Mini Review   **Published Date:- 2022-12-05**

[Integrated vermicomposting and green roof techniques for food production in urban and rural areas](#)

Thousands of tons of biodegradable organic waste generates in urban and rural areas every day, creating disposal problems. Urban organic waste can be converted into valuable output products (vermicompost, vermin-liquid, and earthworms) by applying a vermicomposting technique that had different. Implementing green roofs via soilless culture systems as micro-scale farms led to increasing natural resource use efficiencies as well as producing fresh food. The integration of both techniques will create not just reduce pollution and climate change impacts but also for increasing food production and security in urban, enhance the lifestyle and increase public awareness of environmental issues. This process is profitable at any scale of operation.

Short Communication   **Published Date:- 2022-12-05**

[The smart agriculture applications (current and future)](#)

Smart agriculture applications (monitoring, sensing, automation and control) of micro-climate and environmental conditions for different agriculture production sectors and scales, decision-makers and researchers need to take it into consideration to strengthen the efforts of mitigation and adaption of climate change impacts as well as maximize the natural resources use efficiencies and food production. Motivate the farmers to implement smart agriculture applications, especially in developed and poor countries, strong cooperation for technology transfer and build up the technology infrastructure of information and communication (ICT) plus the internet of things (IoT).

Research Article   **Published Date:- 2022-11-23**

[Evaluation of pulp and paper-making potential of Acacia melanoxylon based on chemical composition grown at Chencha, Ethiopia](#)

The study aimed to examine the chemical composition of Acacia melanoxylon wood as a potential raw material for pulp and paper manufacturing. Samples of Acacia melanoxylon were taken systematically based on tree height at the bottom (10%), middle (50%), and top (90%) of market height. The sample was sorted, dried, milled, and sieved, and all chemical compositions were determined by the standards outlined in ASTM except cellulose and hemicellulose, which were determined by the Kurschner-Hoffer and alkali extraction methods, respectively. The results of the study showed that the overall average values of chemical composition along tree height levels were 45.02%, 21.94%, 23.79%, 5.52%, 3.24% and 0.48% for cellulose, hemicellulose, Klason lignin, hot-water solubility, alcohol-benzene extracts, and ash content, respectively. Except for hot-water extractives, the chemical composition of the bottom and top portions differed significantly. Generally, this study suggests that the chemical composition of Acacia melanoxylon wood is well suited for pulp and paper production.

Opinion   **Published Date:- 2022-10-11**

[ESG (Environmental, Social and Governance) in construction civil: concept that can contribute to the sector](#)

The search for a sustainable development path capable of satisfying the needs of the current generation without compromising the well-being of future generations is not a new challenge. In recent years, climate change and, more generally, the transition to a sustainable development model have become increasingly important. According to the European Central Bank [1], guidelines on sustainable finance, a company aims to develop value by adhering to relevant ideals, such as fair remuneration for employees, respect for ethical and social values and preservation of the environment.

Mini Review   **Published Date:- 2022-10-11**

[Study of ESG criteria and metrics for the construction industry](#)

Considering the performance of supply chains in the three dimensions of sustainability; Economic, Social, and Environmental, ESG scores can function as a measurement scale [1]. Environmental, social and corporate governance (ESG) is an extension and enrichment of the concept of Socially Responsible Investment (SRI) and is an important measure of corporate sustainable development [2,3].

Research Article   **Published Date:- 2022-09-20**

[Evaluation of fiber characteristics and basic density of Acacia melanoxylon (R.Br.) grown in Ethiopia for pulp and paper making](#)

The fiber characteristics and basic density of Acacia melanoxylon were investigated for its potential as a raw material for pulp and paper production. Six trees from the even-aged stand and similar diameter class were selected randomly from the Chencha district of Ethiopia. Wood disks were systematically cross-cut from a log along tree height levels, at the bottom (10%), middle (50%) and top (90%) of the merchantable height and blocks of wood (2 cm x 2 cm x 2 cm)
were taken from pith to periphery at near pith (10%), middle (50%) and near bark (90%) of disk radius. Fiber maceration and basic density were determined, by 50% nitric acid solution and water displacement method respectively. All the data were analyzed using a two-way analysis of variance at ? = 0.05. The fiber characteristics of the selected trees; the fiber length, fiber diameter, lumen diameter and cell wall thickness were measured while the-slenderness ratio, Runkel ratio, flexibility coefficient and wall coverage ratio of the fibers were derived from the measured fiber dimensions. The result showed that- the overall mean were, 1.04 mm, 21.60 µm, 15.36 µm, 3.75 µm, 0.48, 48.05%, 71.10%, 0.34 and 0.56 g/ml, for fiber length, fiber width, lumen diameter, cell wall thickness, Runkle ratio, slenderness ratio, flexibility ratio, wall coverage ratio and basic density, respectively. Generally, Acacia melanoxylon wood is suitable for pulp-and-paper-production, to due-to-its adequate-fiber dimension, derived fiber value and basic density. Therefore, attention should be given to tree growers, government and non-governmental organizations on the plantation expansion of Acacia melanoxylon.

Opinion   **Published Date:- 2022-08-26**

[IZOMIN – Ecological solution for sustainable constructions](#)

The depletion of non-renewable resources is followed by severe ecological and social impacts, and the heavy usage of raw, virgin resources leaves significant, long-lasting footprints. The transition to a more circular economy, where the value of products, materials and resources is maintained and circulated (by recycling activities) in the economy for as long as possible, is an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy. In this context, ecological solutions consisting of materials that help carbon sequestration and necessitate small amounts of energy for production are becoming increasingly popular from a building construction point of view, namely: The raw material is cheap and in large quantities; has low thermal conductivity; are from a renewable source. The paper presents an analysis of IZOMIN an innovative thermal insulating product made from renewable or recycled resources and their main technical properties, the purpose being to inform the market in order to increase the present level of technical knowledge and technologies used to facilitate the implementation of buildings with high energy efficiency.

Literature Review   **Published Date:- 2022-08-03**

[Environmental impact assessment of demolition of a building in India-A case study](#)

Buildings are demolished, when they outlived their service life, become structurally/functionally unfit, or have been built illegally. In India, an RCC framed, 40-storied high-rise building, with a built-up area of about 75,000 sqm, built without relevant approvals along with lots of violations of building bye-laws, has been demolished. There is nothing new in this demolition process, but its effect on the environment is unavailable. A study has been conducted to understand the environmental impact of this demolition. Based on the main primary construction materials, the embodied energy of this demolished building has been computed as 7.07 GJ/sqm.

The civil construction cost of the building was found to be about INR 200 Crores (USD 27 million, assuming a conversion rate of 1 USD 75 INR in the year 2022). Expected GHGs emissions corresponding to this embodied energy were estimated as 42.42×10^3 MT. Energy in the demolition of the building has been computed to be about 8.7 GJ/sqm. The situation, in which this building can be retrofitted and made compliant with local building bye-laws, has been analyzed for its environmental impact.

Short Communication   **Published Date:- 2022-08-02**

[Efficiency of different methods for calculating the mechanized tunnels face pressure considering an earth pressure balance](#)

Different methods for calculating and estimating a safe face pressure were proposed by researchers, which have some advantages and disadvantages. In each of these methods, some related parameters such as soil geotechnical parameters, dimensions of the tunnel, and geological conditions are used. In these methods, using a series of mathematical or empirical functions, the face pressure is calculated. In this study, the face displacements were obtained using the finite difference numerical FLAC3D, the COB (Netherlands Underground Science Center) empirical, and the Leca and Dormieux (1990) analytical methods. The impact of the COB method on different ground stiffnesses is studied and evaluated. The reference case of this research is the Tehran Metro Line 6 tunnel (excavation radius: 4.6 m).

Research Article   **Published Date:- 2022-07-21**

[Defluoridation of water by the Homa* method, a co-precipitation technique using wood ash leachate and alum](#)

High fluoride level in drinking water is an endemic public health concern in East Africa. Unlike in Kenya where it is absent, the Nalgonda technique, a defluoridation method that uses two chemicals, alum, and CaO, has seen mixed results in its application and adoption in Ethiopia and Tanzania. This has been due to the low capacity of communities to manage the process and the breakdown in the supply chain of chemicals used in the technique. In the present study, we attempted to bridge the gap in the chemical deficit by investigating the possible substitution of CaO with leachate from wood ash, a by-product of wood combustion commonly found in Kenya. The leachate was prepared from one part of wood ash mixed with two parts of distilled water and stirred for 24 hours followed by decantation. The new technique, the Homa method, using alum and wood ash leachate was then tested on H_2O samples from three areas in Kenya with high F- concentrations ranging from 5.1 mg L-1, 9.1 mg L-1 to 91.0 mg L-1. The determination of F- concentration by SPADNS Spectrophotometry was applied throughout the experiment. Four levels of alum i.e. 1%, 2%, 3%, and 4% were dosed on five volumes of water i.e. 100, 200, 300, 400, and 500 ml raw water at 5.1 and 9.1 mg L-1 F-. For water samples at 91.0 mg L-1 F-, the same volumes were treated with 5 higher alum levels i.e. 5%, 6%, 7%, 8%, and 9%. The final pH was then adjusted to 7 with ash leachate for defluoridation. The set-up was a factorial design experiment where the final F- concentration was the dependent variable and the volume of raw water, the percentages, and volume of alum and wood ash leachate constituted the different factors. A fitted multivariate regression model of the general form; where Y = Residual fluoride, X = wood Leachate volume, W = alum Concentration, X*W = Interaction ?, ?, ? were regression coefficients, ? = error term, showed that only in the Baringo area did we have an interaction between wood ash leachate and alum concentration significant ($p < 0.05$). Defluoridation occurred ($p < 0.05$) at as low as 10% and as high as 99%, depending on the initial F- content. Total coliform decreased from 310, 290 and 270 count/l respectively to zero. Unfortunately, high chemical and TDS (from 558 mg L-1 to more than 9,000 mg L-1) enrichment were recorded in addition to the mixed data on turbidity. The overall results show that wood ash can substitute CaO in the Nalgonda process. Further investigation is however required to make it applicable for potable water production.

Short Communication   **Published Date:- 2022-07-13**

Bioaccumulation of As, Cd, Cr, Cu, Pb, Zn in Ambrosia artemisiifolia L. in the polluted area by enterprise for the production and processing of batteries

In this paper, the concentration of As, Cd, Cr, Cu, Pb, and Zn was investigated in soil and Ambrosia artemisiifolia L. sampling from polluted cite near the enterprises for the production and processing of batteries in the city of Dnipro in Ukraine. The obtained results of the study were provided to assess the plant species through bio-monitoring and phytoremediation. Though Ambrosia artemisiifolia L. is a weed that causes serious allergic reactions in humans, this plant species can also have a high bioaccumulative capacity regarding metals. The obtained results highlighted the metals' significantly higher concentration in roots than in the inflorescence part in Ambrosia artemisiifolia L. Among all studied metals, Zn and Cu had the highest concentration in Ambrosia artemisiifolia L., while lead was characterized by the highest bioavailable content available to plant forms in the soil. The various distribution of As, Cd, Cr, Cu, Pb, and Zn was found in different parts of the plant. According to plant-up-taking indexes studied elements can be ranked in the following descending order: Cu > Zn > Cr > Cd > Pb. Ambrosia artemisiifolia L. could be proposed for phytoremediation in Zn, Cu, Cd, and Cr contaminated soils although this species is resistant to lead soil pollution.

Research Article   **Published Date:- 2022-07-01**

A hybrid deep learning model to forecast air quality data based on COVID-19 outbreak in Mashhad, Iran

The SARS-CoV-2 (COVID-19) pandemic outbreak has led to some lockdowns and changed human mobility and lifestyle in this country. Mashhad, one of the most polluted cities in Iran has experienced critical air pollution conditions in recent years. In the present study, the potential relationships between air quality conditions (such as popular index and criteria air pollutant concentration) and COVID-19 cases and deaths were investigated in Mashhad, Iran. To do that, the Long Short-Term Memory (LSTM) based hybrid deep learning architecture was implemented on AQI, meteorological data (such as temperature, sea level pressure, dew points, and wind speed), traffic index and impact number of death, and active cases COVID-19 from March 2019 to March 2022 in Mashhad. The results reveal the LSTM model could predict the AQI accurately. The lower error between the real and predicted AQI, including MSE, MSLE, and MAE is 0.0153, 0.0058, and 0.1043, respectively. Also, the cosine similarity between predicted AQI and real amounts of it is 1. Moreover, in the first peak of the pandemic (Aug 2021), we have the minimum amount of AQI. Meanwhile, by increasing the number of active cases and death and by starting lockdown, because the traffic is decreased, the air quality is good and the amount of AQI related to PM2.5 is 54.68. Furthermore, the decrease the active cases and death in pandemic causes a significant increase in AQI, which is 123.52 in Nov 2021, due to a decline in lockdowns, resumption of human activities, and probable temperature inversions.

Research Article   **Published Date:- 2022-05-24**

Nano-silica from kaolinitic clay used as adsorbent for anionic and cationic dyes removal: linear and non-linear regression isotherms and kinetics studies

The increasing occurrence of wastewaters associated with industrial development has begotten a permanent search for new and more efficient techniques for the removal of hazardous substances such as heavy metals and dyes. The use of natural and available resources to develop improved and sustainable commodities for this purpose remains crucial and is among promising emerging green technologies for water treatment. It offers the gradual shifting of hazardous industrial chemicals precursors to the abundant non-metallic mineral resources that receive an added value. This work investigated the uptake capacity by the adsorption process of methylene blue (MB) and azocarmine G (AG) onto nano-silica synthesized from kaolinite clay. The effects of contact time (0-30 min), the adsorbent dosage (5-100 mg), the initial pH of the solution (1-11 for MB and 1-7 for AG), and the initial dye concentration (5-50 mg/L) were studied. The selected conditions to carry out kinetic and isotherm adsorption experiments were: 15 mins, 20 mg, 11 for MB, 1.01 for AG, and 50 mg/L. Four adsorption isotherms and three kinetic models were used to model the adsorption data thanks to linear and non-linear regression methods. From the obtained results, the Freundlich isotherm model fitted well the adsorption phenomenon while the pseudo-second-order kinetic model described well the adsorption mechanism. Furthermore, the free energy of adsorption was similar for the two absorbents, 0.71 kJ, pointing physisorption as the dominant adsorption mechanism. The optimum MB and AG uptake were respectively 13.8 and 36.1 mg/g. Conclusively, the nano-silica represents a potentially viable and powerful adsorbent whose use could lead to a plausible improvement in environmental preservation.

Research Article   **Published Date:- 2022-03-29**

[Assessment of mold contamination in hurricane-damaged homes in Houston, Texas after sanitization by volunteers](#)

The purpose of this pilot study was to evaluate the effectiveness of mold sanitation in homes that suffered hurricane-related water damage. After a home is flooded, sanitation of the structure for mold is necessary before the interior of the home can be rebuilt. In this study, homes
(n = 6) in Houston, Texas that had been flooded by Hurricane Harvey were sanitized by volunteers. At either 6, 8, 15, 25, 34, or 56 days after the sanitation was completed, a Button™ sampler was used to collect a 48-hour air sample, so that the mold cells in the air could be quantified. Each air sample was then analyzed by quantitative PCR (qPCR) assays for the 36 molds in the Environmental Relative Moldiness Index (ERMI) panel of indicator molds. Quantifying the 36-ERMI molds in air samples results in "ERMI-like" values. The ERMI-like values in the sanitized homes were inversely correlated (Pearson p - value 0.04) with the log of the number of days after the sanitation was completed, an indication that it takes time after sanitation for the mold levels to stabilize. This pilot study demonstrated that the ERMI-like metric was useful in assessing post-sanitation mold levels in previously flooded homes.

Short Review   **Published Date:- 2022-03-04**

[Generating eco-friendly electricity from rain water](#)

A new design system is introduced to generate clean eco-friendly electricity from rain fall water. The majority of traffic roads in the world has constructed water ditches for one aim. This is for the accumulation of rain fall water from the roads.