BOOK OF ABSTRACTS

CONTESTATION BETWEEN THE CONVENTIONAL "SCIENTIFIC METHOD" AND A SYSTEMIC INDIGENOUS APPROACH TO DOING (ETHNO)SCIENCE: IMPLICATIONS FOR REGENERATIVE DEVELOPMENT IN AFRICA

Author: Norma Romm

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The aim of this paper is to open a discussion, supported by examples, of disparities in the world of science, with special reference to an examination of backing for industrial agriculture versus agroecological practices in Africa. Indigenous ways of knowing are often disparaged on the world stage as not equipped to provide testable knowledge claims. The Western-originated "scientific method" is grounded in the idea that (expert) scientists must aim to understand reality through isolating variables and considering cause-effect relationships (so that in turn predictions can ensue based on the evidence collected). However, this paper takes the example of how "expert" scientific researchers have posed the claimed advantages of the use of agrochemical inputs by presenting their claims about increased food security as scientifically based. Opposed to this use of science to support industrial agriculture through chemical inputs are those who advocate a more grassroots-oriented science, which is practiced in terms of the value of supporting ecosystemic living. In an appreciation of this (ethno) science, scientists who may be located in academia work alongside networks of lay researchers to develop options for (re)generating ecosystems. This involves a way of knowing that does not isolate variables (such as the effect of a particular pesticide on killing a particular type of pest) but examines through collective discussions involving the community, the likely systemic consequences of any posed interventions in terms of human as well as planetary wellbeing. The paper will offer examples of contestation in the world of "science", with special reference to movements in Africa such as The Pesticides Action Network and the Organic Farmers Network, which oppose genetic engineering bolstered by the so-called "scientific method".

Key words: ecosystemic living, ethnoscience, agroecology.

POSSIBILITY OF OBTAINING HIGH QUALITY GRAPHENE THIN FILMS FOR OPTOELECTRONIC GADGETS FROM THE ABUNDANT GRAPHITE IN NIGERIA

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*Ladansons@gmail.com; haladan@nileuniversity.edu.ng ABSTRACT This investigation has shown for the first time, the possibility of obtaining high quality 2D graphene thin films for optoelectronic gadgets from the abundant Nigerian natural graphite (NNG). In the study, synthesis and characterization of graphene from NNG and the determination of the electrical conductivity of the thin films were conducted. The samples were characterized by X-ray diffraction (XRD), X-ray fluorescence (XRF), field emission scanning electron microscopy and energy dispersive X-ray (FESEM and EDX) to show their structural and compositional features, XRF study showed the mineral compositions as MgO (4.35%), SiO₂ (25.14%), SrO (9.73%), CdO (1.99%) and C (15%). XRD pattern indicated perfectly crystallized graphene flakes. Surface morphology by SEM analysis revealed closely packed, layered and spongy structures. EDX studies indicated the elemental composition as Carbon (86.34%), Molybdenum (10.37%), Potassium (2.38%) and Titanium (0.91%). The reduced graphene oxide RGO-TiO₂ composite thin films displayed glistering and reflecting surfaces due to the less density of electronic trap states and improved absorption in UV-visible region making them suitable for optoelectronic devices. The resistivity of 1.9592, 12.9366, 2.5419 and 25.1256 s/m were recorded for GO, RGO, GO and RGO-TiO₂ thin films. It has revealed that NNG and its products were of high quality. They can be produced for academic research and industrial integration at a lower cost compared to the imported types without detailed characterization systems into African market.

Keywords: Graphite, thin films, flakes, TiO2, Optoelectronic Gadgets

DESIGN OF HIGH-PERFORMANCE GRAPHENE LEAD FREE PEROVSKITE SOLAR CELLS IN TACKLING ENERGY CRISIS IN AFRICA

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Abstract

In this study, graphene was prepared by modified Hummer's method and the optical properties were explored using UV-visible spectroscopy to determine absorption coefficients at different wavelengths based on Beer-Lambert's law. In the second step, lead-free methyl ammonium germanium halide solar cell was designed using GO as carrier transporters. Numerical modeling of the device in solar capacitance stimulating program based on second order differential equation was done. A 0.6227 V, 38.58 mAcm⁻², 83.07 %, and 19.95 % were recorded as the open-circuit voltage, current density, fill factor and power conversion efficiency (PCE). The investigation showed that the presence of graphene improved the optical transparency and enhanced carrier generation and interaction between

other layers which optimized the electrical conductivity and efficiency of the solar cells when compared to previous studies in literature. The results emphasized a viable approach in the design of efficient and stable solar cells at a reduced cost and optical losses. If mass produced can be deployed in Africa due to massive solar energy potential.

Keywords: Hummer, Optical Property, Graphene, Perovskite, Solar Cells, SCAPS

ACCESSING THE WIND ENERGY POTENTIAL FOR POWER GENERATION IN NORTHERN NIGERIA

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Abstract

In this practical investigation, the effect of wind speed on the power output of a wind electric generator using TPS-3730 system was explored for Bauchi state and compared to the wind characteristics of Maiduguri, Borno state. The angle and intensity of the wind was varied to obtain maximum power output. The values of the current (i), voltage (V) and power (P) output were obtained at 0⁰, 15⁰, 30⁰, 45⁰, and 60⁰ respectively. At 15⁰, I 1(W/m²), V 2.70(v), I 4.75(mA), 12.83(w); I 2(W/m²), V 3.10(v), I 6.40(mA), 19.84w; At 30⁰, I 1(W/m²), 1.72(v), I 1.25(mA), 2.15(w); I 2(W/m²), V 2.19(v), and I 2.21(mA), 4.84(w). The results showed that the intensity (I) increases, V and i increases while as the angle increases, I and V decreases. The strength of the wind speed is proportional to the power output. Northern Nigeria has abundant wind energy system, installing wind turbine is vital to the viability of power generation and the economic applications in terms of clean electricity, wind vessels transportation, water pumping, grain milling and sporting activities.

Keywords: Wind speed, Power output, Wind power, Wind turbine, clean electricity

APPLICATION OF INVITRO PROPAGATION TECHNIQUES AND SMART FARMING SYSTEMS FOR GERMPLASM CONSERVATION OF VULNERABLE, THREATENED AND ENDANGERED MEDICINAL PLANT SPECIES: A CASE OF AFRICA AND SOUTH KOREA

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Abstract

Application of both in vitro propagation techniques and smart farming offers a promising strategy for the rapid and mass production of germplasm, contributing to both conservation and sustainable production, and ultimately supporting sustainable biodiversity. In vitro propagation, a biotechnological technique that enable the cloning of plants under controlled conditions, offers an efficient means for the mass production of plantlets and the preservation of germplasm both of which are vital for conserving biodiversity. Smart farming, which incorporates advanced technologies such as sensors, drones, and data analytics, can enhance the precision and sustainability of plant cultivation and management practices, creating a synergistic approach to species conservation. By integrating in vitro propagation with smart farming systems, it is possible to optimize both production and conservation of germplasm while ensuring the sustainability of biodiversity. Additionally, smart farming technologies can aid in tracking environmental conditions, improving resource management, and increasing resilience to climate change, all of which are critical for maintaining biodiversity. This innovative integration not only aids in the conservation of endangered plant resources but also offers a sustainable solution to biodiversity loss, fostering ecological balance in response to global environmental challenges. In medicinal plant resource production, both in vitro propagation and smart farming have been utilized to propagate a variety of medicinal plants, reducing the reliance on wild plant population and supporting sustainable harvesting practices.

Key terms: Conservation; In vitro propagation; Medicinal plants; Smart farming.

DETERMINANTS OF CLIMATE CHANGE ADAPTATION STRATEGIES AMONG CASSAVA AFRMERS IN OWERRE-WEST, LGA, IMO STATE, NIGERIA.

Author: Yusuf Jednah

The study examined determinants of climate change adaptation strategies among cassava farmers in Owerri-West, Imo State, Nigeria. The objectives were to describe the socio-economic characteristics of cassava farmers, examine the adaptation strategies used among the cassava farmers in the study area and to evaluate the climate change adaptation strategies used among cassava farmers. A multi-stage (two-stage) sampling technique was used to collect information from 133 respondents in five (5) communities out of 18. This was achieved using questionnaire with the he[p of trained enumerators who collected primary data for the study. The data collected were analyzed using descriptive statistics, the Likert-Type Scale and multinomial logit regression model. The result revealed that cassava farmers were mostly males

(60.20%), they were also within their productive age bracket of 31-40years (26.5%), married (61.1%), with mean household size of 6memebers/household. They mostly had high school level of education (35.4%), and mean farming experience of 16years. The result on adaptation strategies among the farmers revealed that 20% of the respondents used increased/reduced farm size more among other adaptation strategies. About (19.8%) used early/late planting measure. Among the strategies carried out, the least practiced was planting early maturing crop variety (7.1%). The results on determinants of climate change adaptation strategies revealed that the likelihood ratio (x²) value was 91.78, this was significant at 1% probability level. The Pseudo R² value was 0.2557 which also confirms that all the slope coefficients were not equal to zero. The constraint mostly faced among the respondents was poor agricultural extension service delivery on climate change orientation/knowledge and the adaptation strategies. The study concluded that age, level of education, farm size and level of income among other factors were among the major determinants of climate change adaptation measures carried out among the respondents. The major constraint faced using the mean score of 3.0 was inadequate delivery of agricultural extension services to respondents (3.88) with respect to negative effects of climate change and the mitigation measures. Illiteracy among the farmers and poor source of information on climate change were among the factors of hinderance. Recommendations were made that government and other relevant institutions and policy makers on climate change should scale up effort on policy formations and timely delivery of relevant information using extension agents and other medium of communication to reach out to farmers on the negative effects of climate change and the adaptation strategies to be carried out. This will inform the farmers to enable them carry out mitigating measures to increase their level of output.

HARNESSING INDIGENOUS KNOWLEDGE SYSTEMS AND PRACTICES TO MITIGATE CLIMATE CHANGE EFFECTS IN THE KIGEZI REGION OF UGANDA

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Abstract

This paper unravels the concept of Indigenous Knowledge and Practices (IKSPs). Indigenous Knowledge Systems and Practices (IKSPs) are local knowledge developed over centuries of experimentation by our ancestors and are passed orally from generation to generation. It is a perfect scaffold to sustainable development connecting the past, the present and the future. Indigenous knowledge offers diverse perspectives that enrich students' learning experience. Indigenous knowledge represents an important component of global knowledge on development issues. Indigenous knowledge is an under-utilized resource in the development process. The five examples of indigenous knowledge are: traditional medicine used for healing, sustainable farming, land resource management, traditional arts and crafts, oral traditions and storytelling. The paper deals with how (IKSPs) can be harnessed to deal with climate change, disaster risk management and decision making related to policy development in the Kigezi region of Uganda. The study also concerns itself with the identification of the prevalent application of indigenous knowledge and practices in the mitigation of climate change, establishment of the relevance of the indigenous

knowledge and practices. The methodology involved was basically review of abstracts, articles, book chapters, books and journals on how IKSPs are crucial in mitigating the effects of climate change.

Key words: Indigenous Knowledge and Practices (IKSPs), climate change, mitigation, disaster, risk management, Kigezi region, Uganda

THE PYROLYSIS OF METHANE FOR HYDROGEN PRODUCTION IN THE ORGANIC MATTER OF SHALE RESERVOIRS

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Abstract

Due to the increasing demand for a cleaner source of energy, hydrogen gas provides a long-lasting solution. Mechanisms including steam methane reforming and microwave-enhanced methane cracking, are widely used to produce hydrogen. However, they generate tremendous amounts of carbon dioxide (CO₂) which is a major contributor to the greenhouse gas emissions and are costly to implement [1-3]. In this study, the pyrolysis of methane into hydrogen and solid carbon, is introduced. The diffusion of the generated hydrogen is controlled by the concentration gradient instead of the pressure gradient because the permeability of the kerogen is highly heterogeneous and in the nanoDarcy scale. Crack initiation and propagation as a result of hydrogen diffusion is accounted for by constraining the rock on the lower and right boundaries with roller constraints and allowing an initial crack on the inlet boundary. The parameters used in the numerical simulation and validation are shown in Table 1. The crucial finding is that as the methane decomposes, there is a continuous build-up of hydrogen gas in the kerogen layers which can be efficiently exploited. For reactions occurring under catalytic conditions, the concentration of hydrogen is higher as compared to when the reactions occur without a catalyst. This is because, the catalyst improves the reaction process thereby increasing the amount of hydrogen produced from the pyrolysis process. There is a rapid decrease in the consumption of the catalyst in the early stages of the reaction followed by a sluggish decrease in the late stages. The hydrogen concentration is more around the crack in the initial states and reduces in the late stages of pyrolysis. Meanwhile, the stress is more at the crack tip than in any other region of the domain. This model provides a benchmark for future extraction of hydrogen gas from shale reservoirs.

Keywords: Organic matter; Natural hydrogen; Methane pyrolysis

PROLIFERATION OF AFRICAN INDIGENOUS MEDICINE IN UGANDA: A CASE STUDY OF GREATER MBARARA DISTRICT

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Abstract

This Abstract examines the proliferation of African indigenous medicine and its role in community development with reference to Greater Mbarara, Uganda. It was established that the major challenges of African indigenous medicine and healing included extortion of property and search for riches, human sacrifice and killing clients, fuelling conflicts, failure to cure some diseases, family breakage, psychological torture and destruction of environment. The future of African indigenous medicine is bright if viewed in the context of service provision and increase of health. It was recommended that the increase of health care coverage will be achieved through collaboration and partnerships between traditional health practitioners and community health providers which is already happening, particularly in the area of African indigenous medicine research. Further research in safety and efficacy should be promoted on the quality of the research to improve African indigenous medicine and healing knowledge practice.

Key word(s): African Indigenous Medicine

ANTICANCER POTENTIAL OF DURMILLONE AGAINST HUMAN LUNG ADENOCARCINOMA CELL LINE

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Abstract

Cancer is a threat to global public health, taking the lead cause of death in highly developed nations and the second contributor to fatality in Africa after cardiovascular disease. Cancer causes 1 out of 6 deaths worldwide, which is more than malaria, AIDS, and tuberculosis combined. The cancer dilemma is feared to escalate in Africa with the copied lifestyle. Nature has given molecules of hope in cancer management like the vinca alkaloids. In this line, extracts from various parts of *millettia dura* and their isolated constituents were tested for cytotoxicity against a panel of cell lines. Out of the fifteen flavonoids tested for cytotoxicity, durmillone had a very good activity with IC_{50} of 6.6 ±1.2 µM against A549 cancer cell line. This points to the anticancer potential of rotenoids from this plant, a need for further studies on the seeds/pods form *millettia* species and prospects of developing durmillone into a lung cancer drug.

Key words: *Millettia dura*, durmillone, cytotoxicity, lung cancer

REVERSE TECHNOLOGY; THE SURE WAY TO PRODUCT DEVELOPMENT-THE CASE OF KABRITIS

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Abstract

The conventional process of drug discovery and development is costly, time consuming and can be less productive giving low returns on heavy investments. Developing economies can barely afford the costs involved, a reason for the low drug products coming from these countries. There are concerns to the need of a paradigm shift in the processes of drug discovery and development affordable in low-income countries. One of such approaches is based on facts and practices that have proven record of use, effectiveness and safety. The approach starts from the clinically accepted indigenous medicine and practice already in use by local communities. This transdisciplinary approach is reverse pharmacology and it saves on cost, time with products having higher chances of success in clinical therapeutics. Using this approach. KABRITIS, a jelly supported herbal product was developed leveraged on three-plants used in the management of arthritic inflammation by maceration by the local population around Kabale. The product was validated through laboratory measurements with the aim of improving on the effectiveness, safety, formulation, acceptability and shelf life. The product developed is efficacious at 5mg sample per gram of the vehicle arrived at after a voluntary participation of 50 patients. After the formulation, drug delivery to affected body part improved, there was an increase in the holding time of the drug to the affected body part, an increase in shelf life was realised, the formulation became more clearer and product acceptance improved. By this approach, drug products based on African indigenous knowledge and ways of knowing can be developed in conformity to more acceptable standards.

Key words: Arthritis, reverse pharmacology, herbal jelly.

ADAPTATION APPROACHES TO CLIMATE CHANGE MITIGATION FOR SUSTAINABLE LIVELIHOODS IN AFRICA: A CASE OF LWAKHAKHA SUB CATCHMENT IN ELGON REGION, UGANDA

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Abstract

Climate change continues to extend its impacts globally from anthropocentrism belief, which lead to natural resources degradation, poor agricultural practices and behavioural challenges among the population that worsen the situation. These further escalate into erratic rains, drought, disease outbreak, environmental refugees, food insecurity and unrealistic socioeconomic wellbeing. Therefore, the paper presents inclusive adaptation approaches to climate change impact mitigation in Lwakhakha Sub Catchment, Uganda. The paper employed a descriptive research design using qualitative data collection approaches, and targeted 158 beneficiaries from whom 113

respondents were determined using Sloven's formula. Data was collected using observation, field notice, photography, and interviews. Then, it was transcribed, cleaned, and coded to develop themes and subthemes to aid the interpretation. Moreso, the themes were entered into MS Excel to generate frequency tables for analysis. Results indicated tree growing, soil water conservation, riverbank restoration, energy efficiency, fodder production, apiary, aquaculture, gulley treatment, water resources conservation, and climate smart agriculture were adapted as inclusive approaches by the beneficiaries to mitigate climate change impacts and enhance improved wellbeing in the Elgon Region. Conclusively, Uganda must ensure awareness and education to fight against ignorance & poverty, enhance mindset change, and implement & enforce environment laws & policy for a better future. The paper recommends that the Lwakhakha Sub Catchment committee and the districts should ensure stakeholder involvement in climate change mitigation and adaptation, integrate climate change into academic learners' curricula, and create awareness amongst the population about the need for conservation and compliance with environment laws & regulations.

Keywords: Energy efficiency, gulley treatment, mindset change, restoration

HYPOTHETICAL TECHNIQUE AS INDIGENOUS TECHNOLOGY IN PREDICTING THE IMPACT OF CLIMATE CHANGE: A MANAGEMENT APPROACH WITHIN GURARA RESERVOIR CATCHMENT, NIGERIA Author: Usman Rogo Kabiru

Abstract

The impact of climate change for sustainable development has been studied using hypothetical technique. A summation was proposed using hypothetical techniques considering Global Climate Models and linear trend of the data. Four (4) proposed scenarios of temperature increase (1% and 2%) coupled with a decrease in precipitation of (-5% and -10%) were combined and applied for the study area considering the global projections according to the Intergovernmental Panel on Climate Change. The Water Evaluation and Planning Tool were used to model and evaluate the effect of rising temperature and declining precipitation within the Gurara reservoir catchment for water availability prediction. The results indicate a reduction in available water within the study area from 4.3% to 3.5% compared to the baseline with no change in climate scenario. The findings will assist in developing a blueprint for climate change mitigation Within the Gurara Reservoir Catchment, Nigeria and Africa by accentuating the need to put in place appropriate adaptation measures to further foster resilience to climate change effects. Practically, it is pertinent to develop a more effective policies and regulations through research for effective water resources management in catchment, while also allowing for flexibility in the operational dynamics with the ultimate goal of adapting to climate change effects.

Keywords: Climate Change Models, Hypothetical Techniques and Gurara Reservoir Catchment

LOCKING THE POTENTIAL OF SCIENCE ACROSS AFRICA TO MITIGATE THE IMPACT OF CLIMATE CHANGE AND CREATE REGENERATIVE SOLUTIONS FOR HOLISTIC WELL-BEING: PROMOTING POLICY DEVELOPMENT AND IMPLEMENTATION

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Abstract

Climate change is the major global challenge affecting people's livelihoods, particularly in Sub-Saharan Africa in areas of economic stability, food security, and public health. This paper explores the dire role of science in influencing climate policies that drive ecological and regenerative resolutions for holistic well-being. It looks at the theories and frameworks guiding policy development and implementation, highlighting their relevance in addressing climate change through scientific innovation. A literature review assesses the effectiveness of existing policies and the barriers to their implementation, such as weak institutional capacities, inadequate funding, and fragmented frameworks. The paper calls attention to the need for evidence-based policymaking, stakeholder engagement, and regional cooperation to foster climate resilience. This can be achieved through the integration of indigenous knowledge and modern scientific advancements. Based on this stance, Africa can develop robust policies that mitigate climate risks and promote sustainable development. The paper concludes with recommendations to strengthen institutional support, enhance funding mechanisms, and leverage technology for effective policy execution.

Key words: Climate change, regenerative solutions, holistic well-being, policy development and implementation

NON-DESTRUCTIVE ASSESSMENT OF CLIMATE-IMPACTED BUILDING: A CASE STUDY OF A GOVERNMENT HOUSE IN NIGERIA.

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Abstract

Uncompleted/abandoned buildings which are left unoccupied due to delayed projects from government policy change, leadership change, economic or project priority shifts are increasingly subjected to the effects of climate change. This study targeted exploring how various climate-related factors such as rising temperatures, extreme weather events, and particularly construction parameters of quality control on material and workmanship affect the structural integrity and surrounding environments of a state government house in Nigeria. The government house is among the North-Western states of Nigeria; thus, this study shall make the exact detail of the government house private for safety and security reasons. The study employed an onthe-spot assessment and non-destructive assessment (NDA) to evaluate the structural integrity of the structural elements in the seven (7) guarters of the government house whilst their surrounding soil was taken to the laboratory for testing. Tests includes visual inspection, rebound hammer test on structural elements, sectional analysis of components and structural analysis of the entire structure based on the in-situ strength. Furthermore, it examines the risks of collapse, safety hazards, and negative impacts on local biodiversity and human health. The findings revealed a low concrete strength of 12 N/mm²,10N/mm²,11N/mm²,10N/mm²,11N/mm², 12N/mm² and 11N/mm² for quarters A-G accordingly. The results indicate significant degradation, including cracks, moisture intrusion, and material weakening, all of which compromise the building's safety and functionality. The result further highlighted the importance of NDA in the early detection and management of climate-related structural damages, offering valuable insights for maintaining the longevity and safety of historic and government structures. It is recommended to use advanced NDA methods like groundpenetrating radar (GPR), infrared thermography, and ultrasonic testing, for such study for their minimal harm on the structure. The findings underscore the importance of integrating climate resilience into urban planning mitigate the adverse effects of climate change on abandoned structures.

KEYWORDS: Non-destructive test, Rebound hammer test, Climate-impacted buildings, Tanking.

CLIMATE CHANGE AND COMMUNITY RESILIENCE IN UGANDA TO DAY

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Abstract

The purpose of this paper was to examine the relationship between climate change and community resilience by suggesting what relevant stakeholders must consider in order to have resilient communities against the negative effects of climate change. Methodologically, the researcher employed a purely critical qualitative approach in which desk research methodology was employed. As such secondary data was used

and this data was obtained mainly from scholarly and published research articles surrounding climate change, Disaster Management, and other crucial published reports, with matters of Climate change and Community resilience in Uganda today under scrutiny in which even the challenges facing the communities were also analyzed. Critical content analysis was employed in examining the roles of all the relevant stakeholders in Uganda in reducing the adverse effects of climate change and building resilient communities. Validity and reliability were guaranteed by paying much attention to critical conceptual clarity and interpretative rigor. In this paper I reviewed the genesis, the conceptualization, the roles of the relevant stakeholders in reducing climate change, the challenges that communities are facing as a result of the advent of Climate change, and what must be done by all the stakeholders to reduce climate change and its effects, drawing substantiations from the Ugandan experience. The results indicated that the central government, stakeholder engagement, rejuvenating monitoring and evaluation and tapping on the technology available were key to addressing climate change and its effects. Connectedly, based on literature review, I further concluded that Climate change is some serious phenomena which threatens human existence in this 21st century. However, if all relevant stakeholders come together through unified actions backed by concerted uniform efforts, community resilience could be in position to be built which would help to propel sustainability. Embracing the positive consequences of advancements in technology is quintessential to reduction of the negative effects of climate change though there is need for governments especially in developing countries to subsidize these new technologies as a way of making them accessible to even the lay citizens as this would quickly reduce the negative effects of climate change to Ugandans. I also came up with some recommendations which included; the central government should strengthen the monitoring and evaluation department of its Agencies like NEMA, integrating technology into mainstream societal development projects, continuously empowering local people with relevant skills & knowledge and involvement of all relevant stakeholders.

Key Words: Climate change, Community resilience, Uganda.

EFFECTS OF NEWSPAPER FRAMES ON THE CONSUMPTION OF DISASTER COMMUNICATION: CASE OF DISPLACED WOMEN IN RESETTLEMENT CAMPS IN EASTERN UGANDA

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ABSTRACT

The study sought to evaluate the effectiveness of newspapers on communicating the key crisis events of natural disasters in Uganda. Moreover, the study employed quantitative research designs. The study was investigated the perceptions of women in displaced camps about 3 newspapers. Whilst, the findings of the study indicate that the print media's factual coverage for natural disasters helps to build trust for the newspaper in the public sphere and therefore promotes crisis communication because the medium is the message. Moreover, very appealing messages help to enhance crisis communication. whilst inability for the print media to amplify the risk for natural calamities hinders disasters prevention and recovery for the affected people. Notably, government should ensure that the media regulatory bodies monitor the coverage of issues of national concerned or public interest. They should be given priority in the media because disasters have a great negative impact on the health of citizens.

Key Words: Disaster, Communication, Newspaper frames.

PERCEPTIONS AND COPING STRATEGIES OF FISH FARMING COMMUNITIES TO CLIMATE CHANGE. A CASE FROM LIRA DISTRICT IN UGANDA

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Abstract

Fish farming provides opportunities to adapt to climate change through aguacultureagriculture integration. This is especially important in developing countries where climatic change impacts threaten the social economic sustenance of populations. In Lira District of Uganda, fish farming is a relatively new enterprise, characterised by limited knowledge and skills among farmers on how to address climate change impacts. This makes fish farming in Lira more vulnerable to climate change processes. The current study examined fish farmers' perceptions about effects of climate change on fisheries resources in Lira district and how they cope. A cross-sectional study was conducted, employing both quantitative and qualitative approaches. Data were collected using questionnaires, focus group discussions and interview methods, to assess fish farmers' perceptions, attitudes, behaviour and values concerning climate change. Water quality parameters were measured both in-situ and laboratory following standard protocols to inform about climate change-related vulnerability of fish farmers' livelihoods. Data were analysed using IBM SPSS statistics v23 software and Microsoft Excel 2007. 78% of the farmers (N=30) were aware of the effects of climate change on their fish production while 72% were in a process of identifying coping strategies. Tilapia (Oreochromis niloticus), the most important food fish and social economic sustenance have reduced by an average 2035 fish over the past five years. Mean fish pond temperatures ranged were 25°C-28°C while oxidization levels were 6.2 mg/L - 5.8mg/L, all of which are unsuitable for fish production in the study area. Poor fish pond management practices like unsuitable pond depth lowered productivity. Coping strategies included tree planting; better agro forestry practices; wetland conservation; acquisition of grants and loans; appropriate pond designs and Indigenous knowledge approaches. The study findings support sustainable development initiatives, inform social economic sustenance by addressing climate change impacts on aquaculture in a typical contemporary Sub-Sahara Africa.

Key words: Climate Change; Sustainable Development, Aquaculture, Socialeconomic sustenance, Sub-Sahara Africa

CONSTRAINTS IN IMPLEMENTING ECOSYSTEM RESTORATION TO ADDRESS SUSTAINABLE DEVELOPMENT CHALLENGES IN UGANDA

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Abstract

Ecosystem restoration is recognized as a critical approach to addressing the interconnected global challenges of climate change, biodiversity loss, and social inequality. In Uganda, despite strong policy guidance and national commitments, implementation of restoration projects often falls short of targets. This study, conducted between January and December 2023, utilized a mixed-method approach involving literature reviews, questionnaires, and group discussions with state and nonstate actors, as well as local communities in western and southwestern Uganda, to identify the primary constraints hindering the implementation of restoration projects. The findings revealed several challenges: inadequate funding for the design and execution of restoration initiatives; limited access to technical expertise and baseline data necessary for effective project planning and management; a lack of comprehensive monitoring, evaluation, and learning systems to measure impact and promote continuous improvement; and insufficient capacity to scale up projects beyond the pilot phase. Addressing these constraints requires a multi-faceted approach, including the development of post-graduate programs to train restoration specialists, the establishment of regular forums for dialogue among stakeholders, and fostering collaborations and consortia to implement large-scale restoration projects. Key words: Restoration; Climate; Biodiversity

POSSIBILITY OF OBTAINING HIGH QUALITY GRAPHENE THIN FILMS FOR OPTOELECTRONIC GADGETS FROM THE ABUNDANT GRAPHITE IN NIGERIA

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*Ladansons@gmail.com; haladan@nileuniversity.edu.ng ABSTRACT

This investigation has shown for the first time, the possibility of obtaining high quality 2D graphene thin films for optoelectronic gadgets from the abundant Nigerian natural graphite (NNG). In the study, synthesis and characterization of graphene from NNG and the determination of the electrical conductivity of the thin films were conducted. The samples were characterized by X-ray diffraction (XRD), X-ray fluorescence (XRF), field emission scanning electron microscopy and energy dispersive X-ray (FESEM and EDX) to show their structural and compositional features. XRF study showed the mineral compositions as MgO (4.35%), SiO₂ (25.14%), SrO (9.73%), CdO (1.99%) and C (15%). XRD pattern indicated perfectly crystallized graphene flakes. Surface morphology by SEM analysis revealed closely packed, layered and spongy structures. EDX studies indicated the elemental composition as Carbon (86.34%), Molybdenum (10.37%), Potassium (2.38%) and Titanium (0.91%). The reduced graphene oxide RGO-TiO₂ composite thin films displayed glistering and reflecting surfaces due to the less density of electronic trap states and improved absorption in UV-visible region making them suitable for optoelectronic devices. The resistivity of 1.9592, 12.9366, 2.5419 and 25.1256 s/m were recorded for GO, RGO, GO and RGO-TiO₂ thin films. It has revealed that NNG and its products were of high quality. They can be produced for academic research and industrial integration at a lower cost compared to the imported types without detailed characterization systems into African market.

Keywords: Graphite, thin films, flakes, TiO₂, Optoelectronic Gadgets

DESIGN OF HIGH-PERFORMANCE GRAPHENE LEAD FREE PEROVSKITE SOLAR CELLS IN TACKLING ENERGY CRISIS IN AFRICA

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Abstract

In this study, graphene was prepared by modified Hummer's method and the optical properties were explored using UV-visible spectroscopy to determine absorption coefficients at different wavelengths based on Beer-Lambert's law. In the second step, lead-free methyl ammonium germanium halide solar cell was designed using GO as carrier transporters. Numerical modeling of the device in

solar capacitance stimulating program based on second order differential equation was done. A 0.6227 V, 38.58 mAcm⁻², 83.07 %, and 19.95 % were recorded as the open-circuit voltage, current density, fill factor and power conversion efficiency (PCE). The investigation showed that the presence of graphene improved the optical transparency and enhanced carrier generation and interaction between other layers which optimized the electrical conductivity and efficiency of the solar cells when compared to previous studies in literature. The results emphasized a viable approach in the design of efficient and stable solar cells at a reduced cost and optical losses. If mass produced can be deployed in Africa due to massive solar energy potential.

Keywords: Hummer, Optical Property, Graphene, Perovskite, Solar Cells, SCAPS

ACCESSING THE WIND ENERGY POTENTIAL FOR POWER GENERATION IN NORTHERN NIGERIA

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Abstract

In this practical investigation, the effect of wind speed on the power output of a wind electric generator using TPS-3730 system was explored for Bauchi state and compared to the wind characteristics of Maiduguri, Borno state. The angle and intensity of the wind was varied to obtain maximum power output. The values of the current (i), voltage (V) and power (P) output were obtained at 0[°], 15[°], 30[°], 45[°], and 60[°] respectively. At 15[°], I 1(W/m²), V 2.70(v), I 4.75(mA), 12.83(w); I 2(W/m²), V 3.10(v), I 6.40(mA), 19.84w; At 30[°], I 1(W/m²), 1.72(v), I 1.25(mA), 2.15(w); I 2(W/m²), V 2.19(v), and I 2.21(mA), 4.84(w). The results showed that the intensity (I) increases, V and i increases while as the angle increases, I and V decreases. The strength of the wind speed is proportional to the power output. Northern Nigeria has abundant wind energy system, installing wind turbine is vital to the viability of power generation and the economic applications in terms of clean electricity, wind vessels transportation, water pumping, grain milling and sporting activities.

Keywords: Wind speed, Power output, Wind power, Wind turbine, clean electricity

DETERMINANTS OF CLIMATE CHANGE ADAPTATION STRATEGIES AMONG CASSAVA AFRMERS IN OWERRE-WEST, LGA, IMO STATE, NIGERIA.

Author: Yusuf Jednah

The study examined determinants of climate change adaptation strategies among cassava farmers in Owerri-West, Imo State, Nigeria. The objectives were to describe the socio-economic characteristics of cassava farmers, examine the adaptation strategies used among the cassava farmers in the study area and to evaluate the climate change adaptation strategies used among cassava farmers. A multi-stage (two-stage) sampling technique was used to collect information from 133 respondents in five (5) communities out of 18. This was achieved using questionnaire with the he[p of trained enumerators who collected primary data for the study. The data collected were analyzed using descriptive statistics, the Likert-Type Scale and multinomial logit regression model. The result revealed that cassava farmers were mostly males (60.20%), they were also within their productive age bracket of 31-40years (26.5%), married (61.1%), with mean household size of 6memebers/household. They mostly had high school level of education (35.4%), and mean farming experience of 16years. The result on adaptation strategies among the farmers revealed that 20% of the respondents used increased/reduced farm size more among other adaptation strategies. About (19.8%) used early/late planting measure. Among the strategies carried out, the least practiced was planting early maturing crop variety (7.1%). The results on determinants of climate change adaptation strategies revealed that the likelihood ratio (x²) value was 91.78, this was significant at 1% probability level. The Pseudo R² value was 0.2557 which also confirms that all the slope coefficients were not equal to zero. The constraint mostly faced among the respondents was poor agricultural extension service delivery on climate change orientation/knowledge and the adaptation strategies. The study concluded that age, level of education, farm size and level of income among other factors were among the major determinants of climate change adaptation measures carried out among the respondents. The major constraint faced using the mean score of 3.0 was inadequate delivery of agricultural extension services to respondents (3.88) with respect to negative effects of climate change and the mitigation measures. Illiteracy among the farmers and poor source of on climate change were among the factors of hinderance. information Recommendations were made that government and other relevant institutions and policy makers on climate change should scale up effort on policy formations and timely delivery of relevant information using extension agents and other medium of communication to reach out to farmers on the negative effects of climate change and the adaptation strategies to be carried out. This will inform the farmers to enable them carry out mitigating measures to increase their level of output.

HARNESSING INDIGENOUS KNOWLEDGE SYSTEMS AND PRACTICES TO MITIGATE CLIMATE CHANGE EFFECTS IN THE KIGEZI REGION OF UGANDA

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Abstract

This paper unravels the concept of Indigenous Knowledge and Practices (IKSPs). Indigenous Knowledge Systems and Practices (IKSPs) are local knowledge developed over centuries of experimentation by our ancestors and are passed orally from generation to generation. It is a perfect scaffold to sustainable development connecting the past, the present and the future. Indigenous knowledge offers diverse perspectives that enrich students' learning experience. Indigenous knowledge represents an important component of global knowledge on development issues. Indigenous knowledge is an under-utilized resource in the development process. The five examples of indigenous knowledge are: traditional medicine used for healing, sustainable farming, land resource management, traditional arts and crafts, oral traditions and storytelling. The paper deals with how (IKSPs) can be harnessed to deal with climate change, disaster risk management and decision making related to policy development in the Kigezi region of Uganda. The study also concerns itself with the identification of the prevalent application of indigenous knowledge and practices in the mitigation of climate change, establishment of the relevance of the indigenous knowledge and practices. The methodology involved was basically review of abstracts, articles, book chapters, books and journals on how IKSPs are crucial in mitigating the effects of climate change.

Key words: Indigenous Knowledge and Practices (IKSPs), climate change, mitigation, disaster, risk management, Kigezi region, Uganda

THE PYROLYSIS OF METHANE FOR HYDROGEN PRODUCTION IN THE ORGANIC MATTER OF SHALE RESERVOIRS

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Abstract

Due to the increasing demand for a cleaner source of energy, hydrogen gas provides a long-lasting solution. Mechanisms including steam methane reforming and microwave-enhanced methane cracking, are widely used to produce hydrogen. However, they generate tremendous amounts of carbon dioxide (CO₂) which is a major contributor to the greenhouse gas emissions and are costly to implement [1-3]. In this study, the pyrolysis of methane into hydrogen and solid carbon, is introduced. The diffusion of the generated hydrogen is controlled by the concentration gradient instead of the pressure gradient because the permeability of the kerogen is highly heterogeneous and in the nanoDarcy scale. Crack initiation and propagation as a result of hydrogen diffusion is accounted for by constraining the rock on the lower and right boundaries with roller constraints and allowing an initial crack on the inlet boundary. The parameters used in the numerical simulation and validation are shown in Table 1. The crucial finding is that as the methane decomposes, there is a continuous build-up of hydrogen gas in the kerogen layers which can be efficiently exploited. For reactions occurring under catalytic conditions, the concentration of hydrogen is higher as compared to when the reactions occur without a catalyst. This is because, the catalyst improves the reaction process thereby increasing the amount of hydrogen produced from the pyrolysis process. There is a rapid decrease in the consumption of the catalyst in the early stages of the reaction followed by a sluggish decrease in the late stages. The hydrogen concentration is more around the crack in the initial states and reduces in the late stages of pyrolysis. Meanwhile, the stress is more at the crack tip than in any other region of the domain. This model provides a benchmark for future extraction of hydrogen gas from shale reservoirs.

Keywords: Organic matter; Natural hydrogen; Methane pyrolysis

PROLIFERATION OF AFRICAN INDIGENOUS MEDICINE IN UGANDA: A CASE STUDY OF GREATER MBARARA DISTRICT

Author: Assoc. Barigye Godfrey (PhD) Abstract

This Abstract examines the proliferation of African indigenous medicine and its role in community development with reference to Greater Mbarara, Uganda. It was established that the major challenges of African indigenous medicine and healing included extortion of property and search for riches, human sacrifice and killing clients, fuelling conflicts, failure to cure some diseases, family breakage, psychological torture and destruction of environment. The future of African indigenous medicine is bright if viewed in the context of service provision and increase of health. It was recommended that the increase of health care coverage will be achieved through collaboration and partnerships between traditional health practitioners and community health providers which is already happening, particularly in the area of African indigenous medicine research. Further research in safety and efficacy should be promoted on the quality of the research to improve African indigenous medicine and healing knowledge practice.

Key word(s): African Indigenous Medicine

ANTICANCER POTENTIAL OF DURMILLONE AGAINST HUMAN LUNG ADENOCARCINOMA CELL LINE

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Abstract

Cancer is a threat to global public health, taking the lead cause of death in highly developed nations and the second contributor to fatality in Africa after cardiovascular disease. Cancer causes 1 out of 6 deaths worldwide, which is more than malaria, AIDS, and tuberculosis combined. The cancer dilemma is feared to escalate in Africa with the copied lifestyle. Nature has given molecules of hope in cancer management

like the vinca alkaloids. In this line, extracts from various parts of *millettia dura* and their isolated constituents were tested for cytotoxicity against a panel of cell lines. Out of the fifteen flavonoids tested for cytotoxicity, durmillone had a very good activity with IC_{50} of 6.6 ±1.2 µM against A549 cancer cell line. This points to the anticancer potential of rotenoids from this plant, a need for further studies on the seeds/pods form *millettia* species and prospects of developing durmillone into a lung cancer drug.

Key words: Millettia dura, durmillone, cytotoxicity, lung cancer

REVERSE TECHNOLOGY; THE SURE WAY TO PRODUCT DEVELOPMENT-THE CASE OF KABRITIS

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Abstract

The conventional process of drug discovery and development is costly, time consuming and can be less productive giving low returns on heavy investments. Developing economies can barely afford the costs involved, a reason for the low drug products coming from these countries. There are concerns to the need of a paradigm shift in the processes of drug discovery and development affordable in low-income countries. One of such approaches is based on facts and practices that have proven record of use, effectiveness and safety. The approach starts from the clinically accepted indigenous medicine and practice already in use by local communities. This transdisciplinary approach is reverse pharmacology and it saves on cost, time with products having higher chances of success in clinical therapeutics. Using this approach, KABRITIS, a jelly supported herbal product was developed leveraged on three-plants used in the management of arthritic inflammation by maceration by the local population around Kabale. The product was validated through laboratory measurements with the aim of improving on the effectiveness, safety, formulation, acceptability and shelf life. The product developed is efficacious at 5mg sample per gram of the vehicle arrived at after a voluntary participation of 50 patients. After the formulation, drug delivery to affected body part improved, there was an increase in the holding time of the drug to the affected body part, an increase in shelf life was realised, the formulation became more clearer and product acceptance improved. By this approach, drug products based on African indigenous knowledge and ways of knowing can be developed in conformity to more acceptable standards.

Key words: Arthritis, reverse pharmacology, herbal jelly.

ADAPTATION APPROACHES TO CLIMATE CHANGE MITIGATION FOR SUSTAINABLE LIVELIHOODS IN AFRICA: A CASE OF LWAKHAKHA SUB CATCHMENT IN ELGON REGION, UGANDA

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Abstract

Climate change continues to extend its impacts globally from anthropocentrism belief, which lead to natural resources degradation, poor agricultural practices and behavioural challenges among the population that worsen the situation. These further escalate into erratic rains, drought, disease outbreak, environmental refugees, food insecurity and unrealistic socioeconomic wellbeing. Therefore, the paper presents inclusive adaptation approaches to climate change impact mitigation in Lwakhakha Sub Catchment, Uganda. The paper employed a descriptive research design using qualitative data collection approaches, and targeted 158 beneficiaries from whom 113 respondents were determined using Sloven's formula. Data was collected using observation, field notice, photography, and interviews. Then, it was transcribed, cleaned, and coded to develop themes and subthemes to aid the interpretation. Moreso, the themes were entered into MS Excel to generate frequency tables for analysis. Results indicated tree growing, soil water conservation, riverbank restoration, energy efficiency, fodder production, apiary, aquaculture, gulley treatment, water resources conservation, and climate smart agriculture were adapted as inclusive approaches by the beneficiaries to mitigate climate change impacts and enhance improved wellbeing in the Elgon Region. Conclusively, Uganda must ensure awareness and education to fight against ignorance & poverty, enhance mindset change, and implement & enforce environment laws & policy for a better future. The paper recommends that the Lwakhakha Sub Catchment committee and the districts should ensure stakeholder involvement in climate change mitigation and adaptation, integrate climate change into academic learners' curricula, and create awareness amongst the population about the need for conservation and compliance with environment laws & regulations.

Keywords: Energy efficiency, gulley treatment, mindset change, restoration

HYPOTHETICAL TECHNIQUE AS INDIGENOUS TECHNOLOGY IN PREDICTING THE IMPACT OF CLIMATE CHANGE: A MANAGEMENT APPROACH WITHIN GURARA RESERVOIR CATCHMENT, NIGERIA Author: Usman Rogo Kabiru

Abstract

The impact of climate change for sustainable development has been studied using hypothetical technique. A summation was proposed using hypothetical techniques considering Global Climate Models and linear trend of the data. Four (4) proposed scenarios of temperature increase (1% and 2%) coupled with a decrease in precipitation of (-5% and -10%) were combined and applied for the study area considering the global projections according to the Intergovernmental Panel on Climate Change. The Water Evaluation and Planning Tool were used to model and

evaluate the effect of rising temperature and declining precipitation within the Gurara reservoir catchment for water availability prediction. The results indicate a reduction in available water within the study area from 4.3% to 3.5% compared to the baseline with no change in climate scenario. The findings will assist in developing a blueprint for climate change mitigation Within the Gurara Reservoir Catchment, Nigeria and Africa by accentuating the need to put in place appropriate adaptation measures to further foster resilience to climate change effects. Practically, it is pertinent to develop a more effective policies and regulations through research for effective water resources management in catchment, while also allowing for flexibility in the operational dynamics with the ultimate goal of adapting to climate change effects.

Keywords: Climate Change Models, Hypothetical Techniques and Gurara Reservoir Catchment

LOCKING THE POTENTIAL OF SCIENCE ACROSS AFRICA TO MITIGATE THE IMPACT OF CLIMATE CHANGE AND CREATE REGENERATIVE SOLUTIONS FOR HOLISTIC WELL-BEING: PROMOTING POLICY DEVELOPMENT AND IMPLEMENTATION

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Abstract

Climate change is the major global challenge affecting people's livelihoods, particularly in Sub-Saharan Africa in areas of economic stability, food security, and public health. This paper explores the dire role of science in influencing climate policies that drive ecological and regenerative resolutions for holistic well-being. It looks at the theories and frameworks guiding policy development and implementation, highlighting their relevance in addressing climate change through scientific innovation. A literature review assesses the effectiveness of existing policies and the barriers to their implementation, such as weak institutional capacities, inadequate funding, and fragmented frameworks. The paper calls attention to the need for evidence-based policymaking, stakeholder engagement, and regional cooperation to foster climate resilience. This can be achieved through the integration of indigenous knowledge and modern scientific advancements. Based on this stance, Africa can develop robust policies that mitigate climate risks and promote sustainable development. The paper concludes with recommendations to strengthen institutional support, enhance funding mechanisms, and leverage technology for effective policy execution.

Key words: Climate change, regenerative solutions, holistic well-being, policy development and implementation

NON-DESTRUCTIVE ASSESSMENT OF CLIMATE-IMPACTED BUILDING: A CASE STUDY OF A GOVERNMENT HOUSE IN NIGERIA.

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Abstract

Uncompleted/abandoned buildings which are left unoccupied due to delayed projects from government policy change, leadership change, economic or project priority shifts are increasingly subjected to the effects of climate change. This study targeted exploring how various climate-related factors such as rising temperatures, extreme weather events, and particularly construction parameters of quality control on material and workmanship affect the structural integrity and surrounding environments of a state government house in Nigeria. The government house is among the North-Western states of Nigeria: thus, this study shall make the exact detail of the government house private for safety and security reasons. The study employed an onthe-spot assessment and non-destructive assessment (NDA) to evaluate the structural integrity of the structural elements in the seven (7) quarters of the government house whilst their surrounding soil was taken to the laboratory for testing. Tests includes visual inspection, rebound hammer test on structural elements, sectional analysis of components and structural analysis of the entire structure based on the in-situ strength. Furthermore, it examines the risks of collapse, safety hazards, and negative impacts on local biodiversity and human health. The findings revealed a low concrete strength of 12 N/mm²,10N/mm²,11N/mm²,10N/mm²,11N/mm², 12N/mm² and 11N/mm² for quarters A-G accordingly. The results indicate significant degradation, including cracks, moisture intrusion, and material weakening, all of which compromise the building's safety and functionality. The result further highlighted the importance of NDA in the early detection and management of climate-related structural damages, offering valuable insights for maintaining the longevity and safety of historic and government structures. It is recommended to use advanced NDA methods like groundpenetrating radar (GPR), infrared thermography, and ultrasonic testing, for such study for their minimal harm on the structure. The findings underscore the importance of integrating climate resilience into urban planning mitigate the adverse effects of climate change on abandoned structures.

KEYWORDS: Non-destructive test, Rebound hammer test, Climate-impacted buildings, Tanking.

CLIMATE CHANGE AND COMMUNITY RESILIENCE IN UGANDA TO DAY

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FACULTY OF ARTS & SOCIAL SCIENCES KABALE UNIVERSITY

Abstract

The purpose of this paper was to examine the relationship between climate change and community resilience by suggesting what relevant stakeholders must consider in order to have resilient communities against the negative effects of climate change. Methodologically, the researcher employed a purely critical qualitative approach in which desk research methodology was employed. As such secondary data was used and this data was obtained mainly from scholarly and published research articles surrounding climate change, Disaster Management, and other crucial published reports, with matters of Climate change and Community resilience in Uganda today under scrutiny in which even the challenges facing the communities were also analyzed. Critical content analysis was employed in examining the roles of all the relevant stakeholders in Uganda in reducing the adverse effects of climate change and building resilient communities. Validity and reliability were guaranteed by paying much attention to critical conceptual clarity and interpretative rigor. In this paper I reviewed the genesis, the conceptualization, the roles of the relevant stakeholders in reducing climate change, the challenges that communities are facing as a result of the advent of Climate change, and what must be done by all the stakeholders to reduce climate change and its effects, drawing substantiations from the Ugandan experience. The results indicated that the central government, stakeholder engagement, rejuvenating monitoring and evaluation and tapping on the technology available were key to addressing climate change and its effects. Connectedly, based on literature review, I further concluded that Climate change is some serious phenomena which threatens human existence in this 21st century. However, if all relevant stakeholders come together through unified actions backed by concerted uniform efforts, community resilience could be in position to be built which would help to propel sustainability. Embracing the positive consequences of advancements in technology is quintessential to reduction of the negative effects of climate change though there is need for governments especially in developing countries to subsidize these new technologies as a way of making them accessible to even the lay citizens as this would quickly reduce the negative effects of climate change to Ugandans. I also came up with some recommendations which included; the central government should strengthen the monitoring and evaluation department of its Agencies like NEMA, integrating technology into mainstream societal development projects, continuously empowering local people with relevant skills & knowledge and involvement of all relevant stakeholders.

Key Words: Climate change, Community resilience, Uganda.

EFFECTS OF NEWSPAPER FRAMES ON THE CONSUMPTION OF DISASTER COMMUNICATION: CASE OF DISPLACED WOMEN IN RESETTLEMENT CAMPS IN EASTERN UGANDA

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ABSTRACT

The study sought to evaluate the effectiveness of newspapers on communicating the key crisis events of natural disasters in Uganda. Moreover, the study employed quantitative research designs. The study was investigated the perceptions of women in displaced camps about 3 newspapers. Whilst, the findings of the study indicate that the print media's factual coverage for natural disasters helps to build trust for the newspaper in the public sphere and therefore promotes crisis communication because the medium is the message. Moreover, very appealing messages help to enhance crisis communication. whilst inability for the print media to amplify the risk for natural calamities hinders disasters prevention and recovery for the affected people. Notably, government should ensure that the media regulatory bodies monitor the coverage of issues of national concerned or public interest. They should be given priority in the media because disasters have a great negative impact on the health of citizens.

Key Words: Disaster, Communication, Newspaper frames.

Perceptions and coping strategies of fish farming communities to climate change. A case from Lira District in Uganda

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Abstract

Fish farming provides opportunities to adapt to climate change through aquacultureagriculture integration. This is especially important in developing countries where climatic change impacts threaten the social economic sustenance of populations. In Lira District of Uganda, fish farming is a relatively new enterprise, characterised by limited knowledge and skills among farmers on how to address climate change impacts. This makes fish farming in Lira more vulnerable to climate change processes. The current study examined fish farmers' perceptions about effects of climate change on fisheries resources in Lira district and how they cope. A cross-sectional study was conducted, employing both quantitative and qualitative approaches. Data were collected using questionnaires, focus group discussions and interview methods, to assess fish farmers' perceptions, attitudes, behaviour and values concerning climate change. Water guality parameters were measured both in-situ and laboratory following standard protocols to inform about climate change-related vulnerability of fish farmers' livelihoods. Data were analysed using IBM SPSS statistics v23 software and Microsoft Excel 2007. 78% of the farmers (N=30) were aware of the effects of climate change on their fish production while 72% were in a process of identifying coping strategies. Tilapia (Oreochromis niloticus), the most important food fish and social economic sustenance have reduced by an average 2035 fish over the past five years. Mean fish pond temperatures ranged were 25°C-28°C while oxidization levels were 6.2 mg/L -5.8mg/L. all of which are unsuitable for fish production in the study area. Poor fish pond management practices like unsuitable pond depth lowered productivity. Coping strategies included tree planting; better agro forestry practices; wetland conservation; acquisition of grants and loans; appropriate pond designs and Indigenous knowledge approaches. The study findings support sustainable development initiatives, inform social economic sustenance by addressing climate change impacts on aquaculture in a typical contemporary Sub-Sahara Africa.

Key words: Climate Change; Sustainable Development, Aquaculture, Socialeconomic sustenance, Sub-Sahara Africa

CONSTRAINTS IN IMPLEMENTING ECOSYSTEM RESTORATION TO ADDRESS SUSTAINABLE DEVELOPMENT CHALLENGES IN UGANDA

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Abstract

Ecosystem restoration is recognized as a critical approach to addressing the interconnected global challenges of climate change, biodiversity loss, and social inequality. In Uganda, despite strong policy guidance and national commitments, implementation of restoration projects often falls short of targets. This study, conducted between January and December 2023, utilized a mixed-method approach involving literature reviews, questionnaires, and group discussions with state and nonstate actors, as well as local communities in western and southwestern Uganda, to identify the primary constraints hindering the implementation of restoration projects. The findings revealed several challenges: inadequate funding for the design and execution of restoration initiatives; limited access to technical expertise and baseline data necessary for effective project planning and management; a lack of comprehensive monitoring, evaluation, and learning systems to measure impact and promote continuous improvement; and insufficient capacity to scale up projects beyond the pilot phase. Addressing these constraints requires a multi-faceted approach, including the development of post-graduate programs to train restoration specialists, the establishment of regular forums for dialogue among stakeholders, and fostering collaborations and consortia to implement large-scale restoration projects. **Key words**: Restoration; Climate; Biodiversity

THE SUZUKI – MIYAURA CROSS-COUPLING – CLAISEN REARRANGEMENT – CROSS-METATHESIS APPROACH TO PRENYLATED ISOFLAVONES.

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Isoflavones are secondary plant metabolites mainly found in the Leguminosae.^[1] Isoflavones are phytoestrogens^[2] and they have also been reported to exhibit a wide range of bioactivities including antimicrobial,^[3] antiplasmodial,^[4] antioxidant^[5] and antiinflammatory^[5] activities. The prenylated isoflavones are reported to be more bioactive^[4] due to their increased lipophilicity. These compounds are elaborated by plants in very small quantities and continuous exploitation of the plants may lead to biodiversity loss. Hence, there is need to synthesize the compounds.

We have previously reported the chemical syntheses of the isoflavone natural products 5-deoxy-3'-prenylbiochanin A (**1**) and erysubin F (**2**),^[3] both isolated from *Erythrina sacleuxii*,^[4] using a 2,3-oxidative rearrangement reaction initiated by hypervalent iodine compounds as a key synthetic method because this strategy allowed us to start from conveniently accessible flavanones. In contrast to literature precedence suggesting broader applicability of this method,^[6] we found its scope to be limited by the inevitable formation of flavones as byproducts and intolerence of protected or unprotected OH- groups at position 5 of the flavanone starting material, which resulted in hydroxylation of the arene at position 8 in low yield and selectivity.^[7] This renders 5-oxygenated isoflavones such as 3'-prenylbiochanin A (**3**) inaccessible.

In the present study, we report our investigation on the Suzuki – Miyaura coupling reaction as an alternative key step for the synthesis of prenylated and nonprenylated isoflavones.^[8] The application of Suzuki coupling of para-phenolboronic acids and 3-iodochromones to the synthesis of isoflavone natural products and a comparison of the results with Suzuki coupling reactions using the analogous 4-methoxybenzene boronic acid is reported. We further report an investigation on whether 4'-hydroxyisoflavones can be advantageously used to access isoflavones with prenyl-substituted B-rings. In this study, the synthesis of prenylated natural isoflavones 3'-prenylbiochanin A (**3**), neobavaisoflavone (**4**), 7-methoxyneobavaisoflavone (**5**) and maximaisoflavone J, (**6**) which were respectively isolated from *E. sacleuxii*,^[4] *E. sigmoidea*,^[9] *Psoralea corylifolia*^[10] and *Millettia dura*^[11] has been accomplished.





IS AFRICA ADOPTING BIOTECHNOLOGY TO PRESERVE ITS RAPIDLY DISAPPEARING MEDICINAL PLANT RESOURCES?

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Abstract

Medicinal plants are the major sources of compounds from which different medicines, and raw materials required for commercial medicine production are obtained. These are used to treat different ailments, and or health complications/diseases affecting both human population and other animals. These medicinal plants are however facing great decline in their diversity due to climatic change, and overexploitation. This requires close attention in order to establish ways of conserving these plants. One of the most promising strategies for conservation is biotechnology, which has been increasingly adopted by countries across Africa and other continents. Biotechnology offers methods like micro-propagation through explants, seed banking, and cryopreservation, all of which can help preserve medicinal plant species. However, while some African nations have made progress in applying these biotechnological approaches, their use remains limited. More efficient techniques are still under development, and many are yet to be fully implemented across the continent. This review provides a comprehensive status of adoption of biotechnology in conserving medicinal plants in Africa, which could be valuable in enabling faster and sustainable conservation of medicinal plant resources across the continent.

Keywords: Biotechnology, Conservation, Endangered species, Extinction, In vitro propagation, Medicinal plants,

INDIGENOUS PEOPLES AND ENVIRONMENTAL EDUCATION WITH A FOCUS ON THE BATWA OF SOUTHWESTERN UGANDA

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Abstract

This paper explores the intersection of Indigenous Peoples and environmental education with a specific focus on the Batwa community of Southwestern Uganda. Utilizing indigenous ecology theory as the theoretical framework, the study examines how the Batwa's traditional ecological knowledge and practices contribute to environmental conservation in the Bwindi Impenetrable Forest, Semliki National Park, and Albertine Regions. Over the years, the Batwa have developed a profound understanding of their environment through practices such as honey tapping, beekeeping, and fruit gathering, which reflect a deep-seated relationship with their surroundings. This paper highlights the Batwa's ecological wisdom and their role in conserving these biodiverse regions. The paper also argues that integrating Batwa perspectives into environmental education not only enhances conservation efforts but also fosters cultural preservation, ensuring that indigenous voices are central to sustainable development.

The history and role of Batwa elders and women in leadership and environmental protection is also emphasised, stressing their contributions towards sustainable development and community stewardship. The paper aims to showcase how Batwa traditional practices are integral to the protection and sustainability of their natural habitats. The research paper addresses the impact of the modernization paradigm on indigenous environmental practices. The paper also examines the impact of existing policy and legislation on environmental management and education. It examines how contemporary challenges and external pressures affect the Batwa's ability to maintain their traditional knowledge and practices. While the modernization paradigm has introduced new dynamics that focus on development that disregards conservation practices, the Batwa's environmental activitiess remain crucial to the conservation of their territories. By integrating indigenous perspectives into environmental education and conservation strategies, the paper advocates for an Inclusive Environmental Education Framework (IEEF) that utilizes indigenous knowledge in addressing contemporary environmental challenges.

Keywords: Indigenous Education, Environmental Education, Ecological Management

CLIMATE CHANGE, REFUGEE SELF-RELIANCE, AND SCIENCE-BASED SOLUTIONS IN NAKIVALE REFUGEE SETTLEMENT, UGANDA

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Abstract

Climate change is increasingly exacerbating vulnerabilities among forcibly displaced populations, particularly in sub-Saharan Africa. This study undertakes a desk-based analytical review of the interplay between climate change, refugee self-reliance, and science-informed solutions within the Nakivale Refugee Settlement in Uganda. Drawing upon peer-reviewed literature, policy reports, and grey data sources, the paper critically examines climate-induced challenges and their implications for refugee livelihoods. It evaluates current self-reliance strategies, and explores the role of

scientific innovation and indigenous knowledge systems in enhancing refugee resilience. The findings reveal that while localized adaptation efforts are underway, a more structured, inclusive, and science-oriented framework is essential to foster sustainable refugee self-reliance. The paper concludes with recommendations to integrate climate resilience into policy, scale community-led innovations, and promote regional collaboration across refugee-hosting regions.

Key words: Climate Change, Refugee Self-reliance, Science-Based approaches