

Other

Catastrophic Health Expenditure and Voluntary Health Insurance: Can Community Based Health Insurance Scheme Reduce Catastrophic Health Expenditure in Rural Tanzania?: A Cross-Sectional Study

Sverre Grepperud (PhD, Professor, University of Oslo), Amani Alaeli Mlaki (PhD, MUHAS), Amani Thomas Mori (PhD, Professor, University of Bergen)

Background: Over 150 million people suffer financial catastrophe each year because of out-of-pocket (OOP) payments. Low and middle-income countries (LMICs) comprise a high proportion of the population that has no access to essential healthcare services and the global burden of disease is much higher compared to high-income countries. This paper aimed to analyze the incidence and the determinants of catastrophic health expenditure among members and non-members of the improved Community Health Fund (iCHF) in rural Tanzania.

Methods: A cross-sectional household survey was used to collect data from 722 households in Tanzania. Catastrophic health expenditure (CHE) was defined as households' health expenditure exceeding 40% of total non-food expenditure. Logistic regression was employed to assess the association between CHE and iCHF membership status after adjustment for other socioeconomic and demographic variables.

Findings: When disaggregated by socioeconomic status we found that the incidence of CHE was higher among non-members of iCHF insurance compared to the members i.e 21% versus 15%. The incidence of CHE among non-members was higher among the poorest households compared to the least poor. Being a member of insurance, reduced the probability of incurring catastrophic health expenditure in the lower quintiles but the probability increased in the upper quintiles.

Conclusion: Voluntary health insurance schemes, reduce the probability of households in the informal sector incurring CHE. Policymakers should reconsider the iCHF scheme to be a compulsory means of health financing for every individual employed in the informal sector.

Circular economy in the sugarcane agroindustry: bagasse-fly-ash-based zeolite

*Denise Alves Fungaro (PhD, Researcher, Instituto de Pesquisas Energéticas e Nucleares)
Juliana de Carvalho Izidoro (PhD, Researcher, Instituto de Pesquisas Energéticas e Nucleares)*

The sugarcane industry in the process of producing sugar and ethanol generates bagasse in large amounts. The burning of bagasse used for steam and electricity generation produces 3 million tonnes of bagasse fly ash (BFA) annually. Handling and improper disposal of BFA cause pollution in soils, air, and water, which results in environmental challenges and human health problems. The valorization of BFA is a convenient and sustainable means to reduce solid waste generation and decrease the environmental pollution load. The purpose of this research is to investigate the

application of BFA for the synthesis of zeolite. Because of three-dimensional structure and unique porous properties, zeolite is a value-added product with many applications such as adsorbent material and industrial catalysis.

After separation of the coarser particles containing mainly unburned carbon, fine particles of BFA were used to synthesize zeolite by alkali fusion (550 °C; 1 h; BFA: NaOH= 1:1.2 w/w) followed by hydrothermal treatment at 100 °C for 3 h. Si/Al molar ratio of 1.0 was adjusted with an external alumina source. BFA and synthesized zeolite were characterized using XFR, XRD, and MEV. The results showed that BFA may be used effectively for the synthesis of zeolite NaA with high purity comparable with the commercial product.

Zeolite NaA is employed in sugarcane mills in the dehydration processes for the removal of water from the hydrated ethanol. Thus, the application of BFA in zeolitization process strategy provides not only environmental and economic benefits for the sugarcane agroindustry but also contributes to a circular economy and towards the achievement of Sustainable Development Goal 12.

Impacts of urban growth in hydrological ecosystem services: the case of São Carlos (Brazil, SP)

Edimilson Rodrigues (University of São Paulo), Marcelo Montaña (PhD, Professor, University of São Paulo).

The conceptual framework of Planetary Health has pointed out the need to elaborate development alternatives integrating human living conditions with natural systems, which raises the need for context-specific socio-environmental baselines. Therefore, this ongoing research aims to estimate the changes in hydrological ecosystem services (hES) between the years 1985 and 2020 considering the dynamics of land use/cover (LULC) in three different watersheds in São Carlos (Brazil, SP). The Soil Conservation Service (SCS) method was adopted to determine peak flows for the entire time series analyzed. Given the unavailability of complete empirical data, theoretical conditions and equations from a review of the scientific literature were adopted. Thus, rainy events of 2-hour duration and 50-year return time were considered for the simulation of flow rates based on changes in LULC. The preliminary outcomes show an increase in surface runoff (Q), a decrease in both infiltration and evapotranspiration, related to urban growth. For Q, the increases were 4.58 m³/s (66%), 6.18 m³/s (52%) and 17.40 m³/s (96%) for Mineirinho, Santa Maria do Leme and Jararaca's watersheds, respectively. For infiltration and evapotranspiration were verified a decrease of 61.56 thousand m³ (18.7%), 86.40 thousand m³ (12%), and 305,48 thousand m³ (8.5%) in the same order and the urban sprawl (ha) was 264.94 ha (273%), 275.47 ha (131.48%) and 199.84 ha (166.78%). The modeled data must be interpreted as relative indices, given the uncertainties of hydrological analysis. Even so, it is an expression of the development model, with additions of pressure on environmental systems and hES due to the transfer of flow downstream and changes in LULC, contributing to flooding events in urban valleys.