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Telemetry Reveals Foraging and Roosting Patterns of a Repeatedly Mass-Culled Flying Fox and Offers Avenues to Mitigate Human-Wildlife Conflict

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ABSTRACT

The Mauritian flying fox plays an ecological keystone role in seed dissemination of native trees in the island with the second greatest proportion of threatened plants worldwide. Yet the species faces repeated mass-culling campaigns since 2015 because its diet includes commercial fruits. Culling has contributed in halving flying foxes' population and failed to improve commercial fruit production. Finding non-lethal alternatives is therefore important, and itself depends on a better understanding of the animal's ecology which includes their movement pattern.We used solar powered GPS/GSM radio-telemetry device to characterize the spatiotemporal movement patterns of the Mauritian flying fox to explore possible avenues that this may offer for mitigating the worsening human-wildlife conflict (HWC). Twelve bats were fitted with radio-telemetry transmitters and tracked between December 2014 and January 2017. Bats' geographical and seasonal movement patterns were investigated using QGIS version 3.16.10 Hannover. Fixes were superposed over a land-use and forest habitat quality map to assess habitat-use preferences. A convex hull was constructed for each roosting and foraging site and used to measure the distance of movement. Digital elevation model was created to analyse flying foxes' elevational distribution. Heatmaps were also created to illustrate the bats' distribution. We found that the Mauritian flying fox prefers to forage and roost in forested areas located at an elevation <250 m. However, flying foxes prefer to feed on commercial fruits during their fruiting season and their foraging activity are more concentrated in fruit orchards during the early night. Additionally, foraging and roosting sites tend to be located close to each other and to human habitation. Foraging preference of flying foxes seems to be driven by food abundance and accessibility. Although forested areas seem to be a more important and preferred foraging habitat, the ease of availability of commercial fruits prompts bats to shift their foraging preference to non-forests. Foraging activity indicates that deterrence methods may be more effective in early night. Proximity between roosting and foraging sites reduces energetic cost for food search. The preference to roost in lower elevated forested areas might be driven by the lower level of disturbance and abiotic factors such as temperature and humidity which are important factors in determining habitat adequateness for warm-blooded animals. Preference of forested areas for foraging and roosting highlights the importance of those areas in encouraging flying foxes to stay more within their natural habitats. Restoring the bat's roosting environment may also encourage foraging within forested areas since foraging tend to occur close to roosts. Additionally, restoring lower-elevated forest habitats could possibly serve as a better strategy to contribute towards mitigating the worsening HWC with fruit-growers.

Keywords: *Pteropus niger*, movement ecology, fruit bat, habitat-use preference, frugivory, Mauritius

Human-Wildlife Conflict Around *Pteropus niger*: Towards a Win-Win Solution Between Protecting Commercial Fruits and Threatened Biodiversity

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ABSTRACT

Human-wildlife conflicts (HWC) are on the increase worldwide, adding further pressure on threatened biodiversity and contributing to the ongoing sixth mass extinction driven by other human activities such as habitat destruction, pollution and introduction of invasive alien species. In Mauritius, the Mascarene endemic and endangered flying-fox (*Pteropus niger*) includes commercial fruits (mainly lychee (*Litchi chinensis* Sonn.) and mango (*Mangifera indica* L.) in its diet thereby generating a HWC with fruit growers that was used to justify multiple government implemented mass-culling campaigns since 2015[1]. Exploring possible impactful alternatives to lethal control is crucial because culling has consistently failed to increase fruit production[2], but has increased the extinction risks of the bat. This situation has wider ranging detrimental effects on Mauritian native terrestrial biodiversity because *Pteropus niger* plays an ecological keystone role in supporting native forest regeneration and the culls weaken that role. Several non-lethal approaches are already being used in orchards to deter bats (e.g. creating dense smoke, installation of flags, light bulbs or dried fish above the tree canopy, or the use of firecrackers)[3]. However, no rigorous testing of the efficacy of these methods has been attempted. While some may work, others may represent a waste of time and resources while creating adverse side effects to human health and the environment. The overarching aim is therefore to determine whether certain deterrents and traditional methods used by fruit growers show promise in alleviating commercial fruit losses. The efficacy of auditory and olfactory deterrent methods and of the common traditional methods used by fruit growers to protect crops will be evaluated on lychee trees from sampled backyard gardens and orchards. Fruits losses by bats, other animals, fungal infection and natural fruit fall will be assessed. The ultimate aim of the project is to foster an evidence-based approach to improve the prospects of attenuating the current human-wildlife conflict in Mauritius, which may then serve as example for better management of similar HWC concerning fruit bats elsewhere.

Keywords: frugivory, fruit bats, fruit protection, keystone species, *Litchi chinensis*, Mauritius

Ecology of the Endemic and Endangered Mauritius Free-Tailed Bat (*Mormopterusacetabulosus*) and Implications for Conservation Management

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ABSTRACT

About 80% of all bat species are threatened with extinction, a situation exacerbated on oceanic islands where endemic bats' naturally small geographical ranges are further reduced by anthropogenic threats. Consequently, many island bats decline in distribution, in turn triggering other species declines, thus broadening conservation needs and urgency. However, bats tend to be understudied in part owing to their elusive, nocturnal habits. Research towards endangered island bats should therefore be prioritized. In Mauritius, in contrast to the megabat, *Pteropus niger*, microbats are poorly studied. Here, the Mauritian cave-roosting endemic insectivorous free-tailed bat, *Mormopterus acetabulosus* is used as a model to study the decline of similar insular insectivorous bats. The aim is to review the temporal changes in *M. acetabulosus*' roost distribution and population size. Literature from published reports was reviewed and conservationists and people living near caves were interviewed for any knowledge of past roosts. For each location, latitudes and longitudes data were extracted from Google Earth and mapped using the geographical information systems QGIS and GeoCAT, which also measure the area of occurrence (AOO) and extent of occurrence (EOO); two parameters useful to determine the Red List status of the species. The literature mentions nine caves where *M. acetabulosus* roosts and field surveys, so far, revealed fourteen caves in distinct locations with roosts. The current EOO is 779 km^2 and AOO is 44 km^2 representing an unchanged and about 18% increase respectively relative to the maximum known distribution. Based on these and on other criteria, the species should be categorised as 'Endangered' (EN A4acd; B1b (i, iii) + 2b (i, iii). The discovery of new *M. acetabulosus* roosts suggests that past surveys may have missed these or that they were founded since, although it is also possible that they represent only temporary roosts. The latter two possibilities in particular, argue in favour of protecting caves even if they do not harbour bat roosts. This is the more so important because currently, caves are neglected in Mauritian's conservation management strategies, such that the bat species along with the associated cavernicolous biodiversity are under threat, particularly that substantial human disturbance are being noted around and in many caves (dumping, poaching etc.). This model study species can serve as example to help other countries to better anticipate the future threats to their cave-roosting bats because many other countries are currently catching up with Mauritius' already high human population density, extreme urbanisation, and extensive habitat transformations.

Keywords: biodiversity, conservation, decline, extinction, urbanisation

Ecology and Conservation of the Mauritius Endemic and Endangered Mono-Specific Genus *Roussea*, Rousseaceae

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ABSTRACT

Global terrestrial biodiversity is experiencing a mass extinction event driven by human activities and oceanic islands are being affected disproportionately harder. Mauritius currently ranks second worst country worldwide in terms of proportion of native tree species that are threatened with extinction. Moreover, of all 17 Sustainable Development Goals, only 'Life on Land' is trending downwards in Mauritius. Within this context of relative neglect of conservation of threatened terrestrial biodiversity, research can help maximise the little that is invested in conservation management locally. I studied possibly the fastest declining Mauritius endemic plant species (*Roussea simplex* – hereafter *Roussea*) as a model island plant to better understand the drivers of its decline and inform its conservation. First, the temporal decline in distribution was characterised using the literature, herbarium specimens and field surveys. The role of vertebrate flower visitors (e.g., nectar robbers, pollinators and predators) was characterised using camera trapping and pollination experiments were done to quantify seed set from xenogamy, geitonogamy, autogamy and apomixis, and assess effectiveness of various potential vertebrate pollinators. Possible spatio-temporal variation in the previously documented alien ant-disrupted pollination mutualism was assessed using *in-situ* ant-baiting experiments and monitoring of flowers for ant infestations. The impact of invasive alien plants (IAP) on *Roussea*'s fitness was assessed through a controlled *in-situ* alien plant weeding at two sites, where plants were monitored over two years. *Roussea* now survives in only nine sites with ca. 250 individuals. Its range halved since 1930s relative to its maximum known distribution, and this was weakly related to habitat destruction but rather to ecological interactions1. A new much more potent endemic pollinator (the Mauritius Bulbul) was discovered than hitherto known, but seed set per fruit is much reduced due to pollinators' rarity or local extinction2. Moreover, seed set per plant is reduced by > 90 % due to florivory by alien rats and macaques which also destroy many immature fruits further reducing seed production2. The infestation of alien ants, which was previously documented to disrupt the plant's pollination, was found to vary seasonally, annually and on a multi-decadal scale and a new more aggressive alien ant species was recorded as nectar robber3. IAP significantly reduce the leaf surface area in plants with higher invasion levels, and removal of weed improves the plants' fitness over time4. Vertebrate flower visitors may benefit or hamper *Roussea*'s sexual reproduction and the Mauritius Bulbul is a more efficient pollinator than the less mobile *Phelsuma* geckos. The severity of plant-gecko mutualism-disruption by alien ants varies spatially with height of flowers and is worsened by alien plant invasion. The overall fitness of *Roussea* plants is improved by targeted and gradual removal of weeds in their immediate vicinity. This study showed that even if insular plants may be relatively resilient to habitat destruction for growing in areas that are protected or spared by habitat transformation, they can still decline fast. *Roussea*'s population decline is more related to reduced habitat quality than to habitat loss. Habitat protection alone is therefore insufficient and managing the impacts of threats on biotic ecological interactions is vital to stem the rapid decline. The findings also underscore the importance of incorporating spatio-temporal variation of threats in conservation strategies, and to identify possible cascading effects that would improve conservation management by enabling addressing the ultimate instead of the proximal threats.

Keywords: invasive alien species, invasive alien vertebrates, plant-animal interactions, mutualism disruption, oceanic islands, threatened species 2

Predictive Microbiology as a Risk-Based Tool to Assess the Safety and Quality of Cooked Yellowfin Tuna (*Thunnus Albacares*)

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ABSTRACT

Mauritius has the potential to become an important seafood hub, making it imperative to ensure seafood safety from the sea to the consumers' plate. Cooked tuna meat is proteinaceous in nature and therefore highly perishable. In the Mauritian context, at the end of the process line of a local tuna processing factory, around 0.3%, 8.4%, and 0.1% of cooked tuna were out of specifications for total viable count (spoilage indicator), *Staphylococcus aureus* (toxin-producing bacteria), and histamine (a toxin), respectively. In the event of time-temperature abuse, specific spoilage bacteria (SSO), toxin-producing bacteria, and histamine forming bacteria (HFB) can rapidly proliferate thereby causing premature spoilage, deterioration in organoleptic characteristics, and compromise the safety of cooked tuna meat. The aim of this project was therefore to study the growth of *S. aureus* (as toxin-producing bacteria), *Morganella morganii* (as HFB), and lactic acid-producing bacteria (LAB as SSO) in cooked Yellowfin Tuna (*Thunnus albacares*) when subjected to abusive temperature scenarios. Briefly, cooked tuna meat was inoculated with *S. aureus*, *M. morganii*, and an SSO and the samples were stored at simulated abusive temperatures. Samples were then withdrawn at specific intervals and subjected to microbiological analyses to determine the bacterial population densities. Data points for the Log of the population densities were input in several modeling software (ComBase, Sym'Previus, and IPMP 2013) and the growth parameters extracted after fitting each model. While more trials are needed to increase the R-square values, the maximum specific growth rates (μmax) for vacuum-packed samples inoculated with *S. aureus* and stored at 25 and 15℃ were 0.021h-1 (doubling time, dt=33hr, R2=0.89), 0.035h-1 (dt=19hr, R2=0.86), respectively. For *M. morganii*, a μmax of 0.045h-1 (dt=15.5hr, R2=0.98) was obtained during incubation at 15°C. For the SSO, suspect bacteria were isolated from spoiled cooked tuna and biochemically characterized as *Enterococci*; these were re-inoculated in the vacuum-packed cooked tuna and incubated at 37 and 25°C to obtain μmax 0.20h-1 (dt=3.5hr, R2=0.96) and 0.19h-1 (dt=3.8hr, R2=0.97), respectively. With data from two more replicates, primary models for the different species will be constructed with greater accuracy and growth kinetic parameters extracted. This will then allow us to develop secondary models to map the relationship between growth rates of bacteria and storage temperatures. Growth models have many applications in the food industry and once validated, they can be used in complementarity with traditional microbiological analyses, to expedite the exposure assessment phase of microbial risk evaluation, thereby allowing faster decision making with respect to release of consignments of cooked tuna products and the overall acceptance of the tuna lots at the clients' end.

Keywords: Predictive Food Microbiology Food Safety Spoilage Toxin-Producing Bacteria Cooked Tuna

Multigene Phylogeny Coupled with Morphological Characterization Reveal Two New Species of *Holmiella* and Taxonomic Insights Within *Patellariaceae*

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ABSTRACT

During our investigation of saprobic fungi on *Juniper* (*Cupressaceae*) of Uzbekistan, two novel species of *Holmiella* were collected from the host *Juniperus*. These new species are introduced based on morphological evidence and their phylogenetic relationships are investigated. Taxonomic notes are also provided for the two previously described species of *Holmiella*. Phylogenetic reconstruction based on analyses of ribosomal DNA (ITS, LSU and SSU regions) of *Holmiella* species, strongly supports the three currently recognized taxa (*H. junipericola*, *H. juniperi-semiglobosae* and *H. sabina*) as a monophyletic group. The two novel species are morphologically distinct from *H. sabina*, the type species. Descriptions and illustrations, as well as notes on the taxonomy, and phylogenetic characterization of the two new species are provided. An identification key to the four accepted species of *Holmiella* is also provided.

Keywords: Ascomycetous microfungi / central Asia / juniper trees / phylogeny / taxonomy / *Patellariaceae* / Uzbekistan

A Bioinformatics Analysis of Genetic Variants in The Immune System in Relation To Their Evolution and Role in Diseases

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ABSTRACT

Introduction Africa is unquestionably home to a large number of endemic infectious diseases, including malaria, HIV-AIDS, hepatitis, tuberculosis. Infectious diseases have been a greater cause of morbidity and mortality in the African continent than other parts of the world for decades now, contributing to a lower life expectancy among Africans. However, African populations are the least represented in genetic studies. Only recently, there has been increasing effort into the sequencing of African populations and the genetic diversity of immune receptor genes has not yet been fully Elucidated

Methods A list of 273 human immune receptor genes was retrieved from UniprotKB database and classified into 13 immune receptor classes based on their functions. Linkage disequilibrium analysis was performed for the exonic regions of these genes using Haploview software version 4.2. SNP density was calculated for 347 previously sequenced individuals from 7 populations in 8 African countries (Mali, Burkina Faso, Ghana, Benin, Zambia, Botswana and Nigeria) (collectively referred to as the Baylor dataset) using the outputs from Haploview software. SNP density in the African populations was compared with those of the 1000 Genomes database.

Results Median overall SNP density is consistently lower in the Baylor dataset than the African population of the 1000 Genomes dataset for all immune receptor classes except for T cell receptor D and G genes. SNP density is higher than the European populations of the 1000 Genomes dataset for most receptor classes except for the TLRs. KIRs have the highest SNP density followed by the LILRs and the T cell receptor beta genes. Except for T cell receptor D genes, individuals from Botswana and Mali have the highest median SNP density.

Discussion Our observations are consistent with previous studies, showing that greater genetic diversity is present in African populations than Europeans. However, the differences are subtle because we are taking into account only exonic regions, which are more evolutionarily conserved than non-exonic regions and hence show little difference in diversity.

Conclusion Genetic diversity in our study population is higher than other worldwide populations but less than that in the African 1000 Genomes dataset. Moreover, genetic diversity is highest in the KIRs, which are reportedly the most genetically diverse among all human genes. Significant variation in genetic diversity is observed between the African population studied. Whether this variation is associated with selective pressures remains to be studied.

Keywords: human genomics, African, immune receptor, genetic diversity

Treatment of industrial wastewater using an intensified constructed wetland technology

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ABSTRACT

This study addresses the development of a novel intensified horizontal sub surface flow constructed wetland (HSSFCW) by integrating adsorption removal mechanism to treat high strength industrial wastewater. The objectives of this study are to (1) assess the intensification of chemical oxygen demand (COD) and phosphate (PO4-P) removal; and, (2) generate a set of rate constants of removal of COD (kCOD) and phosphate (kPO4-P) for intensified beds.Two intensified HSSFCWs were set up using coal ash and alum sludge as substrates. The other two, acting as control, were packed with gravels. The systems were started-up for a period of ten weeks of continuous operation with synthetic wastewater (WW) of low COD concentration (in the range of 107-130 mg/l) and phosphate (23-35 mg/l) respectively at a hydraulic retention time (HRT) of 24 hr and a water depth of 0.40 m. After successful start-up, the system was run at a medium strength WW with COD and PO4-P concentration of 912-1563 mg/l and 316-380 mg/l for 18 weeks. Thereafter, the system was operated at a higher COD concentration of 4801-5021mg/l and PO4-P of 488-520 mg/l for 12 weeks and at a more stronger strength WW having a COD concentration of 6439-7860 mg/l and phosphate concentration of 602-621 mg/l. Samples were taken from the systems and were analyzed for COD and PO4-P. The respective adsorption index (n) of coal ash and alum sludge lies within the range, this study demonstrated that coal ash and alum sludge are potent absorbents and could be utilized to intensify the performance of HSSFCW. The progression of COD and PO4-P removal along the system was fitted into the first order plug flow model (K-C model). The performance and rate constants for the intensified beds were determined and compare to that of the conventional one. The intensified performance of the system in removing COD was enhanced by 43 % using activated coal ash and 49 % for removing PO4-P in alum sludge. Hence, an intensified HSSFCWs using coal ash and alum sludge to increase COD and PO4-P removal has been successfully developed. The intensified beds have the potential to be a suitable sustainable and low-cost wastewater treatment option for the industrial sector.

Keywords: novel, intensified, constructed wetland, adsorption, K-C model

Recent advances in bioconversion of lignocellulosic biomass into polyhydroxyalkanoates (PHAs)

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ABSTRACT

Due to increased awareness of environmental sustainability and the enactment of severe regulations throughout the globe, a worldwide cultural shift is unfolding to progressively phase out petroleum-based plastics in lieu of novel biomaterials that are more ecologically friendly (Khatami et al., 2021). Polyhydroxyalkanoates (PHAs) are promising intracellular microbial biopolymers that have received significant attention due to their biocompatibility, biodegradability, non-toxicity, and eco-friendliness in a wide range of applications such as pharmaceutical, medical, textile, materials, fuel, and agricultural fields (Wang and Chen, 2017). Nonetheless, despite its great market potential, the commercial development of PHA biopolymers is constrained owing to its cost-effectiveness mainly the high processing cost of pure carbon substrates. The goal of this study is to look into the possibility of using low-cost carbon substrates derived from low-value lignocellulosic materials (LCM) that would otherwise be disposed as waste and added to landfill stress to generate biopolymer products utilised in daily life, as well as to improve the functionality and yields of glucose produced from PHA substrates that can be industrially scaled up (Khatami et al., 2021; Pagliano et al., 2021). The resistive nature of LCM, which makes it particularly recalcitrant to sugar extraction for fermentation, is one of the most significant barriers to converting lignocellulosic biomass to fermentable sugars (Govil et al., 2020). This research focuses on the production of biopolymers from lignocellulosic biomass utilizing sustainable techniques such as enzyme and microbial activity in order to evaluate their potential as a replacement for conventional polymers. The analysis is unique in that it examines current developments in pretreatment approaches for lowering the recalcitrance of LCM and PHA production from various substrates and routes.

Keywords: Lignocellulosic Biomass; Polyhydroxyalkanoates; Microbial Biopolyester; Biocompatibility; Biodegradability

Quantifying greenhouse gas emissions from indigenous/traditional agricultural practices: the first step towards sustainable and climate resilient food security in Mauritius

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ABSTRACT

The terms climate change, food security, or sustainable agriculture are in the limelight of current agricultural research, to the point that they have become a backbone in global food security under the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs). Mauritius is not exempted from this paradigm shift, which has gained global momentum, and our local way of conventional farming needs to be re-evaluated if we wish to contribute to the fight against climate change. Present day farming in Mauritius is practiced at the cost of high inputs of fertilizers, pesticides, water, and fossil fuel based energy, all applied on a routine, calendar-basis. This approach not only increases the cost of production, but is also environmentally unsustainable in the long term. The present study investigated the compounding effects of various combinations of mulch, tillage and nitrogen based fertilizer on maize growth, grain yield, and plant biomass in three successive crop cycles in the region of Vacoas. Nitrogen based fertilizer (ammonium sulphate) was applied at 120 kg/ha to its corresponding treatments, and maize mulch was applied as full coverage (24 t/ha). The field trials were set up in a 4x3x2 completely randomized block design with 4 treatments: Control, Mulch, Fertilizer, Tillage, each tested at 2 levels, and replicated 3 times in the trials. Greenhouse gas (GHG) emissions were analyzed using the static polyvinyl gas chambers technique. Out of the eight treatment combinations, the highest CO_2 emission (14.1 g/hr/ha) was recorded under treatment no-tillage x no-mulch x no-fertilizer, while the least emission (8.56 g/hr/ha) was observed under treatment tillage x mulch x fertilizer. The control (tillage x no-mulch x fertilizer) was the 6th most emitting treatment (8.89 g/hr/ha) out of the eight treatments. Quantification of greenhouse emissions was one of the scientific assessments required to evaluate the most promising combination to replace conventional agronomic practices. Other assessments included effect of the treatments on crop yield, physico-chemical properties of the soil and soil quality. Based on the results, no-tillage x mulch x fertilizer represents the best alternative to the conventional practice (control) in terms of soil and crop productivity and lower greenhouse gas emissions. This alternative is cost effective, farmer friendly, and most strikingly emerges from the local ancestral farming techniques that can be used to replace the conventional methods without loss of crop yields and farmer income, while being beneficial to the soil and the agro ecosystem.

Keywords: Indigenous/Traditional Knowledge, Sustainable Agriculture, Climate Smart Agriculture, soil fertility, Soil Quality Index

Impact of Climatic Variability on Pathogenic Fungal (and Fungal-like) Species on Potatoes in Mauritius

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ABSTRACT

Potatoes are considered as one of the most economically important non-sugar food crops in Mauritius (Ministry of Agro-Industry and Food Security, 2016). Unfortunately, the production and yield of potatoes are subjected to considerable fluctuation every season due to attack of the crop by pathogenic agents (Schulte-Geldermann, 2012; van der Waals et al., 2016). The objective of this research was to conduct a survey of pre-harvest fungal diseases affecting potato crops grown in different agroclimatic zones of Mauritius and to study the influence of climatic factors on the incidence of Late Blight (LB), being one of the most devastating diseases of the potato crop. A disease surveillance of potato plantations was conducted in fields from different regions of Mauritius, during the year 2019 to 2021. Disease Incidence (DI) of the main pre-harvest diseases; late blight (LB), early blight (EB), brown leaf spot (BLS), Fusarium wilt (FW) and gray mould (GM) was estimated by counting the number of plants with disease symptoms from 100 random plants and repeated 4 times. In addition, foliar samples of diseased plants were also collected. In the laboratory, suspected fungal agents were identified by microscopy, culturing and molecular methods. Pathogenicity trials were also conducted to confirm the virulence of the fungi on healthy potato leaves. The DI for LB, EB, BLS, FW and GM varied from 0.5-100%, 0.5-95%, 0.2-95%, 10-60%, 1-10% respectively. LB was the most encountered fungal disease on potato leaves. To assess the role of climatic factors on LB incidence, historical daily weather data (maximum and minimum temperature, relative humidity, rainfall and wind speed) was retrieved from MMS and NASA sites. The relationship between DI of LB and weather variables was then determined by a Pearson's correlation. Equally, a predictive model was developed using multi-stepwise regression analysis based on two years of DI and weather data. Over the study period, the DI for LB, EB, BLS, FW and GM varied from 0.5-100%, 0.5-95%, 0.2-95%, 10-60%, 1-10% respectively. The causative agents of LB, EB, BLS, FW and GM were confirmed to be Phytophthora infestans, Alternaria solani, Alternaria alternata, Fusarium oxysporum/ Fusarium equiseti, Botrytis cinerea respectively. The pathogenicity tests confirmed fulfilment of Koch's postulates. In addition to being widespread with incidence as high as 100%, LB was significantly influenced by weather factors temperature, rainfall, wind speed and relative humidity ($R2 = 0.27$, $P < 0.05$). Additionally, results from the multi-stepwise regression model showed a weak positive correlation for relative humidity, maximum and minimum temperature respectively. Overall, we can infer that potato crops in Mauritius are susceptible to infection by pathogenic fungi and fungal-like organisms that can compromise the yield of this important commodity. LB was found to affect potato plantations to different extents and the incidence was strongly dependent on weather conditions.

Keywords: Potato, fungi, diseases, late blight, post-harvest, mycotoxin

Ecology of Coral Diseases on the main reef-building coral, *Acropora muricata*, from Mauritius Island

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ABSTRACT

Coral diseases represent a prominent and lethal threat to the health of the main founding members of coral reef ecosystems- scleractinian or reef-building corals. reports of coral diseases, including their negative effects on the coral community structure, have increased alarmingly worldwide over the last few decades. despite this, little is known about the ecology of coral diseases in the western indian ocean, an area of high marine biodiversity and endemism. here we report the key ecological traits such as the gross lesion morphological diagnosis (using the systematic disease description framework by work and aeby, 2006), rates of progression, size class distribution and prevalence of four common coral diseases (white band (wb), skeletal eroding band (seb), brown band (brb) and skeletal growth anomalies (sga)) on the main reef-building coral species, *acropora muricata*, around mauritius island. in terms of lesion distribution on the colony, most lesions occurred as focal points for wb (100%), brb (75%), seb (83%) and sga (50%). in terms of their location on the colony, most lesion occur at the base for seb (35%), at mid-colony for wb (47%) and brb (54%) and at the colony top for sga (73%). with the exception of sga, the majority of lesions for all the other diseases had distinct edges with smooth margins and were linear in shape. the mean lesion size was 2.3±1.5cm, 1.8±1.6cm, 3.4±5.8cm and 2.1±0.7cm for wb, seb, sga and brb respectively. the mean rate of lesion progression (in $cmday^{-1}$)/tissue loss (in cm^2day^{-1}) was 0.54±0.02/4.52±0.54, 0.18±0.07/0.86±0.40, 0.18±0.09/1.31±0.8 for wb, seb and brb, respectively. the rate of progression of sga was recorded at 0.03±0.03 $cmday^{-1}$. the most susceptible size classes for wb (21%), seb (20%), brb (50%) and sga (67%) was reported to be 20-40cm^2, 60-80cm^2, 40-60cm^2 and >240cm^2, respectively. the highest mean prevalence was reported at 5.95±5.12%, 3.08±4.48%, 8.15±7.42% and 3.25±5.63% for wb, brb, seb and sga, respectively. in addition to systematically describing the common diseases, this study also highlights the vulnerability of the dominant reef-building species of mauritius island to rapidly progressing diseases and possible population structure changes as a direct result of coral diseases. however, further research is required to assess the effect of a globally warming ocean on coral disease dynamics.

Comparison of reef fish biomass and coral cover between 2009 and 2020 at Flic en Flac, Mauritius Island

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ABSTRACT

Coral reefs are a system of particular interest, as millions of individuals along tropical coasts rely on the benefits they provide (Wilson *et al.,* 2010). A number of tropical regions have experienced a rise in sea temperature over the past century and it has been predicted to increase in frequency and severity. Studies have shown that several bleaching events varying from minor to severe subsequently resulted in the loss of the live coral cover around Mauritius Island (Pillay *et al.,* 2002, Obura *et al.,* 2017). In addition to the current global deterioration of reefs due to coral bleaching impacting coral reef fishes; the latter are also impacted by human activities such as overfishing and habitat destruction. This study aims at investigating the impact of coral degradation on the reef fish biomass and their sustainability by considering temporal changes in the reef benthic cover and the associated reef fish biomass. The temporal changes in the reef benthic cover and fish biomass between 2009 and 2020 were assessed at a chosen site at Flic en Flac (FEF), Mauritius Island.Triplicate belt transects of 50 m x 2 m were laid to assess the fish communities occurring at the surveyed site. The percentage live coral cover was assessed along triplicate 50m line intercept transect. The percentage of live coral cover at FEF declined from 51.40±1.42% in 2009 to 1.814±0.70% in 2020 whereas the algal cover increased from 1.66±0.13% to 75.19±13.79%. In 2009, *Acropora muricata*, *Acropora cytherea* and *P.lutea* were present at FEF as compared to 2020, whereby only *P.lutea* was present. A significant difference ($p<0.05$) was observed in the total fish biomass between 2009 and 2020. The total biomass declined by three folds from 281.08±6.23kg/hain 2009 to 96.00817±16.08kg/hain 2020; respectively. In 2009 mainly the territorial *Pomacentridae* fish family was present at FEF whereas in 2020, the occurrence of five fish families were noted, namely; *Pomacentridae, Labridae, Acanthuridae, Mullidae* and *Balistidae* families.FEF which was a non-degraded site in 2009 changed to a degraded site in 2020. The results indicated that the coral reef system of FEF shifted from a coral-dominated state to a rubble/algal-dominated state. It has been observed that following a decrease in coral cover, there was a drop in total biomass which could be indicative of either augmented mortality or relocation of fishes to alternate habitats. The results presented here suggest that deterioration in the coral reef habitat, either due to climate change or anthropogenic activities, poses a threat to the reef fishes, warranting close monitoring and possible rehabilitation strategies in certain localities.

Keywords: coral, coral reef, reef fish, fish biomass, total biomass

Coral bleaching patterns during three bleaching events at Flic-en-Flac and Belle Mare, Mauritius

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ABSTRACT

Coral reefs worldwide are under increasing threat from the effects of bleaching by increased sea temperatures which is predicted to be increasing at 1-2°C per century in many tropical regions (Hoegh-Guldberg, 1999).From 2001 to 2016, Mauritius has suffered from a series of bleaching events with varying degrees of bleaching. In 2016, the worldwide worst coral bleaching event led to more than 60% of coral to bleach on the Great Barrier Reef, Australia (Hughes *et al.,* 2017) and for Mauritius 56% of corals bleached (Obura *et al.*, 2017). However, in Mauritius detailed studies on bleaching are yet to be conducted. In this study we document field observations of the bleaching susceptibility of 9 different coral species, namely, *Acropora muricata,* tabular *Acropora sp., Galaxea fascicularis, Pocillopora damicornis, Lithophyllon sp., Porites rus, Montipora aequituberculata, Pavona cactus, Porites lutea* during three bleaching events in 2010, 2016 and 2019. Coral colonies were surveyed along a randomly set 100 m^2 belt transect and a visual assessment of bleaching was performed using the Coral Health Chart of Coral Watch at Belle Mare (BM) and Flic-en-Flac (FEF). The percentage of coral bleached was calculated by counting the number of colonies that were bleached out of a total of 30 colonies for *A. muricata*, 20 colonies for tabular *Acropora sp.*, *G. fascicularis*, *P. damicornis*, *Lithophyllon sp.*, and 10 colonies for *P. rus*, *P. lutea*, *P. cactus* and *M. aequituberculata*, respectively. The accumulation of thermal stress experienced by coral reefs in an area over the past 12 weeks was measured as the Coral Bleaching Degree Heating Weeks (DHW). The DHW values for 2011, 2016 and 2019 at BM were as follows: 8.7 °C-weeks, 12.6 °C-weeks and 7.5 °C-weeks. *Acropora muricata* and tabular *Acropora sp.* were the most susceptible to bleaching whereas *M. aequituberculata*, *P. lutea* and *P. cactus*, were the least affected. About 95 % of *A. muricata* and tabular *Acropora sp.* were bleached in 2016 at both Flic-en-flac and Belle Mare. *Galaxea fascicularis* showed an increase in bleaching in 2016 and 2019 compared to 2010. *Montipora aequituberculata* bleached more in the year 2016, 76.7% at Flic-en-flac and 83.3% at Belle Mare compared to 2010 and 2019. The percentage coral bleaching was significant in 2016 as it was the most stressful year with DHW values greater than 8°C-weeks. Variable field-observed bleaching susceptibility and tolerance of coral species have implications for better coral reefs management and rehabilitation in an era of a globally warming marine environment.

Investigation of the physico-chemical aspects of Ocean Acidification in some selected lagoons around Mauritius

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ABSTRACT

Climate change is affecting the world's oceans by the increased absorption of carbon dioxide which results in a decrease in seawater pH and shifts in the chemical equilibria, promoting adverse ecological catastrophes in a phenomenon known as ocean acidification (OA) (Abril et al., 2021; Middelburg et al., 2020). In this project, we aim to study the variability of pH and total alkalinity (AT) of seawater to elucidate the current status of the carbonate chemistry around Mauritius and to detect possible trends due to OA. Using the t-test statistical tool, we also compare different sites on both temporal and spatial bases. Seawater samples are collected twice per month for each site: Flic-en-Flac (FF, −20.27, 57.37), Albion (AB, −20.19, 57.41), Mont-Choisy (MC, −20.01, 57.55), Trou-d'Eau-Douce (TD, −20.23, 57.80), and La Cambuse (LC, −20.45, 57.70) at a depth of 0.6 m and using borosilicate bottles. The samples are analysed for pH and AT using UV-Vis Spectrophotometry and potentiometry, respectively. Mean values of pH and AT are obtained during July-Oct 2021 as follows: 8.05 ± 0.10 and 2464.2 ± 116.1 µmolkg−1 (FF), 8.11 ± 0.09 and 2423.7 ± 93.1 µmolkg−1 (AB), 8.14 ± 0.12 and 2494.3 ± 87.1 µmolkg−1 (MC), 8.01 ± 0.10 and 2471.0 ± 78.4 µmolkg−1 (TD) and 8.08 ± 0.09 and 2397.8 ± 73.3 µmolkg−1 (LC). Overall means of pH and AT across Mauritius are 8.08 ± 0.11 and 2451.1 ± 97.5 µmolkg−1, respectively. The salinity at all sites remains almost constant at 35 ‰ with the in-situ temperature increasing as the summer season approaches. A positive correlation is obtained between pH and temperature, implying that the pH increases as the temperature increases. AT is not found to vary with temperature. The t-tests do not reveal discrepancies between the sites, indicating similarity in the water quality. These results allow us to have insights on the seawater carbonate chemistry across Mauritius.

Keywords: Ocean acidification, pH, Total Alkalinity, Mauritius

ENERGY

Gendered-Innovation and Energy Management: Green Electricity in the Domestic Sector in Mauritius

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ABSTRACT

The main aim of this research project is Energy Management with the Integration of Gendered-Innovation in Design of Green Energy for Domestic Use in Mauritius. As per Fathallah et al. (2020), rigorous empirical studies starting from household level is required to better understand gendered impacts of energy.

As a hypothesis, the project can be expressed as follows:
Gender consideration impacts on the development (or not) of domestic green energy systems in Mauritius (or will do so in the future). This project may prove or disprove this hypothesis considering Energy Management as a systemic endeavor through technology and behavioral/organizational approaches to optimize the use of energy in households in view of sustainability.

In the conclusions of the UNDP report (Mauritius | UNDP | B.15/07, 2015) on Gender Assessment, it is stated that there is a need for gender-disaggregated data and indicators to establish a baseline in which to measure improvements and identify areas of focus.

Methodology
Level 1 national survey has been completed with some 400 replies secured covering all districts of Mauritius including Rodrigues. Collected data is being validated against Living Conditions Survey 2018/2019 statistics collected by Statistics Mauritius.

Survey sizing was based on a similar study by Permana et al. (2015) in Indonesia which concerned a population size of 400,000 households. With a confidence level of 95% and 5% margin errors, the expected sample size was 384. In Mauritius there are 400,000+ households connected to the CEB network. Level 2 survey has started targeting some 100 households with a longer questionnaire probing renewable energy issues further. Level 3 survey – Detailed case studies on 2 to 3 households will be planned following outcome of Level 2.

Keywords: Gendered Innovation, Energy Management, bottom-up design, gendered disaggregated data

Decarbonizing Energy Systems of African SIDS for Long-term Energy Scenarios

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ABSTRACT

Introduction

The increasing economic growth and population of African small island developing states necessitates a consistent and dependable supply of energy to meet demand. With the effects of global warming and climate change, there is a growing interest in identifying renewable energy sources that can make the energy generation more environmentally friendly while also reducing our reliance on fossil fuels.

Aims and Objectives

The aim of this study is to investigate the pathways to optimally decarbonize the energy system of the African small island developing states.

Methodology

Data were gathered from published reports and collected from energy utilities of the African SIDS. The Open-Source Energy Modelling System (OSeMOSYS) is an energy system optimisation tool used for energy planning was utilised. It can be used for predictive and for explorative scenarios and it has the optimisation objective of finding the least cost solution for the modelled period (Howells et al. 2011; Gardumi et al. 2018).

Findings

The findings reveal that unless climate policy improves, annual coal power output is likely to double by 2040, from 1554 GWh in 2015 to 3087 GWh in 2040, corresponding to a 98.6% rise in emissions from coal power plants. The gradually scaling up green energy scenario until 2030, demonstrates that emissions may be significantly reduced by systematically downsizing coal and other fossil fuel technologies. In comparison to the business as usual case, the 60% renewable energy scenario is expected to reduce annual emissions of greenhouse gases by 66.5 percent in 2030 and 93.4 percent by 2040.

Conclusion

The slowly ramping up renewable energy and by progressively phasing out coal and other fossil fuel technologies, it is possible to substantially reduce emissions.

Keywords: Energy, African SIDS, Energy Modelling, Climate Change, Decarbonisation

Development of a framework for predicting photovoltaic plant power output considering temperature effects under real conditions to enhance grid stability in Mauritius

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ABSTRACT

The rapid development of renewable energy has become a global consensus in the face of the severe energy crisis and growing fossil fuel pollution [1]. Owing to its clean and green nature, solar energy is one of the most rapidly-deployed alternative energy sources in the world [2] and solar photovoltaic (PV) systems convert solar irradiation into electric power using PV cells [3]. Nevertheless, there are constraints that hinder the large-scale integration of PV in the electricity mix. Most importantly, the stochastic nature of solar power poses considerable challenges to the reliability and stability of electrical energy systems and can lead to inefficient utilities planning and substantial financial losses. For a country like Mauritius which intends to considerably increase the contribution of Renewable Energy (RE) sources in its electricity mix from 21.7% presently to a target of 60% in 2030 [4], it is therefore imperative to improve the prediction accuracy of the output of solar PV plants to enable better planning of their integration to the grid. The present research, conducted in collaboration with the local electricity utility – the Central Electricity Board (CEB), focuses on the development of a practical PV plant output forecasting framework that incorporates the impact of site-specific conditions of Mauritius in view of improving the accuracy of its predictions. This will allow the CEB to reliably plan ahead the amount of renewable electricity available so that it can schedule its other plants to meet the remaining electricity demand. The proposed PV power output forecasting framework will also enable the integration of more RE sources in the grid while reducing the investment on costly Battery Energy Storage System (BESS) systems.

Keywords: Photovoltaics, Renewable Energy, forecasting, site-specific, energy planning

A Small Vertical Axis Wind Turbine Hybrid system for Integration into Domestic Use in Mauritius Using Numerical Simulations and Optimization Techniques

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ABSTRACT

The aim of the research is to design, while including gender consideration, and to validate an integrated hybrid wind energy system model for domestic use in Mauritius using a small vertical axis wind turbine (VAWT). Research has been conducted to assess the demand profile for domestic purposes. A Level 1 survey was carried out with a sample size of 120 people and it was found that 36% of households pay between Rs500 – Rs1000 of Central Electricity Board (CEB) bills, 26% between Rs1000 - Rs1500, while 30 % pay above Rs 1500 per month. From the data, Mauritian households will require an energy system between 1 kW to 3kW. With the power output determined, the design of a small-scale wind turbine was performed with the focus laid on H-Darrieus VAWTs (shown below). A 3-bladed H-rotor VAWT using airfoil FX66-S-196 was made as a preliminary design was made. 3-bladed designs were favorable since it increases rotor stability, eliminates symmetrical loading, reduces rotor's torque output, thus reducing vibrations and noise while increasing reliability. Most of the other components have been designed, and will be analyzed using finite element analysis (FEA). The stresses obtained after conducting the simulation will be compared to the yield stress of the chosen material to verify the structural integrity of each component. Material selection for each of the components will be proposed while taking into consideration cost, usage and efficiency (Kyaw *et al.,* 2019). Different airfoils will be investigated to determine the most optimum VAWT through numerical calculations on Q-blade, and a mesh sensitivity study will be performed for each blade to ensure mesh independent results.

Figure 1: H-Darrieus VAWT

Ansys Fluent with the 6 degrees of freedom (6DOF) solver will be applied to estimate the performance of the VAWT. According to Celik *et al.,* (2020), the deviation between the experimental data and the present 3D result is found to be around 8.57% while it is 21.95% between the 2D and experimental data at the steady state condition. Finally, the manufacture, transport, installation, maintenance, operation and decommissioning of the system will be analyzed after the optimized system has been established using the HOMER software. The benefits particularly towards women and to the Mauritian economy will be assessed holistically.

Multi-objective optimisation of distributed generation units and custom power devices with simultaneous distribution network reconfiguration

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ABSTRACT

As the physical expansion of the power system is costly, it is essential to implement other plans to satisfy the growing electricity demand. This can be achieved by using distributed generation (DG) units. Nowadays, DG units from renewable energy sources are favoured to minimise carbon emissions (Mehrjerdi *et al.* 2020, p. 1).However, the fluctuations in the output of these DG units lead to bottlenecks and congestions in the distribution system. Distribution network reconfiguration (DNR) and the integration of custom power devices (CPD) can help to remedy the situation (Zhang *et al.* 2012, p. 138). However, optimisation is needed to identify the most appropriate parameters of the DG units, CPD and DNR. To ensure the best performance of the power system, it is expected to consider the maximum number of objectives and constraints in the formulation of the problem. In this study, a tri-level optimisation approach is proposed. Firstly, objective reduction approaches are applied to eliminate redundant objective functions thereby minimising the computation time (Yuan *et al.* 2017, p.1). In the second level, multi-objective optimisation algorithms are applied to identify the Pareto optimal solutions. Hybrid algorithms are developed to account for the limitations and benefits of individual algorithms. Lastly, decision-making techniques are adopted to select the most desired solution from the Pareto optimal solutions.

Keywords: multi-objective optimisation, distributed generation, custom power devices, distribution network reconfiguration

FINANCE /FINANCIALMARKETS

A Theoretical Model of Directed Lending Policy

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ABSTRACT

This paper attempts to develop a theoretical model of credit market intervention program ofdirected lending to address the problem of credit market inefficiencies. The existing literaturelooks at these inefficiencies based on un-observable characteristics of the borrowers to thelender, however the model attempted in this paper looks at the inefficiencies based onobservable characteristics of the borrowers by introducing screening costs in the model. Theoptimized expected payoff of the lender shows that the loan contract, comprising of loanamount and the interest rate charged, offered to informationally opaque borrowers is differentand un-favorable than that offered to informationally transparent borrowers. To mitigate thisinefficiency, we introduced an additional constraint of extending a minimum loan amount tothe disadvantaged group in this optimization exercise. The results of the modified modelindicate that the loan amount to these borrowers increases at a lower interest rate. Thisdemonstrates the effectiveness of the government intervention program of directed lending.

At the same time, the results also show that the loan amount offered to the transparentborrowers falls. Further, we calculate the optimal level of mandated lending to maximizesocial welfare. The results indicate that the mandatory lending to these disadvantagedborrowers should not exceed half of the total loanable funds. The mandated lending should bemaximum when screening cost relative to the cost of borrowing is the least.

Keywords: credit market inefficiency, directed lending program, intervention, mandatedlending, priority sector

Analyzing The Impact of Exchange Rate and Exchange Rate Volatility On Tourism Demand Using Disaggregated Data: Evidence from Mauritius

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ABSTRACT

The purpose of this study is to investigate the impact of exchange rate and exchange rate volatility on inbound tourism demand to Mauritius, a tourist dependent economy. The study uses dynamic panel data analysis, namely an autoregressive distributed lag (ARDL) model, over the period 1999-2019 from 13 major countries of origin and the sample is further splitted intro two groups: Euro zone and non-Euro zone countries for additional insights. Results shows that in the long run exchange rate volatility has a negative and significant effect on tourism demand for the three samples of origin countries while exchange rate has a significant and negative impact on tourist arrivals from the 13 countries of origin and non-Euro zone countries. Income in the home countries affect tourism demand significantly for the three types of home countries. Relative price and tourism infrastructure in Mauritius, on the other hand, are significant determinants of tourism demand from the Euro-zone countries and the 13 origin countries only in the long run. In the short run, the coefficients do not the expected signs as tourist coming to Mauritius were mostly on inclusive (package) tours which are paid in advance according to (Orhan, et al., 1998). The error correction term has the negative sign and is statistically significant at a 10% level for all models. The empirical results suggest that policymakers should give serious consideration towards improving the tourism infrastructure in Mauritius such as convenient transportation, viable hotels and proper security arrangements to attract the potential tourists.

Keywords: tourism, exchange rate, exchange rate volatility, ARDL

Are Regulations and other Latent Factors Important in Explaining Residential Land Prices in Mauritius?

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ABSTRACT

In the land market, land prices fluctuate over time. This is mainly a consequence of the demand and supply of land in the market, which changes over time as a consequence of underlying factors affecting the level of land demand and land supply. Different factors have been identified in past research as causing the changes in land demand and supply, these are mainly considered as macroeconomic, and demographic factors (Davis and Heathcote, 2007). Another category of factor that could also be influencing land demand and supply consists of land regulations and other non-measurable factors, which have been relatively understudied (Kok et al., 2014).

This study aims at gathering a better insight into the factors affecting land prices. More specifically to decipher if land regulations could be significantly influencing the evolution of residential land prices. Data on residential land prices and other variables, namely macroeconomic and demographic, are collected on an annual basis over the period 1980 to 2019. The time-series data is studied by using a structural time series model, which can incorporate both quantifiable and latent variables when performing the regression analysis. An initial analysis depicted that residential land prices have been following an increasing trend over the study period, as well as containing cycles. The trend included as an unobserved component in the model and measuring the influence of latent variables is significant in explaining residential land prices. Subsequently, it was determined that fundamental factors such as population (aged between 15 – 65 years), unemployment, interest rate, and residential building permits (measuring the supply of land) were also major determinants of land prices. The study highlights that policymakers should be judiciously fixing regulations and other aspects directly linked to the land market as these are important in justifying changes in land prices.

Keywords: residential land price, macroeconomic, demographic, behavioral, regulations, foreign real estate investment

Impact of Exchange Rate Volatility on Export: Evidence from Mauritius

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ABSTRACT

International trade has gained momentum due to globalization. Unfortunately, the outbreak of the COVID-19 pandemic has brought trade across countries to a halt. As a matter of fact, owing to the local and global measures imposed to limit the spread of the pandemic, global merchandise trade and service volume experienced significant contractions of about 5.3% and 8%, respectively in 2020 (WTO, 2021). COVID-19 has dismally shaken the Foreign Exchange Market, thereby heightening foreign exchange exposures. Mauritius was unfortunately not spared Exporters and tourism operators are more and more reluctant to operate in such an unpredictable situation. The study sets out to shed light on the effect of exchange rate volatility (ERV) on the Mauritian export trade system in terms of its leading export partners, namely South Africa, France, United Kingdom, United States of America and Madagascar. The paper will employ the Autoregressive Distributed Lag (ARDL) approach to examine the long-run and short-run relationship between ERV and export using annual data spanning over a time frame of 1980 to 2020. While export will be the explanatory variable, the gross domestic product of both the home and the country of destination, inflation rate, exchange rate, ERV and the trade cost, proxy for transportation cost will be the control variables. ERV will in turn be measured using the GARCH model. Depending upon the effects of ERV, existing policies and trade agreements can be evaluated. Therefore, this study can assist in the formulation and development of appropriate policies to be adopted by stakeholders such as exporters to mitigate the risk of losing out on a transaction and governments to maintain an export-friendly macroeconomic environment.

Analysing the legal framework for electronic commerce from a consumer-oriented perspective: Using Mauritius as a case study

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ABSTRACT

The pandemic led to consequential changes in our lifestyle including the ways in which we work, we eat, we live and most importantly and most relevant to this study here is in the way we trade (Perreve, 2020). By being confined and by avoiding to go out for sanitary and security reasons, people had to devise innovative ways to continue to meet with and procure themselves with their basic needs. In this perspective, electronic commerce became the perfect alternative. A report of the UNCTAD in 2021 (UNCTAD, 2021) makes mention that global electronic commerce jumped to $ 26.7 trillion in 2020 and this upsurge was largely triggered by the Covid-19 pandemic.

Thus, in the contemporary pandemic context, digital trade is allowing economies to function, if not survive, and preventing the so meticulously-crafted post-world war multilateral global economy from a systemic collapse. Digital trade is the future of trade. From the suppliers' as well as the customers' perspectives, many benefits can be drawn from and many opportunities lie in an adoption of e-commerce practices but this also comes with its own threats and challenges.

Some of the main threats linked to the digital trade ecosystem relate to online consumer protection, cyber security, data governance and privacy, cross border sharing of information, competition, intellectual property issues…etc. This research work aims at further expounding on these threats so as to come up with a conceptual framework that will contribute in devising a regulatory framework that will allow electronic commerce to happen in a secure, trusted and safe environment.

Keywords: Electronic Commerce, Digital trade, Regulations, Online Consumer Protection, Cybersecurity, Data Protection.

The Impact of Trade Facilitation on Trade Flows: A Meta-Regression Analysis

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ABSTRACT

Ever since the adoption of the World Trade Organisation (WTO) Agreement on TradeFacilitation in December 20131, there has been mixed conclusions from various researchers in determining the relationship between trade facilitation and trade flows. This paper, therefore, applies a meta-regression analysis (MRA) to the empirical literature of 72 studies (providing 2797 estimates of the effect size) – published between 2003 and 2020, to; (i) determine the extent to which the effect is affected by publication selection bias, and (ii) determine which sources explain the wide variations in the reported effects between trade facilitation and trade flows.

Interestingly, this paper suggests that trade facilitation initiatives do enhance the overall trade performance of an economy - thereby making international trade easier by reducing administrative delays and uncertainty, simplifying procedures, improving predictability, *inter alia*, incorporating new technologies in trade. Though the results show the existence of an overall authentic effect beyond publication bias, its size is relatively small. With regards to potential sources of heterogeneity in reported estimates, this paper finds that differences in primary studies affect reported effect size. For this reason, 52 control variables which accountfor the source of heterogeneity are revealed and classified as follows; (i) country determinants, (ii) geographical coverage (iii) data characteristics, (iv) specification determinants, (v) authors' modelling strategies samples, and (vi) publication characteristics. Given the variety of methodologies, samples and measurements, a weighted least squares meta-regression analysis (WLS-MRA) approach has been applied to test for the robustness of the estimated influences on the effect size and to adjust for potential heteroscedasticity (Stanley and Doucouliagos, 2014)2. All in all, the MRA evidence of the pronounced heterogeneity of the findings providestheoretical and empirical enhancement, which is; (i) instructive for key policymakers in devising strategic decisions by establishing that the effect of trade facilitation measures on trade flows is sufficiently robust to generalize across countries; and (ii) to enable national leaders and private sector traders understand the challenges they and their trading partners face in reducing logistical barriers to international commerce.

Keywords: Trade Facilitation, Trade Flows, Meta-Regression Analysis, Publication Bias, Heterogeneity

Does corruption perception matter for foreign investors? A conceptual Analysis

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ABSTRACT

Foreign Direct Investment (FDI) has proved to be highly beneficial for developing countries. With an increased flow of FDI, there are important spillovers effects to the host country in the form of technological improvement and managerial know how, increased in capital flow, creation of employment, increased in government tax revenue among many other developmental factors. In this paper, the empirical literature is carefully reviewed on the relationship between corruption and FDI inflow from 2000 to 2020 by focusing on more recent studies. Throughout the past years, despite a considerable number of theoretical and empirical studies, there is still no settlement on the direction of the impact of corruption on foreign direct investment. Although the general understanding is that corruption is detrimental and is most likely to deter FDI in a country, past studies have shown that the impact of corruption on FDI inflows is subject to much ambiguity which has led to the formation of two main theories; the "grabbing hand" or "sand in the wheel of commerce" theory and the "helping hand" or "grease in the wheel of commerce" theory. Supporters of the "grabbing hand" theory are of the aspect that corruption acts as an obstruction to FDI inflows which is mainly supported in developed countries while on the other hand, advocates of the "helping hand" theory suggest that corruption can be beneficial in attracting FDI inflows which is mostly believed to occur in developing countries. Even though the methodologies applied and the framework of the various empirical investigations reviewed differ considerably, the paper has mostly shown that there is no general agreement on the nature of corruption-FDI nexus. While the outcomes of the studies are dominated by the confirmation of the "grabbing hand" hypothesis, some have supported the "helping hand" hypothesis, whereas few concluded on insignificant relationships between corruption and FDI inflow. These contradictory outcomes from numerous studies have notified some scholars to explore the connection between some specific aspects of FDI with corruption in a more dynamic framework. Subsequently, the areas of concern from the review have been shown in the discussion of the findings and the paper has also supported the need for further studies in this area with relevant approaches.

Keywords: FDI, Corruption, grabbing hand, helping hand

Attitude towards mobile payment services (MPS): A study on Merchant and Customer Adoption and usage in Mauritius

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ABSTRACT

COVID-19 has undeniably propelled the case for digital payments to unprecedented heights. Indeed, the World Health Organization (WHO) advice that consumers utilize contactless payment methods instead of cash since, in addition to involving human connection, it has the potential to spread the virus through the organisms on it.

Banks and payment businesses have responded with new initiatives to deal with the new reality, while regulators and government agencies have responded by limiting currency in circulation and quarantining bank notes. They're also encouraging people to use digital payments by raising the cap on contactless transactions in dozens of nations around the world.

Card usage has increased dramatically in the last year, particularly in the e-commerce sector. MIPS (Mauritius' Multiple Internet Payment System) reported 14,000 new e-commerce customers and 373 percent new e-commerce merchants. Increased consumer engagement on fundamental commodities like food led to a 400 percent increase in e-commerce transactions by value. (MIPS, 2020). During COVID-19, investments in tap-and-go and POS upgrades, as well as a rise in the contactless limit, resulted in a nearly four-fold increase in contactless transactions and a more than 50% growth-on-growth. In the post-COVID situation, it's worth noting that transactions have remained consistent with those seen during the lockdown, indicating that "people are becoming acclimated to e-commerce."

Indeed, COVID-19 has supplied a response to the long-standing question: Are Mauritians ready for e-commerce and digital payments in general? – while emphasizing that the answer is as simple as a resounding 'yes' to the question of whether people are ready to go from horses to vehicles in the past. However, the correct question in this context is – Is the market ready to offer digital payments? – which will be the focus of our research.

Keywords: Digital payment, COVID, E-commerce, Mauritius

Impact of Risk on Financing Decisions: Evidence from SADC Countries

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ABSTRACT

The purpose of the study is to investigate the impact of idiosyncratic and macroeconomic risks on companies' financing decisions on SADC countries over a twelve year period spanning from 2008 – 2019. Unit Root Fisher Chi- Square Test and Granger Causality test were employed to test for unidirectional and bidirectional relationships cross-sectionally. System GMM was applied as main topology for panel regression analysis. Financing decisions were measured using Net Profitability, Net Equity ratio and Debt to Equity ratio. Estimates reported that there is a significant negative relationship between risk and Net Profitability and Debt to equity ratio. In other words, risky companies in SADC countries diminish leverage in their capital structure. The reason is that banking and financial institutions might charge a higher risk premium for companies having a high risk profile. Ultimately, the cost of debt financing might augment. Consequently, companies prefer to employ internal financing (retained earnings) and reduce the level of debts due to high bankruptcy risk and costs. This finding is in line with the pecking order theory (Myers and Majluf, 1984); Rashid (2012), Sattar (2019). Conversely, the estimates posit that there is no significant relationships between risk and Net equity. This indicates that risks have no relevant impact on this type of financing decision. This refers to the aspect of Modigliani and Miller Approach theory (MM1- Proposition 1) thus reporting that the market value of a firm is affected by its operating income, apart from the risk involved in the investment.

Keywords: Risk, Financing Decisions, SADC Countries

Impact of Capital Structure on the firms' performance: Evidence from Mauritius

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ABSTRACT

This paper analyses the impact of capital structure on the performance of non-financial firms listed on the Stock Exchange Mauritius. This area of research extends empirical findings in two ways. First, it analyses the impact of capital structure on the performance of firms listed on the Stock Exchange Mauritius, which received little coverage so far. Subsequently, the impact of debt maturity on the firm's performance was studied. A sample of 32 non-financial listed companies was considered based on the availability and completeness of data from 1997 to 2017.

For the purposes of this study, size, liquidity and tangibility were studied as control variables. Preliminary analysis of the data showed that firms listed on the Stock Exchange Mauritius have more short-term debt as compared to long-term debt in line with the practice in African and developing countries. The unit root test resulted in a combination of I(0) and I(1) and a panel ARDL model was applied to the dataset. Results showed that the capital structure is an important determinant of the firm's performance in the long run and that liquidity was an important factor impacting the firm's performance in the short run. An inverse relationship was observed between the capital structure and performance in line with Sheikh and Wang (2011), Muscettola and Naccarato (2015) and Seid (2017) amongst others, thereby confirming the pecking order. Results also showed that the impact of short-term debt on the performance of the firm is not significant and the impact of long-term debt on firm's performance is significant in the long run.

The results are in line with empirical findings from developed and other developing countries. The cost of debt and the cost of equity in Mauritius is still considered as high and firms tend to resort to short-term debt to close their working capital gap. Results also conferred an agency problem in Mauritian listed firms and that debt could also be used as a signal by managers.

Key words: *capital structure, performance, ARDL, pecking order theory, agency problems*

COMPUTATIONAL SCIENCES AND MODELING

Computational Study of the Interactions of Cocaine with Fingerprinting Reagents

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ABSTRACT

In recent years, there have been a rise in drug abuse and trafficking cases and thus it has become important to find ways to deter these threats to the society. Cocaine is one of the most common drugs and the United Nations (UN) statistics shows a global increase of seizures, trafficking and illicit manufacture of cocaine from the year 2018 to 2020 (UNODC, p.). The cocaine seizure in Mauritius is also significant as reported by the UN in 2019. One way to decrease drug use and trafficking is to improve detection strategies. In fact, traces of cocaine may be present in latent fingerprints of drug users or traffickers (Bailey et al., 2015, p.6254–6259). Latent fingerprint is the unintentional fingerprint left on a surface by deposits of oils and/or perspiration from the finger. Hence, detection of drugs in latent fingerprints is non-invasive as compared to matrices such as blood or urine. Latent fingerprints are commonly analysed by fingerprinting reagents, however the effect of drugs such as cocaine on these reagents is unknown. There exist challenges to study the interactions between cocaine and fingerprinting reagents at molecular level. Therefore, the aim of this research work is to study the interactions between cocaine and fingerprinting reagents, namely 1,8-diazafluoren-9-one and 1,2-indanedione using computational methods. In this presentation, the theoretical results obtained so far will be discussed. The results show that cocaine effectively binds with both reagents. However, cocaine has higher affinity for 1,2-indanedione. The findings of this research will be useful for the detection of cocaine when present in latent fingerprints and can serve as a reference to study other psychoactive substances interacting with fingerprint reagents. This research is in line with SDG3 more specifically the Target 5, which is "Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol" (UNITED NATIONS).

Keywords: Cocaine, latent Fingerprint, indanedione, DFO, Density functional theory

Novel Computational Methods for Solving Fractional Partial Differential Equations

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ABSTRACT

Fractional partial differential equations (FPDEs) have become of increasing use for modelling physical processes. For example, they best describe anomalous diffusion of contaminants in porous media where the asymptotic long time behaviour of the mean square displacement is non-linear compared to linear time mean square displacements for Gaussian diffusion. Very few of the FPDEs employed in practice have analytic solutions. For some equations which admit closed-form solutions, evaluations of these analytical solutions give rise to unstable numerical evaluations and therefore numerical partial differential equations methods are most needed for efficient and accurate computations of solutions.

Given the range of applications of FPDEs in modern science and engineering, it is imperative to develop novel numerical procedures that possess the key requirements of stability, convergence, speed and accuracy. This present research proposes a novel suite of numerical solvers for the solution of the time fractional diffusion equation (TFDE). Various schemes have been proposed to solve the TFDE and a common feature is the discretisation of the Caputo time-fractional derivative using the standard L1 scheme. The main aspect that distinguishes the current work from earlier proposed numerical techniques is that the numerical algorithms are based on more efficient approximations of the Caputo time-fractional derivative in the framework of a three-point local radial point interpolation method (LRPIM) as these offer the possibility of bringing high levels of efficiency in numerical algorithms due to the meshless nature of radial basis functions.

The high-order L1-2 and L2-1$_\sigma$discretisations for the Caputo time-fractional derivative are considered and a technique based on analytical shape functions in a three-point local radial point interpolation framework is used to approximate the spatial derivative. The numerical schemes are simple and straightforward to implement. Stability of the schemes are established using Fourier analysis and energy methods. Various numerical tests are carried out and the computational results demonstrate that the numerical results of the schemes are reliable and achieve high-order convergence in time as predicted theoretically.

Keywords*:* Fractional Diffusion Equation, Radial Point Interpolation, Caputo Fractional Derivative, Order of Convergence

A Theoretical Investigation of the SN2 Reactions of the Chloromethane Reactant with Methyl-Containing Ion-Pair Nucleophiles

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ABSTRACT:

The bimolecular nucleophilic substitution (S_N2) reaction occurs when a nucleophile attacks a reactive atom centre in a molecule and causes the leaving group to depart simultaneously. A typical S_N2 reaction takes place through the backside (S_N2-b) and frontside (S_N2-f) pathways (Figure 1). The S_N2-b and S_N2-f pathways generate products with different configurations about the reactive atom centre.
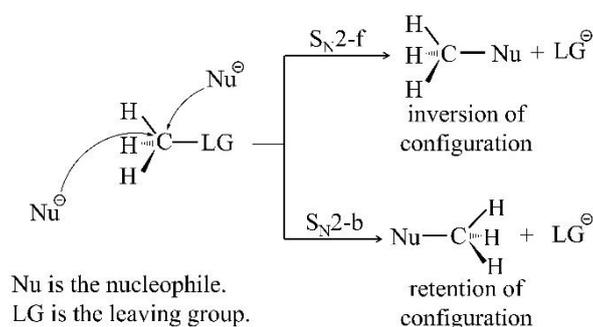
Figure 1: The S_N2-b and S_N2-f pathways of a typical S_N2 reaction

Several factors govern the S_N2 reactions, namely, the reactive centre, nucleophile and solvent. In continuation to our interest in the S_N2 reactions [1-3], the aim of this project was to use bulk solvation and microsolvation to establish the combined effect of the solvent and the cation on the $CH_3Cl + M_nCH_3^{(n-1)}$ (M^+ = Li^+, Na^+, K^+ and $MgCl^+$; n = 0 and 1) S_N2 reactions using the OLYP/6-31++G(d,p) method. The dimethylether (DME) molecules were used to determine the influence of the solvent at the molecular level. The strain and interaction energies between deformed reactant fragments were determined using the distortion/interaction-activation strain model. An increase in the number of DME molecules coordinated to the nucleophile increased and decreased the activation energy of the S_N2-f and S_N2-b pathways, respectively. This difference occurred as a result of the extent of charge separation in the transition states of the pathways. The findings from this project may help experimentalists to avoid trial and error in S_N2 syntheses by predicting the most favourable outcome.

Keywords: Bimolecular nucleophilic substitution, computational chemistry, reaction mechanism, activation strain model

Autoregressive Conditional Duration Modelling for High Frequency Financial Data

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ABSTRACT

As the microstructure literature provides evidence of a negative relationship between volatility and the conditional duration, the Autoregressive Conditional Duration (ACD) model can be used to derive intraday volatility and quantify market risk. An intraday Value-at-Risk (VaR) is defined as the maximum expected loss that will not be exceeded at the time horizon of the next trade. Banulescu et al. (2016) present an ACDGARCH model whereby predicted expected durations from the ACD model are used as explanatory variables to estimate the parameters of a time-varying Generalised Autoregressive Conditional Heteroscedastic (GARCH) model. However, Banulescu et al. (2016) only considers an Exponential-ACD (E-ACD) extension during estimation whereas throughout the years, more flexible ACD extensions have been proposed by changing the functional form of the expected duration or the error distribution assumed for the standardised durations. Our objective is to investigate whether the type of ACD model used in the ACD-GARCH setup has any impact in IVaR calculation. 36 distinct ACD-GARCH models are formulated using six ACD functional forms and six error distributions. For the empirical application, three highly traded ETFs are chosen from the U.S market. One-step ahead VaR forecasts are generated at a risk level of 1%. An adequate risk model should have good unconditional and conditional coverage.No significant difference is noted when the likelihood ratio tests of unconditional and conditional coverage are conducted on the 36 ACD-GARCH models. Hence, it is concluded that the choice of the error distribution or the functional form of the ACD model does not influence the estimation of IVaR and a simple E-ACD model suffices. Such a result is useful to econometricians as estimating simple ACD combinations are computationally efficient since lesser model parameters are involved. Furthermore, this greatly reduces computational time which is helpful when dealing with high-frequency data which most of the time contain over millions of entries.

Keywords: Autoregressive conditional duration, Exchange traded funds, High frequency financial data, Risk measurement, Value-at-Risk

Automatic Translation between Kreol Morisien and English using a Hybrid Rule-Basedand Deep Learning Algorithm

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ABSTRACT

Language forms part of culture, and it also reflects an identity. The exquisiteness of Kreol Morisien (KM) is that the language belongs to everyone instead of a single ethnic group of Mauritius. KM is neither a dialect nor a patois. It is now considered as a language on its own and has great value since it is used by Mauritians daily. Language translation is widely used by tourists, students among others. Unfortunately, less prevalent languages, such as KM, are not catered for by popular translation tools such as Google. Pudaruth *et al.* (2021) introduced the first online translation tool between KM and English (translatekreol.mu) using deep learning. A dataset of 24,810 sentence pairs was used. A basic translation tool has been developed but there exist many issues such as imprecise translation, incorrect translation of names of people, countries and technical words. The dataset used is not up-to-date with the latest edition of Diksioner Morisien. There is still work which remains to be done for developing a good translation tool for KM. This will be an asset for helping the Mauritian in mastering their mother tongue and can also allow foreigners to switch between English and KM easily thus reducing the problem of language divide.

The aim of the study is to propose a more accurate KM to English and vice-versa Translator. A dataset of 50,000 parallel English and KM sentences were fed into the system. Three approaches have been implemented: Transformer model using OpenNMT, Statistical MT using Moses and the state-of-art transformer model with attention mechanism. Evaluation are done using the BLEU score metric which counts the number of matches in a weighted manner. Popular language pairs such as English-French obtains a BLEU score greater than 0.4. OpenNMT obtains a BLEU score of 0.17 for the translation from English⇒KM and a score of 0.24 was obtained for the translation from KM⇒English. Moses obtains a score of 0.14 for the translation of English⇒KM and KM⇒English attains a BLEU score of 0.23. The transformer model improves over the existing results by achieving a score of 0.30 for the translation of English⇒KM and KM⇒English attains a BLEU score of 0.31. In the next stage, we intend to enhance the dataset and use a hybrid Rule-Based and Deep Learning algorithm which is a novel approach to improve the translations quality and the BLEU scores for translation between KM and English. Surely, a reliable MT tool for KM will contribute for the establishment of our mother tongue as a complete national language.

An Analysis of AI and Drone Technologies for Beach Erosion Monitoring In Mauritius

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ABSTRACT

We are interested in identifying the coastal areas that are most vulnerable to erosion in Mauritius. To this end, a systematic literature review has been conducted. Relevant published articles were accessed on Google Scholar, Science Direct, Springer and other online databases. In addition, official publications from the Government of Mauritius have been considered. The research articles were all focused on sand, dune, or beach erosion in Mauritius only. Erosion sites, reef information, lagoon health information as well as any protective measure put in place, were identified, and extracted from each study. This information helped in the identification and assessment of coastal sites susceptible to erosion.

Our findings indicate that over the past decade, the rate of erosion in Mauritius has increased at an alarming rate. In the early 2000s, a thorough assessment of coastal areas was conducted and the areas were then classified as high, medium and low priority areas. High priority areas referred to the zones that faced severe erosion, and Flic en Flac, Belle Mare, Grand Baie and Rivière des Galets belonged to the same (Baird, 2003). However, decades later, the situation worsened, despite the installation of erosion mitigation and protective measures in a few zones. While accretion has been observed at Flic en Flac, a shoreline retreat of 15m has also been recorded. The high priority list keeps growing with Le Morne erosion amounting to 8049±5% metres square was recorded, and its neighbouring beaches added (Doorga et al., 2021; *JICA*, 2015; Duvat, 2009). From the literature conducted, we noticed that the erosion rates for many areas are still unknown to date and that each beach has its own peculiar set of characteristics.In the future, we intend to understand the unique morphologies of the beaches around the island so that we can develop a suitable beach shoreline monitoring approach using drones and Artificial Intelligent Techniques.

Keywords: Beach Erosion, Coastline degradation, Shoreline Erosion, Hard Protective Measures, Artificial Intelligence

Techniques for Cyberbullying Detection

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ABSTRACT

My research focuses on developing a Deep learning algorithm for predicting cyberbullying in online social networks.

With time, the way people communicate has evolved. Social media networks offer ease of interactivity among loved ones. People are no longer bound by physical interaction to communicate or see each other. However, the phenomenon known as bullying which was prevalent during face-to-face communication has also plagued communication via social media networks.

Cyberbullying can be described as the online counterpart of bullying or traditional bullying, taking place in the online world through electronic devices (Tokunaga, 2010). With the advancement in Artificial Intelligence, cyberbullying detection using machine learning is feasible, and to date, many studies have been published where machine learning has been used to detect cyberbullying.

A systematic literature review of twenty-nine papers has been conducted to analyse the various machine learning techniques that have been used for text-based cyberbullying detection. The systematic literature review conducted has revealed that the learning algorithms used range from Unsupervised learning such as K-means to state-of-the-art Deep algorithms such as Transformers. It has also been observed that Precision should be used as performance metric as it shows the correct number of cyberbullying instances classified. Furthermore, the learning algorithms are capable of categorising cyberbullying and non-cyberbullying instances with 90% Precision (Agrawal & Awekar, 2018). However, cyberbullying detection still has issues that are yet to be addressed. For instance, the definition of cyberbullying used and the quality of datasets may heavily affect the performance of the learning algorithms.

In the future, we plan to investigate the potential solutions for the issues identified in cyberbullying detection.

Biomimetic Development of Knitted Fabric Structures: Towards a Sustainable Product Design Process

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ABSTRACT

The portmanteau word biomimicry is an umbrella notion that underpins sustainable designs where researchers learn from nature to solve particular problems (Benyus, 1997). In textiles, biomimicry bequeaths a commodious expanse for study and provides liberal room for creation. As it is still a burgeoning subject, relatively few reconnaissances linked to the systematic development of bioinspired fabrics and their objective validation with the natural source have been reported. Thereafter, in this study, the principles of biomimicry were used to develop novel knitted textile structures. The structures were inspired from the Morpho butterfly's wing scale. It was patronized by the biomimetic design process which hinges on (1) Identification and translation; (2) Abstraction; (3) Emulation; (4) Evaluation; (5) Validation and iteration. In identification, it was probed that the Morpho scale was the right biological template that could be used to mimic knitted structures. Translation implies, stipulating the formal relationship between the scales and knitting parameters. During abstraction, a double plain knitted fabric was used as control. An image-capturing chamber was developed (Imrith et al., 2019). Gaussian filtering, image addition and image subtraction were used for feature extraction from image of the scale to map onto the control fabric. Geometrical 3D proxy models of knitted structures were developed that were feigned to enact as middling between the biological template and fabrics. Eight of 3D proxy knitted models, emulating the scales, were knitted using 100% acrylic yarn on a V flat-bed knitting machine. Throughout the evaluation stage, image segmentation methods namely binarize, local adaptive and morphological threshold were employed concomitantly to 'digitise' the biological template, 3D models and fabrics, respectively. Euclidean distance measurement and pixel values, established that the biological template, 3D geometrical models and physical weft knitted fabrics had a high degree of similarity. Local adaptive method yielded better results for pixel intensity differences. Conversely, the morphological threshold generated better results when measuring Euclidean distance. Lastly, in the validation and iteration phase, image of scales was assessed by employing image analysis, *z*-test and statistical evaluation of the fabrics parameters. High degree of similarity was again observed and the statistical assessment corroborated the observations. In the aftermath, it was therefore inferred that the fabrics exhibited analogous patterns to that of the Morpho scales.

Keywords: Knitting, Biomimcry, Textiles, Fashion, Fabrics

Artefact Detection and Classification in Esophagus Endoscopic Images

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ABSTRACT

Esophageal cancer was ranked seventh in terms of cancer incidence rate and sixth in overall cancer mortality rate worldwide in 2020 (Sung et al., 2020). The early detection of lesions in esophagus lining and their treatment can increase the survival rate of patients with esophageal cancer. Endoscopy is a widely used technique for screening diseases in the esophagus. The main challenge is the presence of artefacts in endoscopic images which often result in misinterpretation of abnormalities and overlooking of viable information leading to unreliable medical outcomes. Various studies have concluded that the rate of undetected upper gastrointestinal cancers over the past 3 years was high (9.8% to 25.8%) mainly due to endoscopic errors (Namikawa et al., 2020). There are various artefacts which can be found in esophagus endoscopic images such as saturation, contrast, blur and bubbles (Ali et al., 2021). Because of the limited small size of the esophagus food pipe and fast movement of the endoscopic camera, one prominent artefact is colour misalignment (Gao et al., 2019). To ease the task of radiologist and doctors, automated applications have to be developed to detect and classify artefacts.

Deep learning with image processing has been applied in medical image analysis in order to enhance the detection of various cancers such as liver, gastric, colorectal, bladder and breast cancer. Convolutional Neural Network (CNN), which is a type of deep learning that mirrors how the brain functions through learning by example (Simplilearn, 2021), is at its full swing of development. CNN eliminates the need for manual feature extraction whereby it is not required to identify the features to be extracted from images beforehand for image classification. Instead, the features are learned while the network processes the images (Mathwork, 2021). There is clearly a research gap in the detection and classification of artefacts, particularly colour misalignment in esophagus endoscopic images.

With the recent advances in deep learning and image processing, there are scopes in developing automated applications that can automatically detect and classify artefacts. In this work, a comprehensive literature review is being carried out to identify and analyse high performing deep learning algorithms used in the detection, segmentation and classification of artefacts in endoscopic images. The best performing algorithm will be applied to and enhanced for colour misalignment detection in esophagus endoscopic images and its performance will be analysed against existing benchmarks so as to derive better results.

Keywords: Artefact detection and classification, Esophagus, Endoscopic images, Deep learning

EDUCATION/HIGHER EDUCATION

Developing an Ethnoscience based Concepts for Teaching and Learning Relational Database Normalisation in e-Learning Context.

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ABSTRACT

Database systems especially the database normalisation aspect is regarded as very difficult to learn and understand for students, and for instructors to know what to teach their students. In a European survey conducted by Connolly and Laiho (2010), they establish the deficiency of key skills of database design on the contemporary staff and new graduate employees in Information Technology organisations. While Fasasi (2018) suggest that underperforming of students especially in science related module is interrelated to the disconnection of amongst what is thought and learnt from science classes and ethno daily levies of typical students. On the other hand, Al-Dmour (2010) note that in different area of the world, various database system' lecturers are facing two main challenges: what to teach and how to teach database course effectively, consequently discovery suitable pedagogy to teach this subject is a test for today's IT. The aim of this study is to suggest a novel ethnoscience concept based teaching and learning model in order to improve academic performance in database systems module for novice students. It therefore means to response to the following main research question: What impact can ethnoscience concepts can have on teaching and learning of database systems module for novice students, especially in the e-Learning context. This research question will be answered by these following research objectives: (I) Review existing literature to identify suitable ethnoscience concepts, theoretical frameworks and models for the teaching and learning database normalisation. (II) Design an ethnoscience based concepts approaches for teaching and learning database normalisation for novice learners. (III) Empirically test the above mentioned ethnoscience based concepts for suitability of teaching and learning. (IV) Compare and suggest areas for future research on the possible impact of ethnoscience concepts approach on the teaching and learning of database normalisation.

Abonyi (2021a) defines ethnoscience as native's consideration of diverse relating to entities and events that have theoretical relationships amongst them. The divisions of ethnoscience would typically include, but not limited to ethnochemistry, ethnophysics, ethnoagriculture, and ethnohistory and so on. Different studies like Fasasi (2017), Connolly and Begg (2006), Hiwatig (2008), Amin *et al* (2019), and Adesoji (2019) are some of the studies that have looked at the difficulties of either teaching and learning of database normalisation or the use of ethnoscience in different fields (mathematics, chemistry, biology).

An extensive literature review on the use of ethnoscience for teaching and learning, and student's academic performance on database systems especially normalisation will be conducted for theoretical background of the study with also a look at different models and theories for teaching and learning. A Quasi-experiment with four groups (traditional, traditional with e-Learning, Ethnoscience, and Ethnoscience with e-Learning) will be used that will consist a population of novice university students that will be doing database system module. A call for volunteers will be made amongst DUT second year Information Systems (IS) and Information Technology (IT) students in order to compile a list of

participants for the quasi-experiment. Only Nguni languages speaking students will be considered and students with high school database modules experience will be excluded from this study. Students below the age of 18 will also be excluded from this quasi-experiment, also an ethical clearance letter will be acquired to conduct the research. This list of participating volunteers will be simple randomly selected and then be randomly split into the above-mentioned groups. The Cronbach's alpha coefficient will be used test reliability of the primary and secondary data while validity will be checked using the Pearson correlation. The pre-test and post-test methods will be used to analyse the results of the experiment that will be later on used to compare with the existing literature for suggestions and contribution to the body of knowledge and to the literature. Some of the limitations of this study include, but may not be limited to, the literature review will focus on the STEM modules, the experiment will only be done on the database normalisation and only Nguni speaking languages students will be included on the experiment. This study is expected to, above to contributing to the body of knowledge, to contribute new pedagogical for database normalisation especially for novice students, and show how ethnoscience can contribute to teaching and learning database normalisation and academic performance.

Keywords: Ethnoscience; Databases; Normalisation; e-Learning

An Assessment of the Higher Education Funding Mechanism In Mauritius And The Development of an Innovative Approach

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ABSTRACT

The Higher Education sector (HES) in Mauritius is experiencing various challenges such as relevance, sustainability, and a need for rationalisation. These could be partly addressed by adopting a more responsive funding mechanism. This fact has been recognised by the policymakers and the Higher Education Act 2017 makes provisions for the introduction of funding mechanisms linked to the performance of higher education institutions (HEIs).

Many countries have gradually moved away from the traditional input-oriented, incremental budgeting systems to more sophisticated ones including a variety of performance-based funding (PBF) mechanisms where fund allocation is based on output. A few of the attributes of PBF revealed by previous studies cover enhanced accountability (with increased autonomy) and efficiency of HEIS, allowing steering of the HES, and ensuring equity in the provision of state funding. PBF applies to both teaching and learning and research activities for which broad parameters are defined to determine fund allocation, and monitoring is done accordingly.

The purpose of this research is to make an assessment of the current funding setup and to make proposals on how the budgeting system and processes within HEIs and at the national level should be adapted to embrace the introduction of an innovative funding mechanism. An in-depth literature review, interviews of key stakeholders, analysis of official documents, and past financial, enrolment, and other data would be undertaken to draw essential information to conduct the study.

This project would generate knowledge about the current budgeting design and processes and the evolution of the financial structure of the HES in Mauritius. It will be of significance to HEIs, the regulatory body, the ministries of education and finance, and policymakers. It will also be of relevance to other countries, especially Small Island Developing States whose HE sector is at a similar turning point as Mauritius.

Keywords: Funding mechanisms, Higher Education sector

A Study of Factors Influencing the Diffusion and Adoption of MOOC among the Millennials in Mumbai

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ABSTRACT

MOOCs or Massive Open Online Courses are free online courses offered to democratize education. They deliver high-quality education with flexibility, convenience, and affordability to learners across the globe. This doctoral work intends to determine the diffusion of adoption of MOOC among users from the Millennial generational cohort based out of Mumbai. Based on the theoretical underpinnings of the Information Systems perspective, satisfaction and the continued intention was determined to understand the diffusion of innovation for MOOCs in the post-adoption phase.

This study develops MOOC Satisfaction Continued Intention Model (MSCIM) by extending the Unified Theory of Acceptance and User Technology (UTAUT2), Information System Success Model (ISS) and Expectancy Confirmation Model (ECM) with additional exogenous and endogenous constructs. All the scales operationalised in the study were adapted from the past literature. Primary data was collected using a survey method by using convenience sampling. Structured questionnaire was employed to collect primary data using Google forms. For analysis, Partial Least Square Structural Equation Modelling (PLS-SEM) method was used using SMART PLS 3.3.3. The results satisfy the validity and reliability of the measurement model. The findings of structural model suggest that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, information quality, system quality, service quality influence satisfaction. The above constructs influence continued intention except for effort expectancy, facilitating conditions, system quality, information quality, and service quality. Along with this, self-efficacy and personal innovativeness also influence the continued intention for MOOCs. R square, F Square and Q square was determined to understand the endogeneity of the model. Mediation analysis highlighted the role of hedonic motivation and performance expectancy in the model.

This study offers managerial and practical implications to MOOC developers in understanding the influence of various determinants on its satisfaction and continued usage. The proposed integrated model will enable MOOC platform providers, educational institutes, universities, and faculties to design and implement MOOC systems that enhance learning through continued usage and increased satisfaction. Appropriate interventions can be introduced to amplify the learning experience and satisfaction of MOOC users, reduce the premature exits from the course and fully optimize the financial investments in MOOC deployments. The study has several limitations associated with a cross-sectional research design.

Keywords: Continued Intention, MOOCs, Millennial, Technology Adoption, Satisfaction

Investigating the barriers affecting successful implementation of online learning in South African institutions of higher learning

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ABSTRACT

Online learning has been around since the past decades, but the arrival of the COVID-19 pandemic heightens the importance of and discourses around online learning. Nothing has popularised online learning in South African higher education institutions more than the COVID-19 pandemic.

The pandemic temporarily closed universities and colleges worldwide and particularly the South African ones. Face-to-face learning has long ended in many South African higher education institutions, and online learning has become the alternative. Online learning, however, in the South African higher education institutions appears less effective and successful as expected because it is still emerging and is surrounded by several barriers that are yet to be addressed.

Despite the vast body of research on online learning, one area that needs further analysis is that of barriers that hinder the successful implementation of online learning in South African higher education institutions. The proposed study aims to examine, explore and offer solutions that minimize or possibly eliminate barriers hindering the successful implementation of online learning in South Africa higher institutions. This subject is still underexplored in literature, and it is expected that the proposed study will establish helpful findings that can improve education practices and expand knowledge boundaries in the context of online learning.

Recently online learning has become the norm in educational institutions worldwide because of the COVID-19 pandemic (Ofusori, 2021). Landa, Zhou, and Marongwe (2021) call the present education system an online learning era. However, as Dube (2020) establishes, multiple barriers still hinder successful online learning implementation. Ready and Babu (2015) note that the barriers to the successful implementation of online learning vary from one country to another.

The New EFQM 2020 and its application in Higher Education Institutions (HEIs)

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ABSTRACT

The EFQM model is a quality framework that has been inspired by the TQM philosophy to help an organisation achieve and sustain excellence in its performance. The new EFQM 2020 was introduced in November 2019 and has been carefully designed to work in parallel with the UN Sustainable Goals, to adapt to the ever-fluctuating working environment, cater for stakeholders needs and produce enduring quality transformation. Unlike the previous EFQM 2012 model with seven dimensions grouped under Enablers and Results, the new version bring forward a more dynamic and predictive assembly of three elements notably; Direction, Execution and Results, which are further sub divided in seven criterion.

On the other hand, the rumbling success of the quality models in the manufacturing industry has led to its adoption in many different service organisations such as educational institutions. Higher Education campuses are a microcosm's society that can be used to fuel a change in mindset to collectively re-shape our economy, society and environment. These institutions are the manufacturers of our future leaders and the need for optimum quality output is vital. Furthermore, the regional lockdowns and travel bans have shaken the income of Higher Education Institutions (HEIs) and with the looming post pandemic effect at door, the latter are left with no other choice rather than to re-orient their managerial strategy towards producing educational and research quality output with minimum resources. The outbreak of the coronavirus disease (COVID-19) has upended the routine operations of these institutions but out of all, it has also provided an opportunity to innovate and adapt to the "new normal". As such, the pandemic crisis has reaffirmed the utmost importance of the EFQM 2020 model emphasis on sustainability for a better future.

Henceforth, this study aims to bring forward a review on the latest EFQM 2020 model and its applicability to HEIs. The research will adopt a conceptual approach whereby an exploratory research will be carried out on the determinants of quality and adaptability of the EFQM 2020 criteria in HEIs followed by in depth interviews and group discussions of major HEIs stakeholders.

Keywords: New EFQM, EFQM 2020, EFQM in Higher Education Institution, EFQM & SDGs, TQM

TOURISM & HOSPITALITY

The adoption of Artificial intelligence in Sustainable Tourism

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ABSTRACT

The degradation of the natural environment and the aggravated climate crisis caused by tourism are complicated phenomena that demand novel solutions (Seetanah & Fauzel, 2018). Conversely, intelligent technologies such as artificial intelligence can act as a catalyst for change and revolutionise business processes with the potential to address significant economic, social and environmental sustainability of tourism (Buhalis & Sinarta, 2019; Gursoy et al, 2019). Despite the growing interest in the application of Artificial Intelligence, the current empirical evidence on the adoption of artificial intelligence in sustainable tourism remains scant. This calls for more extensive scientific investigation. This study seeks to develop test a theoretical model that investigates the influence of Artificial Intelligence adoption on sustainable tourism. Moreover, this research aims to introduce a new perspective on Africa's existing corpus of information technology, psychology and sustainable tourism literature. This field has not been researched in developing countries such as South Africa. A mixed-method research approach will be followed through the application of Atlas. ti to determine key themes emerging from the study. While partial least squares structural equational modelling (PLS-SEM) will be implemented to analyse the causal relationships between latent variables derived from the Unified Theory of Acceptance and of Technology (UTAUT) and Expectation Confirmatory Model (ECM). Data will be gathered from managers and IT experts of Destination Management Organisations located in the Gauteng Province of South Africa. The findings of this study will contribute to the growing body of knowledge in the fields of information technology and social science research with specific reference to artificial intelligence and sustainable tourism. The study will offer a snapshot of the state-of-the-art in these rapidly evolving fields for managers, policymakers, and academicians.

Keywords: Artificial Intelligence, Sustainable Tourism, Technology Adoption, UTAUT, ECM

Embracing Social Media Marketing in the Tourism Industry

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ABSTRACT

Social media interactions have allowed for changes in the process of sharing information, connecting with people and understanding emotions through online connectivity (Kaplan and Haenlaein 2010). This has increasingly empowered tourists as they are now content creators through user generated content, collaborators by sharing their organic videos and photos online and additionally are commentators who are spreading electronic word of mouth about their experiences (Hamilton, Kaltcheva and Rohm 2016; Li, Larimo and Leonidou 2021). These intensified social media interactions have encouraged the sharing of information such as travel plans and tourism experiences online (Beall, Boley, Landon and Woosnam 2021). In view of the power shift from marketers to consumers, the former need to oblige to the sharing of information online as a means to promote themselves. Thus it is highly recommended that tourism providers embrace social media marketing. The tourism industry demonstrated the extensive use of social media marketing with the aim to encourage tourists to share their experiences online (Moro and Rita 2018). There are multiple advantages for tourism marketers in adopting social media marketing. The tourism literature points that the use of platforms such as Facebook influences the decision making process of consumers (Di Pietro and Pantano 2012) while other social media such as Instagram are considered by millennial tourists in the ranking of destinations (Hosie 2017; Marder, Archer-Brown, Colliander and Lambert 2019). Social media marketing allows for the engagement of tourists online who self-promote themselves and simultaneously the destinations (Oliveira, Araujo and Tam 2020). Diffusion of social media activities creates value seeking opportunities for destination marketers who use engagement techniques to highlight their unique selling points (Cheung, Cheah and Sharipudin 2021). Hence it can be assessed that social media marketing is of essence to the tourism industry and this is beneficial for both the tourists and destination marketers. The increasing engagement of tourists through social media platforms allows for competitive advantages in highlighting the value of the tourism providers. Thus demand for specific destinations would increase under the influence of social media marketing. Consequently, the expectation – perception gap in tourist experiences decrease resulting into more satisfied tourists. These further encourage tourists to remain loyal to a destination and spread positive word of mouth through other social media platforms. Finally, the adoption of social media marketing prompts for further need of social media platforms generating more trust towards updated firms generated content disseminated by destinations and the tourism industry.

Keywords: social media interactions, social media marketing, destination marketing, tourism industry

A Predictive Model for Managing Air Travel Behaviour During Pandemics

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ABSTRACT

Air travel behaviour among travellers and airlines is expected to change during a pandemic, especially as contagious as COVID-19. Rapid and extreme changes have become evident in people's travelling behaviours and trends, for example, activity-travel habits, travel preferences and lifestyle habits regarding their travel behaviour (Shamshiripour *et al*. 2020, p.2). Therefore, the main reason for undertaking this study is to predict and understand how a crisis such as the COVID-19/pandemics can affect air travel behaviour among air travellers. This study will attempt to model the air travel behaviour from air travellers and airlines operating in a pandemic environment. The study will focus on low-cost carriers in the South African air travel sector. Vinod (2020, p.228) states that the vulnerability of airliners, particularly low-cost carriers, to the effects of COVID-19 travel restrictions is concerning as once they operate at low cash flow levels, survival is uncertain. Therefore, given the travel bans/restrictions, airliners have been operating at a financial loss and have had to formulate new operational strategies for operating amidst a pandemic (Ivan *et al*. 2021, p3). Therefore, this research attempts to answer the question: what needs to be considered in a predictive model to manage air travel behaviour among traveller's and low-cost airlines in South Africa during a pandemic? Only a few studies have attempted to mode air travel behaviour amidst a pandemic. However, to the best of the researchers' knowledge, no study has considered predicting air travel behaviour from a supply and demand perspective in South Africa to the researchers' knowledge. From a scientific perspective, the study seeks to address this gap. To study the potential behavioural changes in air travel, this research proposes to employ the extended Theory of Planned Behaviour (TPB) and the Protection Motivation Theory (PMT), which have both been applied as explanatory frameworks in studies on air travel behaviour during pandemic crisis events such as COVID-19 (Bhati *et al.* 2020, p2 ;Huang *et al.* 2020, p.2; Bae & Chang, 2021, p.3) and the H1N1 flu pandemic (Lee *et al.* 2012, p.90). The study proposes a sequential exploratory mix-method design to conduct the empirical work. In the initial first phase, 8 airline and 10 online booking agent management employees would be interviewed. A second quantitative phase will follow, wherein 400 air travellers will be sampled with data being generated via a self-administered online survey. Regarding the theoretical and methodological contributions, this study proposes a predictive model to manage air travel behaviour among traveller's during pandemics, focusing on low-cost airlines in South Africa. Though the study will focus on low-cost carriers in South Africa, the study's findings can be equally beneficial to low-cost carriers in other developing countries.

Keywords: predictive model, air travel, travel behaviour, air travellers, pandemic

How South African Farmers Describe a Successful Agri-Tourism Business

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ABSTRACT

Every business wants to be successful (Krishna, Agrawal and Choudhary 2016, p.798). However, success can be measured in different ways. Walker and Brown (2004:577) identified both *financial* and *non-financial* goals to measure success, therefore making success subjective to the entrepreneurs' goals of the business. Examples of success goals include profitability; customer satisfaction; employee satisfaction; award winning; and more. Even farmers want to run a successful agri-tourism business. 'Agri-tourism' refers to the amalgamation of the agriculture and tourism industries by inviting tourists to a farm for entertainment, education or relaxation (Giaccio, Giannelli and Mastronardi 2018, p.219; Van Zyl 2019, p.158). This research aims to determine how South African (SA) farmers measure their agri-tourism businesses success by identifying their achievements. Using a qualitative research approach, semi-structured interviews were conducted with SA farmers, living in the Western Cape, successfully managing an agri-tourism business. As these interviews were conducted in 2021, the Covid-19 pandemic and its impact on the tourism industry influenced several farmers' perception on success. Preliminary findings indicated that farmers' most outstanding achievement was a *sense ofpride in their work* as they were still operational after doing everything themselves. Walker and Brown (2004, p.577) agree that non-financial goals are more important. This was followed by *customer satisfaction*. Pavia, Stipanovic and Mrnjavac (2011, p.101) also found that this is a common goal in the tourism industry. *Providing a consistent quality of products* was also important. Other achievements that farmers mentioned include *receiving recognition*, *positive brand recognition*, *financial success*, *employee's satisfaction*, and *still being operational after the Covid-19 pandemic*. While each of these achievements is subjective, there were patterns of what agri-tourism farmers look at when measuring their success. Only a few farmers identified financial goals as their most outstanding achievement. While each farmer will have their own set of goals for their agri-tourism business, it's essential to clearly identify and describe these goals before developing products/services. These goals will significantly impact how they measure their success.

Keywords: agri-tourism; successful business; outstanding achievements; perceived success

A Critical Assessment of Marine Wildlife Voluntourism in Southern Africa

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ABSTRACT

Marine voluntourism (MVT) has been growing in popularity in developing countries, including Southern Africa. However, there has been limited research on the topic to steer the development of this industry in countries that could benefit. The goal of this study was to carry out a critical assessment of MVT in Southern Africa, using a mixed-method approach. MVT organisations were approached at three case studies, South Africa, Mozambique and Madagascar. Between 2019 and 2020, structured questionnaire surveys (n = 142) and semi-structured interviews (n = 30) were used to collect data from voluntourists at the case studies. An online structured questionnaire targeted voluntourists (n = 211) internationally, to compare data with the case studies. Semi-structured interviews (n = 24) were used to collect data from the staff at the case studies. The data were analysed using statistical and thematic analysis. The voluntourists at the cases studies and internationally were mostly similar. The key characteristics of the MVT organisations at the three case studies were similar to those of MVT organisations described in the literature and the web. Marine voluntourists were motivated to participate in MVT by ecocentric, personal development, personal well-being, and social values reasons. They had ecocentric and activities-related preferences. They had expectations towards overall programme quality, detailed information, and a quality destination. Their satisfaction with the MVT experience revolved around destination and interactions, information and education, and overall programme quality. Perceived ethical conduct of the MVT organisation was an important factor to the voluntourists. Post-experience attitudes included attitudes towards education, the environment, compliance and advocacy, volunteering, citizen science, career choices, and paying for conservation. The voluntourists were clustered into young enthusiasts, mature voluntourists, neutral elders and satisfied elders. The results showed that MVT seemingly draws different clusters, each one of which represents a phase in what could be called a marine voluntourist's path. Motivations and expectations positively influenced satisfaction, the perceived ethical conduct of the MVT organisation and attitudes. Satisfaction and perceived ethical conduct of the MVT organisation partially mediated the relationship between motivations and attitudes, and expectations and attitudes. Perceived ethical conduct of the MVT organisation and motivations were significant positive determinants of satisfaction and attitude. The study provided various theoretical, methodological and practical contributions. New information was generated on the structure of MVT in Southern Africa, which is also generalisable. More research such as this would contribute to a better understanding of MVT in Southern Africa and globally, and guide its sustainable development.

Keywords: critical assessment, voluntourism, marine wildlife voluntourism, travel motivation, tourism experience, tourism satisfaction, environmental attitude, citizen science, marine conservation, ethical conduct.

ECONOMICS AND STATISTICS

The Private Returns to Higher Education: An Economic Perspective of the Mauritian Case

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ABSTRACT

Mauritius is a country with no natural resources and thus, its future is inextricably linked to its capacity to acquire knowledge and apply new knowledge through a highly-trained and specialized workforce, equipped with a range of educational qualifications, experience and commitment. On overall public policies in the higher education sector has aimed at boosting access, mainly through greater financial support for students and a geographical expansion of higher education institutions (both public and private) to ensure higher education is more inclusive. This in turn has implied huge investment by the government (funded mainly by taxpayers money for which the government is accountable) and hence there is call for assessing whether such a significant investment is reaping its fruits by generating the expected economic returns. In order to better understand the private returns to education and the impact of an additional year of schooling in the context of Mauritius, the Mincerian equation is regressed through Ordinary Least Square Methods; the equation is also revisited to include other factors not captured by the equation, which may have a significant impact on earnings, such as demographic factors, sector of employment and employment status. Furthermore, the Two Stage Least Square Method is applied to control for endogeneity bias and also to infer the extent to which education exacerbates or reduces underlying inequality in wages due to unobservable factors. The instruments adopted are father's sector of employment, mother's years of schooling and compulsory schooling laws in Mauritius. The study also seeks to assess the impact of over/under education on earnings through Realized Matches Technique, whereby the education variable is decomposed into required education for a certain job, over-education, and under-education. In the later stages of the study, counterfactual analysis will further be used to assess the marginal returns to higher education. The earnings of the group of individuals in possession of the qualification will be compared to a counterfactual group to assess the economic benefit associated with the qualification itself rather than the economic returns generated by the person in possession of the qualification. In total, six different higher education qualifications will be considered within the National Qualifications Framework: two at postgraduate level (Doctorate and Master's degrees) and four at undergraduate level or sub-degree level (undergraduate degrees with honours, undergraduate degrees ordinary, diploma and certificate). Finally, the study will also consider the variance in returns to higher education around the mean which will be estimated through "Quantile Regression" methods in order to assess the effect of education on wages at different parts of the wage distribution.

Keywords: Human Capital, Education, Private Returns, Mismatch

National Minimum Wage: Labour Market Dynamics and Poverty Impacts in Mauritius. Does Minimum Wage promote Equity and Social Justice? Evidence from Africa

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ABSTRACT

Minimum wage is considered as one of the policy tools to overcome poverty and reduce inequality (Ramma, 2001). Many countries are introducing minimum wage in order to promote economic development and social justice by improving the wages of the vulnerable workers such as women and youth hence protecting workers from unreasonably low wages. Minimum wage legislation is present in most African countries, 48 out of the 57 countries have established a minimum wage (Brosnan, 2019). While there is near universal application of minimum wages in most countries, very little is known about its effectiveness in meeting social justice and equity. Studies related to the effects of minimum wages have often been conducted on a technical level, centering on the effects of wage increases. Furthermore, the debate has always been between those who maintain that increases in the minimum wage will result in unemployment, for instance Neumark and Wascher (1995), Burkhauser et al.(2000), Gorry (2013) as well as Kawaguchi and Mori (2021) while on the other strand, studies uphold that increases will offer much needed assistance to the poor and vulnerable workers (Gindling and Terrell, 2010, Bonin et al., 2019, Sotomayor, 2021). Lost in this area have been serious discussions of the ethical grounds of minimum wage and the questions of equity. Tomlinson et al. (2016) argue that if the minimum wage is set at a reasonable level, it may be a useful policy instrument to raise wages at the bottom end of the wage distribution without having large negative effects. However, the extent to which minimum wage achieves this goal depends on the surrounding labour market conditions and the level of the minimum wage as well as the enforcement mechanism in place (Freeman, 1996).

This study thus seeks to examine the minimum wage system and its effects on social justice and equity across seven African countries. The continent is an interesting case study to examine the social implications of minimum wage as unemployment, inequality and informality are persistent in the region. Moreover, women are over represented in low paid jobs and the informal sector in Africa. Informal workers are not entitled to minimum wages and other benefits such as paid vacation and sick leave. This paper provides a comparative analysis of the minimum wage system, working poverty and unemployment from 2015 to 2019 using data from the International Labour Organisation. The results show that all the seven countries under study have introduced and reviewed their minimum wage system in order to protect vulnerable workers. Minimum wage has followed an upward trend alongside with unemployment level in most countries, whereas working poverty has declined significantly. The analysis also reveals that youth unemployment including graduate unemployment is increasing in the continent and youth faces many challenges which include the poor quality of education and skills mismatch. Furthermore, the results indicate that in many countries minimum wage is given low importance as the Kaitz ratio is on the low side for most of the countries and the proportion of workers receiving less than the minimum wage consist mainly of women. Additionally, women represent a greater share of low paid jobs and their average monthly wage is lower compared to their male counterparts. Besides, the correlation coefficient is negative indicating the presence of an inverse relationship between minimum wage and share of female workers in low paid sector and gender pay gap. In general, women still face discrimination in labour market and unequal access to resources despite the presence of minimum wage in these countries.

Keywords: Minimum Wage, Equity and Social Justice

Poor or Not Poor in which dimensions? Comprehensive Poverty Measures for Better Targeting: The Case of Mauritius

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ABSTRACT

Over the years, Mauritius turned out to be one of the most prolific and prospective African countries. It has been able to shift from middle to a high income country. Different policies and social protection have been adopted to give the citizens a better standard of living. As poverty reduction is a major concern for the government in Mauritius, over the years massive funds have also been invested into poverty alleviation programmes. However, despite the implementation of the different strategies, poverty still prevails and remains a reality for Mauritius. According to poverty reports and studies published for Mauritius, poverty is most likely to be widespread among specific population groups such as persons with low education, those engaged in certain occupations like the coastal communities who depend heavily on lagoon fishing to earn a living and also specific households such as female headed households and those with several children.

Therefore, in order to eradicate poverty, it is essential to accurately and correctly identify different types of poor people. However, a country cannot rely on one set of indicators to identify poor people because different approaches which are being implemented doesn't necessarily means that poor households are being reached. In Mauritius, to name a few approaches implemented are (1) the application of the relative poverty line, produced by the Statistics Mauritius, (2) the creation of poverty maps through Census and Household Budget Surveys to know the specific poverty rates by region, (3) the identification of pockets of poverty, (4) the publication of the Relative Development Index to capture the non-monetary dimensions of poverty and the creation of the Social Register of Mauritius (SRM) to decide on eligible beneficiaries. Nevertheless, each mentioned approaches used have their respective drawbacks. Likewise, this research attempts at tackling the drawbacks in identifying the poor in Mauritius and aims at contributing to the design of a multidimensional poverty measure which goes beyond consumption or income poverty by adding non-monetary dimensions into the measure. This could be thus regularly produced, based on information drawn from existing official household surveys. Moreover, deprivation dimensions and its associated indicators will be selected which will reflect the realities of the Mauritian poor. This will help to better allocate and manage social policies and develop the deprived areas. Once, the multidimensional poverty measure/index (MPI) has been constructed, it will monitor progress on Sustainable Development Goals as one of its targets includes the reduction of multidimensional poverty. Furthermore, the constructed MPI will also be used to produce poverty maps which will show a visual representation of the complex ways in which different adverse deprivation conditions interact thus, creating specific needs and problems in different communities and/or regions of the country. Likewise, this thesis tries to better evaluate the government of Mauritius in pursuing their fight against poverty and deprivations dimensions.

Informal SMEs and the tourism sector in Mauritius.Willingness to Pay for a Tourism Informal Sector Solidarity Fund in Mauritius: A Contingency Valuation Method Approach.

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ABSTRACT

On March 11, 2020, the World Health Organisation (WHO) declared the COVID-19 as a pandemic, where the acute respiratory syndrome coronavirus 2 (SARSCoV-2) has caused coronavirus disease 2019 (COVID-19). The African continent was touched at a later period as opposed to the other continents such as Asia and Europe (El-Sadr *et al,* 2020). Mauritius experienced its first three cases of COVID-19 on the 18th of March 2020 and as such, the borders of the island were closed and a complete lockdown was introduced on the 24th of March 2020.

With reference to the UNDP's Socio-Economic Impact Assessment of COVID-19 in Mauritius which was issued in October 2020, informal employment has dropped by 89,200 (above 59%) as opposed to 40,200 (approx. 10%) for formal employment during the period of lockdown. The report also mentioned the negative consequences of this pandemic on the informal sector operators such as high risk of poverty, low access to decent jobs and wage or even negative social indicators. The Government of Mauritius came up with different measures to support this sector, especially with the financial aid of Rs 5100 to every self-employed person.

As surprising as it may seem, more than 80 per cent of the total labour force of Sub-Saharan African countries are employed in the informal economy and around 55 per cent of Africa's GDP is generated by the informal economy (Adams *et al*, 2013).The contribution of the informal economy in Mauritius ranges from 20 to 25 per cent in Mauritius, which definitely shows us that this sector is expanding in the small island (Medina *et al*, 2017) Informal activities in the tourism sector may include hawkers, street vendors, providers of home stays, unofficial tour guides, transport providers, musicians and dance groups, artisans and many more activities (Zhang, 2017). 3 Wanhill (2002) state that small businesses in the tourism sector are able to cope with the competitive market since they have shown through their ability to effect introductions to their neighbours, advising visitors about itineraries, providing narratives on local history, culture, folklore and landscape, as well as playing an active role in the advancement of the community.

Our study contributes to the literature, since it captures the perception of the public on the informal tourism sector and also the perception of the public about the support given to these informal tourist operators during the COVID-19 pandemic. In addition to this, the study also investigates about the willingness of respondents to pay a one-off voluntary fund which will be managed by the government in order to help tourism informal sector workers to limit the risks of contagion, access to affordable healthcare, provide training, income and food security.

A drop-off survey was undertaken with a sample of 883 people with an open-ended question about the Willingness to Pay (WTP) of respondents. The drop-off was considered mostly due to the COVID-19 sanitary measures. This gave us an idea about the average amount respondents were willing and able to pay for a Tourist Informal Sector Solidarity Fund (TISSF). In order to ensure representative range of individual's perspectives, the sample includes both urban and rural areas.

The double-bounded dichotomous choice elicitation question technique was preferred for this study as opposed to open questions or even bidding games techniques, since Bateman *et al* (2002) and Peterson *et al* (2003) mentioned in their studies that the double b gives more information about the Willingness-to-Pay of the respondents and is less expensive.

The Cronbach alpha of the different theories such as the planned behaviour (Attitude 0.6; Perceived Behavioural Control 0.6; Subjective Norm 0.6), trust in the government (0.7) and even the Social Desirability Bias (0.9) show a minimum figure of 0.6. This is positive, since it supports the reliability or internal consistency of the test items.

The hierarchical modelling was used with the main objective of identifying the importance of each variable used (Darlington, 1968). According to Aron & Aron (1999) and Cohen (2008), the importance of each independent variable can be affected by how much it contributes to the prediction of a criterion.
The theory of planned behaviour predicts the intention of a person to engage in a behaviour in a particular situation (Wayne W *et al*, 2019). This theory has been captured by the first concept of Attitude, where it shows the degree towards which an individual has a favourable or 4 unfavourable view concerning the behaviour of interest. Secondly, subjective norms is also captured, where it measures the belief concerning the approval or disapproval of most people concerning a behaviour. Finally, Perceived behavioural Control which captures an individual's perception about the facility or complexity of undertaking the behaviour of interest. The planned behaviour theory is significant, showing that as attitudes, subjective norms and Perceived Behavioural Control of payment for the TISSF become more positive, an individual's WTP increases.

The social desirability bias captures whether respondents have answered to the questionnaire with 'socially acceptable' or 'socially desirable' answers rather than their 'true' answer (Bernardi *et al* 2008; Lavrakas, 2008). Concerning our study, the Social Desirability bias is negative and not significant, meaning that the respondents have not been influenced by 'socially acceptable' or 'socially desirable' answers (Cheek, 2007).

The questionnaire also captures the perception of the public concerning the financial support of Rs 5,100 given by the government to informal sector workers and the results show that the coefficient is negative and significant, meaning that the lesser the respondents agree with this support, the more is their willingness to pay the TISSF. Another aspect that shows a significant figure is that the respondents to agree that tourism informal sector issues should be included into local government policies. Coming to the Altruistic Behaviour, it has been captured using the Subjective Obligation to Pay (SOP) and General Warm Glow (GW), with reference to Liebe *et al* (2007). These aspects measure the behaviour of individuals who may create the benefits of another individual at the cost of oneself. The coefficients are positive and significant, that is the more the respondent agrees with this behaviour, the greater is the willingness to pay the TISSF.

The policy implications from this study are to mostly help important stakeholders such as the government to implement long-term solutions to support the informal sector, especially during and after the COVID-19. For instance, concerning the governmental support, we can observe that respondents are willing to pay for the TISSF, since they believe that the supports of Rs 5100 was not enough. This may allow the government to consider this one-off voluntary payment as a solution to help the tourism informal sector operators. In addition to this, we have observed that the respondents do also agree to implement the informal tourism sector issues into local government policies. This is a clear proof that respondents feel that the informal tourism sector plays an important 5 role in the Mauritian economy and that it is high time to consider long-term solutions to support them.

The results of the Planned Behaviour Theory are also encouraging, since we can observe that respondents do have a favourable view of the tourism informal sector in Mauritius. They are ready to contribute to the TISSF and this definitely shows that this sector has a positive perspective.

Out of Pocket Health Expenditure in Nigeria: Case Study of Households with HIV/Aids Members

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ABSTRACT

Although a fair share of out-of-pocket (OOP) health spending out of total health expenditure is desirable both as a source of revenue and in reducing demand for health services, its significant share has become a policy concern for the following reasons. First, high OOP health expenditure makes health care services competitive. Second, a high incidence of OOP health expenditure reduces the consumption of health; intensifies inequality to health care services; and increases the vulnerability of households to financial risk associated with costly illnesses. Lastly, OOP health expenditure is unpredictable. Consequently, this study is aimed at examining out-of-pocket health expenditure in Nigeria focusing on households with HIV/AIDS members. The methods of data analysis include the Ordinary Least Squares and Probit/Logit regression techniques. The study used the Ordinary Least Squares regression technique to examine the determinants of OOP health expenditure and analyze the effect of OOP health expenditure on HIV/AIDs. On the other hand, the Probit/Logit regression method investigated the determinants of catastrophic health expenditure. The data for the analysis was sourced from the Nigerian General Household Budget Survey; Living Standard Measurement Study and Demographic Health Survey for Nigeria; and Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS). The result showed that out-of-pocket as a proportion of total private health expenditure and total health expenditure significantly drive HIV prevalent rate. The study recommended that there is a need to broaden our study of HIV in order to be able to proffer recommendations that will redress the menace.

KEYWORDS: Out of Pocket; Health Expenditure; HIV/Aids, Health outcomes; Households

Modelling Non Negative Integer ValuedSpatio-Temporal Count Data

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ABSTRACT

Problems with spatial count data occur in several disciplines. Consider the cases and/or deaths of COVID-19 outbreak. Spatial data usually viewed an average of the events of interest emanates from a lattice structure. The lattice structure is made up of neighboring cells that may be arranged in either regular or irregular grid structures while the neighboring cells may follow some popular spatial structures such as the unilateral or the most complete Queen structure. This work focuses on the two-dimensional representation considers all border cells in the region of interest (Basu and Reinsel, 1993). In the spatial data analysis, it is important to investigate two main issues: Firstly on the spatial dependence between observations from different neighboring areal units and on determining the possible factors or effects influencing the spatial observations. Existing literature has focused on the regular unilateral lattice structure with neighbors of order 1 known as the spatial auto-regressive model of order 1 (SINAR(1)) (Ghodsi et al., 2012). SINAR(1) was constructed by introducing dependence between the observation of interest with its unilateral spatial neighboring observations via the binomial thinning operator . In this work, the SINAR(1) model is extended to the multilateral regular lattice structures such as Rook, Bishop and Queen structures . Firstly, different distributions are used for the innovations to enlarge the existing SINAR(1) model and allow for larger variances usually observed in spatial data due to clustering effects. Secondly further spatial information is allowed to be used in the form of covariates that affect the model leading to a non-stationary model. Under similar extensions the novel SINAR(1) processes for the regular multilateral structures are developed. Inference based on the conditional maximum likelihood (CML) is then discussed. Simulation experiments are implemented to assess the estimators consistency and performance of the CML. The developed models are then applied to the Bei and Yeast data and their goodness of fits are assessed.

Keywords: Binomial Thinning, Multilateral, Neighborhood, Regular Lattice, Spatial, Queen

Analysis of the impact of the use of the improved stove " guev cooker " on the environment and the reduction of greenhouse gas emissions

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ABSTRACT

Many households in African countries remain dependent on woodfuel stoves for their domestic energy needs. This energy dependence on wood resources has inexorably led to increased pressure on forests and accelerated their destruction, at the same time as a deterioration in the health and living conditions of hundreds of millions of human beings, linked deterioration of air quality and greenhouse gas emissions. One of the solutions to reducing the consumption of wood-energy is the popularization of improved stoves. This study aims to assess the environmental impact of the introduction of the Guev Cooker improved stove in rural Benin. Indeed, the improved hearth Guev Cooker is equipped with a rapid cooking system with automatic and programmable ignition, with continuous electrical autonomy, and makes it possible to make available to the populations, techniques allowing to value palm kernel nuts. and other biomass to significantly reduce deforestation, air pollution and GHG emissions. To do this, data is collected from 500 married women, through sampling based on the power calculation method. This involves determining, on the one hand, on the basis of the controlled random assignment method, the savings in wood made by women when cooking meals and the reduction in greenhouse gas emissions (GHG) using a CO_2 detector, after the introduction of the improved stove. On the other hand, this study aims to assess the effect of the improved stove on the energy transition in households.

Keywords : Guev Cooker improved stove, Environment, Greenhouse gases, Deforestation, Benin

Global Value Chains Participation and Innovation Performance

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ABSTRACT

This study investigates the relationship between global value chains (GVC) participation and countries' innovation performance. Importing intermediate goods hypothetically generates knowledge spillovers across countries along the chain that can be tested through exploring the learning effect of GVC participation. The learning effect is particularly beneficial for developing countries disadvantaged in technology production. Thus, the study contributes to the controversial query in literature regarding the biasness of GVC participation against developing countries with abundant unskilled labor. Through merging the EORA26 dataset and the World Development Indicators' R&D stock data, the weighted foreign knowledge backward participation index is constructed. The study shows a significant association between the constructed GVC index and innovation measured by residents' per capita patents for a sample of 83 countries along all income groups. Furthermore, it shows that the quality of institutions matters for domestic innovation. Results show a positive and significant effect of rule of law on residents' per capita patents. In addition, the endogeneity of GVC is tackled by using instrumental variables regressions.

Finally, to ensure results' robustness, relying on TiVA database, a backward participation index is used as the variable of interest. Based on empirical results, this paper offers policy implications aiming at enhancing domestic innovation particularly in middle-low and low-income countries.

Keywords: Global Value Chains; innovation; R&D; institutions

AnEvaluation of the Relationship Between Economic Growth and Unemployment in South Africa: The Role of Small and Medium Sized Enterprises

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ABSTRACT

1. INTRODUCTION & BACKGROUND

The South Africa (SA) real gross domestic product (GDP) has slumped by 1.5%, eroding some of the economic gains the country has made since the severe impact of Covid-19 in the second quarter of 2020 (Maskaeva & Msafiri, 2021:2). Maskaeva and Msafiri (2021:3) continues to say that the South Africa slow growth triggered a high level unemployment rate. As much SA has one of the highest unemployment rate 34.9% in the world, Yeboah (2021:2) posits that the inclusivity and more support for SMEs sector can boost South African Economy. Although this may be true, in 2013, small businesses in SA generated 16% of total turnover in the formal business sector, expanding to 22% in 2019 (Saah, 2021:549). Despites this achievement, Saah (2021:550) again said that the majority of SMEs in South Africa fail at their early growth business stages due to lack of capital and inappropriate systems and processes by the government in handling their growth or deal with risk. Looking at the role "SME Agencies" which includes supporting SMEs growth and sustainability. Kanayo (2021:123) advise that the inclusion of SME Agencies will aid SMEs growth which will in turn create more jobs.

1. RESEARCH PROBLEM

- What role can SME play in stimulating Economic Growth in South Africa?
- What role SME play in reducing unemployment in South Africa?

2. RESEARCH OBJECTIVE

The main objective of this study is to identify how SMEs can contribute to Economic Growth and the alleviation of unemployment in South Africa with recommendation to be made for the attention of policy makers from National and Provincial Government

3. SIGNIFICANCE OF THE STUDY

To propose/recommend growth framework both at the National and provincial government level in supporting SME Agencies which will turn facilitate SMEs growth and expand more jobs.

4. METHODOLOGY

This study will adopt qualitative and quantitative method. Qualitative will include questionnaire (telephonic data) while quantitative will be model specification such as using a vector autoregression and Okun's (1962) type model for "growth" and Aktar and Ozturk (2009) of unemployment as a function of inter alia economic growth. Target population, will be SME Agencies across nine provinces in South Africa.

Keywords: Economic growth, Unemployment, Labour market policies, SME support agencies, small and medium size enterprises (SMEs), Job opportunities creation

Financial Inclusion for Women Empowerment: A Case Study of Mauritius

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ABSTRACT

Women empowerment is considered to be an important pillar for the emancipation and development of the society. There are various ways it can be achieved and one of them remains financial inclusion. Financial inclusion, as defined by FATF, 2011a, p. 12 in De koker and Jentzsch, 2013, is generally defined as ensuring access to formal financial services at an affordable cost in a fair and transparent manner. Chaudry et al. (2012) who state that women empowerment is desired not only for the upliftment of women but due to its contribution to poverty minimization and promotion of growth. Countries like Pakistan, Turkey and Bangladesh account for some 56% of unbanked adults, a society where women are not offered equal rights and benefits due to lack of awareness, accessibility, illiteracy and unacceptance of the society. However, it has been observed that in practice financial inclusion fails to generate structural improvements in women's livelihoods and is not well knitted to capture and deal with gender dimensions (Kabeer, 2005).

In the same line of thought, prior to 2011, we could not know the degree to which women and poor people are excluded from the financial system. Mauritius, being the top ranked country in financial services witness a higher percentage of males involved in financial inclusion as compared to women. Nevertheless, this study will contribute to the literature by looking at an additional quantity dimension namely barriers as well as by addressing the quality dimensions such as financial literacy, convenience, affordability and choice.

Furthermore, the findings of the study will aid policy makers and others in developing packages which will aid in the nurturing of financial inclusion and inclusive development of the country.

BUSINESS MANAGEMENT

Towards Optimising Innovation-Entrepreneurship Outputs in Knowledge Intensive Precincts.

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ABSTRACT

Bloomberg's 2021 Innovation Index ranked South Korea (Korea hereafter) the most innovative economy and Australia positioned 19th among the sixty countries compared. By contrast, World Bank's Doing Business 2020 report placed Australia ahead of Korea with their respective rankings of 7th and 33rd in the 'starting business' indicator set. Given that Korea is ahead of Australia in innovation advancement, it raises the question as to why Korea is behind Australia with regards to entrepreneurship and the creation of start-ups, and why Australia is trailing Korea in the generation of innovation when the former is ahead in entrepreneurship. Despite sharing the same salient drivers and a strong correlation between innovation and entrepreneurship, the significant gap that exists between each country's position in the innovation and entrepreneurship indices is yet to be understood.

One possible explanation for disproportion that exists between innovation and entrepreneurship ranking metrics is the attributes of environments that influence the mechanism of knowledge exploitation into producing the different outputs from innovation and entrepreneurship activities. Another plausible reason could be rooted in the strategic choice by decision makers and intentional focus on certain activities to produce optimal economic performance from limited resources.

Numerous studies have been conducted on the relationships among innovation, entrepreneurship, sources of knowledge with entrepreneurial and innovation behaviours and their drivers, knowledge intensive clusters and economic growth. Little has been researched to identify the important environment attributes that stimulate separately and jointly knowledge creation, knowledge spillover and absorptive capacity of actors in defined geographical locations. So far, no conclusive studies were conducted to examine the relationship among knowledge creation, knowledge spillover and absorptive capacity in knowledge intensive environment how they are affected by specific environment attributes, and how they interact among themselves in unique settings to produce the most optimal economic outputs through innovation and entrepreneurship activities.

The objective of this research is to identify settings or environment attributes that influence knowledge creation, knowledge spillover and absorptive capacity of actors, and their interactions that drive innovation and entrepreneurship outputs. This research will also develop a theoretical understanding of how innovation- and entrepreneurship outcomes may be optimally balanced in purposive knowledge-intensive settings. This research will inform policymakers in formulating better economic policy that leads towards greater economic performance. It will also provide innovators and entrepreneurs with clearer understanding of environment attributes when making decisions and choices for suitable locations that fit their innovation and entrepreneurial objectives.

Research Keywords: Entrepreneurship, Innovation, Precinct Attributes, Knowledge Mechanisms, Output Optimisation

Developing an integrative model of ISO 9001 Effectiveness for ISO 9001:2015 Certified Firms in Mauritius: An analysis of its antecedents and outcomes.

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ABSTRACT

Over the past three decades a large number of organizations worldwide have realized the importance of implementing a quality management system which is a prerequisite for ISO 9001 certification. This quality initiative has been viewed as a strategic move to cope with pressures due to rising competition both in the domestic and global markets. Mauritius is no exception to this quality movement as according to ISO Survey of Management System Standard Certifications – 2019 (up the end of 2019) there are 231 firms which are ISO 9001:2015 certified in Mauritius, which include parastatal or governmental bodies as well. To benefit fully in terms of improved market, operational and quality performance from ISO 9001 certification, it is imperative for organisations to implement and operate an effective quality management system (QMS). It is also argued that just adopting and justifying quality practices clearly is not enough, rather there is a need to lay stronger emphasis on a clear understanding of the critical factors that may influence the QMS effectiveness. Hence this paper will attempt to examine principally two questions, firstly, "What are the critical factors that have a significant impact on a QMS effectiveness", and secondly, "What is the influence of ISO 9001 QMS effectiveness on a firm's performance". Thus laying the foundation to develop a conceptual framework integrating the influential critical factors affecting ISO 9001 QMS effectiveness, the effectiveness of ISO 9001, and organizational performance. Therefore, the objective of this research is to give an overview of the relevant studies and underlying concepts supporting the development of such a model. A survey will be carried out among the quality managers of ISO 9001 certified manufacturing and service companies in Mauritius. Data will be obtained from the managers through a structured questionnaire.

Keywords: Quality management system, ISO 9001 effectiveness, critical factors, organizational performance.

Developing and Testing an Integrative Model of Customer Experience Management for Enhancing Service Excellence and Brand Loyalty in the Banking Landscape of Mauritius

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ABSTRACT

Acknowledging the essence of the pioneer works of scholars and the sustained research interest in the arena of Customer Experience Management, it has been evidenced and argued that Customer Experience Management (CEM) is regarded as the competitive battleground for firms to enhance marketing outcomes related to service excellence and brand loyalty. Existing works on CEM have been widely criticised for underlying theoretical confusion and fragmentation dilemmas revolving around the concept, resulting in diverse and disparate views on CEM. Hence, this research has explored the impact of Brand Experience, Employee Behaviour, Servicescape, Trust, Presence of Other Customers and Customer Value Co-Creation Behaviour on Customer Experiences and in turn, the influence of Customer Experiences on Service Excellence and Brand Loyalty in banking contexts to address the specified research gaps.

Based on a comprehensive and critical review of the literature, a theoretical model comprising of six (6) independents constructs namely, Brand Experience, Employee Behaviour, Servicescape, Trust, Presence of Other Customers and Customer Value Co-Creation Behaviour with the three (3) dependent constructs relating to Customer Experiences, Service Excellence and Brand Loyalty was developed to be tested in the context of the banking landscape of Mauritius. This study has adopted a positivist research philosophy and a deductive research approach through quantitative research methods using structured questionnaires for the two main phases of the research. The targeted population of the study were the customers of the retail banks of Mauritius. Exploratory factor analysis using principal component analysis along with Varimax rotation has also been conducted to confirm the identified structure of the constructs to ensure the validity of the scale items with data collected from 209 respondents. The second phase of the study was mainly focused on the confirmatory phase of the research to test the measurement model and structural model of the research through CB-SEM using AMOS 24.0 from data collected from 810 respondents.

The results of the analysis of this research have confirmed robust findings for the measurement and structural model of this study. This research has thus bridged the research gap on CEM by determining the predictive factors impacting upon customer experience management in retail banking contexts. With the novel experiential theoretical clarity on CEM and the vital evidence of the impact of CEM on Service Excellence and Brand Loyalty, this research has ascertained a theoretical consensus in understanding CEM for enhancing marketing outcomes in the retail banking contexts.

This study has asserted a new academic and practical lens to enhance academic community with original discoveries in the body of knowledge in CEM and innovative thought-provoking practical insights for policy decision making in the arena of CEM to enrich the marketing outcomes in retail banks. These findings will provide new orientations and reflections for policy makers to focus on the experiential part of customer journey in retail banking contexts. Together with the rich theoretical contributions that this study has brought, it is paving a smooth and safe direction for the policy makers of retail banking contexts with stimulating insights for ensuring safe banking experiences in the retail banking contexts of Mauritius that, in turn, is a pressing concern for key policy makers of retail banking sector.

In the light of prevailing uncertainties associated with the current pandemic crisis, this study has asserted a novel baseline theoretical and practical outlook for future research in the arena of CEM within the retail banking contexts for post COVID-19 and any other unforeseen pandemic crisis that can happen in the forthcoming years. In this respect, this research is urging for further proactive research on a safe and branded banking experiences of customers in retail banking contexts. This research has indeed proved that the structural model on CEM represents a different theoretical arc in the arena of CEM research that will enable policy makers with constructive practical insights to enhance the experiences of customers, thus, demarcating itself from previous diverse empirical studies on CEM where there was lack of theoretical clarity on CEM.

Keywords: Customer Experience Management, Integrative Framework, Service Excellence, Brand Loyalty, Banking Contexts

Measuring Service Quality Holistically and Integrating PLS-SEM and IPMA With QFD for Continuous Improvement in The Service Industries

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ABSTRACT

Organizations are constantly looking for means to thrive in the dynamic business environment and to enhance their competitive edge. Numerous tools, techniques and methodologies for organisations to continually improve on the quality of their processes and outputs have been advocated by both researchers and practitioners, among which Quality Function Deployment, also known as QFD, stands out with its adaptability and its successful application in numerous fields. QFD is a team-based, customer-driven management method in which customer requirements are used to drive the product development process through a systematic translation of the customers' requirements into engineering or technical attributes. It is considered as one of the most effective methods to incorporate customers requirements into strategic and operations management (Wang, et al., 2020) with its house of quality matrix that allows organisations to make evidence-based decisions regarding the trade-offs between customers' needs and company's resources and expertise. Despite the tremendous potential of QFD, its effective relies on the accuracy of the voice of the customers captured. The M.Phil. phase of this study focuses on the latter.

This research has 2 main objectives. As first objective, the study aims at validating holistic measurement models of service quality in three service industries (sport and fitness, higher education and hospitability). Secondly, the study aims to empirically test a structural model linking functional service quality, outcome service quality, customer satisfaction and loyalty using Partial-Least Square Structural Equation Modelling (PLS-SEM) and apply Ringle's Importance-Performance Map Analysis (IPMA) to gain perspective on both importance and performance of the constructs in order to identify which attributes should be prioritized for improvement and resources allocation. Those identified attributes are then to be used as inputs for the application of QFD. The research employs a mixed methods approach, which is backed up by post-positivism paradigm, and comprises of an exploratory and an explanatory phase.

On the overall, the current study makes significant contributions with the current findings enabling the top management to make a sound decision in strategizing their overall strategy for customer retention, but also the methodological approach devised and validated in this study ensure that it can be utilised to the future to capture and analyse the needs of the customers. The Ph.D. phase shall incorporate the finding of this current MPhil report in order to prioritize those needs of customers which will actually bring return of investments to the organisation, and to transform these into actionable and feasible plans using the strategic and methodological approach of QFD.

Keyword: Service Management, Continuous Improvement, PLS-SEM, IPMA, QFD

The determinants of medium-and-high-technology manufacturing in African countries

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ABSTRACT

While there is an established literature identifying factors that influence the industrialization and the long-term growth path of countries, not much empirical evidence exists on the determinants of technology intensity in manufacturing. Given the fundamental role of technology in industrial development, this paper contributes to the literature by examining and identifying the factors that influence the relative success of technology intensity in manufacturing (medium- and high-technology manufacturing value added and medium- and high-technology manufacturing exports) in African countries. We use data for 33 African economies covering the period 1990-2018 and estimate a standard probit model. In addition to the known factors of industrialization, our results identified new sets of determinants that contribute to the relative success in technology-intensive manufacturing in African countries. We discuss the implications of these findings in the context of the technology-led structural change debate and the competitiveness of manufacturing in African countries.

Keywords: Technology intensity; Industrial development; Manufacturing; Africa

The interrelationship between work-life integration and organizational commitment of women conservation leaders in the Democratic Republic of Congo.

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ABSTRACT

Hence, this research is pivotal in understanding the work-life dynamics of the women conservation leaders, in contrast to their male counterparts in the Democratic Republic of Congo. This study will look at the work and non-work demands through a lens where both are conceptualized as integrated and overlapping instead of isolated and distant (Voydanoff, 2007). The work-life integration dynamics of women conservation leaders will be explored with reference to the temporal, physical and psychological factors of the boundary and border theory, the instrumental and affective factors of the enrichment theory, and the demands and resources factors of the job demand – resources theory. The three-component model of commitment will be used to explore the dynamics of organizational commitment. The three constructs of the model are: affective, continuance and normative commitment. The temporal, physical and psychological boundaries will be studied.

The geographic scope of this study will be limited to the conservation context of the Democratic Republic of Congo. This research will use a census survey method and a blended research approach, comprising of both qualitative and quantitative research will be pursued. The qualitative method will seek to collect data through semi-structured interviews, in order to uncover the dimensions of work-life integration and organizational commitment. The data will be analyzed using thematic inductive analysis. The quantitative method will seek to collect data through questionnaires, in order to explore the relationship between work-life integration and organizational commitment. The data will be analyzed using Structural Equation Modelling (SEM).

The perceptions about women's role in the household has remain unchanged. According to Pignatti (2016), the employment opportunities available for women have been prejudiced by the perception that women were more appropriate for housekeeping and care-giving works. The perception, emerging from the lack of gender equity, has placed a double burden on women and increased their challenges with regard to ensuring harmony between the different roles they play in life, including professional and domestic roles. The general labor force, not just women, has begun a pursuit for harmony in this current era, which is utterly characterized by competition, stress and the race for existence. According to the studies conducted by Tallis and Lubchenco (2014), many conservation practitioners have explained that the conservation profession will fulfil its mandate to protect biodiversity with effectiveness provided that the due consideration is given to the inclusion of different genders. However, despite the pivotal role of women in the world of conservation, their employment pattern in the labor force has lost friction. In accordance with the data derived from the International Labor Organisation (ILO), dated 21st June 2020, female participation in the labor force accounted for 38.78 % of the total labor force. Women are divided between work and non-work domains and therefore the overlapping role demands and responsibilities can result in increased work-life imbalance and work-life conflict. According to the research undertaken by Weber (2011) and Storm (2009), women have been searching for balance in their career in order to dedicate enough time to their work and non-work obligations. Meyer and Allen (1991) found a positive relationship between work-life policies and organizational commitment. Balance, as a noun, means stability or equilibrium. Taking into consideration the different nature of each domain, with their own unique set of responsibilities including work commitments and marital responsibilities, finding the equilibrium can be unrealistic.

Keywords: work life integration, work life balance, organizational commitment, conservation

Analyzing Market Linkages of Farmers' Wheat Products in Ethiopia: A Study On Bale Zone Smallholder Farmers, Oromia Region.

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ABSTRACT

Introduction: Agriculture is a core driver of the Ethiopian economy that contributes more than 33.5% of GDP (CSA, 2018). Bale zone is particularly known for its extensive wheat production and is sometimes called the "wheat belt'' of Ethiopia (Usman, S. 2016). However, having land resources and a good environmental-climate condition does not advance the Ethiopian economy due to the traditional farming and marketing practice of smallholder farmers. Ethiopia as a whole suffers from weak market linkages on both the input and output sides. Weak systems' connections prevent quality products from reaching end-users. Farmers are exposed to the exploitation practices of the middlemen because the majority of them have no up-to-date information on prevailing market prices. Smallholder farmers have a problem in exploring the new market opportunity due to their limited capacity (USAID, 2011). As such when linkages are absent or weak, markets become inefficient. The purpose of this paper is to review the market linkages and constraints of smallholder wheat farmers' literature along many dimensions, which include but are restricted to scope and objective.

Methodology: After exclusion criteria, 55 relevant and scholarly articles of various researchers and practitioners during 1991-2022 were reviewed through snowball referencing. The articles discussed have been selectively included based on relevance to the topic, qualitative study design, and type of published journal articles. Identification of relevant literature occurred through Google Scholar's Search Engine and Science Direct, Research gate, Emerald Insight's database, as well as identification of studies from reference lists of the articles examined.

Findings: The information related to empirical research and viewpoint of various market linkage drivers like; market extension service, market-oriented production, farmers market information, and farmers wheat market linkage approach captured, studied, and analyzed in detail.

Managerial Implication: In terms of managerial implications of this study hoped that viable solutions would emerge for the farmers regarding market linkages that will assist in the production of a saleable and quality wheat product and pave the way for new market opportunities. The development of market linkages for smallholders will need to focus on establishing a long-term relationship. The research gaps to be filled up in the Ethiopian context will also shed light on the causes of wheat market failures by small farmers to build a market-driven approach towards wheat production and strengthen farmers' market linkages. Smallholder farmer integration production will lead farmer cooperatives to achieve economies of scale. The empirical findings of the present research will also outline the potent marketing strategies that will enhance sustainable access to the wheat market in the Bale Region of Ethiopia and the creation of strong market linkages in a development context.

Originality/value: The study under the title of "smallholder farmers' wheat product market linkages" was not conducted before in the study area but there is a related study on value chains. Previous studies Almost more papers were focused on the technical agricultural production of farmers. This paper provides an insight into various aspects of Farmer's market linkage in general and one can get a deeper and richer knowledge that will help in formulating effective marketing strategies to design an effective and efficient farmer's market linkage. It discovers the research gaps for the new future research routes. This systematic review strongly felt to fill the gap in the farmers' market linkage literature.

Keywords: Market Linkages, Market Information, Marketing Channels and Strategies, Smallholder farmers, Wheat products in Ethiopia

Development of an instrument to measure the influence of Human Resource Development on Internal Service Quality: An analysis of workplace learning efficiency in the Public Sector using Structural Equation Modeling

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ABSTRACT

The purpose of this study is to develop an instrument of measure for the influence of Human Resource Development on internal service quality in the Public Sector in Mauritius. The study will firstly identify the workplace learning methods which employees perceive as effective for service quality delivery and then identify the perceived influencing factors affecting the achievement of service quality delivery when an employee learns in the workplace. This will be followed by the investigation of the relationship between the influencing factors of workplace learning and service quality delivery and the perceived effectiveness of workplace learning. The study will be guided by the research question: What are the perceived influencing factors affecting the achievement of service quality delivery when employees learn in the workplace? It is proposed to use the 3 P's model (Presage, Process and Product) by Tynjala, (2013), derived from Biggs (1987) and modified accordingly to suit workplace learning, to answer the research questions. Presage includes learner factors or individual factors and learning context or organizational factors and the product relates to the outcomes of learning, while the process is the means through which employees learn (formal and/or informal methods). Workplace learning englobes a wide variety of learning activities under formal and informal learning and has common elements: gain in knowledge, skills and attitude. The way individual learn in organisations are influenced by both individual and organizational factors. At individual level: motivation, job satisfaction, reflection, self-efficacy, self-confidence, demographics (age), and at organisational level: team work, work environment, leadership, supervisor support, access to information, communication amongst others will be investigated in relation to the research question. Internal service quality of employees in the public sector is crucial for the delivery of service quality to external customers. Can this be done without a well-developed human resource? What is the role of learning and development in the achievement of this objective? The research aims to benefit scholars by bringing additional knowledge to the literature, and equip practitioners with appropriate tool to respond to the challenges of the public sector in Mauritius. This study will introduce a unique model explaining the relationship between influencing factors and its efficiency and the mediating role of workplace learning to achieve internal service quality. Further this study will be among the few to use multilevel regression analysis for influencing factors of workplace learning at individual and organisational level to cover a sample of 400 employees from 50 government organisations in Mauritius. The development of the model and the testing of the hypothesis will make use of Structural Equation Modeling and ultimately to help bridge the gap between the two fields of study that is Human Resource Development and Internal Service Quality.

Key Words: Workplace learning, Individual factors, organizational factors, multilevel analysis, Structural Equation Modeling Public Sector, Service Quality

Job Embeddedness in new age tech-enabled startups. Job Embeddedness: A bibliometric and cluster analysis from inception to present

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ABSTRACT

Job embeddedness (JE) is defined by (Mitchell et al., 2001) as a vast constellation of different influences based on embedded figures and field theory that influence employee retention. The influences can be financial, social, or psychological in nature. Past research has also provided empirical results of JE benefits in relation to the development of social capital (Holtom et al., 2006), which is considered crucial for an organization's success. Thus, businesses have shown a profound interest in the subject, and have further aimed to align their practices which promote JE in the workforce.

With the increasing importance of JE, in this research we conduct a detailed bibliometric and cluster analysis to provide a holistic review of job embeddedness in the academic literature. A total of 194 articles related to job embeddedness between 2001 and 2021 were identified from the Scopus Data Base through the PRISMA method (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) (Moher et al., 2009) and subsequently analyzed using different software like VOSviewer and RStudio. Based on our analysis, we first present the annual number of publications, the most-cited publications, countries, journals, universities, and authors. We then examine the collaboration network among the different authors and journals via co-citation analysis. The detailed cluster analysis presents a diverse set of seven clusters identified in the literature over time. The different clusters present a holistic view regarding different subjects clusters and research. Finally, we discuss the study limitations of the study and the future research agenda for job embeddedness.

Keywords – Job Embeddedness, Bibliometrics, Cluster Analysis, Visualization

Impact of Jay Customer Behavior on Intention to Quit & Employee Retaliation with Mediation and Moderation of Burnout and Employee Resilience.

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ABSTRACT

The purpose of the current research is assessing the effect of jay customer behavior on employee's intention to quit & employee retaliation with the mediating and moderating role of burnout and employee resilience. With the descriptive cross-sectional data acquired from 256 Indian restaurant employees. The study presents a systematic review of the relatively scarce literature on customer incivility, aiming to reveal academic trends, to unpack significant contributors and recent dynamics, and to recommend future directions. The study also considers the transgender and physically disabled employees which have been overlooked. The present study also examines the role of gender, age, nature of employment and work experience on jay customer, intention to quit and employee retaliation which is entirely unknown. The current study attempts to close this gap by collecting data from these personnel and with the combined rationales of COR and AET theories, the current research seeks to explore how jay customer affect service employee's behaviour through double mediation and moderation effects.

Design/ Methodology/ Approach: The first section of the studyoutlines the bibliometric analysis of the past literature on jay customer of 161 articles using biblioshiny. In the second section the paper conducted the empirical study using 256 restaurant employees. To the collect the data from the target sample, the researchers used the snowball sampling method. The researcher collected the responses through offline and online survey. ANOVA and Structural equation modeling has been used to analyze the data.

Findings: The findings of the bibliometric analysis revealed that thein 2019 the annual production of articles were highest (36) and international journal of hospitality management has found to be the most impact journal with 196 citation 10 publications, h index=5 and g index=10 followed by the most impactful author and country in terms of publication on jay customers. The study also revealed that there is a positive relation with jay customer, intention to quit, employee retaliation and burnt fully mediate the relationship between them. The study also found that employee resilience moderates the adverse effect of such misbehavior on employees. With the ANOVA the study concluded that gender and work experience significantly differ with jay customer, intention to quit and employee retaliation.

Implication: The current scholarly research pays particular attention to aberrant customer behaviour and its consequences as well as to the radical role of organizational support in mitigating such behaviors (Tan et al., 2020). The managers should provide service sector employees with psychological support, guidance, and assistance to overcome the consequences of incivility. Additionally, organizations should provide employees with extensive training before they place them in various service positions. Even more, they should ensure that, upon the successful completion of training, employees have developed autonomy to effectively deal with jay customer. The service sector organizations might also increase customer awareness regarding the negative consequences that their potential incivility might cause to employees. At the same time, they can develop a strong organizational culture that is against incivility.

Keywords: jay customer, employee resilience, intention to quit, burnout

Quality of Life at Work' S Perception and Its Impact on The Private Schools Staff' Loyalty in Togo: The Moderating Effect of the Career Anchors.

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ABSTRACT

The most relevant debates at the heart of the workplace discussions are those that tend to deal with issues relating to the improvement of employees' living and working conditions (e.g. the Rebsamen and Macron laws in France, 2015). The reward received by employees is often not equivalent to the investment of their physical and intellectual capacities, and this leads them into a discontent. As a result, strikes overwhelm the organisational world.

This research focused on the study of the relations between the perception of quality of life at work and employee loyalty while highlighting the moderating effect of career anchors. Its main aim consisted to demonstrate that the attachment of private school teachers to their profession in Togo depends on the quality of life at work that they experience in their work environment. For this purpose, the different components of the quality of life at work concept have been identified in the literature. Employee loyalty dimensions retained concern job satisfaction, organizational involvement and departure intentions. And career anchors have been studied by taking into account the works of Schein (1978; 1990) who designated career anchors as what an employee considers to be the most important and non-negotiable aspect of his or her career.

Empirically, this research had been conducted by collecting data from 275 respondents who are teachers in the private secondary schools in Togo. After regression analyses, it appears that the perception of quality of life at work affects job satisfaction and the organizational involvement of employees, and consequently avoid strikes and employees intentions to leave organizations. However, the moderating effect of career anchors has not been noticed with any dimension of the loyalty concept. It is then appropriate to specify that some hypotheses of this study are validated and others not. Consequently, all the responses raise questions about the generalized nature of the obtained results.

Keywords: quality of life at work, intentions to leave, employee' loyalty, career anchors.

ACCOUNTING/AUDITING/CORPORATE GOVERNANCE

Assessing the determinants of Financial Reporting Fraud: A Systematic Review

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ABSTRACT

Purpose – The purpose of this paper is to carry out a literature review of the qualitative and quantitative studies that have analysed the impact of financial reporting on the detection of financial statements fraud. The main aim is to identify the main determinants of financial Reporting fraud.

Methodology– As a form of meta-analysis, systematic reviews are designed to collect, investigate, classify, and summarize the 'known' and the 'not known' about a specific research -related questions or objectives (Briner et al. (2009) and Petticrew, M., & Roberts, H. (2006)). Two main criteria are set to be in line with the systematic features of the systematic literature review. The first criterion is to limit the inclusion of articles in the sample to those published in the English language only to ease analysis in terms of understandability and comparability. The second important criterion is to identify the relevant key words to the study which are limited to 'Financial reporting fraud' and 'Fraudulent financial reporting'.A final sample of 139 articles is completed which is generally considered sufficient for several previous research

Findings: Even though several articles' findings pointed out the complex and disputed nature of misreporting behaviours, the key findings show that there is a tendency by researchers to categorise the determinants of fraudulent financial reporting in terms of economic, social, psychological, institutional and governance factors.

Contribution: The current study is to build up upon existing research to produce a systematic comprehensive literature review to include most, if not all, the determinants of FRF. This contributes to the body of knowledge on FRF, and the findings and challenges will provide directions and magnitude for future research.

Originality/value – The findings are derived from an extensive and comprehensive literature review of both qualitative and quantitative studies that have studied the link between financial reporting and fraud.

Keywords: Financial reporting, Fraud, Financial Reporting Fraud and Fraudulent Financial Reporting.

Effectiveness of Corporate Governance on Financial Reporting Quality in the Banking Industry in Mauritius

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ABSTRACT

Worldwide financial scandals have led to a number of investigations into the effectiveness of corporate governance practices and financial reporting quality. Global Economic Crime and Fraud Survey indicate that 49% of companies' financial reports do not meet the quality standard (PwC, 2018). Although, there is evidence on the above relationship, no such study has been carried out on the banking sector because in most studies, banks are excluded from the sample as they are specialised in nature and are subject to different regulations and accounting rules. Moreover, as per Deloitte (2016) , only 2% of qualitative research has been carried out on this topic. To fill in this gap, this paper analyses the effect of corporate governance on qualitative characteristics of financial reporting using the approach of Doan et al (2018) in the banking industry in Mauritius. Mauritius because it has one of the strongest economies in Africa with a ranking of 1st in Africa and 2nd among Small Island Developing State (SIDS) (World Bank Group, 2020). Based on all these facts, Mauritius is a leading country and a model among SIDS. Therefore, this study is relevant since it will serve as model and reference to SIDS. This study uses qualitative characteristics-a method that emphases on specific elements in the annual report (Beest, et al., 2009) to determine the dependent variable. The qualitative characteristics of financial information are divided into fundamental and enhancing characteristics (ISAB, 2017). Using STATA to analyse the dataset of 11 banks for 11 years from 2010 to 2020, the results show that CEO duality, board independence, board diversity, board expertise and institution ownership are not statistically significant. However, the presence of audit committee has a positive effect at 5% significance implying that audit committee is effective in fulfilling its monitoring role and providing better quality financial reports thereby reducing information asymmetry between management and shareholders and also protecting investors. Besides the independent variables, this paper considers firm size, firm age, audit firm type and Covid-19 effect as control variables. We find a positive relationship for firm age and Covid-19 whereas firm size and audit firm type are not significant. Covid-19 is positive at 10% significance. However, to determine the exact effect, it is probably too early. But in the short run, it can be seen as a blessing for banks in terms of increased pace of digital transformation in payments (ABC, 2020). Therefore, may be to keep customers and shareholders updated, it has a positive effect on the quality. In general, the evidence suggests that the adoption of corporate governance mechanisms leads to some improvement in quality, constructing an environment in which financial reporting can be more structured and reliable in the banking sector.

Keywords: Corporate Governance, Financial Reporting Quality, Banking, Mauritius

Market Reaction to The Release of Environmental, Social and Governance (ESG)News and Sustainability Reports in Mauritius.

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ABSTRACT

Socially responsible stocks are on high demand compared to conventional stocks, which means that the markets may react more positively to the publication of Environmental, Social and Governance (ESG)news and sustainability reports by companies belonging to sustainability indices (Galema et al., 2008),this being supported by the Efficient Market Hypothesis (EMH), legitimacy and stakeholder theories(Fernando and Lawrence, 2014; Capelle-Blancard and Petit, 2019). In US and Asian countries respectively, Kruger (2015) and Melinda and Wardhani (2020) found mixed outcomes. Apparently, firms with the highest quality sustainability reports exhibit significantly more positive market reactions (Guidryand Pattern, 2010). In Milan, this does not stand (Cardamone, Carnevale, and Giunta, 2012). In NorthAmerica, Lean and Pizzutilo (2020) found that both sustainable and conventional indices performedalmost in the same way, while results of Wu et al. (2015) supported that socially responsible indices aremore resilient to market shocks. Companies with high ESG factors outperformed those formed on low-ESG factors (Chandra and Rad, 2021). It is to be highlighted that most of the studies to date are concentrated in developed countries with very few in developing countries and virtually none in Small Islands Developing State (SIDS). The study intends to assess the market reaction to the publication of ESG news and sustainability reports on the Stock Exchange of Mauritius (SEM) and to find out if there is a difference in the market reaction to the publication of ESG news and sustainability reports by companies that belong to The Stock Exchange of Mauritius Sustainability Index (SEMSI) and other companies.

The event study methodology and OLS regression analysis will be carried out on the listed companies to investigate the impact of ESG news and sustainability reports on the share price movements from 2012 to2021, over two window periods [+5, -5 and +10, -10 days]. Given the uniqueness of the study in Mauritius, market reactions to the publication of ESG news and sustainability reports are expected to be significant post announcement for sustainable companies in key industries. Geographically, the impact of socially responsible activities on stock prices differ (Karlsson and Chakarova, 2008; Amankwah and Abonge, 2011). Therefore, this study will add to the existing theoretical literature from a SIDS perspective and driving non-sustainable companies to pave their way to the sustainability index. Eventually, to better identify companies that are adopting strong sustainability practices, the SEM will have the incentive to build on formal ESG ratings in Mauritius. To accentuate the importance of sustainability reports and ESG criteria, the efforts of standard setting bodies, and market participants in Mauritius are needed to ensure market efficiency, resilience and integrity within the financial and capital markets structure of Mauritius.

Keywords: Market reaction, ESG, ESG Index, Sustainability reports, Stock returns, Mauritius

Impact of Capital Structure on the Firms' Stock Price: Evidence from Mauritius

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ABSTRACT

This paper investigates the impact of capital structure on the stock price of non-financial firms listed on the Stock Exchange Mauritius (SEM). A sample of 29 listed companies was used based on the availability and completeness of data from 2007 to 2017. This article has a threefold aim. First, to study the impact of capital structure on the stock price of firms listed on the SEM, secondly testing for the relevance of the Modigliani and Miller (1963) theories and finally, assessing the use of debt to signal information. Given the dynamic nature of the capital structure-stock price nexus, this study adopts a GMM framework and uses size of the company, liquidity, GDP growth, stock market development and banking sector development as control variables.

A negative and significant relationship was observed between debt and stock price, in line with empirical findings in developed countries. The amount of debt depends on the firm's exposure to its costs of financial distress and the results suggest that shares tend to become unattractive due to higher risk. The results also confirmed Modigliani and Miller (1963) theories, whereby an increase in debt ratios results in shareholders being more insecure. Shareholders therefore require a higher premium for the additional risk. Finally, the presence of agency problems in Mauritian non-financial listed firms was observed such that shareholders are ready to forego part of their revenues to reduce the agency problem. Analysis of the control variables revealed a positive and significant relationship between the stock price and size of the firm, liquidity as well as the banking sector development.

The results confirm that transaction costs are still high in Mauritius and that Government should implement reforms to improve competition in the sector to lower the transaction costs. Government and regulatory bodies could also look into the fiduciary instruments available to increase financing capacity of firms in line with the international good practices.

Key words: capital structure, stock price, GMM, Modigliani and Miller theories, agency problem

Corporate Governance, Capital Structure, and Firm Performance: A Panel VAR Approach

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ABSTRACT

This study examines the interrelationships and interdependenciesamong corporate governance (CG), capital structure (CS),and firm performance (FP) in listed Mauritian companies.A panel vector autoregression (PVAR) approach,which addresses the concerns of endogeneity, causation variables, and relationship dynamics, was applied to a sample of 42 listed companies on the Stock Exchange of Mauritius (SEM) from 2009 to 2019.The Granger causality Wald test, impulse response functions (IRF), and forecast error variance decomposition (FEVD) were used for additional insights. From the PVAR estimates, the Granger causality Wald teststogether with the time path of the impulse responses provide substantial statistical evidence of a positive bidirectional association between CS and FP, supporting trade-off and agency theories for all 42 firms, non-financial and financial firms, respectively. A strong bidirectional relationship was found between CG and CS only for financial firms. The results of the FEVD analysis support the selection of FP as the most endogenous variable.The present study can be valuable to domestic and foreign investors while making investment and credit decisions,managers for their CS and CG disclosure decisions for better FP, and policymakers for their monetary, fiscal, and CG disclosure policies. Future research could include comparisons with other emerging economies and estimates using alternative profitability indicators.

Keywords: corporate governance, capital structure, firm performance, panel VAR,impulse response functions; granger causality, variance decomposition analysis.

MEDICINE AND BIOMEDICAL SCIENCES

Effect of Domestic Processing in the Cancer Chemopreventive Action(S) of Local Foods Using Proteomics.Does cooking influence the chemopreventive action(s) of *Moringa oleifera* pods?

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ABSTRACT

Moringa oleifera pods, well appreciated in stews in Mauritius, have been documented for its numerous secondary metabolites, including polyphenols, which have been highlighted as modulators of multiple carcinogenesis events. However, this vegetable was primarily tested in its raw form, though normally consumed cooked. Thermal processing may cause several physicochemical and biological alterations to foods, hence, it is important to understand the outcome of such processes before indicating the therapeutic value of a particular ingredient. In this regard, this project aims at evaluating the optimum cooking technique that maximizes the cancer protective effect of *M. oleifera* pods and identifying their potential modes of action to support chemoprevention. The pods were boiled and steamed at three different time intervals. The phytochemical analyses demonstrated that the cooked pods had a greater level of phenolic compounds compared to the uncooked form. Steaming revealed to be a better method in retaining flavonoids. Since antioxidant activities have been reported to correlate with anticancer effects of plant-based foods and that plant secondary metabolites can possess multiple antioxidant mechanisms, three different antioxidant assays were performed. Both the raw and cooked *M. oleifera* pods demonstrated notable free radical scavenging abilities. The vegetable also reported potent ferric reducing antioxidant power and strong iron chelating activity across the different processing methods. Shorter steaming time and longer boiling time appeared to be more effective in retaining the antioxidant potential of this food. In addition, the antiproliferative capacity of the raw and cooked pods was compared on a panel of cell lines (HepG2, SW872, AGS, HCT-116, Hs578T, A549, CCD-841-CoN and 3T3-L1). The tested samples reported a large range of cytotoxic levels across the different cooking methods and different cooking time. Additionally, the raw and the short time cooking selectively inhibited the growth of cancer cell lines, enhanced the intracellular level of reactive oxygen species, a hallmark of cancer, in a dose-dependent manner and influenced MAPK phosphorylation, critical for cancer development. Overall, steaming for a short period of time was observed as the best method to retain the chemopreventive properties of this functional food.

Keywords: Functional foods, food processing, cooking, cancer, chemoprevention, polyphenols

Development of Stimuli Responsive Biomaterials for Tissue Engineering Applications

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ABSTRACT

This project aims at blending *Bombyx Mori* silk fibroin (SF) with other biomaterials for the fabrication of scaffolds for tissue engineering (TE) with stimuli responsive abilities and multitasking capabilities. Raw native silk is composed of two filaments of proteinaceous materials namely fibroin (SF) which is surrounded by another proteinaceous material, sericin (SS) (Hacke 2008, p.3) (Figure 1). SF is a fibrous protein with a semi-crystalline structure which provides good mechanical properties such as stiffness and strength (Qi *et al.* 2017, p.237). SF has been typically used in the form of films (Koh *et al.* 2018, p. 59 - 67), hydrogels (Chen *et al.* 2016, p.35684 - 35690) and non-woven mat (Xing *et al.* 2020, p. 5527 - 5535) ideal for TE. The new generation of scaffold is emerging with increasing knowledge available on the biology of diseases. They are expected to respond to the wound by providing support for encouraging cell-material interaction, trigger release of molecules to accelerate growth and degrade at a similar rate to new tissue formation. Therefore, our objective is to fabricate 2D and 3D nano-scaffolds with potential pH and redox responsiveness using extracted *Bombyx mori* SF with drug delivery capabilities.
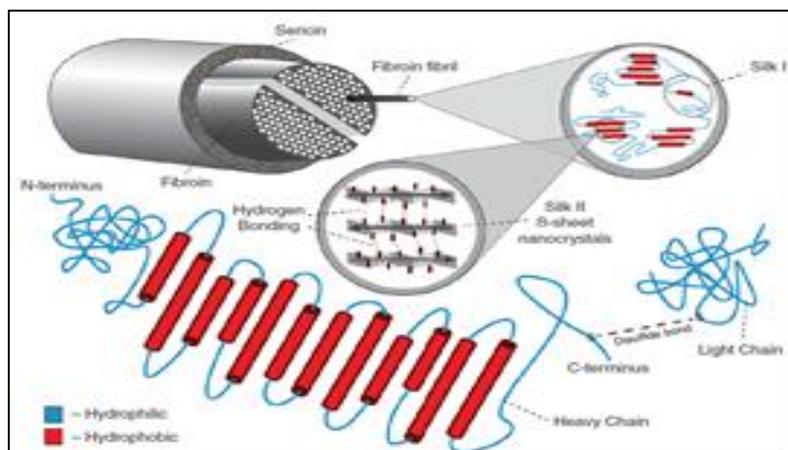
Figure 1.16: The structure of *B. Mori* silk – with the outermost layer consisting of sericin covering the fibroin fibril (Reproduced from DeBari and Abbott 2019, p.e.1536).

Keywords: Silk Fibroin, Nano-scaffolds, Tissue Engineering, Stimuli Responsive, Biomaterials

Wound Healing in Cutaneous Leishmaniasis Using Nanomedicine

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ABSTRACT

Considered as a neglected tropical disease, leishmaniasis is a vector-borne parasitic disease and is caused by *Leishmania* parasites (Akhoundi *et al.* 2016, p.2) transmitted into hosts through the bite of a female phlebotomine sand fly during the course of a blood meal (Elaagip *et al.* 2020, p.2). Cutaneous leishmaniasis (CL) is the most common form of the disease and mainly causes non-healing wounds that leave stigmatising life-long scars upon lesion closure (Ikeogu *et al.* 2020, p.1). Excessive inflammatory response and secondary bacterial infections are two main factors that hamper the normal wound healing process in CL (Conceição-Silva *et al.* 2018, p.5,8). There is an urge for development of new treatment therapies as current curative treatments mainly focus on the eradication of the *Leishmania* parasites without taking into consideration the wound healing aspect of the disease (Goonoo *et al*., under review 2022). This research project aims to develop an alternative treatment for CL wounds in the form of a wound dressing, using biodegradable biomaterials from land and marine biomass namely lignin, cellulose and fucoidan. The study has as objectives the (i) fabrication and characterization of nanofibrous and hydrogels scaffolds, (ii) investigation of *in vitro* release kinetics of scaffolds loaded with natural molecules and (iii) assessment of the wound healing potential of loaded scaffolds *in vitro* and *in vivo.* This project forms part of the Leishmacure consortium between Kenya, Ghana, Mauritius and Germany.

Keywords: Leishmaniasis, Wound healing, Nanotechnology, Biopolymers, Lignin

Computational Modeling of Cell-Scaffold Interaction to Guide Scaffold Design and Performance for Tissue Engineering Applications

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ABSTRACT

Implantation of biopolymer-based scaffolds as a structural and molecular support for tissue regeneration is the future gateway for making modern medical treatment accessible to developing countries [1]. The main barrier for applying them in developing countries remains their high cost. Despite significant research during the past decades in cell biology and cell-material behaviour, only a few scaffolds have reached clinical success. One of the main challenges is to understand cell-material behaviour in order to match scaffold materials and scaffold design with tissue regeneration complex requirements. Successful scaffold design depends on a number of physico-chemical parameters which will impact biological performance by guiding multiplex cell-material interactions. The quest for low cost scaffolds requires a lot of R&D investment from bench to bedside. Artificial intelligence (AI) and machine learning (ML) open up new avenues to design scaffolds and predict their performance based on existing data. Cells and materials can be programmed, in accordance with computational predictions, and used within an automated workflow to generate precise scaffolds "tailored" to meet the needs of the patient. ML algorithms can also help decode the complexities of material properties and their interaction with cells [2].

Over the past ten years, the BDDN Unit - CBBR has generated abundant amount of experimental data on nanoscaffold parameters for tissue engineering applications. These data are used to model the impact of scaffold properties on its biological performance in order to guide and optimize the design of new nanoscaffolds and allow proper scaffold selection for skin and bone tissue engineering.The design of computational models from experimental data will facilitate the research process and assist material scientists to design scaffold in an informed way. A first study on ML methods used physico-chemical data of polymeric scaffolds and *in vitro* data of fibroblast cell culture for the prediction of cell-material interaction on scaffolds [3]. A second ongoing study attempts to model inflammatory responses through the behaviour of macrophage cells on scaffolds to further improve materials performance. Physico-chemical parameters of different polymer blends are also being modelled to predict blend miscibility for effective tissue engineering.

Keywords: scaffold, machine learning, cell-material interaction

FRENCH

Une étude des dynamiques entre langue(s) et industrie(s) culturelle(s) à Maurice : état des lieux, représentations et perspectives

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ABSTRACT

Dans le cadre de notre projet de thèse, nous nous intéressons aux dynamiques entre les langues et les industries culturelles à Maurice. L'appellation 'industries culturelles' apparaît dans le paysage mauricien en 2006 suite à l'adhésion de Maurice à la Convention de 2005 de l'Unesco sur la protection et la promotion de la diversité des expressions culturelles. Contrairement au concept des industries culturelles, les questionnements autour du concept de langues à Maurice occupent une place plus considérable depuis plusieurs siècles, que ce soit dans les sphères institutionnelles, politiques et culturelles. Ces deux objets d'étude, langues et industries culturelles, peuvent être approchés selon une perspective interdisciplinaire car l'un n'exclut pas l'autre, en termes de pratiques, de rôles et de représentations, y compris sur le sol mauricien. Notre étude se focalise sur deux secteurs d'activités au sein des industries culturelles, la musique et le spectacle vivant, et de voir comment les langues participent dans ce processus d'industrialisation, dans un sens large et diversifié, de ces formes d'art à Maurice. Muller-Jaecki (2010/2) reprend la théorie de Chomsky (1957) pour proposer une analyse sur les correspondances entre les pratiques artistiques et les pratiques langagières en proposant une réflexion sur l'ouverture d'un "espace de 'performance'" (Muller-Jaecki, 2010/2 : 63) pour permettre un apprentissage des langues plus efficace. En outre, Masood (2018) propose une analyse sur le rôle de la langue française dans les industries de la culture et aborde le fait que "l'existence de l'espace francophone représente une opportunité de taille pour les pays francophones sur le marché international des biens culturels" (Masood, 2018 : 1). Ces deux études nous montrent les articulations possibles entre les langues et les industries culturelles, mais dans quelle mesure ces articulations sont-elles présentes dans le cas d'un pays multiculturel et multilingue tel que Maurice ? Notre étude vise à identifier ces articulations, à les définir et à proposer des hypothèses à partir d'elles.

Keywords : *industries culturelles, langues, Maurice*

Vers la mise en place d'un dictionnaire du créole rodriguais : enjeux, interrogations et implications. Pourquoi un dictionnaire créole rodriguais?

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ABSTRACT

Alors qu'elles font partie de la même république, l'histoire du peuplement de l'île Maurice et celle de l'île Rodrigues ont connu des cheminements différents. Il s'en est suivi que, bien qu'étant issues de la même souche lexicale originelle (entendons française), les variétés linguistiques créoles, qui ont pris racine dans chacune de ces îles, ont également connu, au fil du temps, des schémas évolutifs différents.

Alors qu'il est établi qu'en dehors de son héritage français, le créole mauricien a également été exposé à des influences lexicales anglophones et asiatiques, le créole rodriguais, pour sa part, tout en conservant plus que sa contrepartie mauricienne, les traces émanant de son héritage français, a surtout gardé trace de certains apports afro-malgaches.

Par ailleurs, même si les deux variétés de langues sont totalement intercompréhensibles, les spécificités linguistiques qui les distinguent l'une de l'autre ont pris, durant ces dernières décennies, aux yeux d'une bonne partie de la population rodriguaise, une ampleur socio-ethno-identitaire, voire politique et pédagogique, suffisamment importante pour en faire un enjeu politique. Par ailleurs, il nous convient de mentionner que les débats épilinguistiques entres rodriguais quant à l'existence « autonome » du créole rodriguais, n'ont pas dans un premier temps, eu une grande résonnance au sein de la communauté des sociolinguistes de l'ile principale, étant donné que le « créole rodriguais » était considéré comme une variante régionale du créole mauricien, pour reprendre les propos du Prof. Vinesh Hookoomsing, alors président de l'Akademi Kreol Morsien dans l'introduction du *Diksioner Morisien* (Carpooran, 2011).

La présente communication ambitionne de proposer une réflexion quoi que sommative sur la pertinence et/ou la nécessité d'avoir un dictionnaire créole pour Rodrigues alors que les rodriguais et les mauriciens se comprennent mutuellement quand ils utilisent leurs langues créoles respectives. Nous tenterons aborder la question sous différents angles, notamment d'un point de vu (i) scientifique, (ii) sociétal, (iii) pédagogique de même que (iv) politique.

Keywords : *Lexicographie, dictionnaire, Rodrigues*

University of Mauritius

DOCTORAL SCHOOL

UoM VIRTUAL DOCTORAL COLLOQUIUM 2022

9-10 March 2022

Organized by the

Doctoral School (UoM)

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POLES OF RESEARCH EXCELLENCE.

PROGRAMME

DAY 1

WEDNESDAY 9 March 2022

OPENING CEREMONY AND KEYNOTE ADDRESS:9:15-10:30		
9:15-9:20	**Opening and Welcoming remarks by the Doctoral School**	**Zoom Link:** **Register at https://zoom.us/ meeting/register/ tJMrcuGprTosEt1 pRI9R10TPCETb2 HB2IZvh**
9:20-9:25	**Address and formal opening by *the Vice Chancellor/Pro VC (Acad)*, *University of Mauritius***	
9:25- 9: 45	**KEYNOTE ADDRESS:** *Dr Yousouf Ismael*, **Secretary General, Mauritius Chamber of Commerce and Industry (MCCI).**	
9:45 - 10:30	**PANEL DISCUSSION:** **Translating research to the community and for policy** *Panelists*: Dr Y Ismael (*MCCI*)/ Patricia D'Unienville (*MCFI Group*), Prof H Coates (*Tsinghua University's Institute of Education, China*) *Moderators*: Prof A Bhaw-Luximon/B Seetanah	

PARALLEL SESSIONS I: 11:00-12:30	
TRACK 1 **THEME: Biotech, Environment and Climate Change 1** **Chair:** *Associate Prof V Florens* **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwpde6rqj0vH9N_9aHXz0iofY4Lm-JjrLZR	**1.** Telemetry reveals foraging and roosting patterns of a repeatedly mass-culled flying fox and offers avenues to mitigate human-wildlife conflict *Vashist Omprasad Seegobin (FOS)* **A38**
	2. Roost distribution of an enigmatic Mauritian endemic insectivorous cave bat. *Yogishah Bunsy (FOS)* **A72**
	3. Human-wildlife conflict around Pteropusniger: Towards a win-win solution between protecting commercial fruits and threatened biodiversity *Geetika Bhanda (FOS) A***71**
	4. Ecology and conservation of the Mauritius endemic and endangered monospecific genus Roussea, Rousseaceae *Prishnee Bissessur (FOS)* **A76**

TRACK 2 **THEME: Energy** **Chair**: *Prof K Elahee* **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjMLO	1. Gendered-Innovation and Energy Management: Green Electricity in the Domestic Sector in Mauritius *Sheena Ramsaha-Poorun (FOE)* **A33**
	2. Decarbonizing Energy Systems of African SIDS for Long-term Energy Scenarios *Bibi Nabilah Hassen (FOE)* **A68**
	3. Development of a framework for predicting photovoltaic plant power output Considering temperature effects under real conditions to enhance grid stability in Mauritius. *Muhammad Zahiir Feizal Coya (FOE)A25*
	4. A Small Vertical Axis Wind Turbine Hybrid system for Integration into Domestic Use in Mauritius Using Numerical Simulations and Optimization Techniques *Dweeshada Ramgutty (FOE)A36*
	5. Multi-objective optimisation of distributed generation units and custom power devices with simultaneous distribution network reconfiguration *Pamela Ramsami (FOE)A1*

TRACK 3 **THEME: Finance /Financial Markets 1** **Chair**:*Dr S Fauzel* **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJMsdOCurz4sHNJXuZ4PlHGATi8Kn3dD32Sc	1. A Theoretical Model of Directed Lending Policy *Shikha Singh A35* *Centre for International Trade and Development, School of International Studies* *Jawaharlal Nehru University, New Delhi, India*
	2. Analyzing the Impact of Exchange Rate and Exchange Rate Volatility on Tourism Demand using disaggregated data: Evidence from Mauritius *Rookayyah Imamboccus (FLM) A6*
	3. The Determinants of Residential Land Price in Mauritius: An Analysis of the Fundamental, Demographic and Behavioral Factors *Narvada Gopy-Ramdhany (FLM)A13*
	4. Impact of Exchange Rate Volatility on Exports: Evidence from Mauritius *Kounshika Devi Kasi (FLM)A16*
	5. Analysing the legal framework for electronic commerce from a consumer-oriented perspective: Using Mauritius as a case study. *Varsha Mooneeram-Chadee (FLM) A23*

PARALLEL SESSIONS II: 13:00-14:30	
TRACK 1 **THEME: Biotech, Environment and Climate Change 2** **Chair: *Prof Y Fakim*** **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwpde6rqj0vH9N_9aHXz0iofY4Lm-JjrLZR	1. Study of major impounding reservoirs of Mauritius for the presence of potential harmful cyanobacteria *Ballah Mohun (FOA)A39*
	2. Biodiversity, distribution and genetic connectivity of Euthyneuran sea slugs around the Mascarene Islands. *Lisa Ah Shee Tee (FOA) A30*
	3. Predictive Microbiology as a Risk-Based Tool to Assess the Safety and Quality of Cooked Yellowfin Tuna (ThunnusAlbacares) *Keshnee Reega (FOA) A79*
	4. Multigene phylogeny coupled with morphological characterization reveal two new species of Holmiella and taxonomic insights within Patellariaceae. *Dhandevi Pem (Thailand) A21* 5. Bioinformatics analysis of genetic variants in the immune system in relation to their evolution and role in diseases *Aaisha Husnoo Moonien (FOA) A74*

TRACK 2 **THEME:** Computational Sciences and Modeling 1 Chair: *Assoc Prof M Mamode Khan* **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjMLO	1. Computational Study of the Interactions of Cocaine with Fingerprinting Reagents *Divya Bhikharee (FOS)* ***A28***
	2. Novel Computational Methods for Solving Fractional Partial Differential Equations *Shilpa Selinska Gina Soopramanien (FOS)* ***A40***
	3 Theoretical Insights into the Effect of Countercations, Solvent, Nucleophilicity and Reactive Centreson Bimolecular Nucleophilic Substitution Reactions *Nandini Savoo (FOS)* ***A66***
	4. Autoregressive Conditional Duration Modelling for High Frequency Financial Data. *Houmera Bibi Sabera Nunkoo (FOS)* ***A69***

TRACK 3 **THEME: Education/Higher Education** **Chair:** *Dr V Teeroovengadum* **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJMsdOCurz4sHNJXuZ4PlHGATi8Kn3dD32Sc	1. Developing an Ethnoscience based Concepts for Teaching and Learning Relational Database Normalisation in e-Learning Context. *Lubabalo Mbangata, International University of KwaZulu-Natal (Durban, Westville Campus)* ***A4***
	2. An assessment of the higher education funding mechanism in Mauritius and the development of an innovative approach *Karoona Charitar, (Open University of Mauritius)* ***A10***
	3. A Study of Factors Influencing the Diffusion and Adoption of MOOC among the Millennials in Mumbai *Ms Jinal Sameer Shah, K J Somaiya Institute of Management, Affiliated to University of Mumbai* ***A55***
	4. Investigating the barriers affecting successful implementation of online learning in South African institutions of higher learning *Skhumbuzo Clement Mtetwa (Da Vinci Institute South Africa)* ***A61***
	5. The New EFQM 2020 and its application in Higher Education Institutions (HEIs) *Keshav Jungbadoor (FLM)* ***A85***

PARALLEL SESSIONS III: 14:30-16:15	
TRACK 1 **THEME: Tourism & Hospitality** **Chair: *Assoc Prof R Nunkoo*** **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwpde6rqj0vH9N_9aHXz0iofY4Lm-JjrLZR	1. The adoption of Artificial intelligence in Sustainable Tourism *Matilda Mashapa (School of Tourism and Hospitality, College of Business and Economics, University of Johannesburg, South Africa)* ***A60***
	2. Testing a Model of Travelers Behaviour Intention in the context of experience product purchase: The influence of Online Review attributes on hotel booking intention *Arshad Pooloo (FLM)* ***A64***
	3. Embracing social media marketing in the tourism industry *Jeyna Ladsawut, International Center for Sustainable Tourism and Hospitality, Faculty of Law and Management, University of Mauritius.* ***A58***
	4. A predictive model for managing air travel behaviour during pandemics *Akhona Melani(North-West University)* ***A54***
	5. How South African farmers describe a successful agri-tourism business? *Ms. Christelle van Zyl, North-West University Student* ***A48***
	6. A critical assessment of marine wildlife voluntourism in Southern Africa *Charmaine Cillliers, North-West University, South Africa* ***A11***

TRACK 2 **THEME: Computational Sciences and modeling 2** **Chair: *Assoc Prof M Mamode Khan*** **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjMLO	1. Automatic Translation between Kreol Morisien and English using a Hybrid Rule-Based and Deep Learning Algorithm *Beebee Zaheenah Jameela Boodeea (FoICDT)* ***A27***
	2 An Analysis of Machine Learning Models Suitable for Error Detection in Infrastructure as Code (IaC) *Sandy Ramasawmy (FoICDT)* ***A67***
	3. An Analysis of AI and Drone Technologies for Beach Erosion Monitoring in Mauritius *Azina Nazurally (FOICDT)* ***A18***
	4. Techniques for cyberbullying detection *Leevesh Kumar Pokhun (FOICDT)* ***A19***
	5. Biomimetic Development of Knitted Fabric Structures: Towards a Sustainable Product Design Process *Manoj Kumar Imrith (FOE)* ***A80***
	6. Artefact Detection and Classification in Esophagus Endoscopic Images *Preeti Bissoonauth – Daiboo (FOICDT)* ***A51***

TRACK 3 **THEME:** Finance /Financial Markets 2 **Chair:** *Dr S Fauzel* **Zoom Link:** **Register at** https://zoom.us /meeting/register/tJMsdOCurz4sHNJXuZ4PlHGATi8Kn3dD32Sc	1. The Impact of Trade Facilitation on Trade Flows: A Meta-Regression Analysis *Neekhil Bhowoniah (FLM)* **A17**
	2. Does corruption perception matter for foreign investors? A conceptual Analysis *Nadeem Ramtally (FLM)* **A44**
	3. An analysis of the Resurgence of Digital Payment in Post COVID Mauritius *Leenshya Gunnoo (FLM)* **A5**
	4. Impact of Macroeconomic and Idiosyncratic Uncertainty on Firms' Financing Decisions: Evidence from SADC countries *Lydie Myriam Marcelle Amelot (FLM)* **A3**
	5. Impact of Capital Structure on the firms' performance:Evidence from Mauritius *Yudeeshen Narayanan (Open University of Mauritius)* **A14**

DAY 2

THURSDAY 10 MARCH 2022

PARALLEL SESSIONS I: 9:30-11:00	
TRACK 1 **THEME:** Biotech, Environment and Climate Change 3 **Chair: *Dr P Fowdur*** **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwpde6rqj0vH9N_9aHXz0iofY4Lm-JjrLZR	1. Treatment of industrial wastewater using an intensified constructed wetland technology. *N. Nurmahomed (FOE) A7*
	2. Recent advances in bioconversion of lignocellulosic biomass into polyhydroxyalkanoates (PHAs) *Nausheen Jaffur (FOE) A15*
	3. Indigenous/traditional knowledge for sustainable, and climate resilient, agriculture in Mauritius *Vagish Ramborun(FOA) A2*
	4. Impact of Climatic Variability on Pathogenic Fungal (and Fungal-like) Species on Potatoes in Mauritius *Sandhya Devi Takooree (FOA) A42*

TRACK 2 **THEME:** Economics and Statistics 1 Chair: ***Assoc Prof N Mamode-Khan*** **Zoom Link:** **Register at** https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjMLO	1. The private returns toHigher Education: AnEconomic Perspective ofthe Mauritian Case *Neha Jugessur (FSSH) A8*
	2. Women Empowerment and Poverty Alleviation: Micro Evidence for Sub Saharan Africa *Anjdilee Taka (FSSH) A52*
	3. Does Minimum Wage promote Equity and Social Justice? Evidence from Africa *V.Dreepaul-Dabee (FSSH) A62*
	4. Poor or Not Poor in which dimensions? Comprehensive Poverty Measures for Better Targeting: The Case of Mauritius *Jyotisha Mawood (FSSH) A78*
	5. Informal SMEs and the tourismssector in Mauritius *Mitch Lebouc (FSSH) A65*

TRACK 3 **THEME:** Business /Management 1 Chair: *Dr V Teeroovengadum* **Zoom Link:** **Register at** **https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjMLO**	1.	Towards Optimising Innovation-Entrepreneurship Outputs in Knowledge Intensive Precincts. *Chan, Kevin Kheng Oon, Centre for Enterprise Dynamics in Global Economies, University of South Australia – Business | City West Campus **A43***
	2.	Developing an integrative model of ISO 9001 Effectiveness for ISO 9001:2015 Certified Firms in Mauritius *L. Vencataya (FLM) **A24***
	3.	Developing and Testing an Integrative Model of Customer Experience Management for Enhancing Service Excellence and Brand Loyalty in the Banking Landscape of Mauritius *Sharmila Pudaruth (FLM) **A34***
	4.	Measuring Service Quality Holistically and Integrating PLS-SEM and IPMA with QFD for Continuous Improvement in The Service Industries *Noorjahan Banon Teeluckdharry (FLM) **A56***
	5.	The determinants of medium-and-high-technology manufacturing in African countries *Rex Asiama* *DSI/NRF SARCHI Industrial Development, University of Johannesburg **A47***

PARALLEL SESSIONS II:11:00-12:30		
TRACK 1 **THEME:** Biotech, Environment and Climate Change 4 Chair*: Assoc Prof R Bhagooli* **Zoom Link:** **Register at** **https://zoom.us/meeting/register/tJwpde6rqj0vH9N_9aHXz0iofY4Lm-JjrLZR**	1.	Ecology of Coral Diseases on the main reef-building coral, Acroporamuricata, from Mauritius Island *Shakeel Yavan Jogee (FOS*) ***A77***
	2.	Comparison of reef fish biomass and coral cover between 2009 and 2020 at Flic enFlac, Mauritius Island *Marie Melanie Virginie Ricot (FOS*) ***A81***
	3.	Coral bleaching patterns during three bleaching events at Flic-en-Flac and Belle Mare, Mauritius. *Sruti Jeetun (FOS) **A82***
	4.	Investigation of the physico-chemical aspects of Ocean Acidification in some selected lagoons around Mauritius *Yadhav Abhilesh Imrit (FOS) **A73***

TRACK 2 THEME: Economics and Statistics 2 Chair: *Assoc Prof N Mamode Khan* Zoom Link: Register at https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjML0	1. Out of Pocket Health Expenditure In Nigeria: Case Study Of Households With Hiv/Aids Members *Julius Olaposi Olabisi (FSSH)* **A32**
	2. Modelling Non Negative Integer ValuedSpatio-Temporal Count Data *Azmi Muslun Chutoo (FSSH)* **A41**
	3. Analysis of the impact of the use of the improved stove " guev cooker " on the environment and the reduction of greenhouse gas emissions. *Darate Corinne Bangami, (FSSH)* **A59**
	4. Global Value Chains Participation and Innovation Performance *Yasmine Eissa, Faculty of Economics and Political Science, Cairo University* **A26**
	5. An Evaluation of the Relationship between Economic Growth and Unemployment in South Africa: the Role of Small and Medium Sized Enterprises *O O Adesile, School of Economics Sciences, in the faculty of Economics and management science at the North-West University***A22**
	6. Financial Inclusion for Women Empowerment: A Case Study of Mauritius *Bheddarshinee Devi Ramjutton (FSSH)***A88**

TRACK 3 THEME: Business /Management 2 Chair: *Dr V Teeroovengadum* Zoom Link: Register at https://zoom.us/meeting/register/tJMsdOCurz4sHNJXuZ4PlHGATi8Kn3dD32Sc	1. The interrelationship between work-life integration and organizational commitment of women conservation leaders in the Democratic Republic of Congo. *Ravi Kumar Keenoo (FLM)* **A84**
	2. Analyzing Market Linkages of Farmers' wheat products in Ethiopia: A Study on Bale Zone Smallholder farmers, Oromia Region. *Kasim Kelil Jarso (FLM)* **A37**
	3. Development of an instrument to measure the influence of Human Resource Development on Internal Service Quality: An analysis of workplace learning efficiency in the Public Sector using Structural Equation Modeling *Kevin Tandrayen (FLM)* **A83**
	4. Job Embeddedness: A bibliometric and cluster analysis from inception to present *Shubh Majumdarr (Indian Institute of Management, Ranchi)***A63**
	5. Impact of Jay customer behavior on intention to quit & employee retaliation with mediation and moderation of burnout and employee resilience. *Apoorva. (National institute of industrial engineering, NITIE, Mumbai, India)* **A29**
	6. Quality of Life at Work' S Perception and its impact on the Private Schools Staff' Loyalty in Togo: the Moderating Effect of the Career Anchors *KossiEssèmou-Abalè Assogbavi (FLM)***A12**

PARALLEL SESSIONS III: 13:00-14:30	
TRACK 1 **THEME: Medicine and Biomedical Sciences** **Chair:** *Prof Bhaw-Luximon* **Zoom Link:** **Register at https://zoom.us/meeting/register/tJwpde6rqj0vH9N_9aHXz0iofY4Lm-JjrLZR**	**1.** Clinico-Pathological Profile of Breast Cancer in Mauritius: A Nationwide Study for 2019 *Marvin Koon (FMHS)**A9***
	2. Clinical Microbiological Assessment of Infected Foot Wounds from Diabetic Patients and their Sensitivity against Fungal and Plant Extracts *Bhavna Madhushi Rakhal (FMHS)**A57***
	3. Effect of domestic processing in the cancer chemopreventive action(s) of local foods using proteomics *Annaelle Hip Kam (CBBR/FoS)**A31***
	4. Development of stimuli responsive biomaterials for tissue engineering applications *Akash Nundloll(CBBR/FoS)**A49***
	5. Development of 3D Hybrid Polymeric Scaffolds with Biochemical/Mechanical Cues for Tissue Engineering Applications *Koushanee Madub (CBBR/FoS)**A50***
	6 Wound Healing in Cutaneous Leishmaniasis Using Nanomedicine *Marie Andrea Laetitia Huët (CBBR/FoS)**A70***
	7. Computational modeling of cell-scaffold interaction to guide scaffold design and performance for tissue engineering applications *Lakshmi YaneeshaSujeeun (CBBR/FoS) **A86***

TRACK 2: FRENCH	
TRACK 2: FRENCH **THEME:** **Chair:** *Dr M Ah Kung* **Zoom Link:** **Register at https://zoom.us/meeting/register/tJwtcuCppjorGNVrtMkXHdLtnSM-Sj7rjMLO**	1. ***Plenary session***
	2. Une étude des dynamiques entre langue(s) et industrie(s) culturelle(s) à Maurice : état des lieux, représentations et perspectives *Ms Kimberly Oxide (FSSH)**A75***
	3. Vers la mise en place d'un dictionnaire du créole rodriguais : enjeux, interrogations et implications *Ms Yani Maury (FSSH)**A53***

TRACK 3 THEME: Accounting /Auditing/Corporate Governance Chair: Assoc *Prof K Padachi* Zoom Link: Register at https://zoom.us/meeting /register/tJMsdOCurz4sH NJXuZ4PlHGATi8Kn3dD3 2Sc	1. Assessing the determinants of Financial Reporting Fraud: A Systematic Review *Mootooganagen Ramen (FLM)A46*
	2. Effectiveness of corporate governance on financial reporting quality in the banking industry in Mauritius *Rudranee Devi Deeljore (FLM)A45*
	3. Market reaction to the release of environmental, social and governance (ESG)news and sustainability reports in Mauritius *Harshini Devi Moonisamy (Open University of Mauritius)A20*
	4. Impact of Capital Structure onthe firms' stock price: Evidencefrom Mauritius *Yudeeshen Narayanan (Open University of Mauritius)A14*
	5. Corporate governance, capital structure, and firm performance: PVAR approach *Rishi Ronoowah, (Open University of Mauritius)A87*

Doctoral Colloquium Organising Team

Prof B Seetanah (Doctoral School); Prof A Bhaw-Luximon (CBBR); Assoc Prof Robin Nunkoo (ICSTH); Dr M Akung (CRSI); Dr V Teeroovengadum (FLM); Prof Y Jaufeerally-Fakim (FoA); Dr P Fowdur (FoE); Assoc Prof V Florens (FoS); Assoc Prof F Mahomoodally (FMHS); Assoc Prof N Mamodekhan (FoICDT) and Assoc Prof M Mamodekhan (FSSH)

V. Jhugaroo; A. Monogee; V. Petit & G.Baungally (Doctoral School, UoM)