1st INTERNATIONAL FORESTRY & NATURE TOURISM E-CONGRESS "New Approaches and Trends in Forestry" November 25-27, 2020

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"New Approaches and Trends in Forestry

NOVEMBER 25-27, 2020, KASTAMONU / TURKEY

ABSTRACT BOOK

KASTAMONU UNIVERSITY
FACULTY OF FORESTRY
2020

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KASTAMONU UNIVERSITY
FACULTY OF FORESTRY
2020

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Faculty of Forestry

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PREFACE

As one of the five universities that was declared within the scope of the "**Regional Development Oriented Mission Differentiation and Specialization Programme**" at the beginning of 2019 by the Council of Higher Education of the Republic of Turkey, Kastamonu University has been designated as one of the universities that shall specialize on "**Forestry and Nature Tourism**" across Turkey. As being entrusted with the mission of specializing in forestry across Turkey by the Council of Higher Education among 10 other universities, and as being in a position where it has the most optimal infrastructure in terms of academics, research studies, implementation and industry, Kastamonu University, in order to duly realize the task it was given, held the "**1st International Forestry and Nature Tourism E-Congress**" with the theme of "**New Approaches and Trends in Forestry**" to share and build upon the obtained scientific data, and to serve as a base for future studies.

It was an utmost pleasure and honor to welcome researchers from both home and away (USA, Romania, Philippines, Pakistan, Kyrgyzstan, Libya) to the e-congress during which a total of 64 academic papers were presented in Kastamonu, the city that is acknowledged as the center of Forestry in Turkey thanks to its forests that cover approximately 65% of the province, its 3 national parks, and its status as being host to the Regional Directorate where the most forest assets are produced.

Climate change is one of the biggest environmental, social and economic threats in today's world, and the importance of the role that forests play in the fight against climate change is evident. Furthermore, our forests need to meet the various needs of the society as a result of industrialization and population growth. Within the context of climate change, the recent pandemic and the different needs of society in an ever-changing world, natural resources and especially the forests are required to be handled with different approaches. Thus, we expect the e-congress held at our university with the aim of shedding light on the needs of society and science to make significant contributions to society, science and forestry with regards to developing new approaches in forestry applications.

For this very reason, I would like to extend my most sincere gratitude and appreciation to the organization committee of the **1st International Forestry and Ecotourism E-Congress** held in Kastamonu. I would also like to commend the valuable academic staff and the distinguished scientist from different institutions that participated in the congress for their great support and participation. We would like to thank and congratulate the valuable staff, the administrators and academics of the Faculty of Forestry at Kastamonu University for their efforts. Lastly, I would like to thank all the institutions and participants that supported and showed interest in our congress, with the hopes that it will prove beneficial and successful for both our university and our country.

Prof. Dr. Ahmet Hamdi TOPAL
Kastamonu University
Rector
Honorary Chair of INFONT 2020

PREFACE

Forests, besides their vital role in combating climate change, have to respond to the increasing and diversified needs of the society brought about by industrialization and population growth. Forestry activities carried out in forests, which are extremely important in terms of the continuity of the ecosystem, should be managed with a different perspective and understanding in this direction, and high value-added products obtained from the forest should also be offered to humanity with an effective, efficient and sustainable approach.

Approximately 67% of the surface area of Kastamonu province, which is regarded as the center of Forestry in Turkey, consists of forests. Kastamonu Regional Directorate of Forestry, with its annual production rate of 3.4 million m^3, is the regional directorate where the forest goods are produced by far the most in Turkey. Additionally, within the boundaries of the province where three national parks are located, the factories such as Kronospan, Kastamonu Entegre, Ekol Plywood, Çağ Plywood, and Dortek, there are also approximately 400 enterprises in the form of SMEs where forest products are processed. Kastamonu also has a significant share in the manufacturing of wood-based doors in the total production in Turkey.

Among the main themes addressed in the Ist International Forestry and Nature Tourism E-Congress were erosion, the adverse impacts of mining sites on forest ecosystems, the change of precipitation and temperatures within the scope of climate change, forest fires, possible effects of climate elements and solutions to ecological problems. In addition, the studies on the certification in forestry, on the carbon sequestration capacity of forests, which are the most important terrestrial ecosystems in reducing the negative effects of climate change, on the biomass estimation of different tree species in forests, as well as on the detection of large mammal species and some insect species that damage forest trees in Kastamonu region were presented.

As for the field of Forestry Industry, thermal processes applied to wood raw materials and their usage areas, the physical and mechanical properties of wood-based nanocomposites, and the importance of natural dyes in the paper industry were mentioned. In addition, the use of Industry 4.0, which becomes increasingly important today, in the forest industry and the situation of the forest products industries operating in Kastamonu during the Covid-19 pandemic were evaluated. Kastamonu University, which specializes in the field of Forestry and Nature Tourism, carried out an outstanding scientific activity within the scope of regional development and mission differentiation in the Ist International Forestry and Natural Tourism E-Congress, during which many different issues were covered.

I would like to express my sincere respect to Prof. Dr. Ahmet Hamdi TOPAL, the Rector of Kastamonu University for allowing this Congress to be organized. I would also like to extend my appreciation to my colleagues for their efforts during the organization of the congress, and to the scientists and participants who shared their knowledge by taking part in this special event.

I hope that the conclusions reached throughout the congress will be beneficial for the forestry of Kastamonu, Turkey, and the world in general, and offer an insight into future studies on forestry.

Prof. Dr. Ömer KÜÇÜK
Kastamonu University
Vice Rector
Chairman of INFONT 2020

KEYNOTE SPEAKERS

Sustainable Forest Operations in the United States Dr. Dalia ABBAS, American University, USA
Raw Materials for The Wood Industry Dr. Marius Catalin BARBU, Transilvania University, ROMANIA
Biodegredible Face Mask from Biofibers Dr. Salim HIZIROĞLU, Oklahoma State University, USA
Global Trends and Opportunities in Forestry Dr. Yusuf SERENGİL, İstanbul University-Cerrahpaşa, TURKEY

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Analysis of Forest Fire (2019-Turkey)

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Abstract

Aim of study: This study was conducted with the aim to analyze forest fires occurred in Turkey during 2019. In particular, it is aimed to determine the reasons for forest fires, the amount and number of burning areas according to region.

Area of study: All of Turkey's forest area is designated as an area of research. Forest fires in terms of Turkey's Mediterranean climate zones are also of importance.

Material and methods: The data of the forest fires in 2019 occurred in Turkey constitute the study material. The database program was prepared by data transfer to the computer. Data were analyzed separately according to the general and regional directorates in Turkey. A database program was used in the evaluation of forest fires information. The data are presented as tables, figures and maps.

Main results: Initially, Turkey's forest area and forest wealth distribution, the composition of tree species of the forest areas are is declared. Furthermore, information about the distribution of forest areas according to the province and the regional directorates is shared. Then, the causes of forest fires (intent, neglect-accident, natural, unsolved), the number of forest fires and the amount of burnt area were specified. In addition, the distribution of forest fires according to regional directorates was given as area and number. The distribution of fires that occurred in 2019 according to forest characteristics, the distribution of forest fires by provinces, and the areal and numerical distribution of the regional directorates according to the causes of fires are shown in tables and figures. Finally, the silvicultural evaluation of the burning areas (the area exposed to the cover fire but not damaged, the area where natural regeneration was prepared, the area included in the artificial regeneration program, the rehabilitation area, the area included in the afforestation program, the area protected because there is no technical operation to be done) were discussed.

Highlights: Suggestions have been made for the protection and renewal of the forests in Turkey and for the acquisition of new forest areas.

Keywords: Forests, Forest Fires, Fire Reason, Turkey.

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The Opinions of the Personnel Working in Fighting Forest Fires on Occupational Health and Safety

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Abstract

Aim of study: The study has been prepared in order to obtain the opinions of the personnel involved in forest fire fighting activities regarding occupational health and safety.

Area of study: The research area is all 8 forest management directorates affiliated to İzmir Forestry Regional Directorate.

Material and methods: In the study, 8 communication centers, 24 watchtowers, and 24 forest fire initial response teams were taken into account as personnel in response to forest fires. A total of 200 personnel (84 temporary workers, 80 permanent workers, 16 forest protection officers, and 20 forest engineers) participated in the survey. The questionnaire form is consisting of 24 questions. The questionnaire form consists of 8 subtitles presented below.

1) Personal information (age, education, work experience),
2) Health status (chronic discomfort, physical disability),
3) Vocational education (learning the profession, in-service training etc.),
4) Working environment (knowing the area, knowing what to do when it reaches the fire area),
5) Personnel status (qualification and number of staff, resting status in fires)
6) Personal protective equipment (suitability of personal protective equipment, adequacy of tools and equipment used),
7) Occupational accident situation (work accident notification status, encountering fatal dangers and simple injuries during work, endangering their lives to extinguish forest fire, etc.)
8) Dangers and risks encountered (danger avoidance plan, doing a dangerous task without thinking, taking orders that endanger the safety of the team during a fire, supervision of the personnel in terms of occupational health and safety, etc.)

The opinions of the staff working in forest fire fighting activities on the above issues were evaluated by the percentage method. These data were then compared with the results of other studies.

Main results: Suggestions have been made to eliminate existing dangers and risks or reduce them to an acceptable level. Recommendations have been made regarding the measures to be taken against dangers and risks, personal protective equipment that should be used according to the types of tasks.

Highlights: The dangers and risks faced by employees in combating forest fires have been identified.

Keywords: İzmir Forestry Regional Directorate, Hazards and Risks, Combating Forest Fires

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Determination of Hazards and Risks in Facilities, Tools, and Equipment Used in Combating Forest Fires

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Abstract

Aim of study: In this paper, hazards and risks in facilities, vehicles and equipment used within the scope of combating forest fires are examined within the scope of occupational health and safety.

Area of study: İzmir Forestry Regional Directorate

Material and methods: The main material of the study is the facilities, tools, and equipment used by the 8 forest management directorates under the İzmir Forestry Regional Directorate to combat forest fires. Accordingly, observations were made in 24 forest management chiefs, 8 communication centers, 24 watchtowers, and 24 first response teams.

Main results: The dangers and risks detected in these environments and the vehicles and equipment used were observed and photographed in terms of occupational health and safety. First of all, these photographs were examined in terms of the dangers and risks faced by the staff. Then, dangers and risks were explained in the form of a pumper truck, helicopters, first response vehicles, team buildings, watchtowers, and personal protective equipment used. Thus, a total of 81 deficiencies or faulty applications were detected in the facilities, vehicles, and equipment used in combating forest fires. These findings have been compared with the results of other studies and many suggestions have been developed.

Highlights: A total of 81 deficiencies or faulty applications were detected in the facilities, vehicles, and equipment used in combating forest fires.

Keywords: İzmir Forestry Regional Directorate, Hazards and Risks, Combating Forest Fires

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Interactive Positioning of Biological Diversity in Protected Areas

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Abstract

Aim of study: In this study, it is planned to implement a digital application that will facilitate the work of engineers and experts working in the Ministry of Agriculture and Forestry and the Ministry of Environment and Urbanization. With this application, it is aimed to increase the ecological knowledge and awareness of local people living in protected areas and their visitors.

Area of study: Digital application are intended to apply to the status of protected areas in Turkey.

Material and methods: In this research, it is aimed to transform the point, linear or polygonal GPS data of the resource values in protected areas into an effective form with text, word, photo or video explanations via an Android or IOS application.

Main results: With the implementation of the digital application, the speed of access to ecological information of engineers and experts working in the field will increase and their dominance in the field will increase. Monitoring results of species conservation action plans will be more efficient. Forest management plans will be planned more effectively. It will be easier to follow up the certification procedures in the field of forestry by local or foreign experts. It will contribute to the economic and ecological planning of non-wood forest products. Biological protection and sustainability in wildlife protection areas will be strengthened. Ecological knowledge and awareness of local people and visitors living in protected areas will be increased.

Highlights: The activity of this study will be realized by transferring the existing spatial and digital information in the Ministry of Agriculture and Forestry and the Ministry of Environment and Urbanization to the digital platform.

Keywords: Biological Diversity, Protected Areas, Digital Application

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Determination of Soil Loss from Watershed of Kartalkaya Dam under Different Land Use Types and using Geotextil (Silt Fence) Treatment

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Abstract

Aim of study: The aim of this study was to assess erosion occured from the watershed under different land use types using Geotextil (Silt Fence) treatment comparing this with WEPP (Water Erosion Prediction Project) simulation computer program.

Area of study: This study was conducted on the watershed of Kartalkaya Dam which is 55 km to city of Kahramanmaraş and located on the Southeastern Mediterrenean region of Turkey.

Material and methods: Soil samples were analyzed for organic matter, permeability and texture (sand, clay and silt) contents. These values were evalvated by WEPP (Water Erosion Prediction Project) computer program and compared to the sediment amounts on the Geotextils (Silt Fence) and relationships were researched.

Main results: Using WEPP modeling, it was found that there was no annual average soil loss and sediment accumulation from forested sites. However there was sediment accumulation of 0.001 tons/ha. from sited treated with geotextiles. There was annual average soil loss of 0.004 kg/m² from rangeland site and annual average sediment accumulation of 0.035 tons/ha. estimated by WEPP model and 0.003 tons/ha. from geotextil (silt fence) treatment. From sites established on agricultural land (harvest) the annual average soil loss was about 0.009 kg/m²estimated by WEPP model. Annual average sediment accumulation, according to WEPP model was about 0.095 tons/ha. and about 0.006 tons/ha. from geotextile treatment. On site established on agricultural areas (after wheat), however, annual average soil loss was found to be 0.008 kg/m². The annual average sediment accumulation was calculated to be 0.076 tons/ha. using the WEPP model. On the other hand, observed sediment accumulation was found to be 0.004 tons/ha. on the geotextiles established on agricultural areas (wheat). On site established on cultivated agricultural area, annual average soil loss was predicted to be 0.008 kg/m² with the WEPP model. With the help of WEPP model, annual average sediment accumulation was found to be 0.077 tons/ha. for all pilot sites. The observed annual average sediment efficiency was also found to be 0.005 tons/ha. for geotextiles.

Highlights: As a result of the research, the soil (agriculture, forest, pasture) under different land use patterns on the Kartalkaya Dam rainfall basin are sensitive to erosion; It should be a priority to take the necessary measures for the protection of soils.

Keywords: Geotextil (Silt Fence), Sediment, Soil Erosion, WEPP (Water Erosion Prediction Project).

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Assessment of Irrigation Water Quality of Side-Mansur Area in Benghazi Region

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Abstract

Aim of study: Sodium adsorption ratio (SAR), Sodium percentage (%), residual Sodium Carbonate (RSC), Permeability index (PI), Soluble Sodium Percentage (SSP), Magnesium hazard (MH) and the physical and chemical parameters of groundwater play a significant role in classifying and assessing irrigation water quality.

Area of study: This study focused on characterization of Groundwater of Side Mansur Area in Benghazi Region.

Material and methods: Groundwater samples were collected from wells to represent different uses such as domestic and farm wells during July to September 2020. The analyzed samples were used for classifying water quality for irrigation purpose.

Main results: The major ionic abundance in the area shows that trend Cl^- > $HCO3^-$ > Na^+ > Ca^{++} > Mg^+ > K^+. Accordingly, the results suggest that the groundwater in the study area There are higher concentrations of major ions and higher values of chemical parameters in the groundwater. The groundwater in the study area is fresh to moderately mineralized, with TDS values ranging from 608 to 1.804 mg/L. (PI) ranges from 51.82 to 66.87% with an average value of about 59.98%. The soil permeability is affected by long-term usage of water for irrigation and other purposes. Based on the (PI) in the study area, 55% of the samples were suitable for irrigation and 45% of the samples were unsuitable for irrigation purpose. However, according to RSC values shows that Suitable water for irrigation use. the calculated values of (SAR) in the study area the results suggest that All samples fall under (Use on sodium sensitive crops must be cautioned).

Highlights: Knowing the physical and chemical parameters of water plays an important role in determining the quality of irrigation water.

Keywords: Water Quality, Groundwater, Benghazi

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Dynamic Erosion Model and Monitoring System (DEMIS) Produces Updated Erosion Statistics by Land Use Types at the Province Scale in Kastamonu

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Abstract

Aim of study: To provide erosion severity distribution maps on which detailed action plans in province scale for combating soil erosion.

Area of study: All available data sets of climate, soil, topography and land use and land cover across Kastamonu were tapped into for computing model parameters exclusive to the RUSLE technology which performed in General Directorate Combating Desertification and Erosion in Ankara.

Material and methods: DEMIS uses an existing map of R-factor of Turkey, which is layered by using 357 minute-data of the Automatic Meteorological Observation Station and calculated as a result of the annual total energy of rainstorm (E, MJ $ha^{-1}y^{-1}$) and the maximum 30-min intensity (I_{30}, mm h^{-1}) ($E \times I_{30}$). DEMIS computes soil erodibility factor from 138 geo-referenced soil samples distributed over Kastamonu. Dependent upon presence of germane soil parameters required to estimate erodibility, the equations of nomogragh were utilized to assess K factor after regression analyses to express best possible relations among three different K values. The topographic factor of DEMIS is interactively calculated by slope length factor (L) and steepness factor (S) along with flow accumulation. Where χ is the flow accumulation and is obtained from DEM using a GIS accumulation algorithm, which employs the watershed delineation tool of Arc view 10.2. DEMIS consumes 44 classes of CORINE land cover (CORINE 2012) as a base map for the RUSLE-C together with correspondent values determined by Panagos et al. (2015). Furthermore, additional adaptive corrections were performed combinatorially using the National Forest Map of Turkey given semi-arid specificities of forest types and vegetative covers. As well, DEMIS could be run to predict soil losses and to assess water erosion risk at the micro-catchment level considering support practice factors along with effects of existent dams and lakes on the erosional transport processes, and has a sufficient capability to be integrated with the Sediment Delivery Ratio to compute sediment amounts reaching outlet of each micro-catchments. Its calibration and validation works have been in progress by comparing with the suspended sediment loads directly measured at 10 monitoring stations of the province scale in Kastamonu.

Main results: Relying upon the DEMIS generated statistics and predictions, the calculated soil loss is nearly eight-million ton ha^{-1} y^{-1}in Kastamonu. Erosion severity also revealed 84.19% of Kastamonu is under the influence of either very low or low erosion although 15.81% of its whole land area is prone to the moderate, severe and very severe erosion. Once sorted by land use types, severe and very severe erosion rates obviously alarm for agricultural lands. When the weight of each model parameter on total loss to determine their effect and contribution was further partitioned, the topographic factor (LS), which represents the combined influence of slope length and slope steepness on overland flow and erosion processes took a lead with rational efficiency of 47.55%, and crop management (C), erosivity (R), and erodibility (K) followed this by the percentages of 34.82, 14.26 and 3.36, respectively.

Highlights: DEMIS has performed successfully to spatially and hierarchically delineate soil erosion risk areas by the severity classes so that the SLM/SSM approaches and technologies to avoid, reverse and restore land degradation by the soil erosion at the Kastamonu province scale.

Keywords: DEMIS, Soil Erosion Risk Assessment, SLM/SSM Practices.

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Reporting and Evaluation in Watershed Rehabilitation Projects; Sample of Uluborlu Pupa Stream Watershed

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Abstract

Aim of study: Since 1950s, watershed rehabilitation projects have been planned and implemented. In our country during the recent years, dozens of micro-catchment have been subject to be studied. However, it is necessary to determine the current situation of past projects and to take lesson from the methods of that time.

Area of study: Pupa stream watershed project, carried out in Isparta –Uluborlu, is the one of the oldest watershed project in Turkey. Due to erosion, flood and overflows, dozens of people's home were damaged, hundreds of livestock were perished, hundreds of hectares of agricultural area were damaged and tons of grain was destroyed in the harvesting areas. In 1971, Burdur Soil Conversation and Rangeland Improvement Practice Group Directorate started for preparation of this project. The area of the project is 4.429.76 ha. From project started year till today, very important works have been done in the field area.

Material and methods: After the office studies, the micro watershed observation form was filled in the field. Technical conditions specified in the legislation are taken as reference. New analysis maps (erosion risk, desertification vulnerability and soil organic carbon maps) were prepared.

Main results and highlights: Uluborlu Pupa Stream Watershed approximately was determined that 50 years ago, Forest Engineers prepared and implemented well-equipped projects. It was observed that the scope of the prepared project (purpose, goal, justification, factors and important dates), activities and budget were given at an adequate level. The need and local demand in the preparation of the project, coordination with other institutions in practice, a multidisciplinary understanding with other professional disciplines, a participatory approach involving the public, localism using the plant species in the region, employment principles by applying with the local people were observed.

Keywords: Watershed Rehabilitation, Uluborlu, Pupa Stream

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Considerations on Forest Management Certification in Turkey as to FSC® (Forest Stewardship Council) Scheme

Ahmet SIVACIOĞLU

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Abstract

Aim of study: The aim of this study is to examine the Forest Management Certification projects which have been carried out in Turkey since 2010 as to the FSC system. Presently, 6.673.308 ha of forests certified in Turkey according to this system.

Area of study: This study based on the Forest Management Certification projects of Turkey as to the FSC system.

Material and methods: In the study, FSC projects currently carried out were evaluated as material. In this study, certification projects in Turkey are examined, problems and their solutions are listed.

Main results: Not only the positive price contribution of the certification process to the wood producer General Forestry Directorate (GFD), but also the country-based contribution to the forest industry should be evaluated. It is not possible to return from the FSC certification process, and it is necessary to establish permanent quality systems in all centre and local forestry organizations. Instead of delegating the management and monitoring of the management of the process only to the Business Marketing Branch directorate, all branches should be involved in this process, management and monitoring should only be controlled by a chief engineer or branch whose job is the certification process. In the certification process, it is important for the top management to own the process and this process must be included in the scope of internal control. The decision on which certification process to use should definitely be agreed with the wood products buyers.

Highlights: In Turkish forestry, Forest Management Certification process must be accepted as an irreversible process, and more efficient system should be established accordingly.

Keywords: FSC, Forest Management Certification, Turkey

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Examination of Certification Systems in Terms of Sustainable Ecotourism

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Abstract

Aim of study: It is aimed to investigate the application of the main certification systems applied at national and international level in terms of ecotourism activities in protected areas.

Area of study: Green Star, Blue Flag, White Star, Greening Hotels, Halal Tourism Certificate, Safe Tourism Certificate etc. national certification systems with Green Globe 21, Costa Rica Certification Program, National Ecotourism Accreditation Program, New Zealand Certification Program, Europark, PanParks, Green Key, Travelife, Breeam and Leed, ISO 14001 etc. international certification systems.

Material and methods: National and internationally published articles, papers, etc. academic studies, as well as various plans, reports, etc. were used as materials in this research. All materials obtained are discussed separately under the title of national and international studies for research purposes.

Main results: Green Star, Blue Flag, Halal Tourism Certificate and Safe Tourism Certificate from national certification systems in our country and Green Globe 21, Travelife, Breeam and Leed, NEAP, Costa Rika certification system, New Zealand certification system and ISO 14001 certification systems from international certification systems were found to be not suitable for protected areas. However, Europark and Panparks and Global Sustainable Tourism Criteria from international certification systems have been found to be suitable for certification of ecotourism activities in protected areas.

Highlights: Sustainable ecotourism criteria and indicators should be established at the national level and an internationally protected certification system should be emphasized in our country.

Keywords: Certification, Protected Areas, Sustainable Ecotourism, Turkey

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FSC® (Forest Stewardship Council) Pesticide Regulations and Considerations in Forestry System of Turkey

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Abstract

Aim of study: The aim of this study is to examine the use of chemical pesticides in Turkey's forestry. There is no use of chemicals in natural forest areas, but pesticides are used especially in forest nurseries. The subject of this study is to examine the issues to be considered in the case of chemical pesticides use in nurseries.

Area of study: This study use documentation of existing FSC Forest Management Certification projects in Turkey. FSC Forest Management Certification process has started in Turkey in 2010, and 6.673.308 ha of forest area has already been certified.

Material and methods: In this study, FSC Forest Management Certification studies conducted in Turkey were evaluated as material. Pesticides may be used in forest nurseries within the scope of these certification projects. In this case, how the chemicals used will be treated is examined in this study.

Main results: In Turkish forestry, any chemical pesticide use in natural forests is not in question. However, chemical pesticides are used against various factors in forest nurseries. These chemicals must not be in prohibited status. If the use of the prohibited chemical is compulsory, derogations are required from the FSC. In case of using chemical pesticides in forest nurseries, occupational health and safety rules and ILO codes must be fully complied with. Environmental and social impact analysis regarding the use of chemicals should be taken into consideration. The effects of chemicals should be revealed through monitoring. In addition, alternative methods to reduce the use of chemicals must be studied.

Highlights: In Turkish forestry, chemical pesticides are used in forest nurseries. In this application, it is necessary to show compliance with FSC Pesticide Policy and the ILO codes.

Keywords: FSC®, Pesticide, Forest Nursery, Forestry

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Environmental Movements Focused on the Solution of Ecological Problems and its Reflections in Turkey

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Abstract

Aim of study: The ecosystem operates in an orderly manner, and it is actualized by external factors or intervention in the deterioration of this order. In this study, the reflections of environmentalist movements focused on the solution of ecological problems in our country in the 20th century and environmentalist movements in terms of forestry were investigated.

Area of study: Environmentalism is a universal issue; It is a movement arising from environmental problems, environmental pollution and consequences of global warming. In this study the environmental movements in Turkey have been examined in a holistic approach.

Material and methods: Literature studies on the environmental movement in general in the world and Turkey is discussed in this study. The results of the research have been evaluated in this context.

Main results: Current studies show the contribution of the ministry of forestry and universities to environmentalist movements. Environmental Problems Research and Application Centers have been established in universities. In addition, foundations and associations engaged in environmentalist movements were opened. However, in the 19th century environmentalist movements, while considering the approaches for the protection of natural habitats, wildlife, primarily birds, wild animals, old forests, In the 20th century environmentalist movements, issues such as anti-war and nuclear armament, protection of nature, prevention of industrial pollution, and preventing excessive consumption of natural resources were adopted.

Highlights: Environmental organizations have been established to find solutions to ecological problems, reduce environmental damage, and become the voice of the people, and environmental movements have begun.

Keywords: Environmental Movements, Ecological Problem, Ecology, Ecosystem, Environmental Pollution, Global Warming.

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Precipitation Trend Analyses in Kastamonu

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Abstract

Aim of study: One of the major problems in the world and the atmosphere is the variability of the climate events and the negative impacts these changes bring about. For this reason, studies dealing with climate changes and their impact have an increasing significance. Among the climatic elements, the most variable parameter in terms of time and space is the amount of precipitation, and the increases and decreases observed in this direction are the most important evidence for climate change. In this study carried out for this purpose, it is aimed to reveal the change of precipitation in Kastamonu province according to years and seasons.

Area of study: Kastamonu province selected as the study area has an altitude of 775 meters and a surface area of 13.108.1 km². It generally has a rugged terrain and 74.6% of its surface area consists of mountainous and forested areas, 21.6% plateau and 3.8% plain. According to the data of Kastamonu Meteorology Station Directorate, the annual rainfall is 461.6 mm and the annual average temperature is 9.7 °C.

Material and methods: The study material consists of precipitation data obtained from Kastamonu Meteorology Station Directorate in order to examine the change of precipitation in Kastamonu during the 1990-2019 period. Annual and seasonal precipitation trends of the precipitation data of Inebolu, Kastamonu and Bozkurt measurement stations in the study area will be examined. Precipitation trends will be analyzed using statistical methods.

Main results: By examining the seasonal and annual trends of precipitation in the 1990-2019 period, it will be revealed whether there is a significant decrease or increase in the amount of precipitation in the study area.

Highlights: Nowadays, where the effects of climate change are increasing it is very important to examine the amount and distribution of precipitation.

Keywords: Precipitation, Trend, Climate Change, Kastamonu

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Investigation of the Usability of Collect Earth Method in Monitoring and Evaluation of River Edge Ecosystem Areas (Riparian)

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Abstract

Aim of study: Riparian areas, defined as river edge areas, have an important place in ensuring ecological balance and are natural bio filter areas in terms of ecosystem. In this study, the importance of riparian areas in terms of land use and land cover (LULC) is stated. The methodological approach of Collect Earth, the software tool of the United Nations Food and Agriculture Organization (FAO), will been introduced on Land Degradation Neutrality (LDN) of Riparian areas and land cover / use classes and land productivity (net primary productivity). How the Collect Earth method should be evaluated for riparian areas, information extraction results from global satellite data sets will be discussed, and recommendations will be presented in national and international context.

Area of study: In this study, Riparian areas will been examined.

Material and methods: The usability of Collect Earth software for land monitoring and evaluation regarding LDN, land cover / usage classes and land productivity in Riparian areas will be investigated.

Main results: By determining the riparian areas regionally, the area containing riparian environmental indicators such as the plant protection layer, continuity and structural parameters is defined. Studies on land cover and land use carried out in areas adjacent to streams constitute an important basis for planning studies within the framework of sustainability. It is extremely important for the LDN caused by land use in the ecosystem within the Riparian areas and for the sustainability of the riverside areas. "Preserving or improving ecosystem services in their current state" for LDN targets is one of the first goals determined for riparian areas as well. Land cover / use classes (changes and trends), land productivity (net primary productivity) and carbon stocks (soil organic carbon) are the leading bio-physical indicators to be monitored for LDN in Riparian regions

Highlights: The selection and applicability of the ways and methods to be followed during the planning of LDN in Riparian regions is extremely important. Today, with the effect of software and hardware developing in the information sector, integrated applications of Geographic Information Systems (GIS) and Remote Sensing (RS) come to the fore in data acquisition and mapping.

Keywords: Collect Earth, Riparian, Land Cover / Use Classes, Land Degradation Neutrality

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Valuation of Water as an Ecosystem Service and a Case Study from Turkey: Yamula Water Dam

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Abstract

Aim of study: It is to calculate the production cost of water including whole interest groups such as the General Directorate of Forestry (GDF) and the General Directorate of State Water Affairs (GDSWA), in the Yamula Dam Basin of Turkey.

Area of study: This research was conducted at Yamula Dam Basin, located within the boundaries of Kayseri province in Turkey.

Material and methods: The cost of water in Yamula Dam Basin was calculated by using the cost method for two different institutions. These institutions are GDF and GDSWA. Investments made within the determined basin boundaries based on Geographical Information System (GIS) were calculated with different interest rates (between 3% - 10%) until the end of year 2129 through the WACUM program produced within the scope of this study.

Main results: The WACUM program was developed to calculate the cost of water more precisely.

Highlights: The cost of water was calculated as 1.40 kurus for the GDF and 18 kurus for the GDSWA. It has been considered that these cost values should be included in national accounting system as the part of natural resources and ecosystem services valuation. This will also contribute to funding ecosystem rehabilitation and restoration via compensation and repayment of costs and lead the development of nature friendly green economy (based on natural resources) model.

Keywords: Valuation of Water, Cost of Water, Global Climate Change, Payment for Ecosystem Services, Cost Method

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Precommercial Thinning Effects on Tree Water Relations in Anatolian Black Pine Stand

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Abstract

Aim of study: The objective of this study was to determine the effects of precommercial thinning (PCT) on water relations parameters in Anatolian black pine stand.

Area of study: The study area was located in Pazarköy/Isparta province. Its mean altitude was 1.550 m a.s.l. and have a mean slope of 57%.

Material and methods: Three levels of PCT (control, 2-2.5X2-2.5 m, 3-3.5X3-3.5 m spacing) were established with three replications at the end of March 2014 in natural Anatolian black pine stand. After precommercial thinning, water relation parameters were periodically measured between the beginning of May 2014 and November 2015. Osmotic potential at full turgor ($\psi\pi 100$), the osmotic potential at turgor loss point ($\psi\pi TLP$), symplastic water at saturated point per dry weight of the shoot (Vo/DW) and the relative water content (RWC) were determined.

Main results: There was no significant difference between the treatments in two measurement years in applied precommercial thinning of Anatolian black pine stand according to $\psi\pi TLP$, $\psi\pi 100$, and RWC. Vo/DW was significantly different between treatments in May 2015. Precommercial thinning applied with 3-3.5 m spacing had the highest Vo/DW. When seasonal changes of water relation parameters were evaluated, there were significant differences in the $\psi\pi TLP$, $\psi\pi 100$, RWC and Vo/DW in some treatments.

Highlights: Generally, PCT treatments did not significantly effect on water relations parameters in natural habitat for the first two years result.

Keywords: Anatolian Black Pine, Spacing, Water Relations, Tree

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The Specimens of Kastamonu Plants at Herbarium ANK

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Abstract

Aim of study: In this study, it was aimed to examine the dried plant samples belonging to the province of Kastamonu in the herbarium of ANK (Ankara University Faculty of Science, Department of Biology), which is one of the oldest and richest plant museums.

Area of study: Kastamonu province is geographically located in the Western Black Sea region within the Black Sea Region. The area is phytogeographically located in the European-Siberian region and in A4, A5 squares according to Davis' Grid system. The altitude in the region is 784 m. (Yaralıgöz Mountain; 1.985m., Göynük Mountain; 1.770m., Dikmen Mountain; 1.471m., Kurtgirmez Mountain; 1.450m., constitutes important heights. Ilgaz Mountain lies in the south of the province), Kastamonu Province mostly consists of rough terrain. The annual average temperature is 10.3 °C and the annual average rainfall is 508 mm. February is the driest month of the year.

Material and methods: The study material consists of 2.331 herbarium specimens belonging to Kastamonu Province and their lists. Various botanical books were used to control the information on plant samples. A database of plant samples has been created and their lists have been prepared. Database program was used in the preparation of the lists

Main results: 87 families were identified as a result of the examination of 2.331 plant samples belonging to Kastamonu Province. The first three families containing the most plant specimens are as follows: The richest family is the *Compositae* family; sample number is 271. *Leguminosae* family takes the second place with the number of 257 specimens, and the *Labiatae* family, which takes the third place, contains 201 samples. Families represented by a single example; *Tamaricaceae, Taxaceae, Verbenaceae, Amaranthaceae, Ebenaceae, Zygophyllaceae, Loranthaceae, Oxalidaceae* and *Myrtaceae*. The oldest examples belong to the 1930s. The most samples were collected in 1981. Most samples belong to the *Compositae* family and were collected by Y. Akman. The collected samples were identified by Y. Akman, E. Yurdakulol, O. Ketenoğlu, M. Demirörs and other researchers. Most of the samples were collected from heights between 1.000 and 1.300 m.

Highlights: Plant samples and prepared plant lists are kept in the herbarium of Ankara University Faculty of Science, Department of Biology.

Keywords: Herbarium, ANK, Flora, Kastamonu, Turkey

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Salep Protection and Development Plan in Kastamonu

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Abstract

Aim of study: The demand for medicinal and aromatic plants in Turkey is increasing every year. In addition, many plant species that are not cultivated are endangered by being collected from nature. Salep from the Orchidaceae family is one of hundreds of non-wood forest products used for food, ornamental and medicinal purposes. This study was carried out in order to ensure the use of salep orchids with high economic value in the future and to expand their distribution areas.

Area of study: This study was applied in the center and districts of Kastamonu province between 2014-2018.

Material and methods: Turkey is used in the production of salep 80 orchid taxa of 10 different genus. With the inventory, protection, development and training activities carried out over the years, a total of 250.000 tubers in 20.000 hectares have been protected.

Main results: With the researches, correct inventories have been reached at local scale. Uncontrolled collection of salep tubers from nature is prevented. Bio-smuggling has been largely prevented by monitoring systems. Studies have been initiated to include Salep in culture. Awareness about salep has been created by increasing the knowledge of local people.

Highlights: Sustainable forest management is guaranteed by the existence of our biological resource values. The population control of the *Orchidaceae* family taxa under the pressure of collecting from nature with biodiversity monitoring systems should be ensured.

Keywords: Salep, Orchidaceae, Bioconservation, Kastamonu

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Comparison of Istanbul University - Cerrahpaşa Faculty of Forestry Campus in terms of Plant Diversity

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Abstract

Aim of study: Istanbul University - Cerrahpaşa Faculty of Forestry campus is not only a long-established campus, but also rich in plant diversity. The main purpose of this study is to evaluate the natural and exotic plant taxa in the campus area, and to compare it with the plant presence in other campus areas.

Area of study: Istanbul University - Cerrahpaşa Faculty of Forestry campus area, which was known to be within the borders of the Belgrad Forest in the past and as a result of the time and urbanization it remains among the residential areas, has been determined as the study area.

Material and methods: All natural and exotic, herbaceous-woody plant species have been identified within the boundaries of the Istanbul University - Cerrahpaşa Faculty of Forestry campus. Subsequent studies on the plant diversity of university campuses in Turkey, has been investigated from 'YÖK Thesis Center' and 'Google scholar'. A total of plant taxa of 35 campus areas have been evaluated. The area, age, plant taxa (natural species, exotic species, medicinal plants, herbaceous plants, etc.) of each campus were compared.

Main results: In the campus area of Istanbul University - Cerrahpaşa Faculty of Forestry, 282 genera and 494 plant taxa belonging to 101 families were identified. The data identified in the study area compared with the plant taxa of 35 other university campuses in Turkey.

Highlights: While Istanbul University - Cerrahpaşa Faculty of Forestry campus has the smallest area, it is ranked 3rd in terms of plant taxa and 1st in terms of family diversity. And also it has been determined to be the richest campus in terms of exotic plant species diversity.

Keywords: Flora, Campus, Diversity

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Use of Heat Treated Iroko Wood in Outdoor Applications

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Abstract

Aim of study: This study was conducted on the study of the outdoor applications of heat-treated wood material obtained from the iroko (Chlorophora Excelsa) wood.

Area of study: This specific wood material is used in especially parks and gardens as outdoor applications such as floor covering in the Adana Archaeological Museum project.

Material and methods: The iroko tree is a tropical tree of African origin. Because it is resistant to water and moisture, it is especially preferred for outdoor floor coverings. The amount of moisture of heat treated iroko wood material applied outdoors was preferred as 5%. The wood material was heat-treated at a certain temperature and time.

Main results: This material is also used in the construction of wooden bower, pergola and winter garden as outdoor applications. In these applications, MUF (melamine ureformaldehyde) is preferred especially in the lamination process of vertical and beam carriers.

Highlights: This iroko wood material forms a better combination with MUF in lamination.

Keywords: Floorings, Tropical Tree, Outdoor Environment, Water Resistance

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Some Physical Characteristics of Wood Polypropylene Nanocomposites Reinforced Magnesium Oxide (MgO)

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Abstract

Aim of study: To research effect of magnesium oxide (MgO) content on some physical properties of wood polymer nanocomposites.

Area of study: Pine wood flour were produced at İstanbul University wood mechanic laboratories. Test samples were manufactured using compression molding from the pellets at İstanbul University wood mechanic laboratories. Tests were performed at Kastamonu University wood mechanic laboratories.

Material and methods: Pine wood flour, polypropylene with and without coupling agent (maleic anhydride grafted polypropylene), and magnesium oxide (MgO) (0, 1, 3, 5wt%) were compounded in a twin screw co-rotating extruder. The mass ratio of the pine wood flour to polypropylene was 50/50 (w/w) in all compounds. Some physical properties of the polypropylene nanocomposites reinforced magnesium oxide (MgO) were investigated.

Main results: As the MgO loading increased the thickness swelling values and water absorption values of the polypropylene nanocomposites were decreased approximately 14%.

Highlights: As the MgO loading increased the thickness swelling values of the polypropylene nanocomposites with maleic anhyride polypropylene were improved.

Keywords: Wood, Pine, Polypropylene, MgO, Nanocomposites, Maleic Anhyride Polypropylene

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Effects of Thermal Treatment on Some Properties of Fir (*Abies* Mill.) Wood

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Abstract

Aim of study: To research the effect of heat treatment on some properties of fir (*Abies* Mill.) wood.

Area of study: The materials were collected from, Ilgaz mountain region. The test samples were produced and tests were performed at Kastamonu University wood mechanic laboratories.

Material and methods: Wood samples conditioned at 65±5% relative humidity and 20±2 °C. Then the dimensions and weights of the samples were measured. Heat treatment was applied to the samples at 120, 150, 180 and 210 ° C for 1 and 3 hours. After heat treatment, dimensional stability and color changes of the samples were examined.

Main results: It was determined that the swelling was mostly tangent, then in radial and longitudinal section, respectively. Control samples group total swelling percentage was found 12.37%. Also, the group of 210-3 test samples total swelling percentage was found 7.63 %. It shows that heat treatment application resulted in a reduction of approximately 40% in the swelling percentage of the samples. Heat treatment application, according to the CIE L * a * b * color measurement system has caused color changes in the wood material. It has been determined that the fir wood has a darker color when the heat treatment time and temperature are increased.

Highlights: Heat treatment application resulted in a reduction of approximately 40% in the swelling percentage of the samples.

Keywords: Fir, Heat Treatment, Swelling, Shrinkage

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The Effect of Nano Zinc Oxide (ZnO) and Hollow Ceramic Spheres on Scratch Resistance in Water-Based Varnishes

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Abstract

Aim of study: To determine the scratch resistance of water-based varnishes modified with nanoparticles against accelerated UV aging effect in some ThermoWood materials.

Material and methods: American ash (Fraxinus americana) and scotch pine (Pinus sylvestris Lipsky) wood were heat treated at a temperature of 190 °C for 1.5 hours and 212 °C for 2 hours. Later two-component water-based varnishes, with D70 - D99 commercial codes, modified with 1%, 3% and 5% ZnO and hollow ceramic spherical (HCS) nanoparticles were applied to the sample surfaces. And then the samples were then subjected to accelerated aging for 240 hours according to ASTM G154. The scratch resistance of varnish layers was determined by TS EN 15186 principles.

Main results: ZnO and HCS nanoparticles used for modifying water-based varnishes increased the scratch resistance in D99 and decreased in D70.

Highlights: In D99 varnish, ZnO and HCS additive increased scratch resistance. When it is desired to increase the resistance against mechanical effects, especially 5% ZnO and HCS additives can be recommended. At the same time, new studies with different additive ratios of different nanoparticles can be suggested to increase scratch resistance in water-based varnishes.

Keywords: Water Based Varnish, Heat Treatment, ThermoWood, UV Aging, Nanotechnology, Scratch Resistance.

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Determining Perception on Ecosystem Services Provided from Inciraltı Urban Forest by Using Q Methodology

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Abstract

Aim of study: The aim of this study is to determine the perception of ecosystem services provided from İnciraltı Urban Forest by using Q methodology.

Area of study: With an an area of 620 acres, İnciraltı Urban Forest is located in Balçova district of İzmir province, on the coast of İzmir Bay. While it was a natural wetland, the area gained by filling has been afforested over time and this area has turned into an urban forest used for recreational purposes.

Material and methods: The Q methodology, which allows the participants to determine their perspectives and priorities regarding the subject, was used in this study to determine the ecosystem services provided in the urban forest.

Main results: As a result of the analysis, three factors, namely three different perspectives, have emerged regarding the ecosystem services provided from İnciraltı Urban Forest. In factor 1 with the highest number of participants, the most agreed statement was "Urban forest contributes to the removal of pollutants in the air".

Highlights: The values that the participants attribute to urban forests through statements are important in terms of guiding the improvements to be made in the quality and quantity of urban forests.

Keywords: İnciraltı Urban Forest, Q Methodology, Ecosystem Services, İzmir.

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Determining Recreation Potential of İzmir Karagöl Nature Park

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Abstract

Aim of study: To determine the recreation potential of Karagöl Nature Park which is one of the most visited destinations in İzmir from the viewpoint of recreation and tourism uses, and to assess the relationship between land use types and actual status of the study area.

Area of study: Karagöl Nature Park, which is located in the Yamanlar Mountain area of Menemen district of Izmir, has the characteristics of a landslide set lake formed as a result of geological movements.

Material and methods: The recreation potential of the Karagöl Nature Park has been determined by using Gülez method considering some criteria such as landscape value, climate, accessibility, recreational convenience, and negative factors. In addition, SWOT analysis was carried out to ensure sustainable use of the area.

Main results: As a result of the study carried out, the recreation potential of Karagöl Nature Park was determined as very high.

Highlights: Maintaining the sustainability of human-environment relationship in recreation areas with high natural potential is the primary goal.

Keywords: Recreation Potential, Karagöl Nature Park, Gülez Method, İzmir.

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Perceptions and Views of Interest Groups on Standing Sales Method: A Case Study in Turkey

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Abstract

Aim of study: Correct determination and best implementation of sales and sales methods in forestry are very important to obtain the most income from wood products obtained as a result of a long process. One of the most important of these sales methods is the standing sales method. Determining the opinions of the interest groups about the method is important in terms of eliminating the problems seen in practice. In this study, the perceptions and opinions of the relevant stakeholders about the standing sales method were tried to be determined.

Area of study: Kastamonu province has been chosen as the study area. The study was carried out at the level of forest management directorates affiliated to Kastamonu Regional Directorate of Forestry located within the borders of the province. 64% of Kastamonu city surface area is covered by forest areas. 561.738.10 hectares of these forests, which are 807.294.70 hectares in total, are fertile forest and 245.556.20 hectares is degraded forest. Forest management directorates in Kastamonu are among the enterprises where the standing sales method is applied intensively.

Material and methods: The study material consists of data from surveys with interest groups and other secondary data. Within the scope of the study purpose, 4 interest groups have been determined as stakeholders in standing sales: Forest Cooperatives (FCOOP), Forest Villagers (FV), Forest Management Directorates (FMD), and Wood-Based Products Processing Enterprises (WPPE). The survey applications were carried out in the first three FMDs (Tosya FMD, Taşköprü FMD, KASKAR (Kastamonu FMD and Karadere FMD) determined as a result of the ranking made with the Ranking method over the variables created for the standing sales. Considering the lower limits determined as a result of the analysis with a statistically 95% confidence level and a 10% margin of error, 30 questionnaires were conducted in FMD, 193 in FV, 135 in WPPE, and 70 in FCOOP.

Main results: As a result of the study, approximately 97% of the forest management directorate employees, 54% of the cooperative managers, and 44% of the wood-based product processors stated that they found the standing sales method positive. On the other hand, only 8% of forest villagers support the implementation of the planted sales method. 25% of the FMDs state that the relations between forest enterprises and forest villagers have deteriorated since the start of standing sales practices. 90% of the FMDs, whereas only 12% of the FVs stated that the standing sales method increased the revenues of the FVs.

Highlights: In the application of the standing sales method, it is recommended to solve the existing problems with a participatory approach and to make arrangements in a way that protects the rights of not only large scale producers but also small scale producers.

Keywords: Wood Products Marketing, Standing Sales Method, Sales and Marketing, Kastamonu, Turkey

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The Determinition of The Problems and Solution Ways, Interested in Allocated Forest Resources to Tourism Sector in Turkey

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Abstract

Aim of study: The determinition of the problems and solution ways, interested in allocated forest resources to tourisim sector in Turkey was researched.

Area of study: The developed model in this study, Antalya / Belek and Çankırı / Ilgaz Yıldıztepe tourism centers by applying was tested.

Material and methods: How to manage tourism functions of forest resources in the relevant public opinions and interests of pressure groups can be based on sustainable forest resource management and sustainable tourism criteria and indicators, using the sectoral social benefits in an analytical logic has been put forward. The value of social benefits / loss criteria, in the context of social and intrinsic values were determined. These values were determine by developed questionnaire forms. The results of questionnaire application is used in the model. Developed model with the technical analysis of the linear combination can be done on the detection of the options that provide a public benefit is provided.

Main results: In accordance with the purpose of the research, problems regarding the allocation of forest resources for tourism purposes have been identified, in this context, it will realize the appropriate allocation of resources to be allocated to tourism, ensure the balance of conservation-use, realize sustainable natural resource management and provide superior public interest, a two-sectoral and multi-criteria, the allocation model that provides a comprehensive assessment with criteria has been developed can be said.

Highlights: Criteria and indicators for the allocation of forest resources to tourism and sustainable land allocation model in forestry.

Keywords: Tourism and Forestry, Sustainable Forest Management and Sastainable Tourism, Public Benefit in Forestry, Forest Land Alocation to Tourism, Land Allocation Model

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Evaluating of Physiological and Biochemical Characteristics of Different Provenance in *Pinus nigra* Seedlings

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Abstract

Aim of study: The aim of this study was to compare the physiological and biochemical characteristics of different provenance of two years old Anatolian black pine [*Pinus nigra Arn*. subsp. *pallasiana* (Lamb.) Holmboe] seedlings.

Area of study: The study was conducted in Denizli-Karahasanlı Forest Nursery. It was 450 m a.s.l and the general aspect was northwest.

Material and methods: Bare-root seedlings which were grown in Denizli-Karahasanlı Forest Nursery belonging to three seed stands (Denizli-Buldan, Uşak-Çatak and Çal-İnceler provenances) were compared. Root electrolyte leakage, chlorophyll content (chlorophyll a, chlorophyll b and total chlorophyll), total soluble sugars and water relation parameters [osmotic potential at full turgor (ψπ100), osmotic potential at turgor loss point (ψπTLP), symplastic water at saturated point per dry weight of the shoot (Vo/DW) and the relative water content (RWC)] were determined at the end of the second growing season.

Main results: There was a significant difference between provenance in seedlings as to root electrolyte leakage and chlorophyll content except chlorophyll b. However, there wasn't significantly different between provenances in total soluble sugars and water relation parameters.

Highlights: Stress resistance was similar between provenances according to water relation parameters. In such studies, evaluation of the physiological and biochemical properties of the seedlings with field performances will give better results.

Keywords: Water Relation, Soluble Sugar, Seedling, *Pinus nigra*

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Investigation of Mine Areas

(The Example of Kastamonu Regional Directorate of Forestry)

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Abstract

Aim of study: The afforestation of mine sites plays an important role in the ecological reclamation of these sites. It is expected that at the end of the mining activities, the changing topography will be arranged and afforested, and the abandoned fields will contribute to the development of mining activities as well as reducing the negative effects on the environment. It is possible to organize the fields and evaluate them in different ways of use in line with the determined purposes. The most accurate method for the recovery of production potential and landscape quality is to use plant communities with similar appearance, species composition and diversity to natural ecosystems. The aim of this study is to evaluate the actual situation in the mine sites within the borders of Kastamonu Regional Directorate of Forestry.

Area of study: The research area is the mining sites that have completed and continue their activities within the boundaries of Kastamonu Regional Directorate of Forestry.

Material and methods: After obtaining the necessary information such as the activity purpose, permit status and the area of coverage, about the sites where mining activities are carried out in the research area, the actual status of the studies has been revealed and the studies conducted have been evaluated.

Main result: It has been revealed that mining permits have been obtained in very large areas and for different purposes of use in the study area, and that the applications for the purpose of restoring the fields to the nature are not carried out in full.

Highlights: This study contributed to the afforestation of the mine sites and their regeneration to the nature.

Keywords: Mine Reclamation, Forest Restoration, Landform Reconstruction

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New Perspectives into Tree Genomics Through Genome Projects

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Abstract

Aim of study: This study aims to provide general knowledge about the completed genome projects of trees mainly fruit trees which can open new insights for tree genomics.

Material and methods: Because of the improvement and decreasing costs in DNA sequencing technologies, many genome projects of organisms were completed up to date. These technologies and bioinformatics approaches enable to sequence of large genomes in a limited time with high sequence depth. Those attempts allow us to determine and characterize many gene families related to vital roles in the cells.

Main results: Some of the conifer draft genomes sequences which include bigger than 20 Gbp are available after those improvements. Up to date, approximately 40 reference genomes are available among 60.000 forest tree species in the world. The first sequenced model forest tree with a smaller genome was poplar (*Populus triocarpa*). Besides, fruit tree genomes were sequenced from dicotyledonous and monocotyledon families such as Rosaceae, Rutaceae, Musaceae and Arecaceae. By using Sanger and Roche/454 technologies together, the first sequenced fruit-bearing species was a grape. Now, sequence data are available many of fruit tree species including grape, apple, blueberry, mulberry, raspberry, pear, date palm, cocoa, pomegranate, peach, kiwifruit, banana, papaya, jujube, sweet orange, Chinese plum, coffee, pineapple, hazelnut, pistachio, olive and mango.

Highlights: Those genomic data can provide new perspectives to resolve the evolution and inheritance of economically significant characters from complex genomes, to cultivate more efficient varieties by marker-assisted techniques, to understand fruit and wood characters and to resolve biotic and abiotic stress responses of trees.

Keywords: Tree, Fruit Trees, Genomics, Genome Projects, Next Generation Sequencing

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Characterization of the Expansin Gene Family in Coffea Tree (*Coffea canephora*) Genome by Bioinformatics Vehicles

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Abstract

Aim of study: The Expansin proteins are pH-dependent cell wall loosening proteins that are a big family in plants. Expansion of the cell in this way constitutes an important stage for plant growth and development. It has been determined that expansin proteins have roles in processes such as seed germination, root growth and development, as well as playing a role in biotic and abiotic stress resistance. Expansin family (EXP) comprises 4 subfamilies: α-expansin (EXPA), β-expansin (EXPB), expansin-like A (EXLA) and expansin-like B (EXLB). In this study, it was aimed to identify expansin genes and to determine their features as in silico in the coffee tree genome (*Coffea canephora*), which is one of the two important sources of coffee production in the world.

Material and methods: A systematic scan of the expansin genes found in the *Coffea canephora* genome was performed using bioinformatics tools, including phylogenetic relationships, chromosomal localizations, three-dimensional protein structures, conserved motifs, gene ontologies, gene duplications and orthologous genes in other species.

Main results: In the *Coffea canephora* genome, a total of 33 expansin genes, 15 CcEXPA, 5 CcEXPB, 6 CcEXPLA, 7 CcEXPLB, have been identified. Many of the coffea expansin genes were in basic character. According to the phylogenetic tree analysis, *Coffea canephora* expansin genes have been divided into 4 main groups. The three-dimensional structure of a total of twenty expansins was estimated at > 90% confidence interval and β-sheet structures were dominant in the proteins. Besides, cellular process and cellular component organization were predominant biological roles of the proteins.

Highlights: The results provided preliminary information to demonstrate the characterization and functional significance of expansin proteins in the *Coffea canephora* plant. These genome-wide identification studies may provide new perspectives for further studies in which fruit production and stress-resistant trees will be improved.

Keywords: Expansin, *Coffea canephora*, Genome-wide Identification, Bioinformatics Analysis

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Investigation of Green Urban Area Spread Quality in Oltanbey District of Gumushane Province

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Abstract

Aim of study: In this study, Oltanbey neighborhood's green area distribution were examined that it's a new settlement area of Gumushane province. It is to determine the current situation and improve the green areas plans. Changes in the urbanization process for the province accelerated in 2008 with the establishment of the university. It is changes in the population growth necessitated new structuring due to the building which did not meet the needs in the vision of modern city.

Area of study: In the Gumushane where topography is of great importance, Oltanbey neighborhood has an important position in the transportation line that requires aesthetic concern at the entrance of the Gumushane city.

Material and methods: Data were made using satellite images, topographic maps and city adjacent maps of Gumushane city settlement areas. Green areas and settlements were determined from the images and their areas were found numerically. Analyzes were made in GIS environment. Old historical camera photographs and current photographs were compared.

Main results: As a result of the study, it was found that the physical usage of the region did not meet the green area requirement per person. In addition to, in the development plans created in this direction, it was determined that the green area approach was inadequate and the region had suitable extension characteristics to increase it. The data obtained in this study are thought to shed light on the ongoing studies in the region.

Highlights: It had been determination of the green texture of the neighborhoods in Gumushane city center. It had been comparison of residential areas (old and new) with green texture with building areas.

Keywords: City Formation, Green Space Quality, Oltanbey Neighborhood.

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Determination of Existing Forest Roads Adequacy to Manage Forest Area (Daday Çamlibel Forest Sub-District Directorate)

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Abstract

Aim of study: To determined the condition of exploitation of forests with forest road networks of the Çamlıbel Forest Sub-District Directorate spatially with GIS (Geographic Information Systems). and for the forest areas that could not be to exploitation, new roads were proposed to exploit it.

Area of study: Daday Çamlıbel Forest Sub-District Directorate is chosen as a sample study area.

Material and methods: The digital terrain model of the area was created by using the "Arc Toolbox - 3D Analyst Tools - Data Management - TIN - Create TIN" commands in order to determine the areas where the existing highway, forest road and village roads belonging to forest sub-district directorate will exploit forest area. Buffer zones have been created by applying a 250 m wide "Geoprocessing-buffer" analysis on the upper part of the slope of all existing roads that exploit the forest by using the TIN layer, or on both sides of the ridge roads and flat areas. Thus, the areas where the existing roads exploited were determined. With the stand map, the layers exploited were overlapped by using the "Geoprocessing-intersect" command, and it was determined how much forest area was exploited by the existing roads. Thus, were determined the parts of the forest area that are not exploited. The road layer which follows to be planned has been created to plan new roads that will exploit areas that have not been exploited. New road routes have been drawn in the area, taking into consideration forest areas not exploited.

Main results: it has been determined that the Çamlıbel Forest Sub-District Directorate, with a size of 10.017.7 hectares, 5.644.2 ha (74.8%) of the 7.544.1 ha forest area has been exploited by existing roads. With the new 15+845 km forest roads planned in GIS, for Çamlıbel Forest Sub-District Directorate 439.8 ha forest area will be exploited for further forestry purposes. In case these new roads are built, 6.087 ha of Çamlıbel Forest Sub-District Directorate will be exploited to serve the forestry purposes and the percentage of the exploited area will be 80.7%.

Highlights: With the proposed 9 forest road for the study case, more forest area will be exploited for forestry purposes.

Keywords: Forest Road, Çamlıbel Forest Sub-District Directorate, GIS, CBS

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Investigation of Forest Assets of Turkey and Provinces by Using TanDEM-X FNF Data

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Abstract

Aim of study: Conservation of forests, which make up about 30% of the world and are very important for the sustainability of ecosystems, is one of the most important issues of today. Today, there are many freely available local and global forest assets maps which were created by using geographic information systems and remote sensing techniques. In this study, one these maps which are called TanDEM-X Forest/Non-Forest (FNF) maps, those were created by using digital elevation models of the TanDEM-X observation satellite for the years 2011-2015, were used. Forest assets of Turkey and provinces were calculated by using these maps.

Area of study: Turkey which covers 783.562 km^2 between Asia and Europe continents and its 81 cities were examined individually in this investigation.

Material and methods: TanDEM-X FNF maps, which was created on a global scale and has a spatial resolution of 50 meters were used in this paper. Each map, which is freely accessible, represents an area of approximately 1 million hectares. These maps contain data on forest/non-forest areas, wetlands, and urban fields. 114 different TanDEM-X FNF maps, which cover entire area of Turkey, were examined within the scope of study.

Main results: According to analyzed TanDEM-X FNF data, 15.4% of Turkey's land composed of forests. The provinces with the highest forest area were found to be Antalya, Kastamonu and Muğla, respectively. According to the ratio of forest fields belonging to the province's surface area, it has been determined that Rize is the first province with a rate of 64.4%.

Highlights: Nowadays, it is possible to reach many data sets that provide statistical data about land cover. The examination and investigation of these data both on a global and local scale is a very important issue in the intervention with environmental problems in the coming years.

Keywords: TanDEM-X, Forest/Non-Forest, Land Cover, GIS, Remote Sensing

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SWOT and Fuzzy Analytic Hierarchy Process Approach to Forest Road Management

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Abstract

Aim of study: Forest roads are aimed to reveal managerial strategies by evaluating strengths and weaknesses as well as opportunities and threats of forest roads.

Material and methods: SWOT analysis was used to create a strategy in forest road management. Fuzzy analytical hierarchy process was used to digitize these factors, and Buckley and Chang approaches, used most in the literature, were modelled. These factors and strategies, prepared in accordance with expert views, were obtained by questionnaires.

Main results: The most significant factor was determined to be "Helping Forest Fires Control" from opportunity factors according to both approaches. The second most significant factor was identified to be, " Lack of Study About Natural Ecosystem and Value Loss" from the weakness factors. The lowest factor was specified to be "Supporting Activities for Increasing Forest Existence" from the opportunity factors according to Buckley approach while this was "Causing Illegal Hunting and Transport" from the threats factors in line with Chang approach. It was concluded that whereas the strategy with the highest significance among the strategies determined in line with the views of experts according to Buckley and Chang approaches was "Protecting Forest and Forest Resources and Improving Physical Infrastructure", the strategy with the lowest significance was found to be "Improving Institutional Capacity and Legal Infrastructure"

Highlights: It was identified in accordance with the obtained results that the weaknesses were the sub-factor group with the highest significance while the opportunity factor was specified to have the lowest significance. More realistic solutions can be generated because qualitative analyses can be digitized and modelled in decision-making processes, thus enabling to make comparisons between factors.

Keywords: SWOT, Fuzzy Logic, Strategy, Forest Roads

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Chemical Characterization of the Cold-Pressed Seed Residues as a Lignocellulosic Biomass

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Abstract

Aim of study: The medicinal use of non-wood forest products has become commonplace over the last two decades. One of the most widely used forms of utilization of these products is especially volatile or non-volatile aromatic oils derived from various methods. Cold-pressed oil production has been used for centuries with its features such as minimal labor and low cost. However, while the residues are still valuable chemicals, they are generally used as animal feed. The aim of this study is to determine the potential use of residues of some cold-pressed seeds as lignocellulosic biomass.

Material and methods: Linum usitatissimum (flax), *Sesamum indicum* (sesame), *Nigella damascana* (black cumin), *Urtica dioica* (nettle) seeds were obtained from Kastamonu local market. The residues were collected and dried, after cold press oil of seeds was extracted. The ash, protein, holocellulose, alfa cellulose, lignin content and methanol-water (65/35% w/w) hot water, cold water, 1% NaOH solubility's of seed residues were determined according to standard test methods.

Main results: Although cold pressed seed residues are rich in protein content, soluble material and ash content, it was concluded that they can be used for various purposes as biomass due to low lignin content.

Highlights: It is aimed to bring a new perspective to the evaluation of cold pressed seed residues with this study. The residue after cold pressed has been determinate to have high values in terms of the amount of the protein and carbohydrate substance.

Keywords: Seed Residues, Lignocellulosic Properties, Ash, Solubility's

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The Effect of Borax and Boric Acid Impregnation on Radiation Shielding Properties of Black Pine Wood at 662 keV

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Abstract

Aim of study: The aim of this study is to experimentally investigate the radiation shielding properties of black pine wood (*Pinus nigra* Arnold *subsp. pallasiana*) impregnated with borax and boric acid at 662 keV photon energy.

Material and methods: The black pine wood was impregnated with 10% borax, 10% boric acid and a mixture of borax / boric acid (5% / 5%) in a vacuum oven with heat. Retention rates were calculated as 72.84, 70.51 and 71.90 kg/m3 for borax, boric acid and borax / boric acid mixture, respectively. Gamma ray attenuation measurements were carried out using a Cs-137 gamma isotope source and a GM-Counter/ Geiger-Müller Zahler PHYWE detector at 662 keV photon energy. Measurements were taken in 3 replicates.

Main results: It was determined that the rate of gamma radiation transmission of impregnated wood with boron compounds decreased. As a result, it has been determined that the radiation shielding properties of wood increase with borax and boric acid impregnation.

Highlights: The radiation shielding properties of impregnated wood are higher than pine wood because of its high density and chemical composition, which contains boron elements.

Keywords: Pine Wood, Radiation Shielding

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Chemical Constituents of Essential Oils of J. *virginiana* Leaf and Fruit

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Abstract

Aim of study: It was aimed to obtain the essential oil of leaves and fruits of *Juniperus virginiana and* to determine the chemical content by using GC-MS.

Area of study: Medicinal plant essential oil and their chemical constituents.

Material and methods: Leaves and fruit of *J. virginiana* were ground by a home-made type grinder, and then their Essential oils were obtained by the water vapor distillation method. The essential oils obtained were stored in sterile Ephendorf tubes at +4 C until GC-MS analysis. Finally, the chemical composition of the essential oil was determined by performing GC-MS analysis.

Main results: The GC-MS analyses revealed that the most abundant of the leaf and fruit oils obtained from *J. virginiana* was DL-Limonene with 23.15% and 5-ethylidene-1-methyl-cycloheptene with 52.55%, respectively. In view results of GCMS, the total number of components determined in the leaf and fruit oils obtained from J. virginiana were 50 components for both essential oils. Both leaves and fruits essential oils are included some same main constituents such as Sabinene, 3-(1-methyl-2-propenyl)-1,5-Cyclooctadiene, Safrole, Caryophyllene, Germacrene-D, Elemol, Germacren D-4-ol and α-Cadinol.

Highlights: Since it contains various bioactive molecules, it is an important plant species that need various researches.

Keywords: *J. virginiana*, Essential Oil, GC-MS, Vapor Distillation

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Evaluation of Methods to Estimate Biomass: A Case Study from Karaçam Planning Unit

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Abstract

Aim of study: The aim of this study was to investigate the aboveground biomass (AGB) of each sample plots estimated using different biomass expansion factor (BEF) and allometric equations (AE). Estimated AGB according to different approaches were evaluated and it has also investigated whether or not there were significant differences between BEF and AE methods.

Area of study: Giresun Regional Directorate of Forestry, Koyulhisar Forest District Directorate, Karaçam Forest Enterprise was selected as a case study area.

Material and methods: In Turkey, a number of studies have been conducted for BEF and AE methods. As a result of these studies, many different AE and BEF were developed for different tree species. The study was carried out 437 sample plots obtained from forest inventory in pure *Pinus sylvestris* stands in Karaçam planning unit. AGB were estimated for every sample plots using BEF and AE. In the BEF method, the AGB was estimated by multiplying stand type level growing stock with BEF and Wood Density (WD) coefficients. In the AE method, AGB was calculated using AE depend on diameter at breast height. The repeated measures ANOVA was applied to determine whether or not there were significant differences between BEF and AE methods using SPSS 20.0 statistical program.

Main results: A statistical difference was determined at 95% confidence level between biomass calculation methods.

Highlights: AD method is considered to estimate biomass more accurately than BEF method.

Keywords: Allometric Equation, Biomass, Biomass Expansion Factor, *Pinus sylvestris*

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Estimation of Growing Stock, Biomass and Carbon Stock of Dry Temperate Forets of Skardu, Pakistan

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Abstract

Aim of study: The quantification of forests carbon has got much popularity in Pakistan after the ratification of Paris agreement in 2015. The present research work was carried out to assess the growing stock, biomass and carbon stockin dry temperate forests of Pakistan.

Area of study: The study was conducted in District Skardu, Gilgit Baltistan Province, Paksitan.

Materails and methods: The total forest area of the study site was mapped through on-screen digitalization of satellite imageries while field visits were carried out during April 2016 to July 2016 for the collection of inventory data. A total 162 plots of 0.1ha was randomly sampled. Biomass and carbon stock was estimated through species specific allometric equations. The annual carbon sequestration was computed by converting the growth rate of the forests into carbon sequestration rate.

Main results: The total forest area was recorded 5.625 ha. The inventory results indicated that the forests are poorly stocked with an average of 85 trees ha^{-1}. *Pinus wallichiana* (blue pine) was found to be the dominant specie with 85.3% trees across the total forest area. The total estimated growing stock in the forest of Skardu was 73.068 m^3 (2.579.327cft) with an average of 12.99±2.21 m^3 ha^{-1}. The total above ground biomass and carbon stock was estimated to be 43.256 and 20.306 tonnes with an average of 7.69 t ha^{-1} and 3.61 t ha^{-1}, respectively. The annual carbon sequestration rate of forests of Skardu was 1.08 ton CO2 ha^{-1}.

Highlights: The above findings will be helpful for proper management of these forests in future, Further, the substantial carbon stock of these forests can be concerved to cope with climate change in future.

Keywords: Biomass, Carbon Stock, Climate Change, Growing Stock, *Pinus wallichiana*, Skardu

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Comparing Soil Co2 Effluxes Between Natural and Plantation Forests in the Philippines

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Abstract

Aim of study: Soil CO_2 efflux (Fco2), is a major component in the C cycle, which provides a pathway for the escape of stored soil CO_2 into the atmosphere. In the tropical climate, like in Philippines, concerns about soil CO_2 emissions have been growing due to unabated conversion of forestlands into agricultural fields and promotion of forest plantations of fast-growing commercial tree species in reforestation projects. Although these perceptions are supported by many reported studies in literature, it remains uncertain how the respiration of soil organisms and roots behave in response to the difference in microclimatic conditions and the amount of SOM in these two types of tropical forest ecosystems. This study aims to compare the Fco2 between natural and plantation forests.

Area of study: The current study was conducted in Philippines regions.

Material and methods: The experiment was established in a randomized complete block design (RCBD) with four replications and eight sampling points per block. The study employed the state-of-the-art soil CO2 efflux automated system machinery (LI-8100A Li-COR BioSciences) to measure the FCO2. Weekly measurements were conducted in May (summer) using the survey chamber technique. Collected data were analyzed using SAS statistical tool (SAS 9.1 Package).

Main results: Results revealed significant differences ($p<0.0001$) of the mean values of FCO_2 between natural forest (6.01 µmol s-1 m-2) and planted forest (2.44 µmol s-1 m-2). Interaction effects between site and forest types are also highly significant ($p = 0.0124$), suggesting that FCO_2 rates are affected by spatial variation of site characteristics. However, FCO_2 rates are not significantly affected by time differences ($p=0.2309$). The observed significant differences between and natural and plantation forest are largely attributed to the differences in the soil organic matter contents and root volumes in these two types of forest ecosystem. These observations suggest that natural forest are large sources of CO_2 emissions, although these emissions maybe balanced by the C sequestration of the diverse vegetation. In contrast, it does not follow that planting of fast-growing results in rapid releases of stored soil C.

Highlights: It is commonly perceived that forest plantations result in rapid liberation of stored soil C while the natural forest as an effective tool in the preservation of soil carbon and mitigating climate change impacts.

Keywords: Soil CO_2 Efflux, Natural Forest, Plantation Forest, LI-8100A, Carbon Sequestration, Fast-growing Trees

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Investigation of Functional Allowable Cut Amounts for Kastamonu Regional Directorate of Forestry

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Abstract

Aim of study: In this study, it is aimed to evaluate and to compare the management purposes and functional allowable cut amounts of planning units in Kastamonu Regional Directorate of Forestry.

Area of study: This study has been carried out for Kastamonu Regional Directorate of Forestry, which has 22 forest enterprises and 182 planning units.

Material and methods: The basic data required in the study were obtained from the current forest management plans used for the management of the planning units within the Kastamonu Regional Directorate of Forestry. Distributions of area, growing stock, increment, and allowable cut for management classes were taken from management plans.

Main results: All forest ecosystems in Kastamonu region have been managed with multiple-use forest management approach. With this approach, 54% of the regional forests are divided into economical (0.67 million ha), 38% ecological (0.47 million ha) and 8% socio-cultural (0.10 million ha) functions. According to the management plans of planning units in the region, the total allowable cuts for economical, ecological and socio-cultural functioned forests are 48.2%, 17.0% and 22.9% of the volume increment, respectively.

Highlights: It is planned that 38.9% of the total increment of Kastamonu forests, according to the forest management plans, will be harvested as allowable cut. Forests were operated under 10 functions with 46 management purposes. The management purpose of high-quality wood production was only available in Türkeli Forest Enterprise.

Keywords: Multiple-use Planning, Functional Allowable Cut, Increment.

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The Impact of Industry 4.0 on Forest Products Industry

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Abstract

Aim of study: In the present work, it was aimed to determine the impacts of 4th industrial revolution on forest products industry.

Area of study: The scope of this research primarily concerns with wood-based products, non-wood forest products were excluded.

Material and methods: A comprehensive literature review was conducted and the findings were interpreted.

Main results: The industry 4.0 can make the manufacturing companies more efficient and profitable with fewer employees. In the forestry sector, automation and industrial optimization provide great advantages in terms of performance and production gain.

Highlights: Digitalization should be a must for the forest-based industries.

Keywords: Industry 4.0, Forest Products Industry, Wood-based Products.

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The Stuation of the Covid-19 Pandemic and the Kastamonu Forest Products Industry

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Abstract

Aim of study: To examine the situation of the forest product industry in Kastamonu, a region rich in forest products, in terms of Covid-19.

Area of study: Kastamonu forest products industry

Material and methods: Throughout the history of humanity, epidemics have been seen as one of the important events that threaten human life and have had important effects on humanity. December 2020, when the Covid-19 pandemic, which spread from the Whuan province of the People's Republic of China to the whole world, negatively affected the health systems and economies of all countries, spread around the world. As of today, more than 1 million people have already lost their lives and many business lines have been adversely affected in this pandemic, which came from others from the world's worst crises in the past and where life was made whole. Kastamonu is an extremely advantageous province in terms of forest products industry and approximately 4500 people work in this sector. Globally effective Covid-19 pandemic also spreads across the province of Kastamonu, and its effect on all sectors is clear like in forest products industry. In this study; As the initial period of the first five months operating in the field of forest products industry in Kastamonu, the conditions of being affected by the covid-19 pandemic were analyzed, the preventions taken by the enterprises and the effects of the precautions by the national authorities were evaluated.

Main results: For the Kastamonu forest products industry, suggestions have been made to make production flexible depending on the changing needs during this and similar crisis periods.

Highlights: Development of emergency and crisis management strategies, etc. In these matters, businesses will be able to turn this crisis, which they will overcome with more or less damage, into an opportunity.

Keywords: Covid-19, Kastamonu Forest Products Industry, Economic Crisis, Pandemic

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End Grain Wooden Parquet Production

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Abstract

Aim of study: To produced end grain laminated parquets in different surface variations by using materials prepared by crosscut from branch woods of native wood species.

Material and methods: In the production of end grain laminated parquet, branch woods of yellow pine (Pinus sylvestris Lipsky), Eastern beech (Fagus orientalis Lipsky) and sessile oak (Quercus petraea Lieble) wood species that are widely growing in our country were used. End grain laminated parquet production was produced according to the laminated parquet production technology and infrastructure features.

Main results: End grain laminated parquets produced from branch woods of scotch pine, beech and oak native wood species have been warping (spring, bow etc.) after pressing. Despite the different press conditions, surface and infrastructure variations, warping could not be prevented.

Highlights: Determined that the end grain laminated parquet cannot be produced from the branch wood of the native pine, beech and oak wood species. It is recommended to carry out new studies for the production of end grain parquet with different wood species and methods.

Keywords: End Grain Parguet, Laminated Parguet, Parguet

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Notes of Distribution, Biology, and the First Outbreaks of *Tomicus destruens* (Wollaston, 1865) (Coleopter: Curculionidae: Scolytinae) in the Black Sea Region of Turkey

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Abstract

Aim of study: Tomicus destruens (Coleopter: Curculionidae : Scolytinae) a member of fauna of Palearctic zoogeographical region and is one of the main pests of Mediterranean forests. The first record of *T. destruens* from Turkey was from Marmaris (Muğla province) in 1971. Until recently, its spread in Turkey has only consisted of the Aegean and Mediterranean geographical regions. In this study, the distribution of *T. destruens* in the Central Black Sea part of the Black Sea geographical region was investigated in detail. In addition, biology, some natural enemies of the pest, and its first outbreaks in the *Pinus* forests in the region were evaluated.

Area of study: The study was carried out in *Pinus nigra* and *P. brutia* forests in the provinces of Amasya, Samsun, Çorum and Tokat in the Central Black Sea part of the Black Sea region.

Material and methods: This research was conducted between 2017-2019. A survey was carried out in Pinus forests. The biological stages of the pest were noted. Both adults of *T. destruens* and its natural enemies were collected in the branches or trunk of the plants. The biology of the pest was carried out in the Green Belt Afforestation (~530 m) area in the city center of Amasya where the pest had an epidemic. However, the areas where *T. destruens* epidemics were examined.

Main results: The first samples of *T. destruens* in the area were found in the center of Amasya in the autumn of 2017. Afterwards, it was determined that the pest was widely found in *P. nigra* and *P. brutia* forests in Samsun, Çorum, and Tokat provinces. Over and above, it has been determined that the Green Belt Afforestation areas in the center of Amasya and pine forests in Kargı district in Çorum province have created an epidemic. In these areas, *Aulonium ruficorne* (Coleoptera: Zopheridae) and not identified red Anthocorid (Heteroptera) nymphs were found as its natural enemies.

Highlights: T. destruens was recorded for the first time from Çorum and Tokat provinces and for the second time from Amasya and Samsun provinces of Central Black Sea part of the Black Sea region in Turkey. The host tree range of *T. destruens* includes *P.nigra* and *P. brutia*. However, it was determined that the pest was widely found and caused epidemics in pine forests in the Central Black Sea part. It has been determined that the species and density of the natural enemy is low in the region and It is predicted that *T. destruens* will increase its outbreaks in the region in the coming years.

Keywords: The Pine Shoot Beetle, *Tomicus destruens*, Black Sea Region, Outbreak, Turkey

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Assessment of the Damage Satus of *Pityokteines Curvidens* to the Stand Edge Conditions

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Abstract

Aim of study: In this study, it was aimed to determine the damage of *Pityokteines curvidens* (Coleoptera, Curculionidae, Scolytinae), a species of bark beetle, in the forests of Kazdağı fir (*Abies nordmanniana subsp. equi-trojani*), according to the stand edge condition.

Area of study: The study was carried out in pure and mixed Kazdağı fir stands within the boundaries of Sinop Forest Enterprise, Ahmetyeri Forest Sub-District Directorate and where the pest has caused damage. Sample areas are at constant elevation and only in shaded aspect.

Material and methods: A total of 964 trees were evaluated in 27 sample areas of 400 square meters. 59% of the sample areas and total trees are located in the stand, and 41% are located on the edge of the stand. All trees found in sample areas were measured in diameter and recorded whether there was pest damage.

Main results: The total number of Kazdağı fir trees in and the edge of the stand are 91% and 96% respectively. Pest damage was detected in 9.9% of Trojan fir located in the stand and 9.6% of Kazdağı fir located on the edge of the stand. There was no statistically significant association was found between the presence of Kazdağı fir trees in or on the edge of the stand and the damage of *P. curvidens.* However, there is a statistically significant difference in the trees located on the edge of the stand in terms of damage to beetle according to the diameter classes.

Highlights: Because of their significant impact on the ecosystem process, bark beetle pest control strategies should be controlled through planning in such a way that they can effectively reduce their harm levels.

Keywords: *Pityokteines curvidens*, Bark Beetle, Shaded Aspect, Stand Edge

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Taxonomic and Faunistic Records on Cone Pests in Kastamonu Taşköprü-Tekçam Clonal Seed Orchard

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Abstract

Aim of study: As the importance of plantation in forestry started to increase, losses caused by damage to seeds and cones began to attract attention. These losses also negatively affect plantation works. The aim of this study was to identify the Scots Pine cone pests and their natural enemies in the Kastamonu Taşköprü-Tekçam clonal seed orchard.

Area of study: This study was carried out between 2016 - 2018 in Kastamonu Taşköprü-Tekçam Scots Pine clonal seed orchard.

Material and methods: The material of the study consists of pests that cause damage and their natural enemies in the study area in Taşköprü district of Kastamonu province. Cones that have deformations in the clonal seed orchard were collected and were taken to laboratory. Identification of the pests and parasitoids were made and were supported by molecular identification.

Main results: Dioryctria simplicella Heinemann, 1863 (Lep.; Pyralidae) known as pest on Scots pine was the first record from Turkey. The larval endoparazitoid *Macrocentrus buolianae* Eady & Clark, 1964 (Hym.; Braconidae, Macrocentrinae) and the exoparazitoid Bracon (Pigeria) piger (Wesmael, 1838) Hym.; Braconidae, Braconinae) were obtained first time on *D. simplicella* in this study at Taşköprü-Tekçam seed orchard. In this study pine cone *Cecidomyiides, Asynapta sp., Resseliella sp., Karschomyia* or *Lobodiplosis* species were also identified on Scots pine cones in Taşköprü-Tekçam seed orchard. In addition to these pests, *Leptoglossus occidentalis* was found in the same area.

Highlights: D. simplicella was observed to feed on Scots Pine needles for the first time and also it was the first record from Turkey. Besides *Macrocentrus buolianae* and *Bracon piger* were recorded first time on *D. simplicella*

Keywords: *P. sylvestris, D. simplicella, M. buolianae, B. piger, Cecidomyiidae*, Kastamonu

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Effects of Mining Activities to Wildlife

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Abstract

Aim of study: In this study, effects of mining activities to wildlife will be evaluated.

Area of study: The research has been carried on Kastamonu forests, located in Northwestern Black Sea Region of Turkey.

Material and methods: Change in the densities, habitats of wild animals and possible risks will be evaluated to identify effects of mining activites.

Main results: There are various restrictive factors on wild animal populations caused by human and natural factors. Extreme and intensive mining activities are one of the important factors restricting wildlife. The presence of mines, which is one of the natural wealth of the countries, provides employment to the countries and also increases the interest in mines and demand for raw materials with population growth. Methods of extraction of mines, storage of residues, disposal methods of these residues and rehabilitation of the site are the practices that determine the extent of the damage they cause to the natural life of the mines. Wildlife species and habitats can be affected negatively due to density of activities. Controlled explosions in the field, dust pollution, rust wastes and noise and vibrations caused by heavy traffic; can stress animals, cause miscarriage of animals at breeding time and/or lead to search for new places or forced migration.

Highlights: Effects of mining activites have various effects to wildlife.

Keywords: Mines, Wildlife, Human - Wildlife Conflict, Kastamonu

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Investigation of the Performance of Natural Dyes Obtained from Turkish Red Pine Bark Adjusting to Wood Pulp Using Starch and Alum

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Abstract

Aim of study: Turkish red pine forests have a distribution area of approximately 6 million hectares in our country. Approximately one million m3 of Turkish red pine bark is left in the forests after cuttings every year. The aim of this study is; To produce natural dyes from Turkish red pine bark left as waste in forests and to ensure that this dye hold to wood pulp.

Area of study: For this aim, the bark of Turkish red pine trees within the boundaries of Aladağ / ADANA Pos Forest Management Directorate was used. Turkish red pine bark was collected immediately after cutting.

Material and methods: Pure water extraction method has been preferred to obtain natural dyes from red pine bark. Wood pulp was supplied from abroad in ready form. *Eucalyptus grandis* wood pulp is used. Spectroscopic analyzes were applied to dyed papers produced in the laboratory.

Main results: With the method applied in the Sokslet device, natural dyestuff was obtained. Good adhesion was achieved by the addition of both starch and alum mordant. The combination of starch and alum mordants has provided even better adhesion. When the color angles are examined; It was observed that the colors obtained were in the I. region.

Highlights: We believe that if Turkish red pine bark left in the forest as waste can be utilized in obtaining natural dyestuffs, it will contribute greatly to rural development and hence the country's economy. At the same time, we think that the use of Turkish red pine bark, which is a high-calorie forest flammable substance, will have positive results in the management of forest fires.

Keywords: Turkish Red Pine Bark, Starch, Alum, Wood Pulp, Natural Dye

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Examination of the Ratios of Holding Onion Skin Natural Dye into Wood Pulp of Alum and Starch Mordants

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Abstract

Aim of study: Until the second half of the 19th century, natural dyes were used for dyeing all kinds of products. In recent years, a worldwide trend towards natural and environmental products has begun. The purpose of this study; It is to obtain natural coloring matter from edible onion skin which is waste in nature. Another purpose is; To determine the effectiveness of starch and alum mordants in dyeing wood pulp with natural dyestuff.

Area of study: The onion skin to be used in the production of natural dyestuffs were collected from the public market of Adana province Sarıçam district as waste. Wood pulp was supplied from a private company that produces tissue paper domestically.

Material and methods: Pure water extraction method is preferred for obtaining natural dyes. Pure water / onion skin ratio of 100br./5br. (1000gr distilled water / 50gr onion peel) was used in the extraction method. Mordanting method is preferred together. Colorimetric measurement (CIE L *a *b *System) method was used in the spectroscopic analysis of papers.

Main results: Onion skin contains high amounts of quercetin. The amount of quercetin increases the dyeing and adhesion efficiency of the natural dyestuff. Quercetin was especially good with alum mordant and a high paint adhesion was achieved. Color saturation and Kubelka-Munk values have also proven good paint adhesion.

Highlights: Natural dye from onion skin will provide the formation of a new line of business. This will also benefit the country's current account deficit. It is possible to use the remnants of natural dyestuff production as a natural fertilizer without any processing.

Keywords: Onion Skin, Dyestuff, Alum, Starch

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Effect of Ecorecreational Attitude on Ecological Life Attitude in Football Players

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Abstract

Aim of study: The aim of this study is to determine the ecorecreational attitudes and ecological life attitudes of athletes participating in sports tourism, to reveal the differences between various variables and at the same time, and to evaluate the relationship and impact between ecological life attitude and ecorecreational attitude.

Area of study: While 304 football players playing professional football in the Ankara region and having season preparation camp studies were included in the study.

Material and methods: The data were collected with the Ecorecreational Attitude Scale developed by Ayyıldız Durhan, Akgül and Karaküçük (2018) and the Ecological Life Attitude scales developed by Önel and Yüce (2018).

Main results: For this study, the ecological life attitude scale was 0.77 and the ecorecreational attitude scale was 0.94 internal reliability coefficient. At the same time, the participants displayed a moderate attitude for both scales. Considering the findings, it was found that the variables did not significantly change the ecorecreational attitude and ecological life attitude, but there was a positive and moderately significant relationship between the ecorecreational attitude and the ecological life attitude. At the same time, it was determined that the ecorecreational attitude significantly predicted the ecological life attitude.

Highlights: The research shows that the participants of sports tourism, who adopt the ecoreational attitude, exhibit a positive ecological life attitude.

Keywords: Sports Tourism, Ecorecreation, Ecological Life, Attitude

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New Trends in Ecotourism: Forest Bathing/Forest Therapy in the World and Turkey

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Abstract

Aim of study: The study aims to reveal the content of forest bathing, which is also recognized as an ecotourism activity, to evaluate the application areas in the world and to make suggestions for the locations where forest bathing sessions can be performed in Turkey.

Area of study: Certified and non-certified routes and bases where forest bathing is applied worldwide will be examined.

Material and methods: The first stage of the study consists of determining the areas where forest bathing and forest therapy are applied. Then, literature and internet research was done, and studies conducted within Turkey and abroad were examined. After obtaining sufficient information, the analysis phase started. It has been investigated and tried to present forest bathing activities to determine the current uses worldwide. Also, meetings were held with Turkey's first certified forest therapist.

Main results: The forest areas where the health effects of forest therapy are determined and the general characteristics of these forests were revealed. Recommendations were made for the forest areas in Turkey to gain and maintain trail designation for forest bathing.

Highlights: Forest therapy, which is considered as preventive medicine, is expected to be approved by the World Health Organization (WHO). Turkey will have a significant role in this context with the forest resources that it has. In this regard, planning studies to be carried out in cooperation with the major countries will increase the value of Turkey's forest resources.

Keywords: Forest Bathing, Forest Therapy, Ecotourism, Forests of Turkey

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Ecotourism in the Mountains of the Issyk-Kul Region

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Abstract

Aim of study: Kyrgyzstan is a country with a favourable climate and natural conditions, which create preconditions for the development of ecological tourism, since there are places untouched by man in the country. The aim of the work is to describe the potential possibilities of ecological tourism in the State Natural Park "Karakol".

Area of study: Ecological tourism, sustainable development.

Material and methods: Analysis and processing of literature data.

Main results: The description of unique natural complexes, flora and fauna, recreation areas and tourist routes of the State Natural Park "Karakol".

Highlights: The main mission of the natural park is to preserve unique natural complexes, forests, objects of flora and fauna, which have a special ecological value for a favourable combination of natural and cultural landscapes, their use in recreational, educational, scientific and cultural purposes.

Keywords: Ecotourism, Karakol, Issyk-Kul, Natural Park, Recreation

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Problems and Solution Suggestions in Daday in terms of Nature Tourism Destination Development

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Abstract

Aim of study: In this study, it was tried to determine the problems experienced in Daday district, which has a very high potential in terms of nature tourism. Then, it was aimed to develop solutions to these problems.

Area of study: The study was conducted in Daday/Kastamonu which located in Turkey's Western Black Sea and TR82 zone.

Material and methods: The method of in-depth interview with the tourism stakeholders in the district through pre-structured questions was applied. The obtained findings were analyzed by word cloud analysis using the Maxqda.

Main results: According to the relevant stakeholders, the main problem is the lack of promotion and advertising. Other problems are the unconsciousness of the local people and the lack of cooperation and coordination among stakeholders.

Highlights: The district is home to very important resources in terms of natural tourism. However, during the interviews, it was observed that the relevant stakeholders were not very conscious about these resources.

Keywords: Nature Tourism, Daday, Kastamonu, Destination

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Contribution of the "Artvin Çoruh Ekotourism Project" to the Destination

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Abstract

Aim of the study: In this study, the "Artvin Çoruh Ecotourism Project" carried out by Artvin Regional Directorate of Forestry within Artvin provincial borders has been evaluated. In the research, the possible effects and contributions of the project to the Artvin destination are examined. In project scope; it ahs been determined that it is aimed to contribute to the province of Artvin especially int he field of tourism, and to reveal previously unknown or little known tourism values in a planned and programmed manner

Area of the study: 4 separate tracks were determined as Ambarlı-Tütüncüler, Ormanlı-Fıstıklı, Çamlık-Yenimahalle and Kafkasör-Genya Mountain as the activity areas of the project.

Material and methods: In the research, the concept of ecotourism was explained by scanning the literature. Afterwards, the "Artvin Çoruh Ecotourism Project" is evaluated as a case study.In order to make detailed descriptions about the study, document scanning, observation and interview techniques were used by using qualitative research method.

Main Results: This project will be created with a 52 kilometer route through ecotourism activities and especially to be at the forefront of Turkey's one of the longest road Artvin is expected to take place in ecotourism destinations. In addition, it is thought that bringing natural beauties to tourism will create important tourism options for nature lovers and eco-tourists.

Highlights: The most important output goal of the project is to bring the natural, cultural, historical and touristic values in Artvin to tourism without destroying the nature. With the project, it is expected that the ecotourism activities in the destination will be activated and rural development will develop. The tracks planned to be created in the work areas and routes determined in the project and the wooden bridge, railing, fountain, sitting benches, table, camellia, viewing terrace and trees and plants to be planted in these areas will contribute to the tourism inventory of the province, and will offer different architectural and landscape options to the destination. With this project, which is expected to contribute to the tourism activities in Artvin, the tourism attraction of the destination will increase and the number of domestic and foreign visitors will increase.

Keywords: Artvin, Ekotourism Project, Case Study

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Determining The Activity Pattern of The Red Fox (*Vulpes vulpes*) in Kastamonu

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Abstract

Aim of study: Examining the daily activities of wild animals is important to explain and understand the behaviour and ecology of them. In this study aimed to determine the activity pattern of red fox (*Vulpes vulpes*) distributed in Kastamonu.

Area of study: Study has been carried on Kastamonu province where is located on North Black Sea region in Turkey. Kastamonu covered with forests with a wealth of endemic flora and fauna diversity.

Material and methods: Red fox individuals were collected with camera traps. Study carried out between 2018-2020 in the Kastamonu province. Data were filtered with WildID Software and activity pattern of red fox were analysed with Oriana Software.

Main results: According to the obtained data various number species were identified in seven different localities. Materials of the present study were collected with camera traps in different habitats in Kastamonu years between 2018-2020. Red Fox displayed nocturnal behaviour.

Highlights: Studies on Red Fox in Turkey still limited. Especially in Turkey, it is important to maintain of sustainability to studies of wildlife.

Keywords: Red Fox, *Vulpes vulpes*, Activity Pattern, Kastamonu, Turkey.

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Determination of Large Mammal Species in Kastamonu Region and Their Daily Activity Patterns with Camera Traps: Preliminary Results

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Abstract

Aim of study: The large mammals have crucial role for maintaining ecological balance as a member of food chains and food webs (such as herbivores, carnivores, omnivores, insectivores) in ecosystems. Wildlife areas and living creatures in these areas are two basic elements in hunting and wildlife. It is important to know these two basic elements for sustainable wildlife management. In this study, large mammal species in Kastamonu region and their daily activity patterns have been tried to be revealed with camera traps.

Area of study: Study was conducted between September 2019 and October 2019 in Ballıdağ Forest Sub-district Directorate and Kurtgirmez Forest Sub-district Directorate located in Kastamonu region.

Material and methods: Twenty four camera traps were placed systematically for each Forest Sub-district Directorate area to determine large mammals for 75 days. Data were collected from camera traps and wild ID 5.0 software programme was used to record and tag the species identities of captured animal images. The capture time and date information generated from captured animal images exported as a timeline table in excel format with wild ID 5.0 software programme. Oriana software programme was used to generate graphics of large mammals' daily activity patterns from timeline.

Main results: In this study 8 large mammal species such as red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), brown bear (*Ursus actros*), grey wolf (*Canis lupus*), wildcat (*Felis silvestris*), marten (*Martes spp*.), brown hare (*Lepus europaeus*) were detected at the Ballıdağ Forest Sub-district Directorate and Kurtgirmez Forest Sub-district Directorate by camera-trapping.

Highlights: The most frequently captured large mammal species were roe deer (*Capreolus capreolus*) wild boar (*Sus scrofa*) and marten (*Martes spp*.) while the less frequently captured large mammal species were brown bear (*Ursus actros*), grey wolf (*Canis lupus*) and red deer (*Cervus elaphus*) by camera-trapping.

Keywords: Camera-trapping, Wildlife, Large Mammals, Daily Activity Patterns, Kastamonu.

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The New Records for Eucalyptus Gall Wasps, *Leptocybe invasa* Fisher & LaSalle and *Ophelimus maskelli* (Ashmead) (Hymenoptera: Eulophidae) from Black Sea and Marmara Region of Turkey

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Abstract

Aim of study: The species belonging to the *Eucalyptus* genus (Fam.: Myrtaceae) are native to Australia, New Guinea, Indonesia and the Philippines. It is used in industrial afforestation in more than 100 countries today because Eucalyptus trees is a rapidly growing leafy tree outside of homeland. Eucalyptus gall wasps, *Leptocybe invasa* and *Ophelimus maskelli* (Hym.: Eulophidae) are Australian origin and are obligate parasites of the *Eucalyptus* species. *L. invasa* the first time in Turkey in 2000 was reported from the Mediterranean region of Turkey. Later on it has also been reported from Aegean and South East Anatolia regions of Turkey. Other eucalyptus gall wasp, *O. maskelli* was introduced into Turkey by accident from the Mediterranean region in 2004. In a little while, it was sproead out to the Aegean region. In this study, the distribution of *Eucalyptus* gall wasps up to 2020 and also morphological and biological characteristics of pests will be explained.

Area of study: The current study was conducted in the Black Sea and Marmara regions.

Material and methods: In the research, a survey was conducted on *Eucalyptus camaldulensis* Dehn. in the region between 2014-2020. The gall wasps found were recorded in the report card.

Main results: As a result of the study, both eucalyptus galls in Samsun and Sinop provinces in the Black Sea Geographical Region and Bursa, Kocaeli and Yalova provinces in the Marmara Geographical Region was determined for the first time.

Highlights: Both species are new records for Black Sea and Marmara insect fauna.

Keywords: *Eucalyptus*, Eucalyptus Gall Wasp, Black Sea and Marmara Region, Turkey.

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Value Orientations and Attitudes of Hunters and Non-Hunters toward Wildlife Conservation in Bartın

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Abstract

Aim of study: Human dimension of wildlife studies have tended to segment the public to understand determinants of human behavior related to wildlife. This study aims to compare attitudes of hunters and non-hunters toward wildlife conservation through measuring its value orientation components and to elicit affecting variables on the attitudes.

Area of study: The study covers hunters and non-hunters in Bartın province.

Material and methods: The study was based on the data from a questionnaire survey with 500 hunters and 1.048 non-hunters conducted in a wildlife valuation project that included a wildlife conservation attitude scale. A reliability analysis of the scale and an independent samples t test with mean scores of the scale were performed. Also, a multiple regression analysis was used to examine the effects of some variables on the attitudes toward wildlife conservation.

Main results: Hunters had more positive attitudes toward wildlife conservation than non-hunters did. This difference that is statistically significant, was due to not only hunters' expectations for plenty of hunting resources with strong egocentric value-orientations, but also stronger motives related to social altruistic and pure biocentric value orientations.

Highlights: Information meetings about wildlife ecosystems and conservation should target younger, less-educated and rural resident non-hunters, as well as relatively older and less educated hunters with lower incomes. All public segments' attitudes toward wildlife conservation in Turkey should be examined with worldwide well-known wildlife attitude scales.

Keywords: Wildlife, Attitudes, Value Orientations, Bartın