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AGROECOLOGICAL SOIL STATUS IN AGROECOSYSTEMS WITH MONOCULTURE

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ABSTRACT

The article presents original results of research. The dynamics of the balance and NPK use efficiency of the typical Ukrainian farm for monoculture cultivation during 2016–2018 has been calculated. Laboratory analysis of soil (pH value, humus content, N, P_2O_5 and K_2O) and grain (N and P_2O_5 content) was conducted in 2019. The negative dynamics of basic nutrient balance in the soil was revealed for 2016–2018 (nitrogen deficiency ranged from –30,6 to –130,9 kg/ha/year, phosphorus – from –25,8 to –62,4 kg/ha/year, potassium – from –34,3 to –244,5 kg/ha/year) and intensive pressures on the soil (NUE = 77,0–260,3%, PUE = 171,3–1902,3% and KUE = 115,8–1429,8%). Soil pH was found on average 5,6 (category: close to neutral), the nitrogen content averaged 99 mg/kg (very low level), P_2O_5 content – 208 mg/kg (high level) and K_2O – 119 mg/kg (medium level) on the farmland areas. The ratio between nitrogen, phosphorus and potassium content in the soil of the studied land areas on average reaches 1:0,9:1,2 while the scientifically sound norm is 1:0,9:0,8. The average humus content is 1,93% (low level). The calculated indicators of nitrogen and NUE balance only in 2017 met the recommended standards of the UN Economic Commission for Europe. The PUE and KUE values in 2016 exceeded the average rate of phosphorus and potassium removal from the soil – 22 and 12 times, respectively. Changes of acidity over the last three years indicate the acidification of the soil environment, which is quite natural: only nitrogenous mineral fertilizers are applied to the soil, which is physiologically acidic, soil liming is not carried out, the green manure crops are not sown, organic fertilizers are not applied, and in crop rotation was a monoculture. The widespread practice of plowing crop residues into the soil without applying phosphorus and potassium fertilizers for three years does not meet the crop requirements for phosphorus and potassium and creates high one-way pressure on the soil. Consequently, relatively high sunflower and maize yields are generated from the existing high and medium content of these elements in the soil. The tendency of decreasing humus content in soil has been noticed.

Keywords: agroecosystem, soil, monoculture, fertility, sunflower, maize, NPK, nitrogen emission.

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THE PROTECTION STATUS OF THREATENED SPECIES AND THEIR SPREADING AREAS IN THE CENTRAL REGION OF THE REPUBLIC OF MOLDOVA

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ABSTRACT

The paper presents a synthesis of the research results carried out over several years in the natural protected areas from the central region of the Republic of Moldova. The object of this research is 41 protected areas located in the forest fund. The focus is on the endangered species of plants and animals as well as the protected areas in which they were identified. The assessment of the protected areas was carried out during the main phenological phases of the vegetal and animal world. The register of valuable species was created, and their status of protection was recorded. There were identified 25 endangered species of plants and 16 of animals in the investigated areas. New areas of distribution were found for some species besides those mentioned in the Red Book of Moldova. The level of protection of the species demonstrates the importance of these areas for the biodiversity conservation. In order to ensure the conservation of these species in the investigated protected areas, it is necessary to strengthen the protection measures in such a way that these species are protected in their natural habitats. For an efficient management of the species and their ecosystems, we recommend developing a list with threatened species of plants and animals for each protected area that should include scientific data about abundance, vulnerability and their coordinates.

Key words: threatened species, status of protection, natural protected areas

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TRANSFORMATION OF GEOSYSTEMS VEGETATION OF SOUTHERN PRE - BAIKAL (*The Baikal Region*)

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ABSTRACT

The article presents the peculiarities of the spatial-temporal organization in the geosystems under different physical-geographic conditions of South-Western and Southern Pre-Baikal. The trends in formation of the plant communities of different landscapes types on the background of changes in the vector of anthropogenic impact are determined for the last 35 years. Basic parameters of the phytocoenoses structure characterizing the facial organization of landscapes are revealed for modern existing environmental conditions in the studied areas.

Key words: phytocoenoses, vegetation, geosystems, spatial-temporal organization, Pre-Baikal

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LEGAL AND POLITICAL CHANGES IN INDIA TOWARDS SUSTAINABLE MINING

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ABSTRACT

The mining industry of India contributes substantially to the economic development of the country. Despite the economic boost and the employment opportunities it creates, it has faced the flak of environmentalists owing to its environmental hazards. It is a potential threat to the ecosystem and biodiversity and there is an exigency to attain a rational balance between the mining activity and environment with an ultimate aim to achieve sustainable development. The present paper discusses the different techniques employed for mining and their individual environmental challenges, the statutes governing mining in India and the significance of rehabilitation and reclamation measures to combat the environmental threats. The environmental risks posed by the mining activity are catastrophic and there is an exigency to attain a rational balance between the mining activity and environment with an ultimate aim to achieve sustainable development.

Keywords: Mining, Environment, Ecosystem, Reclamation, Rehabilitation, Biodiversity

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BUILDING CAPACITY IN ALBANIA THROUGH COORDINATED RESEARCH ACTIVITIES IN NUCLEAR SECURITY

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ABSTRACT

The Institute of Applied Nuclear Physics (IANP) is established in 1970 and is the main user of the radioactive sources in Albania. IANP is a focal point and the main user and provider of nuclear and nuclear related techniques in the country and conducts research, applications, education and expert training in this field. In July 2016 IANP joined the Coordinated Research Project (CRP) J02005 titled "Improved Assessment of Initial Alarms from Radiation Detection Instruments" and in August 2018 joined the CRP J02012 titled "Advancing Radiation Detection Equipment for Detecting Nuclear and Other Radioactive Material out of Regulatory Control" in collaboration with General Custom Directorate (GCD). Participation in the CRP J02005 and the knowledge gained in understanding more the radiation detection system operations, has been a great support in improvements on how systems can be more sustainable. In the CRP J02012, the work has been focused in research experiments with different portable radiation detection instruments that are disposable at IANP. In collaboration with Department of Physics in the Faculty of Natural Sciences are conducted research experiments involving different age, weight and sex of people (students and Institute of Applied Nuclear Physics personnel). The research experiments are performed in different weather conditions (winter/ summer) classroom and field conditions for determining optimal equipment specifications. In August 2019 IANP joined the CRP J02014 titled "Advancing Maintenance, Repair and Calibration of Radiation Detection Equipment". Participation in the above CRPs provided opportunity to expand professional experience and to strengthen the cooperation between IANP and the GCD.

Keywords: research experiments, commodity, coordinate research project, radiation detection

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PRELIMINARY RESULTS RELATED TO HUMAN FACTORS ENGINEERING SPECIFICATIONS FOR ADVANCING RADIATION DETECTION EQUIPMENT'S

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ABSTRACT

The current state of portable and handheld radiation detection instruments and systems used to detect a criminal or an unauthorized act with nuclear security implications involving nuclear or other radioactive material that is out of regulatory control is often inadequate to meet the nuclear security needs of the users within States. This work thoroughly supported by IAEA, chiefly from Division of Nuclear Security, Department of Nuclear Safety and Security. Incorporating human factors early in design is a cost-effective approach to minimizing human error during operational use. Mitigating human error for an established system is more difficult than factoring in human capabilities and limitations in initial design. In some cases, performance (detection sensitivity, battery life, etc.) of the instrument has been sacrificed to reduce weight. Equipment design should be assessed from a human interface perspective to help design engineers to create a better product. This paper provides some of the preliminary results of the research experiments studying the form and weight factors of different radiation detection equipment's. So far are performed about 1000 experiments, mainly students (above 18 years old) and also costumes staff are involved. Experiments were also conducted simulating different weather (winter/summer) and field conditions for determining optimal equipment specifications. All the above described research activities have been done under the Coordinated Research Project (CRP) J02012 "Advancing Radiation Detection Equipment for Detecting Nuclear and Other Radioactive Material out of Regulatory Control" organized by International Atomic Energy Agency (IAEA). Albania has joined this CRP in 2017 and since then the Institute of Applied Nuclear Physics has been collecting data from a large number of research experiments examining different form factors and weights of radiation detection equipment under various use conditions.

Keywords: handheld radiation detection, weight factors, form factors, Equipment design

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SAFETY AND SECURITY INTERFACE OF RPMS USE TO BROADEN RADIOLOGICAL PROTECTION IN ALBANIA

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ABSTRACT

The basic law for radiation protection in the Republic of Albania is Law no. 8025, dated 11.01.1995 "On protection against ionizing radiation" amended No. 9973, July 28-th 2008, [1] which establishes basic safety standards to protect health of workers and the general public environment against the dangers arising from the ionizing radiation activities. Regulation on Physical Protection of Radioactive Materials in Albania has the objective to establish the basic requirements for physical protection of radioactive sources, and apply to all activities relating to the possession, use, storage and transportation of radioactive sources. Physical protection of radioactive sources aims to protect persons, property, society, and the environment from malicious acts, such as theft or unauthorized removal and sabotage involving radioactive sources. As a result of concern over nuclear and radioactive materials out of regulatory control, Albania has installed a number of Radiation Portal Monitors at various border control points. The main issue in relation to illicit trafficking and smuggling in nuclear materials is to detect any possible illegal transits through Albanian territory and borders and to respond to them properly. The knowledge gained on commodities containing NORM, compliance with transportation and safety requirements, and assessment of alarms will be discussed. The importance of documentation, cooperation between safety and security agencies/organizations, and tools to assess radiation alarms will be also covered.

Keywords: ionizing radiation, radioactive sources, radioactive materials, Radiation Portal Monitors

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A CONTRIBUTION TO RELICT AND ENDEMIC FLORA, LIFE FORM AND CHOROLOGY OF PLANTS IN BREDHIK RESERVE IN KOSOVO

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ABSTRACT

Bredhik Reserve is located in Sharr Mountain, in the South of Kosovo, near the state border with North Macedonia. It was established as strict natural area in 2016 and covers 126.16 ha. The study of the endemic and relicts species of Bredhik Reserve is performed for the first time. In group of biodiversity important plant species, determined by us, there are 64 taxa belonging to 46 genera and 31 families. The most species-rich families are Caryophyllaceae, Caryophyllaceae and Salicaceae. Tertiary relicts are 43 taxa, out of them 5 are endemic-relict, while glacial relicts are 7 taxa. There are 15 endemic and subendemic taxa. The results of the analysis of the flora show that the most abundant are Phanerophytes (43.75%), also Hemicryptophytes constitute a significant proportion of the flora (37.50%). The best represented chorological types are Balkan, Boreal and Euro-Asiatic elements. The biological spectrum in respect to biological types, shows strong prevalence of herbaceous perennials (53.12%), followed by tree species (23.44%). The presence of a high number of endemic and relict taxa has a great significance from the aspect of biodiversity and conservation of the area and the data brought could be utilized for further research.

Key words: Kosovo flora, floristic diversity, relicts, endemics, chorological type, life form

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ASSESSMENT OF PHYSICOCHEMICAL WATER QUALITY OF BOUGARA DAM-TIARET, ALGERIA

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ABSTRACT

The present study aimed at assessing water physicochemical quality of Bougara Dam (Algeria). Water samples were collected in 2019 from different locations within the dam's reservoir for a period of three months (from Mars to May). Several physicochemical parameters (pH, temperature, electrical conductivity (EC), dissolved oxygen (DO), dry residuals, oxidizable matter (OM), nitrate (NO_3^-), ammoniacal nitrogen (NH_4^+), chloride (Cl^-), phosphates (PO_4^{3-}), biological oxygen demand (BOD5) and chemical oxygen demand (COD)) were measured. The result of this research showed that mean values of studied parameters, except phosphates and ammoniacal nitrogen concentrations were within the permissible limit of standards established by the National Agency for Hydraulic Resources (ANRH) and Algerian standards for surface water. These findings constitute a basis for monitoring the physicochemical quality of water in the study area.

Keywords: Physico-chemical parameters, Bougara Dam, Tiaret, Water quality.

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INVESTIGATION OF FOREST ECOSYSTEM SERVICES AND PAYMENTS FOR ECOSYSTEM SERVICES IN TURKISH FORESTRY SECTOR PLANS

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ABSTRACT

Forest ecosystems provide a variety of environmental, economic, social and cultural goods and services crucial to sustaining human societies such as food, raw material, carbon sequestration, water purification, soil formation and habitat for millions of species. Due to excessive demand stemming from economic growth, demographic changes and individual choices, ecosystem services are under pressure and they are degraded. That is why it becomes more crucial to prevent these ecosystems and ecosystem services. In this study it is aimed to review the relationship between forest resources and ecosystem services for the Turkish forestry sector. Within this scope, after a brief examination of forest ecosystem services and the current situation of payment for ecosystem services (PES) mechanisms in Turkey, the forestry sector plans and documents are analyzed and how ecosystem services and PES mechanisms are handled in these plans and programs are evaluated. It is determined that there is no detailed purposes or actions on forest ecosystem services, their importance and PES in forestry sector plans in Turkey. Although emerging mechanisms such as PES offer good alternatives for financing forestry sector projects, Turkish forestry sector does not benefit from these resources yet already.

Keywords: forest ecosystems, forestry sector plans, ecosystem protection, payments for ecosystem services.

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PHYSIOTHERAPY IN COMBINATION WITH MULTIMODAL INTERVENTIONS REDUCE IN ADULT PATIENTS CHRONIC NECK PAIN- REVIEW

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ABSTRACT

Chronic neck pain is one of the most frequent musculoskeletal disorders in adults. It not only disrupts a person's quality of life but there is also with very high economic costs. The effects of physiotherapy in this problem are still unclear, and more the combination of physiotherapy with other treatment methods. The purpose was to review the literature in relation to the effectiveness of the combination of physiotherapy with other treatments as an important alternative in the treatment of chronic neck pain in adult patients. The research included the electronic database of Ovid PubMed, PEDro, NLM Tools, and CINAHL. Seven studies on the effects of physiotherapy in combination with other treatments in chronic neck pain were included in the review. Adults patients, only randomized clinical trials, and the studies published in the past two years were the inclusion criteria. The variable that was taken into account after primary treatment was the reduction of chronic neck pain. The study results showed that clinical studies were limited, even if the multimodal intervention may be an effective intervention for chronic neck pain patients. The review showed that physiotherapy has satisfactory effects in the treatment of chronic neck pain in combination with multimodal interventions but there is not enough evidence, due to the small number of trials included in the review.

Keywords: Neck pain, physiotherapy, multimodal, intervention, clinical trials.

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COMPARISON OF WINTER BARLEY VARIETIES (*HORDEUM VULGARE*) FOR BEER IN CLIMATIC ZONES IN KOSOVO

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ABSTRACT

The purpose of this study is the analysis of breeding/cultivation and production of autumn barley for beer (*Hordeum vulgare*) in the climatic conditions of the Republic of Kosovo. In the cultivation analysis and production have been included a total of five barley cultivars: Bingo, Zlatko, Vannesa, Esterel and Rex as comparative (standard). Analysis of breeding and production are conducted in two regions: Dukagjini Plain, and Kosovo Plain. The experiments have been settled by the method of randomized blocks in their repetitions. Area of each experimental plot was 10 m^2. In analyzing the cultivation and production, have been analyzed yield (kg/ha), weight (1000 seeds in grams) hectoliters weight (kg), protein content (%) humidity (%), and starch. Results obtained showed that there were significant statistical differences at different levels for all traits investigated cultivars involved in plots and compared with the standard (Rex) and also between regions.

Keywords: barley varieties, seed weight, hectoliters weight, yield.

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A RETROSPECTIVE STUDY (2017-2019) ON THE SEROPREVALENCE OF BRUCELLOSIS IN LOCAL AND IMPORTED CATTLE IN DIFFERENT ALGERIAN REGIONS

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ABSTRACT

Bovine brucellosis recognized by the OIE as a major endemic zoonoses, caused by the bacterium *Brucella abortus*. The aim of this study was to determine the seroprevalence to *Brucella abortus* in local and imported cattle breeds Algeria between 2017 to 2019.During the three years a total of 63284 local and 63180 imported cattle in different Algerian regions were sampled. The samples were analyzed using serological tests (RBPT and ELISA) of the local cattle sera analysed, 447 (Prevalence 1.89%),321(prevalence 11.13%) and 213 (1.51%) were found to be positive by RBPT and ELISA, respectively. Of the imported cattle sera analysed screened were a cas RBPT positive. The study reports the first evidence of bovine brucellosis over a vast geographical area of western Algeria Between (2017-2019) and therefore, an indication of a real animal and humans health problem. This warrants the need of integrated intervention to New strategies to fight this disease.

Keywords: bovine; brucellosis; seroprevalence; potential risk factors; Algeria.

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