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## THE ABILITY OF MANGROVE AREAS TO CONSERVES CARBON STOCK IN SEMI ARID REGION

Aah Ahmad Almulqu, Flora Evalina Kleruk

*Kupang State of Agricultural Polytechnic (Politani Kupang) East Nusa Tenggara, Indonesia;  
Adicusipto Street, Penfui Kupang East Nusa Tenggara, Indonesia;*

Email: [ahmadalmulqu@yahoo.com](mailto:ahmadalmulqu@yahoo.com)

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### ABSTRACT

Above ground trees and poles biomass was estimated in *Avicennia marina*, *Rhizophora stylosa* and *Sonneratia alba* of mangrove forest in Oebelo, Central Kupang Regency, East Nusa Tenggara, Indonesia. The research was conducted from January 2013 to July 2013, and undestructive method was used trees and poles, which having a diameter of less than 5 cm and over. Choosing the allometric equation based on the difficulties and practicality to get variable in the field become considerations. Results shows that carbon stock pattern different between all of trees and poles, and increasing ranging of diameter will followed of biomass and carbon stock in all trees and poles. Species that contributed the largest amount of carbon was *Sonneratia alba* with the total carbon stored in all individuals of this species of about 59 % of the total biomass stored on the research areas. This species had high number of individuals, high average of diameter and height. At areas of research, *Sonneratia alba* shared a maximum of 59 % of the total biomass, while, *Rhizophora stylosa* and *Avicennia marina* shared 38 % and 3 % respectively.

**Key words:** above ground, biomass, allometric equation, carbon stock

## HEAVY METAL CONCENTRATIONS AND PHYSICOCHEMICAL CHARACTERISTICS OF EFFLUENT ALONG THE DISCHARGE ROUTE FROM HAWASSA TEXTILE FACTORY, ETHIOPIA

Solomon Sorsa<sup>1,\*</sup>, Yadessa Chibssa<sup>2</sup>, Girma Tilahun<sup>1</sup>, Danial Fitamo<sup>1</sup>

<sup>1</sup>Department of Biology, College of Natural and Computational Sciences, Hawassa University, P.O.Box 5, Hawassa, Ethiopia,

<sup>2</sup>Department of Biology, College of Natural and Computational Sciences, Wachamo University, P.O.Box 667, Hossaina, Ethiopia,

Email: [sorsasota@yahoo.com](mailto:sorsasota@yahoo.com)

Received January, 2015; Accepted March, 2015

### ABSTRACT

Hawassa Textile Factory discharges virtually treated effluent into the nearby receiving environment. A study was carried out to assess the physicochemical characteristics and heavy metal levels of effluent released from biological treatment lagoon of the Factory. Heavy metals concentrations in sediment and macrophyte of the nearby stream to which the textile effluent is directed was also measured. Results indicated that some physico-chemical parameters such as pH, PO<sub>4</sub>, conductivity and TDS of the waste water from the two sampling sites were above provisional discharge limits set at national and/or international levels. The concentration of almost all detected heavy metals in samples analyzed from both sites generally followed the order: sediment > macrophytes > flowing waste water. The heavy metals levels detected in sediment samples from both sites followed the order: Mn > Zn > Cu > Cr > Pb > Cd. The mean concentrations of heavy metals in macrophytes followed the same order as in sediment while the sequence in waste water followed the order: Cu > Mn > Zn > Cr. However, Pb and Cd were below detection limit in both macrophytes and waste water samples. Even though the concentrations of heavy metals in samples analyzed were below acceptable ranges of the provisional discharge limits, their accumulation over time and the potential threat on environment health and disruption of ecological integrity was overemphasized. This study suggests quick intervention and closes monitoring to arrest and solve the growing environmental pollution and associated problems in the area.

**Key words:** Effluent, Hawassa Textile Factory, Heavy Metals, Macrophytes, Sediment

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**RIGHTS AND OBLIGATIONS OF STATES IN PREVENTION OF  
MARINE POLLUTION FROM SHIPS THROUGH THE PRISM OF THE  
UNITED NATIONS CONVENTION ON THE LAW OF THE SEA  
(LOS CONVENTION)**

**Jelena Nikcevic Grdinic, Ph.D.**

*University of Montenegro, Faculty of Maritime Studies, Dobrota 36, 85 330 Kotor, Montenegro;*

E-mail: [jelenag@ac.me](mailto:jelenag@ac.me)

Received March, 2015; Accepted April, 2015;

**ABSTRACT**

International regulations governing the protection of the sea against pollution started to develop during 70s. By that time the protection of the sea had not been given special attention due to the fact that sea pollution had not reached large proportions as well as the fact that there was no knowledge about the effect of certain substances and activities to the sea and the marine environment. Namely, it was thought that the sea, as wide space, can absorb all substances brought into it. Over time, the danger that threatens the sea against pollution was being recognized, which caused the necessity to undertake a number of measures aimed at the protection and preservation of the marine environment. It was considered that regulation of these problems, through the adoption of both international and national regulations, would largely have a preventive effect on the sea pollution. One of such regulations represented by an umbrella treaty is the 1982 United Nations Convention on the Law of the Sea. In this paper, the author analyzes the basic provisions of the United Nations Convention on the Law of the Sea relating to the protection and preservation of the marine environment. The author points to various sources of marine pollution. However, the paper mainly discusses the provisions of the Convention relating to the pollution of the sea from ships. Special attention is paid to the provisions governing powers and duties of coastal States, port States and flag States in connection with adoption and enforcement of regulations on prevention of marine pollution from ships.

**Key words:** UNCLOS, state, protection, prevention, pollution, marine environment, ship.

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## SUSTAINABILITY DEVELOPMENT OF AGGREGATES SUPPLY IN CROSS BORDER AREAS BASED ON THE NATIONAL, REGIONAL AND EU POLICIES

Lavdie Moisiu<sup>1</sup>, Sokol Mati<sup>2</sup>

<sup>1</sup>*Geological Survey of Albania, Tirana, Albania;*

<sup>2</sup>*BERALB Private company, Albania;*

Email : [ledimoisiu@yahoo.com](mailto:ledimoisiu@yahoo.com) ; [ledimoisiu@gsa.gov.al](mailto:ledimoisiu@gsa.gov.al)

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### ABSTRACT

This article gives a review on the natural resources of the region of the border Greece – Albania. It gives an evaluation of the aggregates potential on and their actual exploitations, as well as the flow of the aggregates between two countries and possibilities for further sustainable development of exploitation of aggregates in both cross border areas. The sustainable development ideas are given based on the frame of the mining strategy of Albania, territorial planning, re-evaluation of mineral reserves. The long term strategy of minerals of Albania, which include the exploitation of aggregates is carried out under political and institutional reforms toward integration of the country in the EC structures and it intend to ensure a sustainable and long term development through effective investments. In the article is presented the actual situation and perspective development in mining activity, for the aggregates in the border areas, new concepts for mining activities connected with the European strategy for minerals, challenges, trade and requests for aggregates, new products in this business, recycling possibilities, stronger focus on the supervision and monitoring of existing (and future) activities to eliminate the illegal quarrying, increase transparency to the public and involvement of the local authorities on decision making, with scope to realize profit activities and maximum profit to citizens, with slogan “ Minerals and Energy for a sustainable development”.

**Key words:** aggregate, legislation, mining activity, sustainable development

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## THIRD SECTOR AND YOUTH EMPLOYMENT

**Eda Bezhani**

*The University of "Aleksandër Moisiu" Durrës, Faculty of Business, Albania;*

Email: [edabezhani82@gmail.com](mailto:edabezhani82@gmail.com)

Received March, 2015; Accepted April, 2015;

### ABSTRACT

Member States of EU that are prone to use optimally the factors resources of the production. All the common policies that EU has implemented in the function of competition, expressed in the general form of the Common Market that will help us to better use the factors. Starting from this point of view the answer to eliminate the social problems that exist in our country can be eliminated through Social Economy. Third Sector represents an economic development model that seeks to balance the private and social interests in a free market economy. It represents a third way, which should be accepted (at least partially) by different groups of those who believe in the total market economy and taking into account the role of the state in maintaining the balance mentioned above. Unemployment is a global phenomenon that greatly affects young people, especially those from poor environments, with little education and no work experience. As a response to this situation the European Social Economy has proposed the creation of social enterprises and labor integration. These organizations train young people in the current work environment, so they can recognize the habits and appropriate responsibilities.

**Key words:** Social Economy, youth employment, social enterprises, qualifications.

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## FLY ASH - CEMENT MICROSTRUCTURE OBSERVED BY SEM IMAGES

**Denisa Demi***Fushë - Kruja Cement Factory, Tirana, Albania;*E-mail: [denisademi@yahoo.com](mailto:denisademi@yahoo.com)

Received March, 2015; Accepted April, 2015;

### ABSTRACT

At a basic level, scanning electron microscope SEM can be used as an adjunct to optical microscopy, for example to obtain high-magnification images of concrete fracture surfaces or to analyze material not identifiable by optical microscopy. SEM does this very well, but the full potential of SEM goes much further, especially in non-routine examinations. SEM is especially useful in studies of deleterious processes such as sulfate attack, including the particular form of sulfate attack known as delayed ettringite formation (DEF), alkali-silica reaction (ASR), alkali carbonate reaction and any other situation where the microstructural or micro compositional characteristics of the concrete need to be examined. SEM can be used to distinguish between different types of cement in older concrete such as 'ordinary' Portland cement and sulfate-resisting cement. SEM in conjunction with digital image analysis can determine the aggregate and cement content of concrete. Using polished concrete sections, the areas occupied by aggregate, paste and air are measured, the water-cement ratio is estimated and the mix proportions calculated. This technique can be particularly useful where conventional chemical methods cannot be used, perhaps because of the presence of limestone and soluble silica in the aggregate.

**Keywords:** Fly ash, concrete, SEM, EDS, microstructure.

## ANALYSES OF MICROBIOLOGICAL DATA INDICATES FROM PHYSIC-CHEMICAL PARAMETERS, IN FISH SPECIES FROM SITNICA, LEPENCI AND LUMBARDHI I PRIZRENIT RIVERS (KOSOVA)

Ferizi Rrahman<sup>1</sup>, Puto Klementina<sup>2</sup>, Maxhuni Qenan<sup>3</sup>, Hulaj Beqe<sup>4</sup>, Bislimi Kemajl<sup>5</sup>

<sup>1</sup>University of Pristina, Faculty of Medicine, Pristina, Kosova;

<sup>2</sup>University of Tirana, Faculty of Natural Sciences, Department of Biotechnology, Tirana, Albania;

<sup>3,4</sup>University of Pristina, Faculty of Agriculture and Veterinary, Pristina, Kosova;

<sup>5</sup>University of Pristina, Faculty of Mathematics and Natural Sciences, Pristina, Kosova;

E-mail: [rahman.ferizi@uni-pr.edu](mailto:rahman.ferizi@uni-pr.edu)

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### ABSTRACT

The main objective of this study was to isolate enteric pathogenic bacteria from fishes, *Shigella spp.*, *Salmonella spp.*, *Coliform and Streptococci*, bacteria that might be transmitted to humans after using and consuming fish. Fish samples were collected during March-October 2013-2014 applying electrofishing method alongside Sitnica, Lepenci and Lumbardhi i Prizrenit rivers. Preparation and isolation of *Shigella spp.*, *Salmonella spp.*, *Coliform and Streptococci* species from fish samples was realized using standard bacteriological procedures. The isolation of enteric bacteria in fish is an indicator of fecal contamination and/or water pollution. From our analyses we found that the level of presence of such bacteria is within the international standard value of  $5.0 \times 10^6$  CFU/ml that are already approved by many countries. The lack of *Salmonella Spp.*, *Shigella spp.*, *Coliform* and *Streptococci* bacteria on the fecal samples of fish can justify the water purity of these rivers according to microbiological aspect, even though there was presence of sewage waste collector, as well as lower water temperatures of these rivers. Also this results could have been impacted from the presence of heavy metals such as Cadmium (Cd) and Plumb (Pb). It is worth mentioning that they values were a bit higher that allowed standards according to the World Health Organization (WHO). As we know, variability of subtypes of different bacterial aspects reflected for research, risk management, and public health strategies.

**Key words:** Fish, river pollution, *Shigella spp.*, *Salmonella spp.*, Coliforme, Streptococci.

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## SEROEPIDEMIOLOGY OF VARICELLA-ZOSTER VIRUS INFECTION IN ALBANIA

Gazmend Bejtja<sup>1</sup>, Alma Robo<sup>2</sup>, Arjan Harxhi<sup>3</sup>

<sup>1</sup>Ministry of Health of Albania, Department of Public Health, Albania;

<sup>2</sup>Institute of Public Health, Albania, Department of Control of Infectious Diseases, Laboratory of Virology, Albania;

<sup>3</sup>University Hospital Center "Mother Tereza", Tirana, Clinic of Infectious Diseases, Albania;

E-mail: [Gazmend.Bejtja@shendetesia.gov.al](mailto:Gazmend.Bejtja@shendetesia.gov.al)

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### ABSTRACT

To date, there is no universal varicella vaccination in Albania. A seroprevalence study of varicella zoster virus (VZV) was conducted in 2010-2012 among children 0-15 years of age, to assess the patterns of the epidemiology of varicella in the Albanian population. The acquisition of antibodies to VZV in population of Albania (Vlora Region) occurs during childhood and adolescence. Over 39% of children 5 years of age had antibodies to VZV. There is observed a 3-4 fold increase of the VZV sero-positivity among children 4-5 years of age as compared to children 1-3 years of age. Around 58% of children 10 years of age had antibodies to VZV. The VZV seropositivity reaches the level 75% among adolescents of 15 years of age. Given the relative lower rate of varicella transmission in Albania, the introduction of VZV universal coverage in Albania, will require an adolescent catch-up campaign. Despite the high rate of childhood vaccine coverage, the acceptance of VZV vaccine, especially the adolescent catch-up dose, has to be addressed through a specific strategy.

**Keywords:** Varicella zoster virus; Chickenpox; Epidemiology; Serosurveillance; Vaccination;

## CHLORBENZENES, ORGANOCHLORINATED PESTICIDES AND PCB IN BIOTA SAMPLES OF KARAVASTA LAGOON

Anida Dukaj<sup>1</sup>, Bilal Shkurta<sup>2</sup>, Aurel Nuro<sup>3</sup>

<sup>1</sup>Tirana University, Faculty of Natural Sciences, Physic Department, Albania;

<sup>2</sup>University of Vlora "Ismail Qemali", Faculty of Education, Department of of Natural Sciences, Albania;

<sup>3</sup>University of Tirana, Faculty of Natural Sciences, Department of Chemistry, Albania;

E-mail: [anidaduka@hotmail.com](mailto:anidaduka@hotmail.com)

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### ABSTRACT

In this paper are presented concentrations of chlorobenzenes, organochlorinated pesticides and polychlorinated biphenyls (PCB) in biota samples of Karavasta Lagoons. Fish and mussel samples were taken in September 2014. Ultrasonic extraction was used for extracting organochlorinated pollutants from tissues of biota samples. Clean-up procedure were realized using firstly silicagel treated with 45% sulphuric acid for lipid hydrolysis followed by a second clean-up procedure in an "open" florisil column. Analysis was realized in HP 6890 Series II, gas chromatograph equipped with  $\mu$ ECD detector. For separation of chlorobenzenes, organochlorinated pesticides and PCB markers was used Rtx-5 capillary column (30m x 0.32mm x 0.25 $\mu$ m). Mono to hexachloro benzene was determined in fish samples. The organochlorine pesticides detected were: HCHs (a-, b-,  $\gamma$ - and d-isomers) and the DDT-related chemicals (o,p-DDE, p,p-DDE, p,p-DDD, p,p-DDT), Heptachlors, Aldrines and Mirex. Analyzes of PCBs was based on the determination of the seven PCB markers. Organochlorinated pollutants were found for all analyzed samples. Monochlorobenzene was found higher than other chlorinated benzenes. The main origin of organochlorine pesticides could be as result of their previous uses in agricultural areas near the lagoon. PCB 28 and PCB 118 were found in higher level than other congeners. These levels were comparable to levels reported from previous studies for this ecosystem. Cluster analyze was used for interpretation of data found for biota samples of Karavasta Lagoon.

**Keywords:** Chlorobenzenes; Organochlorinated pesticides; PCBs; Fish samples; Karavasta Lagoon; GC/ECD

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## CHALLENGES OF THE HARMONIZATION OF MACEDONIAN ENVIRONMENTAL LEGISLATION WITH THE EU LEGISLATION

Zoran Sapuric<sup>1\*</sup>, Marko Andonov<sup>1</sup>, Kimo Cavdar<sup>1</sup>

<sup>1</sup>*University American College, Skopje, Macedonia,*

Email: [sazoran@hotmail.com](mailto:sazoran@hotmail.com); [sapurik@uacs.edu.mk](mailto:sapurik@uacs.edu.mk)

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### ABSTRACT

European Union is one of the world leaders in the development and implementation of environmental standards. The EU has developed a complex system of environmental legislation. The main goal of this legislation is to provide a high level of environmental protection. On a way towards the EU integration Macedonia faces with a number of challenges in harmonization of its environmental legislation with the EU legislation. There are some positive results in the harmonization, but the problems start with the practical implementation. There are a number of subjective and objective reasons for weak practical implementation. In the future Macedonia has to make intensive efforts to perform harmonization and to implement its environmental legislation. The main aim of this paper is to analyze the process of harmonization of national environmental legislation with the EU legislation. Also the paper aims to give some recommendations for overcoming the problems and challenges in this process.

**Key words:** Legislation, environment, harmonization, implementation, European Union public awareness, households, citizens.

## THE RELATION BETWEEN HELICOBACTER PYLORI INFECTION AND GASTRIC MUCOSAL DAMAGES

Kopaçi Ermela<sup>1</sup>, Rexha Tefta<sup>2</sup>

<sup>1</sup>Farmatech sh.p.k, , Tirana, Albania;

<sup>2</sup>Tirana University, Faculty of Natyral Sciences, Biology Department, Bulevardi “Zog I“, Tirana, Albania;

Email; [ermelaselimi@gmail.com](mailto:ermelaselimi@gmail.com);

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### ABSTRACT

Introduction and aim: Chronic gastritis is the most common manifestation of *Helicobacter pylori* infection. The changes in the gastric mucosa have tendency to progress to mucosal atrophy. By this work we want to prove the relation between *Helicobacter pylori* infection and inflamatory changes of gastric mucosa, the grade of change according to the type of gastritis and the possible relation of *Helicobacter Pylori* infection to age and gender. Material and methods: In this retrospective study, by period of time 2010-2013, are taken to study 200 individuals, who submitted at a private hospital center, with gastro-intestinal symptoms, vomiting, pain or upper abdominal discomfort, bloody vomiting and black coloured stool. To diagnose the inflamatory changes of gastric mucosa and the presence of *Helicobacter pylori*, it is used the invasive method of endoscopy. The zones where biopsies are taken are cardia, antrum, corpus, fundus and pylorus. The taken biopsy is stained by Giemsa stain method, modified. Age and gender are taken for each patient. According to the degree of changes found in submucosal glands, the sample is devided in three individual groups: without gastritis, non-specific gastritis and chronic gastritis. In the examined group there are positive and negative status of *Helicobacter pylori* infection. Results: Acoording to the our study, *Helicobacter pylori* results to be the main cause of chronic gastritis development ( $\chi^2 = 64.45$ ;  $p < 0.0005$ ). Percentage positivity of *Helicobacter pylori* in individuals with gastritis is 75,5%. There couldn't be fined an statistically reliable connection between *Helicobacter pylori* and the samples individuals gender. ( $\chi^2 = 4.3$ ;  $p = 0.364$ ).

**Key words:** *Helicobacter pylori*, gastritis

## ASSESSMENT OF NATURAL DIETS IN THE ADULTS OF TWO SMALL BODY NATIVE FISHES AND FINGERLINGS OF TWO EXOTIC SPECIES INHABITING THANA LAKE, LUSHNJA-ALBANIA

Abedin Dyli<sup>1</sup>, Rigerta Sadikaj<sup>2\*</sup>, Dritan Arapi<sup>2</sup>, Edlira Baraj<sup>3</sup>, Marsida Bllaca<sup>1</sup>, Vladimir Spaho<sup>1</sup>

<sup>1</sup>Agricultural University of Tirana, 1001 Tirana, Albania;

<sup>2</sup>University of Tirana, Blvd. Zogu 1, 1001 Tirana, Albania;

<sup>3</sup>Polytechnic University of Tirana, 1001 Tirana, Albania;

\*E-mail: [rsadikaj@hotmail.com](mailto:rsadikaj@hotmail.com)

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### ABSTRACT

Thana lake (Albania) is populated with 16-18 fish species, from which 9-11 are native species and 7 non-native species. Three non native species were introduced in the lake spontaneously whereas four other species were introduced in consciousness, in the framework of repopulation programs for the purpose of fishery activities. For a period of 12 months we have studied the diets and some ecological feeding indices for two native species, bleak and common roach adults and two non native species, bighead carp and grass carp fingerlings. We proved that the relative content of zooplankton in bleak diet was 76.81% when in bighead carp diet it was 73.98%. Average value of diet overlap index between these two species was  $aab = 0.661 \pm 0.156$ , showing the existence of food competition. In the diet of common roach, macrozoobenthos had the highest value of frequency (40.97%). The frequency of occurrence of zooplankton was 29.44% when the vegetal component 13.3%. In the diet of grass carp fingerlings the relative frequency of algae was 61.38%, when for the macrophyta was 18.24%. Zoobenthos frequency was 6.62%. The average value of diet overlap frequency between common roach and grass carp was  $aab=0.464 \pm 0.119$ , showing moderated competition between them.

**Key words:** zooplankton, zoobenthos, ecological indices, native, non native

## RISK FACTORS FOR HUMAN BRUCELLOSIS

Eralda Mariani<sup>1</sup>, Polikron Pulluqi<sup>2</sup>, Enver Roshi<sup>3</sup>

<sup>1</sup>*Department of Public Health, Ministry of Health, Tirana, Albania;*

<sup>2</sup>*Department of Family Medicine, Faculty of Medicine, University of Medicine, Tirana, Albania;*

<sup>3</sup>*Faculty of Public Health, University of Medicine, Tirana, Albania;*

E-mail: [Eralda.Mariani@shendetesia.gov.al](mailto:Eralda.Mariani@shendetesia.gov.al)

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### ABSTRACT

Brucellosis is a zoonotic disease of worldwide distribution. Despite its control in many countries, it remains endemic in Albania. The aim of this study was to determine the risk factors for brucellosis infection in the Korça region in Albania. An age and gender matched case—control study was conducted including 111 cases and their respective controls. Brucellosis cases were defined on the basis of epidemiologic, clinical, and laboratory criteria. Subjects were interviewed using a questionnaire to obtain risk factor information. A logistic regression model was used to assess the association between the disease and the variables studied. Significant risk factors for infection were related to male gender, rural residence, occupation handling animals, breeding animals (OR= 3.9 95%CI 1.8 - 9.2), raw milk and unprocessed dairy products consumption, a family history of brucellosis in the home (OR=3.7 95%CI 1.4 - 7.2). The knowledge about disease transmission route dairy product as a mode of brucellosis transmission were protective factors. Pasteurization of milk and dairy products and education regarding eating habits must be pursued for eradication of human brucellosis, especially in rural areas.

**Keywords:** brucellosis, risk factors, dairy products

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## THE IMPACT OF WOODEN CONSTRUCTION ELEMENTS IN THE ENERGY BALANCE OF THE WOODEN BUILDING IN ALBANIA

**Firdus Haveraj***Agricultural University of Tirana, Faculty of Forest Sciences, Tirana, Albania;*Email: [firdushaveraj@gmail.com](mailto:firdushaveraj@gmail.com)

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### ABSTRACT

Thermal insulation is rated as one of the most effective interventions to reduce energy requirements for heating and cooling according to numerous studies in the energy sector in general and in the housing sector in particular, due to the reduction of heat transmission coefficient of construction elements. The study aimed to assess the impact of wooden walls and windows in energy balance, in order to ensure energy efficiency in the wooden building. The project was based on the identification of typical types of walls of wooden houses mostly used in Albania. It was conducted for a typical wooden building in the climatic area of Tirana, for three types of walls and three types of wooden windows. Heat transfer coefficients of the walls and windows were assessed by Knauf Insulation 1.2 program. The impact of nine (9) typical combinations of three (3) types of walls with three (3) types of windows was assessed by the influence of relevant heat transfer coefficients in thermal balance of the annual demand for heating and cooling, generated by the program Casanova version 3.3.08. The thermal impact of the windows is also estimated by energy-flow diagram. It was concluded that these combinations between walls and wooden windows were in compliance with the requirements by 80 - 110 kWh/ (m<sup>2</sup> year), set by the “National Strategy for the Conservation of Energy in buildings 2015”.

**Keywords:** energy balance, wooden wall, wooden window, thermal performance

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## **SATELLITE-BASED ESTIMATION OF HYDROLOGIC COMPONENTS – APPLICATION TO SNOW AND PRECIPITATION**

**Cezar Kongoli<sup>1,2</sup>, Sean Helfrich<sup>2</sup>, Robert J. Kuligowski<sup>2</sup>**

<sup>1</sup>*Earth Science System Interdisciplinary Center (ESSIC), University of Maryland College Park, MD, USA*

<sup>2</sup>*National Oceanic and Atmospheric Administration (NOAA), National Environmental Satellite Data and Information Service (NESDIS), NOAA Center for Climate and Weather Prediction (NCCWP), College Park, MD, USA*

Email: [Cezar.Kongoli@noaa.gov](mailto:Cezar.Kongoli@noaa.gov); [Sean.Helfrich@noaa.gov](mailto:Sean.Helfrich@noaa.gov), [Bob.Kuligowski@noaa.gov](mailto:Bob.Kuligowski@noaa.gov);

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### **ABSTRACT**

In this paper, we present satellite-based methods that are applied operationally at National Atmospheric and Oceanic Administration (NOAA), National Environmental Satellite Data and Information Service (NESDIS) for the estimation of snow and precipitation, with special emphasis on snow depth and surface rainfall. A potential joint application of these methods would be for the hydrological analysis of rain-on-snow events which are occurring more frequently. A new operational snow depth estimation method blending satellite and in-situ measured snow depth is described. The method is applied within NOAA's Interactive Multi-Sensor Snow and Ice Mapping System (IMS) providing 4-km resolution snow depth estimates over the Northern Hemisphere twice daily. Unique to the production is the application of snow depth generated interactively from the analyst that is also ingested into the objective analysis. Next, an operational satellite rain rate product is also presented with example applications and validation against in-situ data.

**Key words:** Satellite Remote Sensing, Snow Depth, Rain

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## **THE POWER OF MIX COMMUNICATION IN RELATIONSHIP MARKETING OFFLINE VERSUS ONLINE: THE CASE OF THE ALBANIAN BANKING SECTOR**

**Ervin Myftaraj**

*Marketing Department, Business Faculty, University "Aleksander Moisiu", Durrës, Albania;*

E-mail: [ervin.myftaraj@yahoo.com](mailto:ervin.myftaraj@yahoo.com)

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### **ABSTRACT**

All companies use element mix of communication for communicating with their audience. Now communication is not only to inform, persuade or remind customers about the existence of the product on the market, but companies also communicate to care for their existing customers. Through communication is achieved to maintain a personalized relationship between the company and its customers, so to implement marketing relationships. The purpose of this study is to assess the importance of the communication mix in the process of building marketing relationships offline market and online market. For realization of this study, is used marketing literature and was taken a sample of 316 consumers, who were answering questions about the importance communication mix and its impact on marketing relationships. The choice is made randomly grouped by demographic distribution according to the region where they live, age, gender, educational level and sector in which they work. The questionnaires were completed in two major Albanian cities, Tirana and Durrës. Study is the based on primary and secondary data for the financial sector Albanian case. The findings of this research, from the descriptive analysis and processing of statistical data, emphasize that communication mix is important for marketing to build relationships as it offline and online.

**Key words:** Communication mix, Marketing of relations, Offline and online market

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## THE ASSESSMENT OF WIND POTENTIAL IN MAMAJ, TEPELENË, ALBANIA

Elena Bebi<sup>1</sup>, Jorgaq Kaçani<sup>2</sup>, Edmond Ismaili<sup>3</sup>

<sup>1</sup>*Polytechnic University of Tirana, The Production and Managing Department, Tirana, Albania;*

<sup>2</sup>*Polytechnic University of Tirana, Rectorate, Tirana, Albania;*

<sup>3</sup>*Faculty of Engineering, Mie University, Japan;*

Email: [ebebi@fim.edu.al](mailto:ebebi@fim.edu.al); [jorgaqkacani@yahoo.com](mailto:jorgaqkacani@yahoo.com); [edeajp@gmail.com](mailto:edeajp@gmail.com)

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### ABSTRACT

In this article, wind characteristics and wind energy potential of a site in the southern part of Albania were analyzed utilizing the 10min wind speed data collected from 2 towers during the period March 2013- June 2014. Wind speed distribution and statistical analyses were conducted using two-parameter Weibull probability density functions. Good agreement was found by comparing the measured data and Wind Atlas data. The annual mean wind speed was 5.64 m/s. The results derived from this work indicate that the selected site is suitable for developing a small scale wind farm.

**Keywords:** Wind speed, Wind energy, Weibull distribution, Wind power density.

## ASSESSMENT OF HEAVY METAL POLLUTION IN SITNICA RIVER SEDIMENT

Ardian Rugova<sup>1</sup>, Tahir Arbnesi<sup>2</sup>, Ilirjan Malollari<sup>3</sup>

<sup>1</sup>Kosovo's Medical Agency, Prishtina, Kosova;

<sup>2</sup>Department of Chemistry, FMNS, University of Prishtina, Kosova;

<sup>3</sup>Department of Industrial Chemistry, University of Tirana, Albania;

Email: [ilir.malo@gmail.com](mailto:ilir.malo@gmail.com)

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### ABSTRACT

Being essential and integral parts of water systems, sediments used to provide the substrate for organisms and through interaction with the overlying waters play an essential role in the aquatic ecosystem. Natural environment which is polluting by heavy elements is considered as a universal problem. The heavy metals released in the environment as the result of human activities, atmospheric depositions and erosions would finally enter in to the aqua systems. This work contributes to the monitoring of sediment pollution in Sitnica River district by assessing the degree of pollution in the surface sediment. Since, heavy metals are toxic, stable in the environment and potential to combine with the nutritive continuum. Thus, they are considered as one of the most significant pollutant in aqua systems. The surface layer of sediment is chosen where this layer controls the exchange of metals between sediments and water most. The primary goal of the study is to determine the concentration of Pb, Cd, Cu and Zn in surface sediments which act as contamination indicators. Samples were collected twice a month between January and December 2013 from 6 sites along the River Sitnica. The concentration of these elements was determined by using Atomic Absorption Spectroscopy (AAS). All the determined parameters with AAS were compared with the results of ICP/OES method. Concentrations of metals generally decreased with distance downstream, with highest values occurring in the industrial upper stream of Sitnica River. Concentrations of cadmium, copper, and zinc in 2013 were lower at most sites than those in previous years. Unlike, the lead and cadmium concentration were generally higher in 2013. The most probably reasons of these results may be the influence of thermal power plants at Obiliq, located very close to Sitnicar River.

**Key words:** Sitnica River, Sediment, Heavy metals, water contamination