

Employing Machine Learning To Determine Higher Lifetime Cancer Risks Caused by Crop Residue Utilised as Construction and Building Materials

Abstract

Recycling agricultural waste in recycling increases the circular economy and environmental sustainability. However, agricultural by-products made from recycling agricultural waste materials include naturally occurring radionuclides that pose a threat to both the environment and human health. In order to prioritise their specialised functions, this article presents a review of the pertinent research on the radiological characteristics of agricultural by products (such as rice husk ash, mussel shell, palm oil clinker, and palm oil fuel ash). As a result, the analysed agricultural by products' absorbed gamma dose rates, yearly effective dose rates, and extra lifetime cancer risks were calculated. Several machine learning techniques were used to train, validate, and test the specific concentrations of substances, AGDR, AEDR, and ECLR. All agricultural by products that were analysed had their radiological qualities evaluated, and it was determined that none of them It also appeared in previous studies where the main sources of human exposure were reported to be ^{226}Ra , ^{232}Th , and ^{40}K in building and construction materials. Mehta and co[1]. For example, one of the primary findings from the NORM databases stated that around 85% of the garbage had an increased amount of building materials, which produced about 42% of the waste with an excessive gamma dose rate below the permissible range. In an identical example Miranda Rather verified that natural radiation sources account for 70% of the radiation dosage that people inhale. As a result, radon and its products irradiate the cells of the pulmonary system and distribute underneath creating leukaemia and anaemia, and building occupants and potential users are exposed to both internal and external radiation fromNORsfromdirectgammaraadiationfromradionuclidesamateedrials us for devevOther cancers including those of the liver, bone, the liver, skin, lung, and kidney, which account for 314% of lung cancer cases and result in 20,000 mortality annually in Europe.Overall, resources must be assessed for potential radioactive materials to show that users can choose their use wisely and reduce any hazards.Relevant research have revealed that some building materials hold a higher lifetime cancer risk than the UNSCEAR world population weighted average, possibly presenting an intrinsic cancer risk. In addition to the data mentioned earlier, it has been discovered that the risk of cancer rises with prolonged contact to these substances.

It becomes very difficult to disregard some recycled waste materials' viability given the health dangers that they pose.A review of the radioactive danger of all lopment is pertinent and merits investigationfrom the standpoint of radiatection.A growing numer of people are using technology and science to sole challenges.tion pro% of all lung cancers, equivalent to 20,000 deaths annually in Europe . Overall, resources must be evaluated for some building materials surpasses the world population-weighted average by UNSCEAR indicating that potential users have increases with increasing exposure time to these materials. Pereira and Bravo. It operates neurons like Brasov. The machine learning algorithm consists of input compressive strength-based concrete using machine learning models. Strength compared to support vector machine. Yet modelled and Niedostatkiewicz (2019) utilized the state-of-the-art achievements [3]. In machine learning techniques for concrete mix design the results that can be used in practical

Arjun Gupta*

Department of Agriculture, Agricultural University, India

*Author for correspondence:

ArjunGupta45@gmail.com

Received: 01-Apr-2023, Manuscript No. jagri-23-99953; **Editor assigned:** 03-Apr-2023, Pre-QC No. jagri-23-99953 (PQ); **Reviewed:** 17-Apr-2023, QC No. jagri-23-99953; **Revised:** 20-Apr-2023, Manuscript No. jagri-23-99953 (R); **Published:** 27-Apr-2023 DOI: 10.37532/jagri.2023.6(2).23-25

applications. Predicted alligator and longitudinal cracking of the asphalt mix design using ML this is the rationale for this investigation. This paper provides a comprehensive assessment of agricultural by products with particular attention to the specific activities of ^{226}Ra , ^{232}Th and ^{40}K . These radionuclides were used to determine the potential hazards from the use of studied agricultural by products. These ^{226}Ra , ^{232}Th , ^{40}K , AGDRin, AGDRex, AEDRin, and André using the Support Learning Machine (SVM), Neural Networks (NN), Ensemble Trees (ET), regression [4].

Keywords: Aster materials • Cancer• Agricultural by products • Radioactivity climate

Introduction

The worldwide market for assets for the constructed climate is supposed to twofold in size by 2050. On the other hand, rapid urbanization and industrialization have accelerated the demand for cement and the natural resources necessary for its production. Notwithstanding this, concrete creation produces around 8 % of worldwide carbon dioxide into the climate. Global warming and negative effects on the environment follow as a result. Sustainable cement production necessitates concrete plans for mitigating the environmental and climate impacts of cement production. The integration of societal and economic requirements through the recycling of agricultural wastes as cement substitutes is one such strategy as well as environmental requirements. There is overall worry about the normally happening radionuclides (NORs) in reused squanders utilized as building and development materials, in light of the Uranium/Radium series, Thorium series and Potassium as fundamental radiation source Miami and other, Joined Countries Logical Board of trustees on the Impacts of Nuclear Radiation. This is also clear from previous research that identified ^{226}Ra , ^{232}Th , and ^{40}K in building and construction materials as the primary sources of human exposers [5].

Material and Methods

Information source and assortment

Obtaining, screening, and evaluating pertinent material are all part of the procedure. A number of databases, including Science Direct, Web of Science, and Google Scholar, were used to locate a dataset. To augment data collection, appropriate data was likewise accumulated UNSCEAR, WHO, CEU, European Commission (EC), and the Canadian Nuclear Safety Commission. The International Atomic Energy Agency (the International Commission on Radiological Protection (ICRP), and the Organization for Economic Co-operation and Development (OECD) were some of the others [6]. It has a lot

of pozzolanic activity and is perfect for partially replacing cement in concrete. Discoveries from a previous study showed that the compressive strength, flexural strength, and tensile strength of substantial examples with 10 % concrete substitution RHA are comparable to the control specimens [7].

Appraisal of radiological risk records

Using globally acceptable equations and Microsoft Excel 2016, the potential carcinogenic risks of the agricultural by-products studied were evaluated based on their specific activities (^{226}Ra , ^{232}Th and ^{40}K). As shown in the equations, these hazard indices are the external and internal absorbed gamma dose rates. The external and internal annual effective dose rates which are calculated using Equations and, as well as elevated lifetime risks for both outdoor and indoor cancer [8-10].

Conclusions

Using six distinct machine learning algorithms, this study examined the radionuclide content of agricultural by-products and predicted their excess lifetime cancer risks (ELCR). This study's main findings showed that the naturally occurring radionuclides in RHA, MS, POC, and POFA do not cause cancer. Nonetheless, the potential users ought to apply them with alert. In comparison to the UNSCEAR world population-weighted averages, the excess lifetime cancer risks in RHA, MS, POC, and POFA were approximately 12%, 63%, 22%, and 31% lower, respectively. The LR addresses the most reliable strategy for anticipating the ELCR of overviewed agrarian side-effects. In terms of mean absolute error, the LR method outperformed the SVM, RT, ET, GPR, and NN algorithms for training and testing the ELCR datasets. Order to predict the ELCR of agricultural by products overall, the findings assist in determining, comprehending, and anticipating the risks of cancer associated with the utilization of agricultural by-products derived from recycled agricultural waste. Furthermore, it gives the reference data to

laying out the radiation checking system and re-tributes for the utilization of rural side-effects containing NORs. However, the range of the ELCR of agricultural datasets ought to be taken into consideration for future research in it greater accuracy.

References

1. Amoabeng BW, Gurr GM, Gitau CW *et al.* Cost:benefit analysis of botanical insecticide use in cabbage: Implications for smallholder farmers in developing countries. *Crop Protection*. 57, 71-76 (2014).
2. Antonious GF, Meyer JE, Snyder JC. Toxicity and repellency of hot pepper extracts to spider mite, *Tetranychus urticae* Koch. *J Environ Sci Health B*. 41(8), 1383-1391(2006).
3. Belmain S, Stevenson P. Ethnobotanicals in Ghana: reviving and modernising age-old farmer practice. *Pesticide Outlook*. 12(6), 233-238 (2001).
4. Benineza GG, Rwabudandi I, Nyiransabimana MJ. Landslides hazards assessment using geographic information system and remote sensing: Gakenke District. *Earth and Environ Science*. 389(1), 012015 (2019).
5. Bergmann EJ, Raupp MJ. Efficacies of Common Ready to Use Insecticides Against *Halyomorpha halys* (Hemiptera: Pentatomidae). *Florida Entomol*. 97(2), 791-800 (2014).
6. Dian Dhika A, Nasution U. Effect Of Extraction Method Of *Tithonia Diversifolia* Leaves Against *Spodoptera Frugiperda* Larva Mortality. *J Pharm Life Sci*. 8(10), 22-25 (2022).
7. Islam M S, Morshed A. Study on Homemade Bio-Pesticides and Organic Pest Management in Organic Farming. *Int J Eng Sci*. 2(7), 18-25 (2013).
8. Isman MB. Botanical insecticides, deterrents, and repellents in modern agriculture and an increasingly regulated world. *Annu Rev Entomol*. 51, 45-66 (2006).
9. Isman MB. Botanical insecticides: for richer, for poorer. *Pest Manag Sci*. 64(1), 8-11 (2008).
10. Nyirenda SP, Sileshi GW, Belmain SR *et al.* Farmers' ethno-ecological knowledge of vegetable pests and pesticidal plant use in Northern Malawi and Eastern Zambia. *Afr J Agri Res*. 6, 2 (2011).