with metallic catalysts such as mono-component dopants such as Co, Ni, Pt or bi-component dopants like Co/Ni or Co/Pt. All reported results are based on morphological and structural characterization performed by Transmission Electron Microscopy, micro-Raman spectroscopy and Thermogravimetric analysis.Finally, will be presented our initial steps in the implementations of the third generation solar cells using SWCNTs we produce.

INSULATION SYSTEM WITH PARALLEL AIR CHAMBERS

Raul Cătălin ENE, Silviana BRATA, Daniel DAN

The present paper presents the theoretical results obtained on innovative thermal-insulating façade system (THFS) that can be used for new buildings or for thermal rehabilitation of existing ones. The THFS is composed by a vertical system with multiple parallel air stripes embodied in stone wool insulating panels. The thermos-technical properties of the THFS as thermal resistance, permeability to vapors and general behavior in defined conditions are evaluated using the software "WUFI Plus 3.1". Using the results obtained on material, a comparative study is performed on an energy efficient high school building (HSB) built it in Salonta, with the aim to evaluate the general efficiency of this system versus traditional system used.

SOIL PHYTOREMEDIATION SOLUTIONS FROM PESTEANA SUD MINING PERIMETER

Adrian FLOREA, Emilia-Cornelia DUNCA

The main activity from Pesteana Sud mining perimeter belonging to Oltenia Energetic Complex was lignite extraction. The activity from this mining perimeter is currently ceased. This activity involves environmental disruptions beginning with prospecting stage and which are amplified in reserves exploitation stage. Opencast mining have a strong impact on soil due to scraping and dumping processes. The disappearance of the soil must be understood as the disappearance of a "living body" formed in time, with all its features - primarily fertility - which provides a favorable environment for plant development. On the tailing dump of the Peşteana Sud open pit, anthropic soils called protosoils are formed. The phytoremediation of these anthropogenic soils is recognized as a cheap and environmentally friendly alternative technology that uses plants, microorganisms and enzymes to remove, retain, immobilize or transform pollutants, mainly of anthropogenic origin, from the soil. The paper provides solutions for the phytoremediation of the tailing dump in the Peşteana Sud mining perimeter using grass and legume species.

THE BIOCLIMATIC POTENTIAL OF MONEASA RESORT (ROMANIA) AND THEASSOCIATED RISKS

Ovidiu GACEU, Marin ILIES, Florin PAIUSAN, Alexandru ILIES, Stefan BAIAS, Dorina Camelia ILIES, Cosmin MESTER, Anca Luminita Deac, Cornel TAUT

The resort Moneasa is composed of the villages Moneasa and Rănuşa, Arad County, with an area of 6 824 ha and a population of 884 inhabitants. The paper aims to present the bioclimatic potential and the wind-induced risk aspects in the resort. The study methods consists of consulting of the existing bibliography, field survey, the interpretation of the thermo-baric maps, as well as the classical processing of the meteorological database for climatic purposes. The resort has a

significant natural and anthropic tourism potential for cure, which generates unique spa conditions in Europe. It is protected by forested slopes, 300-500 m altitude on the three parts, but can be affected sometimes by dangerous weather phenomena, as was the case of 17th September2017. Due to the morphology of the relief ``bottom of the bag`` type in which air masses can drain and very high speeds move can causing significant damages.

PRESERVATION ANALYSIS OF THE TYROLEAN GREY CATTLE FROM 1940´S AND NOWADAYS (2014) UNDER ORIGINAL RURAL ENVIRONMENT

András GÁSPÁRDY, Marcel MATIUȚI

The paper is concerned with the Tyrolean Grey Cattle breed, an autochthon, dual purpose, alpine mountain cattle breed. The objective of the paper is to describe the typical characterization of that breed and reveal the possible changes of major body measurements by time. For the analysis body measurements of 59 animals were recorded in 2014, and with the collaboration of the "Südtiroler Rinderzuchtverband" herd book body measurements data of 46 individuals (from 1946 until 1957) were collected. Adjustments for 3 years of age were achieved for each body measurement by quadratic regression, then analysis of variance was performed according to time era. Regarding the body measurements the results showed increased body parts caused by selection for larger frame and dairy type during that time (in all cases $p<0.05$). The conclusion of the investigation is that the Tyrolean Grey Cattle breed is still today a robust cattle and related to the aboriginal form despite of some discernible modification proven.

STUDIES REGARDING THE RISKS ON THE SOILS GENERATED BY THE SANTĂUL MIC CLAY AND ASH DEPOSITS AND THE PREVENTIVE MEASURES

Carmen GHERGHELEȘ, Emilia Valentina PANTEA, Monica COSTEA, Stelian PANTEA

Energy installations have a complex impact on all environmental factors (atmosphere, water, soil, flora, fauna), the energy sector being considered as the main source of pollution. The appreciation of the environment in an area at a given moment is given by the quality of air, water, soil, population health status. The waste disposal activity carried out at DZC Santăul 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 distancesResearch 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.

MEASLES IN CONSTANTA, ROMANIA: IMPLICATIONS IN PUBLIC HEALTH

Stela HALICHIDIS

The purpose of this study is to to draw attention to the possibility of recurrence of diseases whose incidence has been reduced by vaccination but which may evolve epidemic without vaccination. The evolution of measles can be severe and the complications, some of them with the possibility of occurring many years after acute infection, can cause death. We registered 670 patients with Measles hospitalized in Clinical Infectious Diseases Hospital of Constanta during 01.01. 2017-30.09.2018*.The distribution by place of origin was: 452 from urban area and 218 from rural environment and sex ratio was slightly in favor of male sex. The most frequent symptoms were: fever, maculo-papular eruption, broncho-pulmonary involvement. Hospitalized cases generally had a severe evolution, requiring sustained and expensive treatment. Measles vaccine is included in the National immunization Program. Studied cases evolved in the absence of specific vaccination among the underprivileged population or those who refused vaccination for various reasons.*

STRAY DOG FAECES, IMPACT ON THE PUBLIC AND ENVIRONMENTAL HEALTH

Viorel HERMAN, JánosDÉGI, Diana MariaDÉGI, IonicaIANCU, NicolaeCATANĂ, CorinaPASCU

Bacteria with zoonotic potential, found in the intestine of dogs, proved to be a significant risk factor for the human health, if accidentally ingested. The exposure to zoonotic bacteria from the faeces of stray dogs could pose an important health problem to the municipality of Timisoara.The aim of this study is to evaluate the presence of the enterobacteria responsible for the transmittable zoonotic diseases as well as to evaluate the presence of Enterococcus faecalis in dog faeces samples collected from parks in Timisoara, and their antimicrobial resistance. Out of 60 faeces samples, 34 samples were positive for Escherichia coli (56.67%), 28 were positive for Klebsiella pneumonia (46.67%), 11 were positive for Proteus mirabilis (18.34%), 14 for Pseudomonas aeruginosa (23.34%) and 43 were positive for Enterococcus faecalis (71.67%). Antimicrobial resistance to various classes of antibiotics was noticed in all the isolated bacterial strains.Dog faeces from the urban environment may represent an important source of potentially pathogenic microorganisms, both for dog owners and for the regional community, especially children.

DETECTION OF *SALMONELLA SPP* WITH ZOONOTIC RISK IN HOUSEHOLD DOG, STRAY DOGS AND ENVIRONMENTAL IMPACT

Viorel HERMAN, János DÉGI, Nicolae CĂTANĂ, Corina PASCU,Daniel TĂTAR, Ionica IANCU

Salmonellosis is a disease common to both animals and humans, with a wide geographical spread and natural focus. It is transmitted from animal to human but also inversely, with a high zoonotic risk. The access of salmonella-carrier dogs to parks or green areas is an important source of environmental contamination with infected feces and ensures their permanent presence in the environment. Research has been carried out in 3 counties in the west of the country, and 76 samples of dog feces were analyzed for this purpose. These dogs had access to the public parks in the 5 locations where fecal samples were collected, with the possibility of contamination of the environment. Of the 50 strains of Salmonella spp, 38 were included in serogroup B (76%) and 12 in D (24%). Of the 76 samples, other bacteria such as E. coli and Pseudomonas were also isolated. An alarming increase in the resistance of Salmonella strains to common antibiotics has been observed. 50 strains of Salmonella spp were isolated from the feces examined, representing 67% positive samples.

PHYSICOCHEMICAL ANALYSIS OF HONEY SAMPLES COLLECTED FROM LOCAL MARKETS OF TIRANA, ALBANIA

Fatjon HOXHA, Renata KONGOLI, Ilirjan MALOLLARI, Tomislav TOSTI, Dušanka MILOJKOVIĆ-OPSENICA, Živoslav TEŠIĆ

*The present study was carried out to determine the quality and authenticity of honey samples of local and imported brands available in Tirana markets. Physicochemical analysis of these samples were carried out in accordance with Harmonised Methods of the International Honey Commission (Bogdanov et al. 1997, updated in 2009) and for Free Acidity **AOAC 962.19** method was used. The sugar profile of honey was determined by high performance anion exchange chromatography (HPAEC) with pulsed amperometric detection (PAD). The results obtained were compared with Codex Alimentarius Commission (CODEX STAN 12-1981) and European Union Council Directive (2001/110/EC). The ranges of different parameters are: moisture 11.1-18.57%, Electrical Conductivity 0.09-0.79 mS/cm, pH 3.37-4.58, Free Acidity 10.1-31.5 meq/kg and 5-hydroxymethylfurfural (HMF) 12.61-663.58 mg/kg. The most abundant sugars were fructose, glucose and sucrose, whereas two samples exhibit maltose concentration higher then 5g/100g. Generally the samples are within the limit values of standard of honey, except HMF values which the samples present high amounts, and specifically the samples **M9** and **M11** have respectively 638.7 and 663.58 mg/kg HMF, and of course in these samples the diastase activity is absent. The high values of HMF (over 500 mg/kg) and the absence of diastase activity, it is an indication of adulteration of honey with invert syrup. Also sugar profile confirmed such behavior i.e. content of sucrose and maltose were also above. In addition the influence on the health was examined. High disaccharides concentration doesn't have direct negative influence, on the other hand high HMF concentration can be very dangerous to human health. This compound is cancer genic and prolonged exposure of high amounts can produce development of diseases such as liver and kidney failure, diabetes and development of various types of cancers.*

HIGHLIGHTS ON HIKING TRAILS PRESENTED IN ECOTOURISM PRODUCTS: THE CASE OF CREASTA COCOSULUI PROTECTED AREA (ROMANIA)

Gabriela ILIES, Simona-Alina SIMION, Marin ILIES, Mihai HOTEA, Silviu-Vasile BUMBAK

Creasta Cocosului – Mara Cosau Valley is one of the first Romanian ecotourism destinations, designated by the Ministry of Tourism in 2014. Nevertheless, eco-tourism activities have a longstanding history, since the area is covering seven important nature preservation sites and traditional villages, with marked hiking trails along 30km in mountain environment and 46km around the villages. Basic ecotourism services are mostly managed by the association leading the project (Ecologic Maramures), WWF (www.wwf.ro), travel agents and private mountain guides. This variety of economic and environmental stakeholders triggered a differentiation in communication patterns on the features of the hiking trails. Therefore, this paper looks at the relevance of the information and the subsequent discursive highlights. The research design is organized around participant observation, field research and content analysis on the main outputs: maps, websites, travel blogs and official publications. The result is an in-depth analysis on the features of hiking trails in the study area, with focus on the concepts used to enhance tourists' experience.

ANALYSING INDOOR MUSEUM AIR QUALITY IMPLICATIONS: CASE STUDY OF SALACEA MUSEUM HOUSE IN ROMANIA

Marin ILIES, Dorina Camelia ILIES, Aurelia ONET, Stefan BAIAS, Alexandru ILIES, Grigore HERMAN, Andreea LINCU, Ovidiu GACEU, Tembi TICHAAWA, Maria GOZNER, Dana MIHELE

This study appriases the indoor air quality of museums and its consequences for visitors and museographers in the Romanian context. Using the Salacea Museum House located within the Bihor County as a case study, the broader aim was to determine this associated health risks, while making recommendations for better preservation of the important heritage elements/products found within the Museum. Consequently, the study employed multiple techniques to analysed the microclimate, by way of monitoring air and fungi related activities during a 30 days period lasting between 03.06.2018 – 02.07.2018. For temperature and humidity monitoring, we used data function logger Klimalogg Pro (nine sensors), Oxigenometru Extech SDL150; Luxmetru data logger Extech SDL400 and Piranometru digital Voltcraft PL-110SM. Inside the museum house for isolation of fungi air, sampling techniques were used. The fungal contamination was determined using the conventional techniques of open plates called Koch sedimentation method.. The cartographic materials were processed using softs 3D Studio Max, Corel Draw și Corel Photopaint. Based on the obtained results, the air inside the museum was found to be a potential risk to human health. The fungal structures identified included: Geotrichum sp., Cladosporium sp., and Alternaria sp. The analysis of the results obtained further indicates that the space reserved for the preservation of cultural goods does not fully meet the fundamental conditions necessary to promote quality microclimate. Thus, the study advocates the need for the designing and implementation of a systematic monitoring mechanisms to ensure proper ventilation of the space for better air quality.

MAPPING AND SPATIAL ANALYSIS OF WINDTHROW IN THE GUTÂI MOUNTAINS, ROMANIA: THE CASE OF THE EXTRATROPICAL STORM FROM 17.09.2017

Marin ILIEȘ, Mihai HOTEA, Gabriela ILIEȘ, Silviu BUMBAK

Wind gusts are considered the most important natural hazardous agent to European forests by volume of damage resulted during extratropical and convective storms, being responsible for more than half of total forestry loss. During most of these meteorological events forests stands are damaged by windthrow. In exceptional cases, wind can blowdown whole stands. Landform height and morphological complexity can significantly drive storm and wind conditions, tampering parameters such as wind speed and direction, thus producing an eolian stress that selectively impacts forest stands and infrastructure. The study focuses on two representative forest sites in the Gutâi Mountains (Maramureș County, Romania) that were affected by the extratropical storm that hit north-western Romania on 17 September 2017. The methodological framework highlights three essential stages: 1. The field measurements, observations and mapping of the main geographical features, as well as the forestry damage in the two investigated areas; 2. Detailed cartographic representations (scale 1:10.000) of the registered spatial data highlighting overthrown and uprooted trees by species; 3. The interpretation of resulted cartographic materials compared to the scientific evidence concerning windthrow dynamics in a complex terrain.

INFLUENCE OF THE SOLAR IRRADIANCE VARIABILITY ON A DIRECT-COUPLED PV WATER PUMPING SYSTEM

Vlad IMAN, Marius PAULESCU

Water pumping is one of the simplest and the most useful application of a photovoltaic (PV) system. Numerical results on the influence of the solar irradiance variability on the performance of a direct-coupled PV water pumping system are reported. The study was conducted on data collected from a full monitoring of the direct-coupled PV water pumping system operating in real meteorological conditions on the Solar Platform of the West University of Timisoara, Romania.

CO_2 REDUCTION BY USING US FIELD FOR COAL COMBUSTION

Ioana IONEL

Romanian coal is a low quality fuel. Therefore the ignition and combustion of coal powder in industrial furnaces is supported by an additional fuel: oil or gas. The paper focuses on two processes that are enhanced using an US (ultrasound) field: a. Drying of coal powder in an US field, having special parameters for achieving mass and heat enhancement and b. Burning of coal powder in an US field.The theory is completed by experimental results and interpretation. The selected burner is a Romanian patent. The conclusion of the paper draws attention to pre-drying and combustion technologies in an US field, thus producing special conditions for improved combustion efficiency for the low calorific coal powder. As result, the stability of combustion is achieved without extern support, the general efficiency of the boiler might be improved, and a CO_2 reduction might be achieved, for the same fuel input.

IMPORTANCE OF INDOOR AIR QUALITY

Ioana IONEL, Makra LÁSZLÓ, Ramon Mihai BALOGH, Nicolae Stelian LONTIȘ, Delia Gabriela CĂLINOIU, Daniel BISORCA, Dan Nicolae GHERMAN, Cristina CERCELARU

Indoor air quality (IAQ), in terms of pollutants' concentration, is very important when people are developing a regular, continuous activity indoors. In door specific parameters such as temperature and humidity must also be controlled, because technological processes must fulfill special environmental conditions, and, not at least, because ventilation must be installed, if pollutants thresholds exceed, in order to protect humans working inside. Appropriate humidity avoid from annoyances and sufficient air exchange reduces accumulation of air pollutants. Health effects from indoor air pollutants may be experienced after exposure or, possibly, months or years later. The paper focuses on results achieved from several case studies, indicating that the air in closed industrial environments is polluted. According to the Romanian legislation, special thresholds must be introduced for specific air pollutants in technological spaces, in order to prevent diseases, with immediate or long-term effect, in close liaison to the technological process and exposure time of the personnel working/activating indoors.

SOCIAL AND PSYCHOLOGICAL RESILIENCE IN THE FACE OF DISASTER

Oltea JOJA

Startingwith the 1970s the term resilience has made its way into such various domains as the environmental, social, political, as well as in psychology and psychopathology. Resilience describes the capability of people, societies and cultures to lead themselves or their environment in the face of challenges into new developmental pathways. Specifically, social resilience is the ability of groups or communities to cope with external stressors and disturbances as a result of environmental,social, and political change.One of the most relevant formsof the new concept is the psychological resilience after disaster,which constitutes the object of the present analyse. Disaster resilience focuses upon the strong points and not the impairments following a disaster. The available research evidence suggests that psychological resiliencefollowing disaster or any traumatic events may be more prevalent than previously believed.This paper analysesthe indicatorsof psychological resilience, which can provide significant ante-factum relevance for disaster policies. Resilient outcomes, meaning ahealthy functioning after disaster,is considered in line with data suggesting resilience is the result of multiple independent predictors.Taking into account research indicating that not all individuals develop psychopathology or impaired health after traumatic events,the present paper examines some of the underlying mechanisms that influence the development of stress-related resilience.

ECONOMIC ANALYSIS OF SUSTAINABLE DEVELOPMENT FROM ASPECT OF GLOBAL AND LOCAL INFLUENCES

Goca JOVANOVIĆ, Slavko BOŽILOVIĆ

Sustainable development is a complex phenomenon which by default encompasses conflicting aims. On the one side sustainable development includes utilization of existing resources in order to transform them into socially and marketable acceptable products which increase the quality of human beings' lives. While, on the other side, utilization of existing resources and their transformation into socially and marketable acceptable products decrease the base and increase the risks for further development. Economic dimension of sustainable development is very important for sustainability of development strategies because the part of realized economic effects could be used for activities which increase resource base for future development as well as in increase of efficiency in resources utilization. Those activities, properly designed and realized, could prolong their availability. It is a sort of paradox that negative effects of transformation resources are concentrated locally while the positive effects of products are spread globally. From this immediately follows that, in geographical sense, certain inversion exists in concept of sustainable development: on the local level the sustainable development is violated in order to make it possible on the global level. This paper aims to analyse economic aspect of sustainable development and its accordance with the distribution of effects of development. The case study is based on example of Pančevo city (Republic of Serbia)

AIR QUALITY AND SOURCES OF AIR POLUTION: CASE STUDY PANČEVO CITY, SERBIA

Goca JOVANOVIĆ , Slavko BOŽILOVIĆ

Quality of air is the directly functional dependent on pollutants existence in it. The presence and intensity of pollutants in the air depends on the number, distribution, kind and emission intensity of the pollution sources. Effects of air pollution on the certain geographic location are the result of pollutants emission and the processes which reduce the air pollution. This paper aims to research concentration of certain pollutants in the air and their correlation with potential sources of pollution depending on their geographical distribution. For researching coherency between potential sources of air pollution and the multidimensional linear regression and correlation analysis is used. The coherence research between the potential source of air pollution and pollutant concentration is based on the geographic location and meteorological parameters. The case study is based on public data for Pančevo, Serbia. The extended study is based on the available data for Belgrade city because of relatively short distance between those two cities. In extended research the impacts of watercourses near the researched area (The Danube, Sava and Tamiš rivers) are included also.

EVALUATING THE FISHERY PRODUCTION AND COMPOSITION OF ISMARIDA LAKE (THRACE, GREECE), AIMING TO ITS ENVIRONMENTAL FRIENDLY MANAGEMENT

Antonis K. KOKKINAKIS,Kosmas D. SOFRONIDIS

Ismarida Lake is located in Northern Greece (Thrace), at 18 km away from the Komotini city. It is a lake in the "National Park of Eastern Macedonia-Thrace" and protected by international and national legislation. Fishery production data elaborated in this paper ranging for 30 years (1979 to 2008), including total annual fishery production and the production of three commercially important fish species as common carps, eels and grey mullets (Mugilidae) were presented in timeline charts and separated in decades and lustrums with a calculation of mean production, for each year. The composition of the fishery production was presented also through five and ten year's periods in percentage. During the decade of 70's the fishery production of the lake was high, but all over the 80s the lake was receiving municipal and industrial wastes, leading to its rapid hyper-eutrophication, and to a consecutive reduction of total fishery production was reduced from 45.009 kg (1980-1989) to 17.646 kg (2000-2009). The results presented prove the degradation of the fishery production of Ismarida Lake and help to understand the ecological situation of the lake and to suggest and develop a conservational and environmental friendly fishery management.

THE SOCIOECONOMIC EVALUATION OF AESTHETIC POLLUTION IN THE CITY OF ATHENS

Odysseas KOPSIDAS

The purpose of this research is to evaluate the general benefits of the conservation and restoration of city structures effected by carbon monoxide and expresses these benefits in monetary units using the Contingent Valuation Method (CVM).The maintenance of the urban environment often entails excessive costs paid by the people through taxation. A city free of aesthetic pollution results in an increase in tourism. A portion of taxation paid by the citizens is allocated to cleaning the city. An increase in tourism provides the government with additional revenue through Value Added Taxes (VAT). The increase in the money supply is not significant enough to affect the inflation rate, but gives the government additional revenue for the maintenance of the city and additional resources to service the national debt. The evaluation of these public goods cannot be expressed in the private sector, so we apply a modified version of the Contingent Valuation Method. The objective of this work is to determine the Athenian citizens willingness to pay (WtP) for this public good. Furthermore, the objective of this work is to

investigate the willingness of the citizens to pay more taxes for the conservation / restoration of building facades in the historic sectors of Athens.

MAPPING STAKEHOLDERS' PERCEPTION OF THE MAIN VULNERABILITIES, LIMITATIONS AND OPPORTUNITIES GENERATED BY LAND-SEA INTERACTIONS IN THE DANUBE DELTA - BLACK SEA COASTAL ZONE

Luminita LAZĂR, Mariana GOLUMBEANU, Florin TIMOFTE, Magda-Ioana NENCIU

Rural development in coastal areas of the EU is increasingly affected by changing market developments, decreasing population densities, urban sprawl, lack of employment, desertification and other environmental, economic and social pressures. Moreover, coastal areas provide interesting business opportunities, but are also influenced by economic activities in the hinterland. In the frame of the COASTAL Project, Multi-Actor Approaches are combined with System Dynamics to analyse the environmental, economic, and social interactions of rural and coastal areas in a holistic manner. The underlying feedback structures governing the dynamics, vulnerabilities, limitations, and business opportunities of the land-sea system are identified and analysed, taking into consideration the regulatory frameworks, stakeholder priorities and social-economic conditions at the local, regional and macro-regional scale levels. Multi-Actor Labs using qualitative and quantitative tools are set up to support the co-creation exchanges between scientific experts, stakeholders, business entrepreneurs, sector- and administrative representatives.The project is organized around six interacting, complementary Multi-Actor Labs (MALs) spread over the EU, exchanging their tools and expertise and connected through a Collaborative Knowledge Exchange Platform, to be further exploited and developed beyond the project life time: the Romanian case study covers the Danube Mouths and Black Sea coastal zone. Due to the semi-enclosed location and size of the contributing catchment area, the Black Sea is vulnerable to anthropogenic pressures and pollution sources. Even today the Black Sea catchment is still under pressure from excess nutrients and contaminants due to emissions from agriculture, tourism, industry and urbanization in the Danube basin. The increased rates of eutrophication, pollution and bioaccumulation affect both the biodiversity and fishing sectors. Mass tourism is also an important growth sector for the Black Sea and eco-tourism is becoming more important in the region. Approximately 65% of the Romanian coastline is located in the Danube Delta Biosphere Reserve and subject to tourism regulations, resulting in conflicts between nature conservation and economic development. Failing to resolve these conflicts has economic and political impacts, which calls for urgent co-creation actions among all the stakeholders involved.Local actors and experts from the Danube Delta and Black Sea coastal zone participated in collaborative exercises to analyse problems, the underlying causes, propose and discuss solutions, and validate and interpret the impacts of simulated business and policy decisions. Three interactive workshops were organized, focusing on Blue Growth (industry, transport and administration), Tourism and Fisheries & Aquaculture, attended by local stakeholders from the Constanta and Tulcea counties. Qualitative and quantitative techniques were combined in this co-creation process supported by graphical tools to gain in-depth understanding of the systemic transitions underlying the land-sea interactions in each specific domain. These systemic transitions will further be synthesized and analysed with system dynamic models to produce multiple transition scenarios for key business and policy indicators.

LAND CONSOLIDATION AND SUSTAINABLE DEVELOPMENT

Jelena LAZIĆ, Milan TRIFKOVIĆ, Goran MARINKOVIĆ, Žarko NESTOROVIĆ

Land consolidation as a tool for land management produces positive effects for multiple and various dimensions of agricultural development including societal and economic parameters as well. Land consolidation as a process which requires engagement of experts of various scientific fields and certain period of time for its realization produces costs which must be smaller than its positive economic effects. Land consolidation costs, in that sense, shall be treated as an investment in agriculture production development while its other positive effects are difficult for precise determination. This paper aims to consider, analyse and discuss land consolidation effects from aspect of sustainable development in the sense defined by United Nations. Methodology for land consolidation effects is based on simplified mathematical models and case study is based on available data for Vojvodina, Republic of Serbia.

ENVIRONMENTAL IMPACT OF HYBRID ELECTRIC VEHICLE PASSENGER CARS IN URBAN AREAS

Nicolae Stelian LONTIȘ, Ion VETREȘ, Liviu Nicolae MIHON, Eduard OANȚĂ

The scientific study will reveal the environmental impact of hybrid electric vehicle passenger cars emissions for two configurations of hybrid-electric propulsion systems simulated on ECE and EUDC emissions test cycle with Advance Vehicle Simulator software.

APPLYING SIMULATION TECHNIQUES FOR PROPER TREATMENT METHOD, PLANT DESIGN AND ECONOMICS FOR SOME FOOD INDUSTRIAL WASTES

Ilirjan MALOLLARI, Violeta LAJQI, Luljeta PINGULI, Sami MAKOLLI, Redi BUZO, Erald KARAKASHI

The energy saving from recycling of food industrial waste is really the difference between the energy required to manufacture a new product minus all of the energy required to transport and reprocess the product in the recycling phase. If that difference is greater than the energy that would be realized from combusting that product and recovering the energy then recycling is indeed the best option. In this work we have considered the proper treatment of some food industrial waste such as cheese whey from dairy industry, wastes from slaughterhouses and meat processing plants in Albania, corn Stover from agricultural cultivation waste, glycerin wastes from biodiesel production, spent grains from bier production etc., in order not only to avoid environmental problems, but also to profit some useful product with economic and social interest. Firstly we have done characterization of these wastes, and have performed some experimental tests, for their treatment aiming to profit some energetic values (biogas test), and obtaining some chemicals such as Ethanol, Xylitol, Polylactic Acids, etc. On the other hand it was drawn process flow sheets, using the engineering software so called Super Pro Designer,

and also we have also performed the computer simulation procedure aiming to have the optimal value for the biogas (methane) capacity production, economic cost, and optimal expenditures during production. We have used also the ASPEN PLUS vs 10 for the process scaling up and anaerobic reactor design and was designed the treatment plants for each of abovementioned food industrial waste by those engineering computer software.

SOIL IMPROVEMENT TO COUNTER LIQUEFACTION BY COLLOIDAL SILICA GROUT INJECTION

Yasemin MANAV, Selcuk TOPRAK, Ertugrul KARAKAPLAN, Ramazan MANAV, Mehmet INEL, Engin NACAROGLU

Soil liquefaction due to earthquakes is a major reason of damage to buildings and other structures. This study deals with soil improvement against liquefaction by injection of a particular stabilizer, colloidal silica, which is nontoxic and stable. Laboratory experiments were performed to determine the effects of colloidal silica grout injection regarding soil strength and deformations. The experiments involved static and dynamic triaxial tests on untreated and treated soil samples. The variables used in the tests are the relative density (loose-40%, medium-60% and dense-80%), the confining pressure (100 and 300 kPa), and the curing period of silica treated samples (7 and 28 days). The results clearly indicate the significant increase in strength of the soil with colloidal silica injection. Furthermore, the relative increase is the highest in the sand of the lowest relative density which is the most probable candidate for soil improvement. The observations that the increase in the strength of colloidal silica treated sands with curing time is gradual and continuous add to the advantage of this method for use in soil improvement works. By using the dynamic test results, the equivalent Young's modulus (or shear modulus) and the hysteretic damping ratio of untreated and treated soils are compared.

SOIL HEAVY METAL CONTENTS FROM MONITORING SITES OF MARAMUREȘ COUNTY, ROMÂNIA

Alexandrina MANEA, Mihail DUMITRU, Nicoleta VRÎNCEANU, Amelia ANGHEL, Alina EFTENE, Petru IGNAT, Andrei VRÎNCEANU, Sorina DUMITRU, Victoria MOCANU

One of the main area that is rich in metalliferous ores (gold-silver ores, polymetalliferous ores, copper mineralizations, iron and manganese ores) is the Maramures County which has a long history of mining of non-ferrous ores. Moreover, in the Baia Mare area were two nonferrous metal smelting factories, Romplumb (lead smelter) and Phoenix (copper smelter) wich have been major sources of environmental pollution. Field studies were made across the Maramures County. The soil samples were taken from agricultural and forest sites according to a regular network (8x8km) part of Romanian soil quality monitoring system.On whole county, the concentration range of Cu, Zn, Pb, Cd, Co, Cr, Ni, Mn were: 5.6-48, 31-243, 17-639, 0.1-2.0, 45-1265, 0.1-31, 1.6-86, 0.2-100 mg/kg, with mean values of 20, 78, 57, 0.75, 544, 11, 22, 23 mg/kg. The mean concentration of the heavy metals decreased in the order of Mn>Zn>Pb>Cr>Ni>Cu>Co>Cd. According to Romanian legislation, normal values are exceeding in 95% of sites for Pb, 45% for Ni and Cu, 15% for Co and Cu and 10% for Zn, Cd and Mn. The coefficient of variation (Cv) of investigated heavy metals decreased in the order of Pb (141%)> Ni

(71%)> Cr (57%)> Cu (51%)> Mn (50%)> Co(48%)> Cd (47%) > Zn (41%).The results show high values in some sites due to mining and smelting activities and appropriate measures should be taken to protect human health and the ecological systems.

THE POTENTIALLY TOXIC ELEMENTS IN AGRICULTURAL SOILS FROM THE NORTH WEST REGION, ROMÂNIA

Alexandrina MANEA, Mihail DUMITRU, Nicoleta VRÎNCEANU, Andrei VRÎNCEANU, Amelia ANGHEL, Petru IGNAT, Victoria MOCANU, Alina EFTENE, Sorina DUMITRU

In the framework of the Soil Quality Monitoring project, 121 samples of agricultural soil (Ap 0-20 cm, regularlly ploughed field), 164 samples from land under permanent grass cover (0-10 cm and 10-20 cm, pastures and meadows land soil) and 6 samples on orchard (0-20 cm) were collected across the whole North West Development Region at a density of 1 sample site/8 km^2.The aim of this survey was to assess the concentration range of potentially toxic elements (Cd, Cu, Co, Ni, Pb, Zn) in agricultural soil of North West Region.The pseudo-total concentrations of Cd, Cu, Co, Ni, Pb and Zn were determined in the soil samples using atomic absorption spectrometry after extraction by the aqua regia ($HCl:HNO_3$ – 3:1) – microwave digestion method. The percentage of soils exceeding the normal contents according to Romanian legislation were below 40% for Cu, Pb and Ni and below 10% for Zn and Co. High values of some elements are related to the human activities and in these sites research on heavy metals contents into plants should be carried out.

SUSTAINABLE INDUSTRIAL GROWTH WITH THE REDUCTION OF ENVIRONMENTAL EMISSION IN CHINA: THE EVIDENCE OF EMPLOYMENT VARIETY

Yanbing MAO, Zeyuan LIU, Adriana GRIGORESCU, Elena CONDREA

The increase in environmental emission is usually the challenge to the industrial growth, which attracts much attention by the design for the country industrial structure. In current work, the development of industry with the reduction of environmental emission in China was analyzed in 2003-2015. The discharge of 4 pollutant factors (chemical oxygen demand, dust, SO_2, and heavy metal) was collected in 4 industrial sectors (Manufacture, Mining, Construction, Supply). The significant increase in the product value of these industrial fields was recorded. Despite, the discharge of pollutant was changed as the function of time. In 2003-2006, the amount of pollutant discharge was increased with industry development while it was reduced to 50% or more in 2007-2015 with industrial scale growing 3-4 times. This was supported by the result of hierarchical clustering analysis (HCA) and principal component analysis (PCA), which conducted the cluster analysis of the time-dependent changing of environmental emission with the quantity of employment, industrial-scale. Moreover, more industrial employee in manufactory and supply industry than that in other industry fields. This supposed that the resource-consumed industrial structure changing and industrial technology upgrade happened in China in recent decade, which was probably responsible for the environment improvement. It illustrated that the Porter Effect (PE) worked in the industry growth in China after 2011 as the decrease in pollution even with the constant industry scale and the employment quality increasing. Accordingly, our results proposed that the productivity was the satisfied indicator to indicate the relationship between industry

growth and pollution reduction. Therefore, an insight into the relationship of industrial growth with environmental emission was provided, which was a new approach to assess the sustainable industry growing in developing country.

RESEARCH REGARDING ON POLLUTION MONITORING WITH THE HELP OF BENCTONIC MACROCONVERTEBRATES AT BEGA RIVER NEAR TIMISOARA

Anca-Andreea MARIN, Benoni LIXANDRU, Gheorghe CIOBAN, Sorin MORARIU, Florica Morariu

An important role in the monitoring of the water quality is represented by the benthic macro invertebrates. They are a key component in the transfer of matter and energy in the aquatic ecosystems.From February 2014 to September 2016, 20 quantitative seasonal samples of benthic macroinvertebrates were collected at different seasons in the Bega River water. Samples were collected from the upstream, middle and downstream of Timisoara city.The aim of this paper is to identify the changes that occur in the structure of benthic macro invertebrates communities due to anthropogenic activities.Once the identification of saprobionte organisms has done, it have been performed the density, abundance and frequency of the sample. Based on these values, we can say that the upstream segment waters falls into the category of superior quality compared to the waters of the central segment, especially in the downstream segment.

SOCIETAL AND ECONOMIC EFFECTS OF LAND CONSOLIDATION

Goran MARINKOVIĆ, Milan TRIFKOVIĆ, Jelena LAZIĆ, Žarko NESTOROVIĆ

Land consolidation is primarily introduced with the aim to group fragmented land ownership, to reduce costs and increase the agricultural production. But achieving this aims the concomitant positive effects appears in sense of economic and societal parameters. The analysis of societal effects in this paper is based on analysis on migration of the population while the economic analysis is based on agricultural production of wheat and corn. For research of societal and economic analysis of land consolidation effects the multiple linear regression method is used. The case study is based on available data for Vojvodina, Republic of Serbia.

ASSESSMENT OF COLONIAL WATERBIRDS IN THE DANUBE DELTA BIOSPHERE RESERVE (ROMANIA) DURING 2015 – 2018

Mihai MARINOV, Alexandru DOROȘENCU,Vasile ALEXE, Lucian – Eugen BOLBOACĂ, Janos Botond KISS, Cristina NANU, Katarina TOŠIĆ, Marian TUDOR

We present the research results on all identified colonies of waterbirds in the Danube Delta Biosphere Reserve – Romania (not including pelicans) from 2015 to 2018. The largest number of total breeding pairs for all colonial waterbirds was recorded in 2016 (51,457 bp). Between 2015 and 2018, the highest (average) numbers of breeding pairs were those of Chlidonias hybrida (11,042 bp),

Phalacrocorax carbo (7,209 bp) and Microcarbo pygmaeus (3,846 bp), while the lowest were recorded for Bubulcus ibis (14.75 bp), Chlidonias leucopterus (10.5 bp) and Sternula albifrons (2.5 bp). Most of the species showed relatively high variation in breeding population size over the years. This could be attributed to diverse factors such as weather during the nesting period, fluctuating water levels or increasing disturbance by human activities. The most stable population across the 4-year study, according to the coefficient of variation, was that of the Eurasian Spoonbill (Platalea leucorodia, CV= 0.13). However, tern and gull populations showed the highest degree of variability both during our study and compared with previous ones. The Sternula albifrons population has decreased by 96.15 % since 2001, Thalaseus sandwichensis by 89.54% and Ichthyaetus melanocephalus by 78.75%, while Chlidonias niger and Chlidonias hybrida have increased.

SITUATION OF THE MAIN HUNTING SPECIES IN TIMIS COUNTY – ROMANIA

Carmen Luminița MATIUȚI, Marcel MATIUȚI, Cornel LERA

The paper presents the link between the number of species of hunting interest and changes in the anthropic ecological systems. Timis County there are 86 hunting funds. On these funds is complementary feeding of game, especially in winter. The feed rules are calculated according to the relief, the game species and the allowances for quotas. Quotas are mandatory. The wild boar (Sus scrofa ferus) has been particularly popular in the plains area in large numbers approx. 3700 in 2018. The existence of large grain farms offers very good conditions for food, water and tranquility. Boar brings damage not only to agriculture but also to other hunting species: roe deer (Capreolus caprelolus), pheasant (Phasianus cholchicus), wild rabbit (Lepus europeus). The number of rabbit rabies for 2018 are about 20000 and are continuously decreasing. The fallow deer (Dama dama) and mouflon (Ovis aries musimon) is particularly in the Complex for Hunting Pischia and sporadically in other areas of the county. A numerical decrease is also recorded for roe deer cca. 4200 exemplares in 2018. The important cause to decreased the number of partridges is relatedto theintroductionof the pheasant.

ETHNOZOOTECHNY, A SCIENCE OF THE HISTORY OF ANIMAL BREEDS

Marcel MATIUȚI, Carmen-Luminița MATIUȚI, Denis Laurențiu DIACONESCU, Ioan HUȚU

Etnozootechny deals the relation between man-animal-environment in past and present societies and their transformations determined by animal breeding evolution. The purpose of this paper is to present the importance of animal genetic resources in Intra-Carpathian area. The existence of local livestock breeds is important for keeping genes, which gives them certain qualities, such as rusticity or products obtained for traditional recipes to which is added the beauty of a landscape through their existence. The purpose of Transilvanian Rare Breeds Association is the identification and preserving the breeds which are on the verge of extinction. The owners of local breeds are supported logistically by the association through university extension and this breeds are verrry important for the bioeconomy.

EFFECTS ON LONG TERM FERTILIZATION WITH NP ON SOIL FERTILITY

Nicoleta MĂRIN, Mihail DUMITRU, Carmen SÎRBU,Traian CIOROIANU, AlinaAGAPIE

The paper presents results obtained from a long term field experiment located within Agricultural Research and Development Station – (SCDA Lovrin). The experiment is located on a Chernozem. The experiment has two factors: first one is nitrogen with 5 graduations (N0, N50, N100, N150, N200 kg/ha), the second one is phosphorus with 5 graduations ((P0, P40, P80, P120, P160 kg/ha). The soil samples were taken on 0 to 20 cm depth, after harvesting of maize (Andreea hybrid).From physical point of view, the analysed soil has a fine texture belonging to clayey loam subclass. The percentage contents of the main texture fractions were recorded within the following ranges: clay 36,8-38,8 %; silt 25,6-27,4 %, sand 5,8-6,4 %. The soil has no carbonates. The results obtained after laboratory analysis and statistical processing showed that: the lowest crop yield (4585 kg/ha) was obtained in the variants fertilized with 160 kgP/ha and without nitrogen application; the highest crop yield (6653 kg/ha) was obtained in the variants fertilized with N200P80, which is recommended if the maximum or almost highest crop yield is intended to be obtained. At the same phosphorus dose applied, the highest crop yield was attained in the variants with different nitrogen doses applied on a 120 kg / ha phosphorus background; the nitrogen provided the highest yield increases regardless of the applied phosphorus dose. The pH values have decreased from 6,65 in control to 6,33 in the variants fertilized with 150 kgN/ha and to 6,20 in the variants with 200 kgN/ha applied. The long term fertilization with nitrogen and phosphorus did not lead to statistically changes on soil nitrogen and humus contents. The applied doses of 120 and 160 kgP/ha led to very significant increases of available phosphorus content, from 49 mk/kg in control to values ranging between 90 and 99 mg/kg. The long term fertilization with nitrogen and phosphorus did not lead to statistically changes on soil available potassium content. The long term application of the chemical fertilizers with nitrogen and phosphorus did not determine statistically increases of the soil heavy metal contents (cadmium, copper, manganese, lead and zinc).

WIRELESS ROUTERS AND THEIR IMPACT ON THE ENVIRONMENT

Marina Adriana MERCIONI, Nina HOLBAN, Vlad Virgiliu TODEA

Everywhere, in every aspect of life today, wherever someone goes he is subject to certainenvironmental factors, whether they are natural or man-made. This paper will approach aspecific theme, namely the effect of the wireless routers on our lives and our livingenvironment. This paper will approach a specific theme, namely the effect of the wirelessrouters on our lives and our living environment.This paper aims to clariff the impact the electromagnetic radiation emitted by wireless routerson the health of living organisms and the possible effects they may have on them.The approach chosen to clear this aspect is the development of a universal application forWindows 10 that scans the area around the user for available wireless connections and returnsthe average value, strongest value and calculates the transmission power, power density andelectric field strength in that position based on the router signal strength.The scope of this application is to determine the amount of different connections in the areawhere the scan is being made and is a good tool to find the strength of the surrounding electricfield and the amount

of transmission power that is generated by the wireless routers, anddetermine if it is between normal values.This application was developed to demonstrate if the wireless routers have a negative effecton the surrounding electromagnetic field.

MATHEMATICAL MODELLING OF THERMAL DESORPTION OF THE CRUDE OIL POLLUTED SOIL

Valer MICLE, Dorina POP, Ioana Monica SUR, George Călin ROGOZAN, Gianina Elena DAMIAN

The purpose of this paper is to present a mathematical model based on the results obtained during the experiments on the application of thermal desorption at the temperature of 350°C, with treatment durations of 5, 10 and 15 minutes in case of soils with different textures contaminated with crude oil. We opted for a polynomial model, containing both a linear component, and a non-linear component, to which we also added a component of the interactions among the three parameters (treating duration "t"; initial pollutant concentration "C_0"; content of clay in the soil "A") influencing the residual pollutant concentration in the soil in the process of thermal desorption. The equation of the mathematical model: $C = C_0 \times e^{-12.2585\,\frac{t}{A}}$.
In order to verify the integrity and conformity of the mathematical model thus obtained, were calculated with it the values of the final concentrations I in all of the 36 experimental points and were compared with the real values obtained through measurements. The proposed model can be used to estimate the effectiveness of the process of decontamination through thermal desorption. Results show the existence of a good concordance between the experimental data and data calculated using the mathematical model.

WINDS EFFECTS ON SEA LEVEL IN THE WESTERN BLACK SEA BASED ON 10 YEARS DATA ANALYSIS FROM THE CLIMATE CHANGE PERSPECTIVE

Maria–Emanuela MIHAILOV, Maria–Ionela TOMESCU–CHIVU, Luminița BUGA,Alina – Daiana SPÎNU

The relationship between the annual wind records from Romanian shore weather station and annual mean sea level, is examined using observations covering period 2006-2016. It is demonstrated that even such a relatively short record is sufficient for finding a convincing relationship. Using measured data from a weather station is found to give a slight improvement over reanalysis data, but for both the correlation between annual mean sea level and wind energy in the west–east direction is high. Supplementary data from a numerical hydrodynamic model are used to illustrate the regional variability in annual mean sea level and its interannual variability at a high spatial resolution. Recent climate change and land uplift are causing changes in sea level. This study implies that climatic changes in the strength of winds from a specific direction may affect local annual mean sea level quite significantly. Water levels at a particular location are not only affected by the local air pressure but also by other factors, so this simple correlation is rarely observed. Using 10 years (2006- 2016) of Constanta - Romania coastal sea-level observations, we examine the contribution of these latter processes to long-term sea-level rise, which, to date, have been relatively less explored. A specific

analysis and to evidence the correlation between wind pattern and sea level, the 2014 is chosen due to the frequent western winds that occurred during January and August in the Romanian Black Sea coast.

INITIAL ASSESSMENT OF THE UNDERWATER NOISE IN THE ROMANIAN BLACK SEA SHELF

Maria –Emanuela MIHAILOV, Alexandru NICOLAEV, Adrian FILIMON, Alina–Daiana SPINU

Quantification of underwater noise is a current and evolving topic in marine environmental science that is relevant to Marine Directive 2008/56/CE (MSFD). MSFD aims to achieve Good Environmental Status (GES) by 2020. The MSFD highlights the need to establish anthropogenic noise levels that do not affect marine Biota (Descriptor 11) and represents an important progress to preserve marine environment. Over the last decade, anthropogenic noise in the Western Black Sea has increased dramatically in aquatic environments and is now recognised as a chronic form of pollution in coastal waters, neglected so far. To date, very few studies have investigated the noise levels and spectra in marine environments. At present no legislation exists in Romania to protect the living resources and biota from anthropogenic noise. The present study represents the first assessment of anthropogenic noise pollution in the Western Black Sea by characterising noise levels using underwater noise monitoring system. During 2016 -2017, acoustic samples (30- 40 min time length) were collected using high end pressure transducers and their spectral content was analysed in 1/3 octave bands (dB re 1 µPa). The NIMRD noise team adapted specific data acquisition standards for different meteorological, hydrological and vessel conditions for several locations. The results are expressed in peak pressure, peak-to-peak and peak–RMS measurements. The total noise of 132 dB (re 1 µPa) was the highest value from all the measured peak – to-peak of the underwater noise levels on the research vessel on a 3 Beaufort sea state scale. The minimum RMS noise of 106 - 108 dB re 1 µPa were determined in the southern Romanian shelf, 2 Mai – Vama Veche Natural Reservation, in anchor. Mapping of impulsive noise (characterised by short duration and a fast pulse rise time) associated with piling, underwater explosions or airgun signals used in seismic surveying, is analysed too. Results indicate that the current noise levels in the Romanian Black Sea shelf warrant further investigation as a potential threat to the fish and mammal community which occurs in this already pressured habitat. Based on results obtained, it is recommended that further studies focus on a wider geographical and temporal range in order to start to fill the knowledge and legislative gaps regarding anthropogenic noise monitoring in the Romanian EEZ waters.

CO_2 EMISSION DECREASE BY REDUCING THERMAL LOSES

Alin MIHAIUȚI, Daniel BISORCA, Ioana IONEL

All Romanian economic operators who consume annually an amount of energy exceeding 1000 tons equivalent oil / year (11628 MWh / year) have the obligation: (a) to carry out periodically an energy audit to underpin the establishment and implementation of measures to improve energy efficiency and (b)to develop energy efficiency improvement programs that include short, medium and long-term measures.These two compulsory actions reveal also possibilities for the improvement of the energy consumption efficiency, mainly by depicting the weak points. The energy gain is further transformed in less emission, especially the CO_2 exhaust is taken into consideration, as according to the Paris Conference, the temperature augmentation by 2015 must be kept under 2 degrees C (even less 1.5 degree C), taken as basis year 1990. The climate change must be hold under control, if one dreams of security, health and sustainable development of the planet.The paper presents two case studies

describing concrete possibilities to reduce heat losses by recovery, and thus considerable amount of CO_2 emission is reduced, in comparison to the current functional solutions.

TUNING SYNTHESIS BETWEEN CARBON NANO-TUBES, CARBON NANO-ONIONS AND GRAPHENE IN THE SAME REACTOR

Călin MOISE, Dorel DOROBANȚU, Alin JDERU, Marius ENACHESCU

A review of our achievements in the field of single-walled carbon nano-tubes (SWCNTs) synthesis by means of pulse laser vaporization will be presented. Statistic results about the influence of different technological parameters on the SWCNTs synthesis will be reported. A new laserablation chamber designed forKr-Fexcimerlaser experiments and a new route for target preparation will be reported. Based on our best knowledge, there is no reported data about the possibility of using only graphite cement for target preparation in such experiments. In our experiments, the use of this graphite precursor has eliminated the need for pressing or hot pressing treatments [1,2]. Comparison in between this new route and the classic one in terms of SWCNTs production will be reported. We will report results about the influence of the ablation target composition on the formation of SWCNTs as well as the influence of the carrier gas used in the experiments. Finally, tuning the target composition as well as the ablation parameters we were able to synthesize carbon nano-onions (CNOs) and graphene using the same reactor. These studies were done on graphite targets undoped or doped with metallic catalysts such as mono-component dopants such as Co, Ni, Pt or bi-component dopants like Co/Ni or Co/Pt.All reported results are based on morphological and structural characterization performed by Transmission Electron Microscopy, micro-Raman spectroscopy and Thermogravimetric analysis.

SPATIAL DATA GEOPORTAL FOR LOCAL ADMINISTRATION – SOLUTION FOR SMART CITIES

Anca-Maria MOSCOVICI, Clara Beatrice VILCEANU, Carmen GRECEA, Sorin HERBAN

Implementing a spatial data geoportal at Local Administration level using EU non-refundable funds could be a smart solution for managing secure, smart city and valuable property based on IoT meant to reinforce Europe's cultural diversity by making our heritage and our cultural creations available to a wider number of citizens.The cooperation of the citizens, private and the public sector are key elements that develop among all, a smart city for all the stakeholders, opportunities and a good quality of life in the city. For local administration winning the title for "European capital of culture" initiative implied managing a large amount of data, with infrastructure projects supported by an information platform Timisoara has to be more socially inclusive and economically resilient. This platform facilitated a good visibility of the candidate city in the context of enhancing the contribution of culture to its long-term development in accordance with its priorities and strategies.In the conclusion of the study we will show the importance and

the role of the smart city in the progress of our city in the coming years and the benefits brought in the year when Timisoara it will be the European capital of culture.

MARINE BIOMASS VALORISATION AS POTENTIAL BIORESOURCE FOR BIOCOSMETICS AND ECO-AGRICULTURE

Ticuța NEGREANU-PÎRJOL, Bogdan-Ştefan NEGREANU-PÎRJOL, Mariana GOLUMBEANU, Gabriela-Mihaela PARASCHIV, Anca Cristina LEPĂDATU

Economic, environmental, social and political pressures due to industry, agriculture, mass tourism and urbanization in the coastal area require the complex valorization of the Black Sea bio-resources by developing and applying innovative and emerging biotechnologies. Coastal land areas provide interesting bio-resources, such as residual marine biomass, as well as interesting business opportunities for its use in eco-agriculture (as bio-fertilizer) and biocosmetics field. The residual marine biomass sampleshave been collected from three Romanian Black Sea coastal zone locations (Mamaia- Pescarie Constanta, Eforie Sud – Capul Turcului Golf and Vama Veche - 2 Mai), in the period March and September 2018 and qualitative and quantitative analyses,supported by graphical tools, have been performed for macro- and micro- flora and fauna identification and communities characterization for system dynamics and interactions, based on the international standard methodology. Triage, identification, chemical and biochemical analysis of biological material are essential to identify its capacity as a potential bio-resource for eco-agriculture and biocosmetics. Residual marine biomass samples collected from the shallow coastal area have been analysed depending on their nature: plant biomass, animal biomass, microbial biomass.Macro- flora and fauna triage and identification have been made based on taxonomic characters emphasized by stereomicroscope and Nikon microscope. Considered quantitative parameters were occurrence frequency and dominance of a low number of species. Bacterial contamination has been expressed as evolution in time of total number of colony forming units (TNCFU). Faecal origin of pollution has been confirmed by calculating the probable number of coliform bacteria (MPN) of CT (total coliforms)/g.; The probable number of coliform thermos-tolerant bacteria (MPN) of CF (faecal coliforms)/g.; The probable number of bacteria (MPN) of ST (total Streptococci)/g; The probable number (MPN) of SF (faecal Streptococci)/g and by displaying the presence of Enterobacteriaceae (from the types Escherichia, Salmonella, Citrobacter, Enterobacter and Klebsiella), Pseudomonadaceae (Pseudomonas aeruginosa), as it raises the possibility of the presence of pathogenic germs. Bacteriological analysis included also the presence of bacteria Vibrio cholerae and Staphylococcus aureus. Pathogenic microbial flora isolation and identification have been made on selective culture media, based on biochemical reactions. The increased rates of bioaccumulation and pollution, seasonal temperature variation and summer mass tourism affect the biodiversity but the material is still consistent, microbial charge does not cause sanitary problems and preliminary analyses of the residual biomass anticipate a strong capacity as a potential bio-resource for eco-agriculture and biocosmetics. System dynamic models will be further developed to synthesize and analyse laboratory data and to produce scenarios for key business applications of this bio-resource in the circular bioeconomy and biomedical field.

LOW-COST SYSTEM TO ACQUIRE ENVIRONMENTAL PARAMETERS IN URBAN AREAS IN THE CONTEXT OF IoT

Nicoleta NEGRU, Cosmin RUS, Nicolae PĂTRĂȘCOIU, Cecilia ROȘCULESCU

Along with the increase in the number of vehicles, there is an alarming increase in pollution levels, especially in urban agglomerations, due to the high levels of pollutants that result mainly from road jams. In order to be able to keep under some control all these factors require the creation of a traffic management system capable of allowing fluent circulation of motor vehicles, as traffic jams are the largest polluters, this being visible through the formation of clouds of pollution (smog). This paper presents a system for acquiring and analysing environmental parameters in order to create an interfacing map of a city so that it can then make some decisions regarding the traffic management system. This system is built from relatively cheap modules and is programmed in the LabView programming environment.

FACING THE CHALLENGE OF DEVELOPING MARICULTURE AT THE ROMANIAN BLACK SEA: SHELLFISH AQUACULTURE DEMONSTRATIVE CENTER

Victor Nicolae NIȚĂ, Simion NICOLAEV, Valodia MAXIMOV, Magda-Ioana NENCIU

Since 2012, at the first meeting of the GFCM Black Sea Working Group (WGBS), it was concluded that mariculture is a development priority for the Black Sea region. The main features identified, namely a heterogeneous development in the various regions of the Black Sea (Turkey vs. Bulgaria vs. Romania), constraints related to environmental factors (climate, salinity, exposed coastline, no sheltered areas), difficulties in integrating mariculture with other uses of the marine and coasta environment (transport, tourism etc.), the need to implement an appropriate legislative framework with clear certification procedures for marine aquaculture products, all call for immediate attention and focused research. At the Meeting on the Establishment of a Demonstrative Center for the Promotion of Sustainable Aquaculture in the Black Sea, September 27-28, 2017, Constanta, Romania, it was decided that NIMRD "Grigore Antipa" will host and coordinate a demonstration production module for the cultivation of mussels (Mytilus galloprovincialis). NIMRD's experts have extensive experience in marine aquaculture through the projects developed (fish and invertebrate species of commercial interest). The demonstration production module for mussel culture will be based on long-line technology and will have 2 components: long-line system on sea floats + boats & shore facilities (analytical laboratories and purification system). The demonstration module for mussel production will form the basis of training activities in the field of mitiliculture and will cover all aspects of the production cycle: biology and ecology of M. galloprovincialis; providing brood and collecting larvae from the natural environment; design and construction of the long-line system; mussel growth and handling technologies; mussel processing and purification technologies; production management systems (production costs, market analysis); training in methodological and practical aspects of the sanitary-veterinary classification of mollusks for domestic consumption/export.The first training course on mussel culture already took place during 17-28 September 2018, involving trainees from Bulgaria, Georgia, Turkey, Ukraine and Romania, from research organizations, authorities and the business sector. Representatives from the sanitary-veterinary authorities also attended and were engaged in

discussion regarding certifications aspects of shellfish waters. The aim of the training was to enhance the theoretical and practical knowledge, focusing legal and administrative issues.

BUSINESS PLANS FOR INFORMATION RURAL ECOLOGICAL DEVELOPMENT

Ana ONICA, Dumitru MICUSA, Elena NECHITA, Dumitru TODOROI

The purpose of this sub-project is: (1) to plan a web design business to support information of ecological development of rural sector, (2) to promote business ideas in the field of Information Technologies, (3) to demonstrate the need for a project aimed at promoting business in the on-line environment, and (4) to address effective marketing strategies for ecological business development in Moldova. This sub-project is presented under the business plan of an enterprise that offer web design and web development services. The business plan allows for a broad analysis of the structure and strategies addressed by the firm. It is divided into the financial, managerial, marketing, and actual description plan. Based on the business plan we can see the profitability and necessity of WEB FACTORY on the Moldovan market; The web design firm can create a creative and original online environment for local businesses; Can easily expand on the international market. This sub-project leads to discussions on the development of SMEs in the Republic of Moldova on the virtual platform, facilitating the access of the clients to the services and products of the local companies. It also addresses the problem of the low-profile promotion of domestic firms in the on-line environment. The business plan developed within this sub-project can easily be applied in practice. All the data and analyzes made are true, so it can be used to set up an economic entity that provides web design and web development services. The idea of a business is relatively new on the Moldovan market, and the services and strategies that WEB FACTORY intends to apply are creative and feasible. This sub-project can be implemented in Moldova due to the fact that in the elaboration of this plan was analyzed the demand and supplay of web services on the domestic market, and with good financing and qualified staff it can become not only a profitable business, but also a competitor for existing businesses. The submitted results represent a research sub-project performed under the Project „Anti-migration management in the rural sector of the Republic of Moldova" that is developed in the period 2015 - 2020 by the team of AESM and supporters.

CUBURILE ,,LUMINA ÎNGERILOR"

Mihai Teodor OLTEANU

Goticul ne duce cât mai aproape de lumina îngerilor, de culoarea, iubirea, dăruirea Lui Isus, Nouă. Care sunt locurile prin care, într-o catedrală gotică, putem comunica cu El? Oare numai Altarul? Eu cred că ferestrele Catedralei împodobite cu vitralii sunt spațiile prin care, această lumină ne pătrunde, ne îmbracă de iubire și ne ferește de păcatul mândriei, egoismului, infatuării orgoliului. Oare acest dar pe care îl primim fără să-l cerem, căci noi în general, nu ne rugăm să primim iubire să putem iubii și ierta deodată și mai degrabă ne rugăm să putem strânge averi; oare acest dar îl răsplătim cumva și cândva? Să construiești azi o biserică e atât de scump (în toate sensurile cuvântului). Să așezi în piețe, în parcuri, în fața unor lăcașuri publice bucăți de vitralii luminate din interior și din exterior noaptea, căci ziua ele au lumina Astrului, ce o primesc iar apoi, ne-o dăruiesc nouă prin căldura culorii învăluită de sticlă, prin muzica și mișcarea acestor trupuri (cuburile), acestor ființe vii ce vin să te întâmpine, să te oprească din drum, să-ți spună că sunt vii la fel ca tine și că vor să-ți vorbească; să se împărtășească ție prin culoare, muzică, lumină și

dans. Ele aceste cuburi, dănțuind în mrejele piramidei au vrajă, au curaj, au energie și te îmbie la meditație, la înțelegere, la pace și la frumos, la găsirea și regăsirea propiului suflet mereu rătăcit în graba noastră de a trăi corect. Metalul patinat, sticla pictată, covorul de licheni sau de iarbă, oglinda fărâmată de soare și de picioarele trecătorilor ce încăodată ne pune la picioarele noastre culoarea din fețele cubului, spunându-ne că ea poate fi călcată și privită deodată, dar nu uitată; ea oglinda e martorul nostru permanent al căutării de lumină, de cer. Aceste corpuri – trupuri – ființe, ar putea fi darurile unui artist către orașul său, iar orașul le merită cu prisosință. Prea multe îi cerem acestui oraș, e timpul să-i și dăruim, nu doar să ne plângem că nu avem cu ce-l înfrumusețea. El ne-a dăruit în toate timpurile frumusețea și curățenia inimii lui. Benedetto Croce, critic italian și filozof idealist, spune că în artă nu există progres și cred cu putere că este un mare adevăr. Arta e o înlănțuire permanentă a creației unor oameni ce nu pot fi asemuiți unii cu alții, cărora nu avem dreptul să le facem ierarhizări datorită însăși Unicității lor. În toate civilizațiile oamenii de știință au admirat arta, cultura și au gândit permanent la conservarea ei. Biblioteca este o astfel de instituție, o instituție a transcendenței artei, o instituție a păstrării în veci a fiorului artistic. Bibliotecile și muzeele sunt și vor rămâne lăcașuri în care veșnic Dumnezeu e deasupra noastră. Între artiști și oamenii de știință nu a existat niciodată conflicte de netrecut. Mâna Lui, a divinității, i-a înlănțuit, i-a împăcat întodeauna chiar dacă unii au fost neînțeleși în timpul lor și au plătit credința lor în artă, în știință, cu propria viață. Biblioteca Politehnicii este o astfel de citadelă menită să pună în valoare știința, arta și cultura precum și credința unui întreg neam, a întregului univers.

RESETTING THROUGH HOPE. EXHIBITION OPENING AT THE GLOREP2018 CONFERENCE

Mihai Teodor OLTEANU

Mihai Teodor Olteanu is considered the painter of the Revolution. Exalted in a world of apathy and enthusiasm when others distort the suspicion, he paints and lives to continue the ideals of the youngsters killed, their parents, whom you cannot cure their loss, relativizing the significance of the overthrow of the dictatorship with the price of blood. The Revolution of Timisoara gave the painter the power of freedom of expression and action. The painting is dedicated to the city and the charity, as a continuous prince brought to the martyrs of the revolution, forgotten by its benefactors and even more by those who confiscated it.Writer Doina Uricariu affirms with a full admiration for the artist's works: "… vital paintings with waterfall, echoes and whirlwinds, like Van Gogh" ... " The paintings of the artist are remarkable by the colors, by th, spiritual growth and paradise". "Painter Olteanu paints as he breathes, as if time is not enough to paint all the avalanche of feelings, and this is reflected in the alert sequence of exhibitions organized everywhere. Exhibitions such as Amsterdam, the Basilica of Notre Dame in Lyon, Bari, Toronto and other corners of the world testify to the intense activity of the artist"."The artistic vision of simple things, the freedom of style, the noble message transmitted, the belief in an ideal world, have been appreciated by international personalities with great admiration for the art of the artist"

THE IMPACT OF TECHNOLOGICAL WASTEWATER FROM THERMAL POWER STATIONS ON THE QUALITY OF SURFACE WATERS

Emilia Valentina PANTEA, Carmen GHERGHELEȘ, Aurelia ONEȚ, Eliza AGUD, Stelian PANTEA

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 on the quality of the underground and surface waters were imposed by the nature of the water used, the way of their use, the way of evacuation of the waste water in the plant, groundwater and surface water pollution and pollutants potentially present in discharged water.The central heating plant operated in the west, the industrial zone of Oradea, it was equipped with two large combustion plants, and used as main fuel coal (lignite), and auxiliaries: natural gas, fuel oil.Surface water from Crişul Repede could be accidentally contaminated by the discharge of large cooling water flows if this water came into contact with environmental pollutants. Cooling water evacuated to the emissary, Crişul Repede river, used for cooling of the aggregates, which did not require purification, was monitored weekly for the following indicators: temperature, residual filtered at 105^{o}C, chlorides, sulphates, CCO-Cr, organic solvents extractable, pH , suspended matter. The sampling site was the switching basin before the evacuation channels to the emissary.The results of the technological wastewater quality investigations into the emissary (Crişul 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.

ROLE OF EDTA IN LEAD MOBILIZATION AND ITS UPTAKE BY MAIZE GROWN ON AN ARTIFICIAL PB-POLLUTED SOIL

Georgiana PLOPEANU, Mariana MARINESCU, Nicoleta VRÎNCEANU, Vera CARABULEA

Presence of heavy metals in agricultural soils is of major environmental concern and a great threat to life on the earth. Soil pollution with heavy metals is a serious issue worldwide. Mining operations, industrial production and domestic and agricultural use of metal and metal containing compound have resulted in the release of toxic metals into the environment. Metal pollution has serious implications for the human health and the environment. Phytoremediation is considered an economical and environmentally friendly method of exploiting plants to extract contaminants from soil. The purpose of this paper is to study the maize seedling, growing and behaviour in a soil polluted with heavy metals. Maize is known from literature as lead accumulators in artificially polluted soil with 1000, 2000 and 3000 mg / kg Pb of soil and in the presence of different treatments with EDTA as the mobilization agent. Significant increases are at all variants versus control. This means that the treatment choice for phytoextraction (Pb concentration, EDTA concentration) is the amount of biomass. From the statistical calculation it results that in the variant with 1000 mg Pb / kg soil + ratio EDTA / Pb = 0.5 have no significant decrease in leaf weight. In conclusion, EDTA application does not influence hyperaccumulation. The toxicity of 3000 mg Pb / kg is too high and the plant does not tolerate this toxicity. Thus, another ligand / lead ratio has to be chosen and other solutions are sought to stimulate plant growth and increase the accumulation of metals in the plant.

THERMAL DEGRADATION OF PHOTOVOLTAIC PANELS: EVALUATIONS USING A RANGE OF TESTING METHODS

Nicolina POP, Roxana BEIU, Paula SVERA, Corina MNERIE, Gheorghe HUTIU, Virgil-Florin DUMA

Photovoltaic (PV) cells are prone to thermal degradation in time therefore they have to be monitored; when their parameters reach critically low values, they have to be replaced. The aim of the present study is to explore a range of testing methods for such a monitoring, including: Scanning Electronic Microscopy (SEM), Atomic Force Microscopy (AFM), as well as hardness measurements. Two categories of samples are considered for the study: news PV cells and used PV cells; the latter have been exposed to various atmospheric conditions for several years, the most significant being the temperature influence. Differences in the structure and properties of the two categories of PVs are assessed using these three methods. A good concordance between the results of the comparisons made between used and new PVs has been obtained using all methods considered. The significance of the characteristic parameters of the PVs involved in each testing is discussed.

CULTURABLE BACTERIAL COMMUNITIES FROM THE SPOILED WALLS OF THE HERITAGE BUILDINGS

Dorin POPA, Rahela CARPA, Marioara MOLDOVAN, Doina PRODAN, Mariana GOLUMBEANU, Simona VARVARA, Maria POPA

Microorganisms, such as bacteria, fungi, archaea and cyanobacteria, are capable of colonizing on surfaces of a wide range of materials and could cause the biodeterioration of these, particularly the walls of historical buildings exposed to changing environmental conditions, such as temperature, relative humidity, pH and sunlight. The deterioration of the walls of the heritage buildings constitutes a major problem. Five samples were collected from five different cavities inside the heritage building Wing C of"1 Decembrie 1918" University in Alba Iulia, during the spring of 2017. The bacterial community from these samples was investigated by microbial culture methods on nutrient agar. Culture-dependent method is commonly used to isolate and identify the composition of microbial communities, but generally only less than 1% of the whole population can be detected by this techniques. Despite this low percentage, our study revealed not only the prevalence of the colony forming units but also the presence of a high number of colonies for each sample. The aim of this study was to establish the colony forming units of microbial communities inhabiting the heritage building from Wing C of"1 Decembrie 1918" University in Alba Iulia. The investigation also included the microscopy features as the bacterial shapes.

VACUUM ANNEALING EFFECT ON FE-BASED NANOMATERIAL'S REMOVAL EFFICIENCY OF U(VI) AND SOME ACCOMPANYING ELEMENTS FROM DILUTED AQUEOUS SYSTEMS

Ioana-Carmen POPESCU (HOŞTUC), Ligia STOICA, Carolina CONSTANTIN, Ovidiu OPREA

*Uranium mining activity has a rich tradition in Romania leaving behind a radioactive and toxic legacy represented by the low radioactive waste dumps, tailing ponds, mine waters and other wastewaters resulted from the nuclear fuel fabrication. The mine waters' and poor ores' samples chemical analysis showed that U(VI) is accompanied by other heavy metals such as Cu (II), Cr(VI) and Mo(VI). The existent literature data have shown that besides U(VI) potential carcinogenic action the accompanying elements have a toxic effect on the human body causing different ailments, some of them extremely severe, such as chronic bronchitis, pulmonary tuberculosis, gastric disorders, enteritis, liver damage caused by Cr (VI); pruritus, rash and dermatitis due to Cu (II); skin, eyes and respiratory tract irritation caused by Mo (VI).Zero valent iron nanoparticles have been recently considered as eco-friendly highly effective remediation tools for organic and inorganic pollutants.The present contribution aims to point out the vacuum annealing effect on Fe-based nanomaterial's removal efficiency of U(VI), Cu(II), Cr(VI) and Mo(VI) from diluted aqueous systems as natural analogues for mine waters. Two types of Fe-based nanomaterials were investigated, sa follows:Fe-based nanomaterials synthesized in laboratory by the reduction of Fe (II) salt with sodium borohydride ($NaBH_4$)-**NMS**; and Fe-based nanomaterials synthesized in laboratory by the reduction of Fe (II) salt with sodium borohydride ($NaBH_4$) and vacuum annealed – **NMSTT**; The obtained results have suggested that the vacuum annealing treatment increases the Fe-based nanomaterial's stability and decreases its' reactivity in the first hour of reaction.*

ASSESSMENT OF MOLECULAR DIVERSITY AND STRAINS IDENTIFICATION OF SOME SINORHIZOBIUM MELILOTI ISOLATES FROM ALFALFA ROOT NODULES

Sorina POPESCU, Camelia TULCAN, Aurica BOROZAN, Salvina IHOS, Silvia ALDA, Oana-Maria BOLDURA

Endophytic bacteria were isolated from root nodules of alfalfa (Medicago sativa L.) plants, from different soil profiles in the west part of the country. Molecular diversity studies of 15 rhizobia isolates from were conducted using Enterobacterial Repetitive Intergenic Consensus (ERIC) molecular markers and PCR fingerprinting method and a phylogeny dendrogram was constructed. Based on their genetic diversity scores, 10 isolates were analysed by 16S rRNA region by DNA sequencing in order to identify their strain and defining their position in their taxon. Five of analyzed strains were found to be nonsymbiotic bacteria related to Pseudomonas and Bacillus genera, known as universally coexistent with symbiotic bacteria in the nodules. For the other 10 it was found that they are part of Rhizobium symbiotic bacteria order. Our study suggests that among isolated bacteria there is an obvious correlation, since they are coexisting in root nodules. Moreover, our results suggest that the symbiotic and nonsymbiotic bacteria interact together with their habitats.

EXAMINATION OF THE PRESENCE OF POLYCHLORINATED BIPHENYLS IN THE SOIL NEAR TRANSFORMER DEVICES

Milena RADOJEVIĆ, Marija PILČEVIĆ, Vladimir GUDALOVIĆ, Bojana STANIMIROVIĆ, Jelena PETROVIĆ, Ilija BRČESKI

Polychlorinated biphenyls (PCBs) are a class of the synthetic chemical compounds composed of a biphenyl ring with chlorine atoms attached at the benzene rings. The source of PCBs in many countries has been attributed, among other things, to the use of transformers containing PCB transformer oils. These oils enter the environment through poor handling of damaged electrical equipment, leakages, spillage during retro filling and also illegal dumping of PCB containing waste. The tests were performed on locations in the Republic of Serbia (Figure 1). Soil samples were taken from the wells in the vicinity of the transformers. Drilling was carried out to a depth of 2 m. From each well, per 3 (three) composite samples were analyzed from a depth of 0.0-0.8 m, 0.8-1.5 m and 1.5-2.0 m. The content of polychlorinated biphenyls (PCBs) as Aroclor 1260, but also as congeners, in soil samples was determined after extraction by hexane gas chromatography with ECD detector and gas chromatography with mass (MS) detector. Test results show the presence of PCBs in the soil. The values were compared with the legal norms in Serbia, but they were taken from the Dutch list. Contamination of these compounds practically can prove to be permanent, and remediation costs are extremely high.

ENERGETIC AND ENVIRONMENTAL EFFICIENCY COGENERATION OF A BAKING PLANT

Sorin Mihai RADU, Dan Codrut PETRILEAN, Ioan Sabin IRIMIE, Mihaela Dana RACS, Bogdan Ioan GAITA

One of the most modern possibilities to capitalize on the thermal potential of secondary energetic resources is represented by cogeneration. The paper deals with the installation of a cogeneration system at a baking plant, system which has one thermal engine in order to reduce on one hand the losses of thermal energy through burnt gases and on the other hand the environmental pollution and impact. The baking plant has a continuous yearly operation and in its classical operation scenario it comprise steam and hot water generation, necessary for the technological processes specific to the bread industry. The main problem consists in checking the operation conditions capable of offering natural gas and electricity economies within profitable limits. Identifying the profitability of adopting a cogeneration solution is carried out using comparative determinations which take into consideration energetic, monetary and environmental expenses for different exploitation conditions of the baking plant. Taking into consideration the measured parameters as reference data at the moment of the research, the opportunity and the profitability of using a cogeneration based on an electricity generating driven by a heat engine was assessed.

IMPORTANCE OF KNOWLEDGE ON HABITAT STRUCTURE FOR WILDLIFE CONSERVATIONAND MANAGEMENT IN EASTERN CROATIA

Vlatko ROŽAC, Dragan PRLIĆ, Siniša OZIMEC, Tihomir FLORIJANČIĆ

The protection of habitats makes an integral part of the nature protection in the European Union, regulated under the Council Directive on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), adopted in 1992. Together with the Birds Directive, it sets the standard for wildlife and nature conservation in the member states, including the Republic of Croatia. The updated digital Terrestrial Habitat Map of Croatia (delivered in December, 2016) gives the spatial overview of natural and semi-natural, non-forest terrestrial and inland freshwater habitats at scale 1:25 000. The activities in field validation of habitats identified by photo interpretation were carried out in eastern part of Croatia, from June to August 2015 and from May to August 2016. Geographically, eastern Croatia is located at southwestern part of the Pannonian Plain, comprising 12,486 km^2 or 22% of surface of the land area of the Republic of Croatia. The altitude ranging from 78 m (lowest point in southeastern part) up to 984 m (highest point in western part). Total 5,032 field points were collected by using tablet with a GIS/GPS and Habitat Mapper application. The composition and distribution of the main habitat type classes in eastern Croatia were analysed, comprising surveyed area in size 10,262.02 km^2. Prevailing habitats belongs into following habitat categories: I) Cultivated non-forested land and habitats with weeds and ruderal vegetation (47.4%), E) Forests (40.0%), J) Constructed and industrial habitats (3.59%), A) Inland surface water and wetlands (3.54%), C) Grasslands, bogs and tall herbs (2.83%), and Scrubs (2.59%). In addition, the endangered and rare habitat types included in the Natura 2000 sites are presented. Knowledge on habitat structure makes an important tool in planning measures for maintaining a favorable conservation status of habitat types in eastern Croatia, environmental protection, and in sustainable management with natural resources in agriculture, forestry, hunting and fisheries.

ENVIRONMENTAL PARAMETER MONITORING SYSTEM FOR URBAN TRAFFICRESTRICTION / RECONFIGURATION

Cosmin RUS, Nicoleta NEGRU, Monica LEBA, Andreea IONICĂ

Transport access is critical for inclusive growth, economic development leading to rising demand for road transport. Although there has been a gradual change in the environment and an increase in the number of cars, emission of pollutants and noise emission have not been measured and properly managed over the years leading to numerous health consequences described below. Road transport is by far the most dangerous source of emissions, with a share of 93% of the amount of greenhouse gases thrown into the atmosphere. This paper presents a study that will enable an urban air quality monitoring system to be set up for an efficient management of road traffic in order to increase the quality of citizens' lives.

NEW STRATEGY FOR THE RECOVERY OF RARE EARTH ELEMENTS (REES) FROM HUNGARIAN RED MUD

Ali SALMAN, Tatjána JUZSAKOVA, Zoltán BAKONYI, Endre DOMOKOS, Thamer Adnan ABDULLAH

This study focuses on a selective method for the recovery of the rareearth elements (REEs) such as (Sc, La, Y) from the Hungarian red mud which is considered as a waste. Bauxite residue (red mud) is a hazardous waste generated from alumina refining industries. Unless managed properly, red mud poses significant risks to the local environment due to its extreme alkalinity and its potential impacts on surface and ground water quality. Several parameters such as leaching agents, contact time, temperature, and solid to liquid ratio are being investigated in order to achieve an optimum REE recovery from the red mud. The REEs recovery procedure includes using a combination of technological steps acid leaching, solvent extraction and ion exchange adsorption. The acidsleaching was investigated in our study. Hydrochloric (HCl), sulphuric (H_2SO_4) and nitric (HNO_3) acids were applied for leaching. The chemical composition of leaching solutions was investigated byICP-OES techniques. The effect of parameters including different acid concentrations, acid compositions, leaching time were studied.

PREPARATION OF NANO-METAKAOLIN ADMIXTURE TO INVESTIGATE THE IMPACT ON MECHANICAL PROPERTIES OF OIL WELL CEMENT (OWC)

Ali SALMAN, Thamer Adnan ABDULLAH, Mohammed AL-ASADI, Tatjana JUZSAKOVA

This work aimed at to investigate the effects of the incorporation of nano-metakaolin (NMK) as pozzolonic material having promising mechanical properties (compressive strength) into oil well cement (OWC). Nano-metakaolin (NMK) was prepared from kaolin rock following thermal activation of kaolin clay at different temperatures (700–800 C) for 2 h then crushing and ball milled for 40-60 h. The cement used in this study comprised of oil well cement class G. NMK was incorporated as a partial replacement additive (in 3 wt %, 6 wt % and 10 wt %) of cement with two different average particle sizes (75nm,100nm) and a water to cement ratio (w/c) of 0.44 was used. Several techniques were used to prepare and characterize the NMK by Particle Size Analyzer (PSA), X-ray diffraction (XRD), X-ray fluorescence (XRF), scanning electron microscopy (SEM) and the Brunauer-Emmett-Teller (BET) methods. The results showed and supported the notion that the NMK acted not only as filler, but also as an activator to consolidate the hydration process, since NMK particles react with the calcium hydroxide $CaOH_2$ crystals to produce calcium silicate hydrate (Ca–Si–H) bonds. It fills the pores to increase the strength, decreases the size of the crystals at the interfacial zone and transmutes the calcium hydroxide feeble crystals to the Ca–Si–H crystals, and upgrade the interfacial zone and cement paste domain.

INTERNET OF THINGS RELIABILITY ASSESSMENT BASED ON MONTECARLO SIMULATION

Daniel SÂRB, Răzvan BOGDAN, Nicolina POP

Smart devices are by this time frequently in our daily lives and new ideas of using the internet will be shaped all the time. More than 50 billion devices are expected to become a part of Internet of Things systems in the following decade. These devices will become omnipresent and involved in every aspect of life, ranging from wearable devices to sensors monitoring industrial processes. The goal of today companies is pointing into a sustainable environment, and Internet of Things can assist this acceleration, becoming a game-changer for sustainability.

LOCAL SUSTAINABILITY STRATEGIES BY APPROACHING URBAN RESOURCES CONSUMPTION

Mirela SĂLĂJANU, Ildiko TULBURE

Human economic activities, especially industrial ones have the defined goal to support increasing the human quality of life. Nevertheless these can have beside positive direct and desired effects also negative, undesired and sometimes unthinkable effects on environment and society. With the goal of assuring sustainability of our human society it is therefore needed to assess economic activities, especially industrial processes not only from economic and technical points of view but from environmental and social ones as well. Debates about regional and local environmental quality are nowadays especially connected with the concept of sustainable development. After the Conference for Environment in Stockholm in 1972 and after the release in the same year of the first report to the Club of Rome „The Limits to Growth" it was understood that besides wanted effects of the technological progress, undesired and negative effects can appear, not only because of developing, but because of using new technological applications. It was clear that the arisen environmental and social problems are very serious and need to be solved. After this time the environmental awareness began changing, currently actually debating about sustainability awareness. The concept of sustainable development, defined for the first time in the Brundtland Report was accepted as a possible solution for the global complex economic, environmental and social challenges. This concept was very large discussed 1992 during the Conference for Environment and Development in Rio de Janeiro, so-called "Rio" – Conference, stated in the closing document „Agenda 21", as well as debated 2012 during the "Rio+20" – Conference. Many actions after this time have emphasized that the evolution of technical, social and ecological systems has to be analyzed in synergetic relation, in order to succeed the successful operationalization of sustainable development on different levels, on global, national, and regional as well as on a local level. The goal was and still is to find the best strategies for assuring the sustainability of our society, by taking into account the multitude of aspects related to economic and social activities. In the meantime there is a general conviction that sustainability of our human society cannot be achieved without assuring an appropriate environmental quality. For the operationalization of sustainable development appropriate strategies for economic, environmental and social developments have to be applied. This means that resources consumption is very important to be analyzed and assessed in the effort of finding future alternatives for renewable resources, based on water, wind, and solar energy, in order to be used on urban areas and actually not only. General notions regarding sustainability will be presented, as well as application examples with regard to

resources usage and consumption. The idea is to take into consideration as early as possible the negative impacts on environment and society because of using certain resources, as the fossil and renewable ones. In this context several alternatives regarding urban resources consumption will be analyzed and debated for supporting the sustainability assessment process. Gaining strategies on local level means actually developing strategies for urban sustainability in cities. The vision of having in the future sustainable cities, by taking into account regional differences, is currently worldwide a pretty discussed topic. It will be emphasized that nowadays there is no agreement regarding a general definition for a sustainable city or there is no complete agreement upon paradigm for what components should be included in this concept. Connected to this idea, developing a kind of a "general methodology" to be applied into the practice for real concrete situations by taking into consideration regional differences would represent a major progress in this field, just to come from the vision of sustainable cities to reality. In the present paper existing possibilities to assure an urban resources consumption for getting local sustainability will be emphasized by assuring minimal environmental and social impacts. Obtained results will be discussed and conclusions concerning the usage potential of the presented vision will be drawn.

THE BIOMETHANE A PROMISING ALTERNATIVE RENEWABLE FUEL IN ROMANIA

Nicolae SDRULA, Daniela Simina ȘTEFAN, Cornel CRAIU

The biogas have been significantly developed in the last 2-3 decades over the world, based on available residual bio-resources, contributing both to reducing of fossil gas consumption and uncontrolled gas emissions. In Europe, the action is required by the E.U. Directives till 2020 or 2050, regarding ratio to be achieved between renewable and fossil fuels to produce energy. For Romania case, have to underline that 30 years ago over 400 units of biogas were in running stage, besides today there exist only o few (about 24, based only on outside technologies, medium power, which may not process the current residual bio-resources potential). Taking in account the autochthon paste achievements and experience in this domain, still preserved by owners, the paper proposes to revamp these opportunities for the sector.The authors underline that such developing, applied on large scale may partially reduce the dependency of imported natural gas fuel parallel with reduction of pollution.The content of presentation is based both on previous Romanian achievements (for gas producing) and on current world/European practice for bio-methane obtaining.The way to turning in account of obtained biogas is versatile and depend on local conditions. As basis, the raw biogas, slightly pretreated, may be either directly used on home gas cookers or as fuel for motors producing warm water and electricity (cogeneration). Additionally, adequate purification and compressing may be applied on biogas. In this last alternative, the obtained gas, called bio-methane may be used either as motor fuel (captured into pressure charging car recipients) or delivered into national gas network. The work presents some official data regarding the actual situation in Romania on energy supply upon villages and dwellings, sustaining that in many cases delivery of any energy, including those of biogas is peremptorily required. For future cases, Romania may develop, based on produced biogas, technologies for biogas purification on adequate standards. In this moment, 16 European countries joined to an organization dealing with registering of bio-methane, as suppliers or consumers, and any new country will be sustained and assisted to apply proper methodologies and proceedings for this aim.The work presents the current situation in Romania regarding biogas production and perspective for next decades, in case the farmers, local or central authorities are

interested to develop such technologies, based on Romanian patents (already tested). Also, the methods to purify the biogas to bio-methane are annalised and discussed.Finally, the procedure for attending the European body, dealing with evidence of all bio-methane quantities delivered into or extracted out from national networks, is described. Developing of more plants producing biogas, based on available residual bio-resources, sustained by turning in account of bio-methane may arise independency from imported fossil gas resources, parallel with reduction of global uncontrolled spillage of dangerous matters or gaseous emissions into environment.

CULTURAL RELIGIOUS TOURISM IN THE REPUBLIC OF MOLDOVA

Anastasia SLOBODZEAN,Nicoleta TODOROI,Elena NECHITA,DumitruTODOROI

Justification of development strategies for the cultural religious tourism, harmonization of the interests of religious cultural institutions and management of economic agents providing special and general services. The work shows the strengths, weaknesses, threats and opportunities of religious tourism in the Republic of Moldova providing for the continued discussions as to the further development of this domain. Based on the performed analysis one may conclude that the religious tourism is a quite important branch of tourism in the Republic of Moldova, as the monasteries are the main tourist attractions in the country.This work considers the discussions relating to the position of religious tourism in the Republic of Moldova and offers several methods and development methods. The results of this work are upheld by the value of useful statements, conclusions and recommendations: studies in the manner of cultural religious tourism, didactical staff in public and private education, editing of scientific-didactical works. The work may be useful for the students in mastering and examining the dimensions of cultural religious tourism, for the tourist agencies practicing this form of tourism, for the statistical analysis and prognoses, as well as for the determination of new development directions of tourism in the Republic of Moldova. The need to justify new forms of tourism and their integration into the offers of specialized tourist agencies; elaboration of development plans and diversification of tourist offers in collaboration with all institutions. The submitted material representresearch results performed under the Project „Anti-migration management in the rural sector of the Republic of Moldova".that is developed in the period 2015 - 2020 by the team of AESM and supporters.

MONITORING OF CO_2 UPTAKE BY MICROALGAE IN INDOOR ENVIRONMENT

Gabriela SOREANU, Igor CRETESCU, Mariana DIACONU, Maria IGNAT, Valeria HARABAGIU, Corneliu COJOCARU, Petrisor SAMOILA

In this study, CO_2 uptake by microalgae in a sparged reactor processing air from indoor environment is evaluated in order to provide starting benchmarks for further biosystem development in the light of a specific environmental application related to air treatment in closed environments (that could address not only CO_2, but also other contaminants removal). The study has been performed by using spirulina (Arthrospira platensis) as microalgae model and preliminary results revealing the limits of the process performance with respect to nutrient solution particularities, biomass yield and contact time are presented and discussed.

ENVIRONMENTALLY FRIENDLY SYNTHESIS OF NOBLE METALLIC NANOPARTICLES FROM AQUEOUS EXTRACT OF *PAEONIA OFFICINALIS*

Ana-Alexandra SORESCU, Alexandrina NUTA, Rodica-Mariana ION, Ioana-Raluca SUICA-BUNGHEZ

Noble metallic nanoparticles, especially silver nanoparticles (AgNPs) and gold nanoparticles (AuNPs) exhibit physical-chemical properties that contribute to a continuous development of the researches in this field. There are different methods used to synthesize both AgNPs and AuNPs, from the conventional (i.e..: chemical and electrochemical methods, γ radiations, etc.) to the unconventional ones ("green chemistry" methods). Among the unconventional methods, the most used and studied are the ones based on plant extracts (aqueous or alcoholic) in the presence of silver nitrate ($AgNO_3$) and tetrachloauric acid ($HauCl_4$), under heat or at room temperature.Peony (Paeonia officinalis) has multiple therapeutic effects: fights acne, dermatitis or various skin inflammation as well as diminishes stomach aches. This plant contains tannins, alkaloids, oligoelements (calcium, magnesium, iron), vitamin C and flavonoids, phytocomponents that gives the aqueous extract obtained from leaves of Paeonia officinalis excellent properties to obtain metallic nanoparticles.This paper presents the eco-friendly synthesis of both AgNPs and AuNPs from aqueous extract of peony leaves. To prove that AgNPs and AuNPs are obtained, UV-Vis, FTIR and DLS spectra are recorded and the results confirm the biosynthesis of metallic nanoparticles. The results are presented in comparison with the chemical obtaining of AgNPs via sodium citrate method.

SILVER AND GOLD NANOPARTICLES FROM *CUCURBITA MAXIMA*: AN ECO-FRIENDLY ALTERNATIVE

Ana-Alexandra SORESCU, Alexandrina NUTA, Rodica-Mariana ION, Sabina Georgiana NITU,George Ionut RADU

Silver nanoparticles (AgNPs) and gold nanoparticles (AuNPs) have physical-chemical properties due to their size and structure that contribute to a continuous growth of the researches in this scientific field. Different methods are used to biosynthesize AgNPs and AuNPs and in the last decade more and more importance are gaining the ones based on aqueous plant extracts in the presence of metallic salts (silver nitrate and tetrachloauric acid).Squash (Cucurbita maxima) is a plant with numerous therapeutic applications: antiparasitic, antioxidant, can help in cancer prevention, etc. Squash contain mostly carbohydrates, little protein and almost no fat and is full of provitamin A, beta-carotene, as well as calcium and potassium.This paper presents the "green synthesis" of both AgNPs and AuNPs from aqueous extract of squash peel. To prove that AgNPs and AuNPs are obtained, UV-Vis, FTIR and DLS spectra are recorded and the results confirm the biosynthesis of metallic nanoparticles. The results are presented in comparison with the chemical obtaining of AgNPs via sodium citrate method.

ENERGY CONSUMPTION AND GHG EMISSION REDUCTION IN OBJECTS WITH COMPLEXT ENERGY SYSTEMS

Krume STOJANOV, Dame DIMITROVSKI

A heat pump is a device that transfers heat energy from the heat source to theconsumer-heat sink.Heat pumps are designed to transfer the heat energyinan opposite direction of a spontaneous heat transfer through absorbing the heat from a cold place and freeing heat to a warmer place. The heat pump uses a small amount of external power to achieve the transfer of energy from the heat source to the heat sink.In this paper, a model of calculating the expenses of energy is displayed, as well as expenses on fuel, saving energy and reducing the emission of greenhouse gases in systems where it is planned an implementations of heat pumps.The complexity of the building, the energy system and the outside conditions influence the process of GHG production and emission. The possibilities to utilize the waste energy and to use it in the object energy needs are shown and analyzed.

STRATEGIC BIO-ECONOMICAL AND ECO-ECONOMICAL MANAGEMENTAPPLIED IN THE APPROACH OF THE MAIN OBJECTIVES OF THE ROMANIAN AQUACULTURE WITHIN THE EUROPEAN UNION

Cristinel Gigi ȘONEA, Petre Adrian ISAR, Marcel MATIUȚI, Ciceronis CUMPĂNĂȘOIU, Andra Cristina ȘONEA, Camelia Daniela MIREA, Delia NEDELCU, Valentin DIMON.

The strategic bio-economical and eco-economical management applied in the field of fishing has the aim to develop entirely the potential of the aquaculture in Romania and in the European Union, according to the objectives of the Europe 2020 Strategy : sustainability, food security, economical growth and employment. An improved setting for aquaculture will contribute to production growth and to fish supply in Romania, will reduce the import dependence and will push up the development of the rural areas. The European Committee, together with all the other member states, have introduced strategic orientations for aquaculture, in order to approach the challenges this field confronts with, and to identify the domains (for example, the administrative simplification, the space improvement, the market organisation, a better labeling and information) which help the market to release the potential of the aquaculture field of the European union. Aquaculture depends on the quality and health of the sea waters, as well as of the freshwater. The European Union Environment Laws – especially the Frame Direction concerning water (Direction 2000/60 EC) , the Direction of strategy for the marine environment (Direction 2008/56 EC) and the Rule for use of exotic species, as well as of absent species at local level in aquaculture (EU Rule no. 304/2011) – insure the achievement of these previous conditions. Moreover, the European Union Law establishes high standards for health, customer protection and environment sustainability, standards which must be observed in the aquaculture activities, both in Romania and in the European Union member states. These present for their producers, implications connected to the cost management, which can develop into a competitive advantage if the customer's attention is directed towards quality, which may contribute to the acceptance of aquaculture at local level.

IMPLEMENTATION STUDY OF THE CONCEPT OF PASSIV HAUS IN CANADA

Dorin TĂTARU, Andreea Cristina TĂTARU, Aurora STANCI

Passive House were made for the first time in Germany, this concept is used later in other different climates of the south, west and southwest Europe. To determine whether an area is suitable for this concept of the passive house will use software Passive House Planning Package (PHPP) 2007 by which we determine the needs for heat and total consumption of primary energy of a home preset depending on latitude, longitude and climatic conditions. For a home to be considered passive house it must be within the maximum allowable on heating requirements ie 15 kWh /m² year nor the total primary energy consumption of 120 kWh/m² year. In this paper we will determine whether such Passive House concept according to German requirements for passive houses a predetermined pattern can be implemented in Canada. To achieve this experiment, we calculate the amount of heating and total primary energy consumption to seven cities located in Canada placed at different latitudes and climates. From these results we can determine whether these areas can be used such houses and buildings and which modifications can be made to the houses to be implemented in these areas.

EMOTION & TEMPERAMENT ROBO-INTELLIGENSES. MEASUREMENT & ADAPTABLE CREATION.

Dumitru TODOROI

*Materialization of notions of information, knowledge, and conscience, its functions, and its adaptability features with the perspective of intelligent systems creation process helps to investigate and develop the Computer Based Information Emotion Systems (CBIES) for Information, Knowledge based, and Consciousness Societies. The CBIES' higher level elements for these societies are evaluated based of its corresponding CBIES' lower level (component parts and phases of activity) elements.Human **emotions** in order to create Emotional ROBO-intelligences (EQ) as the continuation of Creative ROBO - intelligence (IQ) are examined. Fruitful cooperation of both IQ and EQ intelligences will evolve in Consciousness Society, which will be created, according to multiple surveys in the field, in the 2019 - 2035 years. Human **temperament**s with the purpose of creating artificial emotional, sensual and creative intelligences are examined. **Adaptable tools** help to define the new robotic elements. They are used to define higher level elements of **emotional** and **creative** ROBO-intelligences. Formulation, formalization and adaptable algorithmation of higher level elements of the **temperament** ROBO-intelligences, as first component parts of Adaptable tools, represent the evolutionary development of creation process of the Consciousness Society's ROBO-intelligences.Adaptable Tools, in such a way, are used for preparing first 3 stage of Robotic Program Products development, they define superior, next level elements of ROBO - intelligences. Present 2018 year of research is concerned to Aura development for Robotic Entities. Presented adaptable information technology for ROBO-intelligence's creation process is used in the institutional project "Creating Consciousness Society" that is developed in the period 2008 - 2018 by the team of AESM and supporters.*

CULTURAL ECOSYSTEM SERVICES AS A BRIDGE TOFUTURE CHALLENGES FOR SUSTAINABLE DEVELOPMENT

Judita TOMAŠKINOVÁ, Ján TOMAŠKIN

When featured in management plans, cultural ecosystem services tend to lack adequate integration and quantification. One usually finds them grouped under non-consumptive direct use values. It is envisaged that the demand for cultural ecosystem services in industrialised countries will increase, since more emphasis will be placed on recreational activities and this shift will be backed by higher spending on this segment. This does not mean that such services are not valued in traditional societies; however, here their importance is for the most part attributable to their contribution to cultural identity and even to the survival of such societies. It is regrettable that cultural ecosystem services tend to be marginalised by decision makers, either due to economic or even to ecological considerations, and this in spite of the importance attributed to them by diverse stakeholders in society and indeed by the public itself, as evidenced by the results of numerous exercises carried out to assess public perceptions about such services. This paper reports the results of research aimed at assessment of the recreational value (in the content of cultural value) of Pembroke *Garigue* Heritage Park *(NATURA 2000 site in the Maltese Islands), which is visited by about 22,000 tourists per year. This region has great potential in terms of tourism and is unique especially because of presence of cultural and natural heritage in the same place. The questionnaire survey was conducted from January to October in 2018 by direct contact with visitors in the area and its surroundings. The return rate of the questionnaire was 75.54% (491 respondents) out of a number of 650 distributed copies consisting of 24 questions each. Following the processing of the results using the method of travel costs, with an average duration of stay of 1.87 day and respondents' costs of € 127.47 per person / per stay, the total value of the recreational value was calculated at 5,244.115.8 €. The overall ecosystem assessment services of the evaluated protected area are resulting from recreational activities estimated at € 87,401.93 when converted to 1 ha of total area of Pembroke Heritage Park.*

THE PRODUCTIVE, ECOLOGICAL AND ENVIRONMENTAL FUNCTIONS OF GRASSLANDS IN AGRICULTURAL LANDSCAPE

Judita TOMAŠKINOVÁ, Ján TOMAŠKIN

Grasslands fulfills the important agricultural landscape productive and non-productive functions and ecosystem services. Production relevance is related to the production of plant biomass that is used as forage for livestock, and now also as a renewable energy source. Grasslands ensure along with the productive functions also significant non-production – ecological and environmental functions in agricultural landscape. The sod (root biomass and tillering zone), with a dominant share of 80 % in primary grass swards production, ensures these functions. The production of root biomass and aboveground phytomass was examined on three grass swards types – permanent grass swards (PGS), over-sown grass swards (OGS), temporary grass swards (TGS) with four variants of mineral nutrition. The experiment was carried out in the research area of GMARI in Banská Bystrica (Slovak Republic). The lowest root biomass production was observed on TGS (7.300 t.ha^{-1}), the highest production on PGS (8.270 t.ha^{-1}). The root biomass production is highly influenced with mineral nutrition and with climate change. The significantly highest amount of

root biomass (8.340 t.ha^{-1}) was produced on grass swards fertilized at highest doses of nutrients (180 kg N + 30 kg P + 60 kg K.ha^{-1}) and amount of root biomass was significantly higher during the dry years than climatically normal and wet years. Parameter for the evaluation of drought effect on the grass swards is the ratio of the root mass to the aboveground mass ratio (R:S). The results of R:S (4.020 – 5.163) demonstrate the significant ecological stability of the grass swards to the drought stress factor. All studied factors (year, mineral nutrition and grassland type) had a significant influence on the production of the tillering zone. The smallest amount of production of the cut-off zone produced OGS (0.497 kg.m^{-2}), followed by TGS and PGS (0.558 kg.m^{-2}). We recorded the lowest production of above-ground phytomass at TGS (0.581 kg.m^{-2}), higher on PGS (0.635 kg.m^{-2}) and the highest on OGS (0.655 kg.m^{-2}). OGS production was statistically significantly higher than on TGS. The accumulation of biogenic elements in roots and in aboveground phytomass of grass swards was also determined. The total grass sward biomass accumulate: 362.7kg.ha^{-1} N, 41.8 kg.ha^{-1} P, 252.1kg.ha^{-1} K, 115.5 kg.ha^{-1} Ca, 49.7kg.ha^{-1} Mg onaverage. Based on the results achieved, we recommend a more intensive use of the PGS feed system or the OGS. Permanent grass swards are ecologically more stable, better tailored to the site than TGS, and together with optimal mineral nutrition can provide adequate production of root biomass (8.270 t.ha^{-1}) and crop of above-ground phytomass (6.350 t.ha^{-1}). It is also advisable to recommend the use of OGS where we recorded the highest yield of above-ground production (6.550 t.ha^{-1}) and adequate production of root biomass (7.790 t.ha^{-1}). The TGS cultivation system is economically more demanding and disturbs the dynamic balance of the ecosystem.The evaluation of heavy metals concentration in soil and plant biomass is documenting the environmental importance of grassland ecosystems. Monitoring was carried out during the years 2009–2011 on permanent grassland, in the region of Starohorské vrchy – habitat Radvaň, National park Nízke Tatry – habitat Panský diel and National park Veľká Fatra – habitat Kráľova studňa (Slovak Republic). We specified following elements of heavy metals in soil and plant samples (root biomass and above-ground part of vegetation): Cd, Co, Cr, Pb, Zn, Mn, Cu, Fe and Ni. We recorded the highest concentrations of Fe (1351.45–3569.37 mg.kg^{-1}) and Mn (330.28 – 589.27 mg.kg^{-1}) and the lowest concentrations of Cr (3.93–7.62 mg.kg^{-1}) and Cd (1.61 – 2.35 mg.kg^{-1}) in all three evaluated environments (soil, roots, aboveground sward). Based on achieved results, we can state that heavy metals are mostly concentrated in plant roots and in soil. Significantly lower content was determined in biomass of above-ground parts of vegetation. The grasslands are as excluder of a large group of heavy metals – Cd, Co, Cr, Pb, Mn, Fe a Ni in view of the heavy metals transport in soil – root – aboveground biomass, (bioconcentration factor BCF < 1). This strategy is very suitable for bulk feed production, heavy metals concentration is relatively low in aboveground parts of sward, and there is no contamination of the food chain.

INCREASING BUILDING ENERGY AND ENVIRONMENTAL PERFORMANCE FOR SUSTAINABLE CITIES

Ildiko TULBURE, Adrian DREGHICI

At the latest after taking place the Conference for Environment in Stockholm in 1972 and after releasing the first report to the Club of Rome „The Limits to Growth" in the same year was finally understood that wanted effects of the technological progress could be attended by undesired and negative effects. This can happen not only because of developing new technological applications, but

maybe much more because of the usage way of these ones. Registered events have shown that the arisen environmental and social challenges are pretty stringent and need to be seriously debated and solved. All these developments have had as a result changes in the global environmental awareness. In order to find solutions for the problems shown above, which could be applicable to several countries, with respect to regional differences, worldwide have begun discussions on scientific, social and political levels. After many debates, the concept of sustainable development, defined for the first time in the Brundtland Report was accepted as being a possible solution for the complex global environmental, economic and social challenges. This concept was very large discussed 1992 during the Conference for Environment and Development in Rio de Janeiro, the so-called „Rio – Conference", as well as stated in the closing document „Agenda 21". Some years before, in 2012, the „Rio + 20 – Conference" took place again in Rio de Janeiro with the foremost goal to assess most relevant results got in this time period and to define future action directions for achieving the sustainability of our human society. Many actions after this time emphasize that the evolution of technical, environmental and social systems has to be analysed in synergetic relation, in order to succeed the successful operationalisation of sustainable development on different levels, on global, national, regional as well as on a local level. The goal was and still is to find the best strategies for assuring the sustainability of our society, by taking into account the multitude of aspects related to the economic and social activities. Gaining strategies on local level means actually developing strategies for the urban sustainability in cities. The vision of having in the future sustainable cities, by taking into account regional differences, is worldwide a pretty discussed topic, also in some Eastern European countries. For this it is important to analyse and evaluate the existing cities infrastructure, one most important element being represented by existing buildings in and around cities. It was recognised that urban sustainability is among the most critically important global issues of the 21st century. It is estimated that over 50% of the world's population is currently living in urban areas. Some developed scenarios for the future urban development estimate that by 2050 the proportion of the global population living in cities will rise to 70% . The big challenge is that cities nowadays consume about 75% of all world's energy and emit around 80% of all greenhouse gases. Therefore the fight against climate change will be won or lost in cities, so it is crucial that urban habitats will become more efficient, not only for themselves, but for future generations and the Earth's diverse ecosystems. Buildings energy and environmental performance is one relevant concern in the efforts of gaining sustainable cities. It is to be mentioned that in the European context related to buildings energy performance, there are several efforts in the direction of its improving. Issues related to improvement of buildings energy performance are mainly regulated under the Directive 2010/31/UE. In this regard it can be stated that in our country specific authorities try to promote measures in the direction of increasing buildings energy performance. This is made especially by designing new buildings with low energy consumption, by thermal rehabilitation of existing buildings and by correctly informing building owners and administrators about the state of the art. In this regard the energy performance certificate is playing an important role for improving the built-up urban framework and for environmental protection. Buildings energy performance should be taken into consideration when reffering to existing possibilities of getting sustainable cities. This could improve building affordability for customers, and also improve the dwellings energy performance, what would finally mean a decrease of electric and thermal energy consumption on a local level in the direction of getting local sustainability.

POLLUTANTS EMISSIONS INDICATOR REGARDING ELECTRICAL POWER SUPPLY

Ildiko TULBURE, Andrada OANCEA

Currently the main part of the energy used by population on a global level is obtained on the basis of burning fossil fuels. Fossil fuels represent a finite resource so that governments should be concerned to move to other energy types, especially to renewable energies when it is the discussion regarding electrical power supply. Due to constant development of daily human activities based on large energy consumption, pollutants emissions, especially CO_2 emissions, but also NO_x and SO_2 emissions, are increasing faster than it has been firstly assumed. Emerging industrial activities implies that the concern over ~~the~~ negative environmental impacts grows as well. There are several methods and tools used for environmental impact assessment, a pretty used and interesting one being the method based on calculating the environmental footprint of different products or processes. The environmental footprint actually measures pollutants emissions because of resources demand based on diverse consumption processes taking place in production processes and in our daily life. Although renewable energy resources, as wind, solar, geothermal, hydroelectric and biomass, provide substantial benefits for our climate, our health and our economy, there are nowadays many debates regarding potential environmental impacts of the technologies used for transforming renewable energy resources in electric and thermal energy necessary for our daily activities. Pollutants emissions in the whole life cycle of renewable energies will be emphasized and compared to the pollutants emissions when using fossil fuels. The environmental footprint of using renewable energies will be debated by establishing corresponding pollutants emissions. Each Earth resource has its own environmental footprint, the vision should be to use the Earth resources having the smallest environmental footprint so that finally the undesired environmental impact should be as low as possible.

SOME ISSUES REGARDING EVOLUTION OF WIND TURBINES

Ionela Adriana ȚIȘCĂ, Constantin Dan DUMITRESCU

The paper highlights the relevant aspects of trends towards the future of wind energy. The aspects concerning the form, the dimensions of the wind power plants in order to widen the area of use, the choice of a compact structure, the possibility to develop the process of implementation of on-shore and off-shore power plants with minimal costs, the elimination of the disadvantages signalled during the operation of wind power plants to the new types of power plants. They will highlight the aspects regarding the logistics of the equipment implementation of the dimensions and the shape of the blades, the solutions chosen for the location of the generators, and the advantages deriving from the widening of the field of the new generation plants. These power stations are maximizing and streamlining the wind potential and transforming it into a high level of electricity production. All this at a minimum level of impact on the environment. Here is also the placement of new types of power plants in urban environments, taking into account the fact that the issues related to the operating noise of the centres are eliminated while at the same time eliminating / minimizing the effects of the shadows.

PERSPECTIVES OF USING BIOMASS: Evidence from Romania

Claudiu Ioan UNGUREANU, Ionica ONCIOIU, Eugenia GRECU, Ioana IONEL

The energy generated from biomass and its derivatives, such as biogas, is of particular interest; Agricultural areas and the various types of existing waste - which are raw materials in producing this type of renewable energy - make this form of energy a remarkable potential. In Romania, there is a significant discrepancy between the developments in green energy projects; Of all renewable sources - wind energy and photovoltaic energy - dominated the market and damaged other sources such as hydro, biomass and biogas from the attention they ought to have. The main factor that has impeded a similar development is the considerably higher costs involved by biomass or biogas projects. The development of this green energy niche has long remained behind other renewable energy projects. But it remains attractive in order to balance the energy capacities. The article analyzes the sources of energy production from biomass, the challenges this activity faces, its growth prerequisites and the future evolution of this sector.

CONSIDERATIONS REGARDING THE IDENTIFICATION OF HIGH POTENTIAL MATERIALS FOR BIOGAS PRODUCTION

Lucia Ana VARGA, Adrian E. CIOABLA, Ioana IONEL

The paper presents the comparative approach to greenhouse gas emissions for the waste disposal scenario and the waste disposal scenario in biogas plants.The presentation highlights the need to use organic waste and wastewater in anaerobic fermentation processes as a source of biogas production.The conclusions present the environmental benefits of energy recovery of biogas waste, in line with the European commitments on circular economy, waste management and the promotion of energy from unconventional sources.

AN EIS STUDY ON THE METALS DISSOLUTION FROM WPCBS IN BROMIDE ELECTROLYTES

Simona VARVARA, Sorin Aurel DORNEANU, Petru ILEA, Roxana BOSTAN, Maria POPA

Waste printed circuit boards (WPCBs) contain substantial amounts of metals, such as Cu, Fe, Ni, Sn, Pb, Al, Zn, Sb, Au, Ag, Pd and include epoxy resin, glass fibres, ceramics and other non-metallic fractions, which embody large numbers of brominated flame retardants and other harmful substances, that might create serious pollution problems upon disposal [1]. In view of the environmental and economic benefits, increasing attention has been paid to the development of different processes for hazardous components separation and metals recycling from WPCBs [2]. The common methods include dismantling, shredding, air separation, electrostatic separation, pyrometallurgy and hydrometallurgy. Mechanical separation has low efficiency in metals recovering and it is usually used as a pre-treatment process. On the other hand, the chemical methods have been associated with serious secondary pollutions by the release of dioxins and

furans in the atmosphere and by generating high volumes of effluents. In this context, the development of new green and sustainable WPCBs recycling methods remains a challenging task.The present study is part of a research work aiming to elaborate an innovative and pollutants-free hydrometallurgical technology for the metals recovery from WPCBs. In this paper, a fundamental study investigating the dissolution process of several metals (Cu, Fe, Sn, Pb, Zn) has been carried out in bromide-based electrolytes, using electrochemical impedance spectroscopy (EIS). Different electrical equivalent circuits have been proposed to broaden understanding the dissolution mechanism of the metals.

TRAFFIC EMISSION ESTIMATES FOR A MAIN URBAN STREET

Ion VETREȘ, Eduard OANȚĂ, Nicolae Stelian LONTIȘ

The scientific study will present an emission inventory of a main urban street from an average crowded town in Western part of Romania. Through simulation software the inventory will consider the number of vehicles and types of propulsion that are driven in that street.

ASSESSMENT OF ETHANOL PRODUCTION FROM AGRICULTURAL LIGNOCELLULOSIC BIOMASS USING ON-SITE CELLULASES FROM *TRICHODERMA VIRIDE*

Teodor VINTILĂ, Monica DRAGOMIRESCU, Alexandra FERENCZ, Rufis TAGNE

Lignocellulosic biomass, like wheat straw and corn stalks, is generated world wide as residues from agricultural activities, or cultivating special crops. The yield, productivity and cost for the enzymatic hydrolysis of cellulose to glucose are crucial for the production of second generation ethanol. In this study we evaluate the activity of a crude extract of a local strain of Trichoderma viride. The enzymes are the whole cellulolytic enzyme pool produced in SSF culture by T. viride CMIT3.5. These enzymes were used in combination with cellobiase from Aspergillus niger – Novozyme 188 to hydrolyze two types of biomass: wheat straws and corn stalks. The pretreated was hydrolyzed at 50^{o}C, pH 4,8 for 96 hours applying 15 U of cellulase/gram cellulose and 90 U of cellobiase/gram cellulose. Calculating the ethanol yields reported to lignocellulose (DM), the following results were obtained: 0.272 g g^{-1}wheat straw and 0.186 g g^{-1} for corn stalks. Our calculations indicate regions having high agricultural productions as suitable for a 50000 tones capacity ethanol biorefinery capable to process one half of the entire straw production. The surface needed to provide the feedstock necessary for the biorefinery: around 10000 km^{2} need to be covered to harvest the agricultural residues for bioethanol production in agricultural areas as south-west and west regions with counties of Timis and Dolj. As for montaineous and colinary region Center, 34000 km^{2} can provide just over one half of the feedstock necessary for a commercial scale biorefinery.

POTENTIAL FOR RENEWABLE ENERGY PRODUCTION FROM WASTES GENERATED IN A PIGS FARM AND SLAUGHTERHOUSE

Teodor VINTILĂ, Alexandra FERENCZ, Florin SALA, Adriana Raluca WÄCHTER, Ioana IONEL

Biogas produced from wastes is regarded as advanced biofuel and is under current EU regulation promoting the growth of advanced biofuels. In this study, we have assessed the potential of a pigs farm and an adjacent slaughterhouse and meat processing enterprise to produce not only meat, but energy as well, through anaerobic digestion of wastes produced during current activities to produce biogas as energy carrier. Laboratory equipment used in the Laboratory of Industrial Microbiology and Biotechnology is an Automatic Methane Potential Test System – AMPTS II. The investigated samples and quantities used in the present experiment were prepared according to standard protocol VDI4630 and BPC. We have assessed the potential of a pig's farm and an adjacent slaughterhouse and meat processing enterprise to produce biogas as energy through anaerobic digestion of wastes generated in production activity. The results indicate solid sludge and fats resulted from slaughterhouse to produce high yields of methane reported to dry organic matter. Although organic wastes resulted from slaughterhouse can generate high quantities of methane by anaerobic digestion, large quantities of organic wastes are generated in the assessed pig's farm and the potential for energy production is much higher in the case of pig's farm than slaughterhouse. Combining organic wastes generated in the pig's farm with the organic wastes resulted from slaughterhouse, or organic wastes generated in the pig's farm with the biomass produced on 200 hectares of triticale as catch crop, can supply the feedstock necessary to operate an one-megawatt installed power biogas plant.

CONTRIBUTIONS TO THE SUSTAINABLE DEVELOPMENT OF THE AREASAFFECTED BY THE OPERATION IN OLTENIA BASIN. STUDY OF CASE ROVINARI CITY

Bogdan VLADU, Marin Silviu NAN, Emilia-Cornelia DUNCA, Alin SULTAN, Dorel VIȚAN

The basic economic activity of Rovinari is the mining industry, an activity on which almost all other activities are based within the city, with a great influence on the economic situation in the area. Rovinari's development strategy is based on the principle of sustainable development. The paper aims to present solutions for the sustainable development of the Rovinari area, an area affected by mining.

VARIOUS PERSPECTIVES OVER THE GREAT UNION IN BANAT. IDENTITY OF THE REGION SEEN AS A REFLECTION OF HISTORY, MEMORIES AND ART.

Mihaela VLĂSCEANU

The study is a pleading for getting to know the history of Banat and how the Great Union with Romania affected lifestyles and mentalities in a province with multiple identities either political, confessional or cultural. We can relate to a series of metamorphoses unfolding to shape a diverse ethnic structure with strong background in the European cultural space. Noted for its genuine diversity, the province of Banat was always shaped by a convergence with European history, note in this sense the period when Timişoara, the capital city of Banat became residence for Carol Robert de Anjou, where he had built a residence in the castle which is today the Banat Museum building. One may notice in this aspect how historical experience plays a fundamental role in the identity of a region, specifically for Romanian Banat, with its natural boundaries surrounding this political, administrative or multicultural entity: Mureş River at North, Tisza at West and the Danube at South. We notice in general how the discourse about the past changes, what we as historians can do is to be objective and always present the historical truth. How can we share the memory of these events, if not by all means providing the documents, the various points of view of those who witnessed them or the reality seen through the eyes of the artists. Also, we currently witness the replacement of identity in Banat, as we today consider Timişoara a cosmopolite city, part of the central European modern milieu, born when the Habsburgs conquered the province and shaped it as Kronland, a part of the empire where strong economic interests collided. With a history which oscillated between the great powers of a specific period: Ottoman and Habsburg rules, the latter a period when colonists from all over Europe settled in Banat and developed a provincial civilization with multiple layouts. Modernization transgressed to all fields, and we can recall the Baroque architecture and art shaping the newly acquired province. The ethnic character of these colonists was also an important factor in the transformation of the province cities into urbanized areas with all the requirements of such a denomination. The legacy of the Austro-Hungarian Empire is visible everywhere, everyone knows that Timişoara is often reffered as ,,Little Vienna" due to the analogues found here which resemble the urban plan, the religious and civil architecture, sculpture, even landscape art (following the prototype of Versailles with the English gardens realized by A. Le Notre for king Louis XIV) of 1900s Vienna. As I have stated in the title this is a sincere pleading for the true history of Banat, a history which was lost and recovered by historians presenting the panoramic view of the events most frequently, neglecting the details for the sake of synthesis, or serving identity visions. The fulfillment of the national unity (the union of Banat with Romania), which after World War I was formed of Oltenia, Muntenia, Dobrogea and Moldova was the result of the political events which led to the change of Temeswar into Timişoara. This brought the Romanian problem into the European attention. Most of the historians challenged by the subject agree that World War I had a key role in the development of Romanian national consciousness. This concept became reality after the war when Romania gained control over Bessarabia, Bukovina and Transylvania. Which were the cultural and ethnic realities of Banat province is another question to be answered by the present study? Memories, arts and history above all, make up the vivid picture of those days when Romania was made Whole/Entire. But the fact that parts of the country were joined after hundred years of political separation resulted in a fragmented society where the determination of national identity conflicted with the multiethnic and multicultural truth, as a statement most frequently quoted by contemporary historians. Visual documents (pictures taken on the occasion) will set the stage where the ideas of self-determination evolved. The once upon a time modern Habsburg province transgressed into contemporary historical province with all the inherent problems of nation

building. Research methodology requires in this case the use of comparison, contextualization and the use of pictures as eye witnesses of the events, as well as the interpretation of passages of written memories of participants reflecting subjective, but true points of view.

STUDY OF APPLYING HYDROXYAPATITE FOR IMMOBILIZATION OF HEAVY METALS IN A CONTAMINATED SOIL

Nicoleta Olimpia VRÎNCEANU, Dumitru Marian MOTELICĂ, Mihaela PREDA, Veronica TĂNASE, Iuliana IVANA, Georgiana PLOPEANU

This study evaluated the efficiency of hydroxyapatite on immobilization of heavy metals (Cd, Zn and Pb) in a contaminated soil from Copșa Mică. A 30-day incubation experiment was performed using contaminated soil mixture with hydroxyapatite at 0, 1, 2, 3, 4, 5 and 6 wt %. The effectiveness of applied amendments was assessed using single chemical extraction of metals from soil (using DTPA-$CaCl_2$-TEA at pH 7.3 or NH_4NO_3). The results demonstrate the high potential of hydroxyapatite to reduce the availability and possible toxicity of heavy metals in contaminated soils.

LEACHING INVESTIGATION OF A NEW CONCEPT OF LANDFILL DISPOSAL FOR WASTE INCINERATION RESIDUES ON ENVIRONMENTAL CONDITIONS EXPOSURE. PART 1: SCENARIO AND DISPOSAL MODEL SETUP.

Mihail Reinhold WÄCHTER, Daniel DAN, Ioana IONEL

Disposals for waste incineration residues are connected to the subsequent release of potentially harmful substances like inorganic salts and metal trace into environment, due to the leaching phenomenon that occurs by the exposure of the landfill on environmental conditions. Present article deals with investigation in the field for such type of landfill, that is build up through a new concept for landfill residues stabilization by encapsulation into ash rock crystallization matrix. The protocols for the leaching behaviour investigation are specifying by EN standard 12920+A1 2008. In this regard, present paper emphasis on the scenario conditions and disposal model setup, in order to investigate a leaching behaviour for a small scale landfill disposal exposed into environmental conditions.

COMPARISON OF ENERGY CONSUMPTION MODEL IN INDUSTRIAL GROWTH OF CHINA AND EAST EUROPE

Jizhi ZHOU, Zeyuan LIU, Adriana GRIGORESCU, Elena CONDREA

Fast development of economy was recorded in China in recent decade, which was relative to the green growth of its industry. In current work, the renewable energy consumption combined with the reduction of green house gases (GHGs) in China was evaluated according to the industry output in 2003-2015. Hierarchical clustering analysis (HCA)was used to figure out the relationship of industry output of 3 industrial sectors (Manufactory, Mining and Supply) to the energy consumption model. The result revealed that the output percentage of manufactory industry was not affected by the change of energy model significantly, while the changing of industrial structure was promoted by the transformation of energy-consumption structure. These features reflected that the green energy index was composed of renewable energy consumption and GHG reduction, which revealed the industry growth-driven energy consumption in China. Moreover, the relationship of green energy index to industry growth of East Europe in 2005-2016 was evaluated in the same way. The result showed that in countries of East Europe (Bulgaria, Romania, Poland, Czech Republic, Austria) the industrial structure changing seemed not achieved in the country that consumed green energy, although the fuel energy consuming might inhibit the industry evolution. The GHGs reduction was impacted by industry growth. Accordingly, the "feedback model" can describe the relationship between industry growth and energy consumption, which reflected bidirectional causality between energy consumption and economic growth. Therefore, the inhibition of industry growth was not suggested in East Europe as the industry growth probably led to renewable energy consumption and GHGs reduction as similar as the situation in China.

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