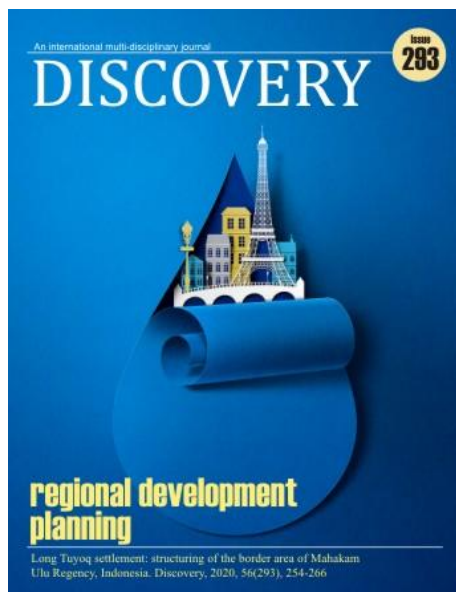


DISCOVERY

About the Cover



The concept of regional development planning is creating and opening new settlements, which is a combination of Liu Mulang and Long Tuyuq, which became the new settlement of Long Tuyuq village. The concept of the new settlement using the concept of a garden house. Primary and secondary data-based research techniques. In its implementation, carried out by conducting a survey. People who are in an unorganized environment are the people lower-middle-class economy, so what is thought about is the concept of environmentally friendly settlement planning with providing facilities and infrastructure that are operationally able to improve quality social and physical. The development of an area is getting better, far away from a seedy impression. The Government of Mahakam Ulu Regency in the spatial plan has been arranged settlement patterns for each village and sub-district. This pattern is stated in the spatial plan which is still in the process of ratification, considering the status of existing land. (Ref: Purwadi, DioCaisar Darma, Muhammad Ikbali, Syahrul, Surya Darma. Long Tuyuq settlement: structuring of the border area of Mahakam Ulu Regency, Indonesia. *Discovery*, 2020, 56(293), 254-266); (Image: EikoOjala).

Modeling the diameter at breast height (DBH) with height and volume of *Shorea robusta* using destructive method: A study from Banke District, Nepal

Ram Asheshwar Mandal, Ganesh Bahadur Khadka, Mohan Shrestha, Sanjay Prasad Sah, Arjun Lamichhane

There is very good correlation between tree diameter, height and volume which is useful to evaluate and calculate the volume of standing trees but study regarding this is very limited in Nepal. Therefore, this research was objectively conducted to correlate diameter with height and volume and determine form factor of *Shorea robusta*. Banke district, Nepal was selected as study site. Altogether 70 healthy plants were selected and felled applying destructive method. The Shapiro–Wilk test and Kolmogorov–Smirnov test were done and box plot was prepared to check the normality so only 61 data were used for the research work. Out of this data of 47 trees were used for model equation development and remaining was used for validation purpose. The natural log regression was applied to develop the model between diameter at breast height (DBH) and height of the plants. The polynomial order 2 model was used to show the relation between volume and DBH and these models were validated. The results showed that r^2 value was 0.892 and equation showing correlation between height and DBH was, $\text{height} = 9.9414 * \ln(\text{Diameter}) - 11.666$. The overall estimated tree form factor was 0.493 and 0.462 of diameter over and under bark respectively. The equations of over bark volume equation for top diameter upto 20 and 10 cm as well as under bark volume for top diameter 20 and 10 cm were $y = 0.0009x^2 + 0.0097x - 0.2113$; $y = 0.0013x^2 + 0.0145x - 0.317$; $y = 0.0008x^2 + 0.0104x - 0.2137$ and $y = 0.0013x^2 + 0.0155x - 0.3206$ respectively whereas y stands for volume and x equals to DBH. The r^2 values were over 0.9 and ANOVA and t-test showed that there was significant relation between these variables at 95% confidence level. Moreover residual plots showed close to zero and the values of Root Mean Square Error (RMSE), ratio of RMSE to standard deviation (RSR), percent bias (PBIAS), Mean Deviation (MD) and Mean Absolute Deviation (MAD) were very less. The volume equation will be useful for forest science to calculate and evaluate the volume of standing plants.

Discovery, 2020, 56(293), 239-253

Long Tuyoq settlement: structuring of the border area of Mahakam Ulu Regency, Indonesia

Purwadi, DioCaisar Darma, Muhammad Ikbai, Syahrul, Surya Darma

The concept of regional development planning is creating and opening new settlements, which is a combination of Liu Mulang and Long Tuyoq, which became the new settlement of Long Tuyoq village. The concept of the new settlement using the concept of a garden house. Primary and secondary data-based research techniques. In its implementation, carried out by conducting a survey. People who are in an unorganized environment are the people lower-middle-class economy, so what is thought about is the concept of environmentally friendly settlement planning with providing facilities and infrastructure that are operationally able to improve quality social and physical. The development of an area is getting better, far away from a seedy impression. The Government of Mahakam Ulu Regency in the spatial plan has been arranged settlement patterns for each village and sub-district. This pattern is stated in the spatial plan which is still in the process of ratification, considering the status of existing land.

Discovery, 2020, 56(293), 254-266

Geo-spatial mapping of Wetlands and Sustainable Development in Niger State, Nigeria

Samuel Ibibi IBRAHIM, Nwaerema Peace

This study presents the geo-spatial mapping of wetlands and sustainable development in Niger State, Nigeria. The importance of wetlands in the development of socio-economic and bio-resources availability of Niger State needs a critical investigation. Thus, Data for the study were imageries obtained from National Space Research and Development Agency (NASRDA). The NASRDA data were generated from soils and rock types as well as their water holding capacities across the three zones of Niger State to form the wetland areas using GIS approach. Findings indicated that the spatial spread of wetland in Niger State was highly present in Edati, Mashegu, Lavan, Bosso, Chachanga, Borgu. Wetland areas moderately decreased from the center to Shiroro, Paiko, Rafi, Kotangora, manga and Rija. Thus, wetland areas extended to the State boundaries of Gurara, Tafa, Sulaja and Munya. Greater part of the wetlands was formed from the segments of the northern drainage basin of the State. However, the effective use of wetlands will require increased wetland utilization, improved laws and regulations and greater dissemination wetland education for sustainable development of Niger State in Nigeria.

Discovery, 2020, 56(293), 267-272

SOCIAL SCIENCE

Addressing Moral Decadence in Contemporary Nigerian Society: The Religious Option

Chinedu Jonathan Dick, Victor Ifeanyi Ede, Ozioma Faith Chiaghanam

Right from the colonial invasion and conquest up to the present day, Nigeria has witnessed progressive degeneration of morality. Before the colonial era, the common characteristics of the Nigerian society was the existence of norms that were pivotal to the running of the society. However, in recent times, all the prohibitions that aided the maintenance of high moral and disciplined society have been neglected and abandoned due to the influence of western culture mainly brought about by colonial invasion. This calls for moral reorientation anchored on Christian ethical principles. This paper examined the problem of moral decadence, its

causes, effects and the need to address the ugly trend through the application of Christian moral principles. Decline in parental authority and domestic values, influence of science and technology, media influence, materialism, poverty, and the collapse of discipline in our schools were identified as the major causes of moral decay in Nigeria. The paper maintains that Moral Education based on Christian morality and the application of it in our societal lives is the panacea to current moral disorientation and abuse in our society today.

Discovery, 2020, 56(293), 273-280

Effective risk management and the profitability of insurance firms in Nigeria

Ponjul B Gonji, Bala VN Gonji, Yohanna G Jugu

The paper examine effective risk management and the profitability of insurance firms listed on Nigeria stock exchange from 2008-2018. The study used capital structure, firm size and working capital as the independent variables while the dependent variable used is return on equity (ROE). STATA 13 was used to analyzed the data obtained from the annual report of the twenty six insurance companies used for this study. The result revealed that capital structure and working capital significantly affect the profitability of insurance firms listed on Nigeria stock exchange. It also revealed that firm size does not affect the profitability of insurance companies in Nigeria. The study recommends that insurance companies should try as much as possible to increase their capital structure as well as working capital so that they can boost their profit. Insurance companies should not bother so much with increasing their size since it does not affect their profitability. They should rather look for modern means of marketing to increase their market share and hence, profit instead of firm size.

Discovery, 2020, 56(293), 281-290

ENGINEERING

Adequacy of port reception facilities in APAPA port, Lagos Nigeria

GBADAMOSI Kolawole T, OJO Ayoade A, ADENIRAN Adetayo O

This study explored the major criteria for determining the adequacy of port reception facilities to ensure compliance of shippers in safeguarding the environment. Marine pollution remains a major problem in the Nigerian environment. Shipping and seaport activities as a factor of urbanization and industrialization have contributed to the scale of pollution. The primary data was collected through simple random sampling technique which is a probability sampling that is capable of giving sample representation and generalization from the population. The examination of port adequacy concerning port reception facilities revealed that the port reception facilities were performing and at good operational services, meanwhile the paired t-test on the MARPOL waste category revealed that oily bilge water (0.044), sludge (0.004), slops (0.000), scale and sludge from tank cleaning (0.000), sewage (0.012), plastic (0.05), operational waste (0.000) and cargo waste (0.000) were efficiently handled with a significance level less than 0.05 (critical region). This study recommends a thorough inspection, monitoring, control and enforcement of Marpol 73/78 within the jurisdiction of the flag state for checking violation, criminalities, and also preserves the marine environment. The need for acquiring modern equipment to test and detect pollution is essential to enhance the sufficiency of evidence for the prosecution and discourage further pollution occurrences.

Discovery, 2020, 56(293), 291-303

MEDICINE

Evaluating Methods of Rat Euthanasia on the Liver and Kidney of Wistar rats: Cervical dislocation, chloroform inhalation, diethyl ether inhalation and formalin inhalation

Aguwa Ugochukwu Samuel, Okeke Somadina Nnamdi, Ezejindu Darmian Nnabuihe, Eze Chinyere Elizabeth, Okoro Janeth, Obinwa Benedict Nzube, Ovie Felix O, Obi Kelvin Chukwuemeka, Ogbuokiri Doris Kasarachi, Okeke Chijioke, Izuogu Morris

A lot of procedural errors are committed at the point of sacrifice of research animals. This study compared four common methods of rodent sacrifice and their effects on the liver and kidney of Wistar rats. A questionnaire was distributed among Experimental and Clinical Anatomists of Nigeria (SECAN) during their annual conference as part of the preliminary studies. Twenty male Wistar rats weighing 160 to 200g were separated into four groups of five rats each. After two weeks of acclimatization, the animals were sacrificed; Group A by Cervical dislocation (control), Group B chloroform inhalation, Group C diethyl ether inhalation and group D Formalin inhalation. Blood was collected by cardiac puncture for serum chemistry. The liver and kidneys were harvested and fixed in 10% formalin for histological studies. Result of our preliminary studies showed that 90% of our scientists use rats for their studies, out of which 50% sacrifice their animals using chloroform sedation. Fifteen percent (15%) use formalin inhalation while 6.25% and 16.25% use diethyl ether and cervical dislocation respectively. Our results show that the methods of sacrifice showed adverse effect on the liver function test and kidney function tests of the rats except chloroform sedation that significantly increased alanine aminotransferase levels. However, Histological studies showed that while cervical dislocation showed no adverse effects, chloroform, diethyl ether and formalin inhalation showed various forms of cyto-architectural distortions on the liver and kidney tissues and should therefore be discouraged or used with caution.

Discovery, 2020, 56(293), 304-312