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PERCEPTION AND PUBLIC HEALTH IMPACT OF LANDSCAPING OF THE CENTER FOR WETLAND, UNIVERSITY OF UYO, UYO, NIGERIA

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ABSTRACT

Environmental pollution creates conducive environment for breeding of parasites and causes serious problem to human health. A study on the perceptions and health implications of landscape architecture in Uyo was investigated. The objectives of the study were: to assessed and improved on the Center for Wetland landscape in the University of Uyo and to investigate the prevalence of intestinal parasites before and after landscaping, and assess the relationship between participants' preferences and perception of landscaping and health implications. A hundred 100 participants who were staff and students of the University of Uyo were selected by stratified random sampling and were served with structured questionnaires. Soil samples were analysed for soil parasites using Baermann method, formal-ether sedimentation and zinc-sulphate floatation methods before and six months after landscaping. The results revealed that landscaping reduces the prevalence of soil borne parasite in the Center for Wetland soil from 61.7% before landscaping to 16.7% after landscaping and improve the sanitation, drainage and hygiene of the Center and create a conducive environment for learning. The prevalence and mean intensity of parasite species isolated from Wetland soil before landscaping were *Ascaris lumbricoides* with a prevalence of 6.7% and mean intensity of 4.0, *Ancyclostoma duodenale* with a prevalence of 25% and mean intensity of 2.93, *Strongyloides stercoralis* with prevalence of 13.3% and mean intensity of 3.63 and *Trichomonas hominis* 6.7% and 2.5. The environmental and public health characteristics of the Center before landscaping shows a high level of pollution, offensive odour, flooding, poor sanitation and unconducive environment for learning. After landscaping, there was a tremendous improvement in the environmental and public health characteristics which creates a good psychological impact, conducive environment for learning and reduces stress, tension and fatigue. The study demonstrated the importance of landscaping of the environment, its benefits and health implications. Sustainable landscape planning should promote the training of environmental management and landscaping at higher institutions of learning.

KEYWORDS: Landscaping, wetland, perceptions, intestinal parasites and public health

Introduction

Perception is the process in which information is derived through senses, organized and interpreted. It is an active process which takes place between the organism and environment. Perception of our environment/landscape helps us to understand and react to our environment (Duggar, 2018; Kankan *et al.*, 2021). Landscaping is an art of planning the drives, walks, lawns, shrubs, garden, flower bed etc. so as to form a beautiful setting for a building and urban city. Landscape is the network of man-made and natural infrastructure as well as green space around our habitation, civic and public places.

There are also some negative impacts of landscaping on environment and public health such as prevalence of diseases of public health significance, pollution and deforestation (Gbonhinbir, 2022). Changes in the landscape affect not only people's well-being but also how people perceive and use the landscape (Feng *et al.*, 2020; Abraham *et al.*, 2010). Soil types and their characteristics potentially affect the occurrence and dissemination of pathogenic organisms and thus provide an objective means of identifying the strata using a landscape ecological approach. The landscape foot hill, plain land, basin and riparia geomorphic strata also influence the prevalence of environmentally based diseases in the landscape (WHO, 2020).

Municipal, industrial and medical wastes contain a variety of potentially significant chemical constituents and pathogenic organisms that could negatively affect public health, landscape, air, soil and groundwater qualities (Adedosu *et al.*, 2013). Such pathogenic organisms found in solid waste include parasitic nematodes, protozoa and other microorganisms (Adeolu and Tope, 2011; WHO, 2020).

The parasitic nematodes whose infective stages can embryonate in the soil are soil transmitted helminths (STHs) (David and Charles, 2010). These (parasitic nematodes represent a serious threat to humans, animals and plants. Soil-transmitted helminths can cause a range of symptoms including intestinal manifestations (diarrhoea and abdominal pain), general malaise and weakness, impaired cognitive and physical development, and chronic intestinal blood loss which can lead to anaemia (World Bank, 1993; WHO, 2022). In general, Soil Transmitted Helminths (STH) prevalence tends to increase under warm and moist conditions in both human and animal populations, as these conditions may expedite development and prevent desiccation (Usip, 2017). Climatic conditions have long been used to predict where a parasite can persist, and when outbreaks might occur. For example, bioclimatographs, descriptions of the climatic envelop in which disease occurs, have been developed to predict outbreaks of STHs in domesticated animals. Changing climatic conditions and shifting patterns of seasonality have also been shown to have

significant impacts on transmission of Soil Transmitted Helminths (STH) (Nyarango *et al.*, 2003; Damen *et al.*, 2007; WHO, 2020; Funso-Aina *et al*., 2020).

Studies pertaining to knowledge, benefit, health implication of landscaping and the analysis of landscape soil and vegetation have not received much attention in Nigeria and presently there is no documented evidence of such study in Uyo Centre for Wetland and Waste Management Studies in University of Uyo, Akwa Ibom State, Nigeria. Hence, the gap in literature necessitated the choice of this study. The study aimed to explore participants' perceptions and the impact of landscaping of the Centre for Wetland and Waste Management Studies. The specific objectives included participant rating of the Center for Wetland features and characteristics and the prevalence of intestinal parasites in the Center for Wetland soil before and after landscaping. The area of study is the Centre for Wetland and Waste Management Studies in the University of Uyo, Akwa Ibom State (Fig. 1).

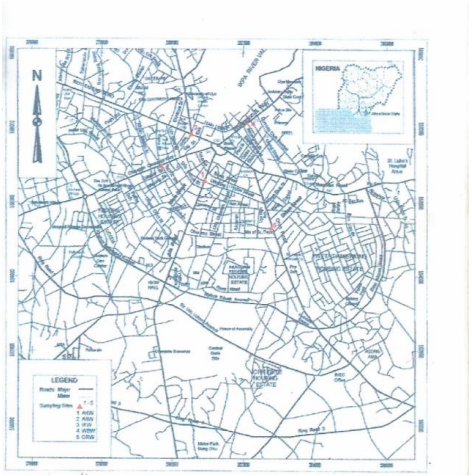

Fig. 1: Location of Sampling Sites on the Map of Uyo City

Geographically, Uyo is located on latitude 05°32N and longitude 07°56E. It has an elevation of about 60.96m (200ft) above sea level but has a rather level terrain which has resulted in very serious drainage problems particularly during rainy season. Rainfall is the main source of municipal drain water which commences in April and ends in October. The dry season usually starts in November and ends in March. Other sources of Uyo urban drain water include broken pipes, waste water discharged from homes and other commercial institutions. The mean annual rainfall is 2484 millimeters. The relative humidity varies through the year from 70 to 80 percent. The mean annual temperature in Uyo urban is 27°C.

Study Design

A descriptive cross-sectional study with analytical research design was employed which comprises of construction of a landscape around the Center for Wetland and Waste Management Studies. Sampling sites were randomly selected for the collection of top soil samples around the Center for Wetlands used for examination for the presence of soil transmitted parasites. Stratified random sampling method was used for selection of participants from people who were conversant with the features and characteristics of the Center for Wetland (inclusive criteria). A structured questionnaire was used for collection of data on perception and health implication of the Center for Wetland and Waste Management Studies environment. 100 structured questionnaires were administered to staff and students of University of Uyo who were familiar with the Center for Wetland and Waste Management Studies. Also, sixty soil samples each were collected before and after landscaping of the Center for Wetland and Waste Management Studies.

Assessment and Improvement of the Center for Wetland and Waste Management Landscape

Assessment

The Center for Wetland and Waste Management surroundings were examined between August, 2019 – January, 2020. The surrounding was usually filled with muddy dishes and stagnant pool of water especially during the raining season (Fig. 2 (a) and (b)). The moist soil was assessed for present of intestinal parasite using Baermann concentration and floatation method.

LANDSCAPING OF THE CENTER FOR WETLAND AND WASTE MANAGEMENT SURROUNDING

The stagnant water was drained, and the top muddy soils were excavated. Twenty (20) trips of laterite was poured and compacted. Architectural landscape was constructed using paver stone and vegetation was planted in January, 2020 (Fig. 3 and Fig. 4). After six months, the Center for Wetland and Waste Management Studies soil was re-examined for intestinal parasites between August 2020 - January 2021 using Baermann concentration and floatation methods.

Fig. 2 (a) Side View with Muddy ditches

Fig. 2(b) Front View with Stagnant Water

Fig. 2: Environment of the Center for Wetland and Waste Management Studies Before Landscaping

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Fig. 3: Center for Wetland and Waste Management Studies During Landscaping

(a) Left side view (b) Front view (c) Back view (d) Side view

Fig. 4: Center for Wetland and Waste Management Studies After Landscaping

COLLECTION OF SAMPLES

Collection of Soil Sample from Center for Wetland and Waste Management Studies

Ten soil samples per month were collected from different sites in the Center for Wetland and Waste Management Studies for six months between August 2019 – January 2020 before landscaping, giving a total of 60 soil samples. The exercise was repeated six months after landscaping between the same period August, 2020 – January 2021 giving a total of 60 soil samples.

Soil Sampling

Soil sampling was carried out in the morning between 6 am and 11 am as recommended by Nwoke *et al*. (2013) from each of the sites when the soil is still presumed wet. Approximately 100gm of topsoil was collected randomly at a depth of 2 – 3cm using a hand shovel and the samples were collected into the sterile universal container, new polythene bag and clearly labeled. The various soil samples were transferred to the parasitology laboratory section of Animal and Environmental Biology, Post Graduate Research and Laboratory immediately after each collection for processing and examination.

LABORATORY ANALYSIS

Examination of Soil Sample

One part of the triplicates of the soil sample was analysed using Baermann method. The second part was analysed by formal ether sedimentation method and the last part by Zinc sulphate floatation method.

Baermann Method

The microscopic examination of the landscape soil was done using Baermann apparatus according to the method described by (Gelaye *et al.*, 2021; Garcia and Bruckner, 1993). The Baermann was assembled by clamping a glass funnel fitted with rubber tubing and with a stopper to prevent free flow of water. Warm water was heated in an electric plastic heater and a thermometer was used to check the temperature of the water until a temperature of 40°C was achieved. The warm water was poured into the glass funnel containing the soil sample almost filled and allowed to stand for 2 hours.

Twenty grams of the soil sample was suspended on a piece of wire gauge and two layers of cotton gauze, the preparation was left to stand for 2 hours. After 2 hours of incubation, the clamp was opened and 10 ml of the filtrate was collected into the centrifuge tube and spun at 2500 revolutions per minute for 5 minutes. After centrifugation the supernatant was discarded and the sediment was mixed with Lugol iodine solution and was observed under x10 and x40 magnifications.

Analysis of Soil Sample by Formal-Ether Sedimentation Method

Twenty grams of the second part of the soil sample was placed in a tube containing 40°C warm water and was allowed to homogenized for thirty minutes. The suspension was then strained through a wet cheesecloth placed over a funnel to remove coarse sand particles formed. Formal/ether solution was added to the filtrate in a centrifuge tube and mixed thoroughly and kept for 24 hours before it was centrifuged at 2,500 revolution per minutes (rpm) for five minutes. The supernatant was discarded and the sediment was placed on a slide, covered with cover slip and observed

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under X10 and X40 magnification of a compound microscope.

Analysis of Soil Sample by Zinc Sulphate Floatation Method

Zinc sulphate floatation technique described by Nwoke *et al*. (2013) was used for examination of soil sample. Twenty grams of the third part of the soil sample was analysed using the modified zinc sulphate floatation method. Twenty grams of each soil sample was placed in a centrifuge tube, and suspended in warm water for thirty minutes. The soil sample with water was filtered through a 1 mm sieve. 15ml of the filtrate was poured in a centrifuge tube and kept for 24 hours before it was centrifuged at 2500 rpm for 5 minutes. The supernatant was discarded and the sediment was resuspended in zinc sulphate solution and centrifuged again at 2500rpm for 5 minutes and then transferred to a test tube stand. The zinc sulphate solution was added to form a meniscus and a coverslip placed on it for 10 to 20 minutes. The coverslips were carefully removed and placed faced down on a clean slide and examined microscopically at x10 and x40 objectives respectively.

Statistical Analytical Techniques

Primary data collected from the field survey were entered, manage and analyzed using the SPSS statical package version (Version 21). Data were analyzed using descriptive statistics. The chi-square (x^2) test was used to find any significant difference between variables.

RESULTS

Demographic Profile

The questionnaire for the study which comprises of questions for perceptions and health implications of the landscape in the Center for Wetland before and after landscaping was administered directly to 100 participants mainly the University of Uyo staff and students who had a fair knowledge of the Center for Wetland before and after the landscaping.

Table 1: Participants' Rating of the features of the Centre for Wetland and Waste Management Studies Environment Before and After Landscaping

Features of the Center for Wetland	Rating Before Landscaping		Rating After Landscaping	
	No. %	No. %	No. %	No. %
Green Space (grass vegetation)	No 80 (80)	Yes 20 (20)	No 0 (0)	Yes 100 (100)
Level of Pollution	Low 14 (14)	High 86 (86)	Low 90 (90)	High 10 (10)
Flooding	Low 20 (20)	High 80 (80)	Low 96 (96)	High 04 (04)
Drainage	Bad 70 (70)	Good 30 (30)	Bad 10 (10)	Good 90 (90)
Psychological Impact	Bad 80 (80)	Good 20 (20)	Bad 10 (10)	Good 90 (90)
Relief Tension and Fatigue	No 75 (75)	Yes 25 (25)	No 0 (0)	Yes 100 (100)
Increases Concentration	No 82 (82)	Yes 18 (18)	No 05 (05)	Yes 95 (95)
Conducive for Learning	No 78 (78)	Yes 22 (22)	No 30 (30)	Yes 70 (70)

The result in Table 1 shows the participants' rating of the features of the Center for Wetlands and Waste Management Studies before and after landscaping. Before landscaping the rating on Green space was 20% while 80% indicated that there was no green space in the Center but 6 months after landscaping, 100% of the participants maintained that the Center for Wetland and Waste Management Studies had 100% green space surrounding the Center.

Before landscaping the perception on the level of pollution was 86% but after landscaping pollution level drop to 10%. Before landscaping the perception on the flooding rate was 80% but after landscaping flooding rate was reduce to (04%). Similarly, drainage was 30% but after landscaping drainage improve up to 90%. The rating of the perception for psychological impact was 20% but after landscaping the psychological impact increased to 90%. Also, before landscaping the percentage of those who ticked that it reduces tension and fatigue was 25% but after landscaping 80% agreed that it reduces tension and fatigue. Those who agreed that it increases concentration before landscaping were 18% but after landscaping 95% said it increases concentration. Similarly, before landscaping only 22% said the Center was conducive for learning whereas after landscaping 70% of the participants declared that the Center is conducive for learning. Therefore, there was a significant improvement in rating of the features of the Center for Wetland after landscaping.

The result in Table 2 shows the characteristics of the Centre for Wetland and Waste Management Studies Environment before landscaping, the soil characteristics were muddy, miry with sandy/loamy soil, with loose surface whereas after; landscaping the soil become compacted with clay soil. Also, before landscaping the soil texture was loose, the soil surface was slippery, there was no scape stone and the environment was waterlogged. However, after landscaping, the area was compacted with laterite and scape stone was put in place. The water log was no more there. The soil texture is firm, not slippery, there is a proper drainage with no stagnant water even during the rainy season. The environmental and public health characteristics of the centre before landscaping shows high contamination of the environment with striking offensive odour, leeches, environmental pollution, inadequate sanitation and non-existence of sanitation facilities but after landscaping there is no more contamination of the environment with leeches, no more offensive stinking odour, the environment is hygienic with sanitation facilities such as dust bin and adequate maintenance of the environment with attractive vegetation and scape stone.

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Table 2: Characteristics of Center for Wetland and Waste Management Studies Environment Before and After Landscaping

SA	Soil Characteristics		
1	**Characteristics**	**Before Landscaping**	**After Landscaping**
	Soil Type	Muddy Mirry (Sandy loamy)	Compacted with laterite (Clay soil)
	Soil Texture	Loose	Firm
	Soil Surface	Slippery	Not slippery
	Scape Stone	Absent	Present
	Water	Water lock	No water lock
B	**Environmental and Public Health**		
	Contamination of Environment	Highly Contaminated	Not Contaminated
	Sanitation facilities	Non existent	Available
	Sanitation	Inadequate	Adequate
	Odour	Offensive	No striking odour
	Leeches (*Hirudo medianalis*)	Present	Absent
	Vegetation	Scanty	Uniform
	Hygienic	Non-Hygienic	Very Hygienic
	Attractiveness	Non-Attractive	Very Attractive

PUBLIC HEALTH IMPLICATION FOR CENTER FOR WETLANDS AND WASTE MANAGEMENT STUDIES

The result of monthly prevalence of soil transmitted parasite in the Center for Wetland and Waste Management Studies (Table 3) indicates that the highest prevalence was recorded in the month of August, 2019 (90%) followed by September, 2019 (80%), October, 2019 (70%) and November, 2019 (60%) while the least prevalence occurred in the month of January, 2020 (30%). The prevalence decreased with increasing dry season period. There was no significant difference ($p > 0.609$) in monthly prevalence of soil transmitted parasite. However, the prevalence was significantly higher ($p > 0.05$) during the rainy season August to October 24 (80%) than the dry season November to January 13 (43.3%).

Table 3: Monthly Prevalence of Soil Transmitted parasite in Wetland Soil Before Landscaping

Month/Year	No. of Sample Examined	No. (%) of Soil Sample Positive	No. (%) of Soil Sample Negative	Chi-square	Df	*P* Value
August, 2019	10	9 (90)	1 (10)	2.703	5s	0.609ns
September, 2019	10	8 (80)	2 (20)			
October, 2019	10	7 (70)	3 (30)			
November, 2019	10	6 (60)	4 (40)			
December, 2019	10	4 (40)	6 (60)			
January, 2020	10	3 (30)	7(70)			
TOTAL	**60**	**37 (61.7)**	**23 (38.3)**			

Table 4: Prevalence and Mean Intensity of Parasite species Isolated from Wetland and Waste Management Studies Soil Before Landscaping

Parasite	No. Examined	No. (%) Infected	Total of Parasite	Mean Intensity
Ascaris lumbricoides	60	14 (23.3)	56	4.0
Ancyclostoma duodenale	60	23 (38.3)	67	2.91
Strongyloides stercoralis	60	12 (20.2)	44	3.67
Trichomonas hominis	60	8 (13.3)	20	2.5
TOTAL		**57**	**187**	**3.28**

The result in Table 4 above indicates that out of 60 soil samples examined before the landscaping of the Center for Wetland and Waste Management Studies, the prevalence of parasites isolated and their mean intensity were *Ascaris lumbricoides* (23.3%) with a mean intensity of 4.0, *Ancyclostoma duodenale* (38.3%) with a mean intensity of 2.91, *Strongyloides stercoralis* (20.2%) with a mean intensity of 3.67 and *Trichomonas hominis* with prevalence of (13.3%) mean intensity of 2.5. Thus, *Ancyclostoma duodenale* (Hook worm) recorded the highest prevalence (38.3%) while *Ascaris lumbricoides* had the highest mean intensity (4.0) parasite with the least mean intensity of 2.5 was the *Trichomonas hominis.* The prevalence and mean intensity of the intestinal parasite are significantly different ($p < 0.006$).

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Table 5: Prevalence of Soil Transmitted Parasites in Landscape Soil before Landscaping in the Center for Wetland Soil before and After

Type of Landscape and Their Location	No. of Soil Sample Examined	No. (%) of Soil Sample Positive	No. (%) of Soil Sample Negative
Center for Wetland soil before landscaping	60	37 (61.7)	23 (38.3)
Center for Wetland soil 6 months after landscaping	60	10 (16.7)	50 (83.3)
Total	**120**	**47 (39.2)**	**73 (60.8)**
Chi-square		45.019	
Df		1	
P Value		< 0.001*	

Out of 60 soil samples examined by the use of Baermann method, formal ether concentration and zinc sulphate floatation methods before landscaping; 37 (61.7%) were positive for soil-transmitted parasites. However, 6 months after landscaping, only 10 (16.7%) out of 60 soil samples examined were positive (Table 5). There was a significant difference ($p < 0.001$) between the prevalence of soil-transmitted parasites in the Center for Wetland and Waste Management Studies soil before and after landscaping. The egg and larvae of the following soil parasites were identified: *Ancyclostoma duodenale, Strongyloides stercoralis, Ascaris lumbricoides, Trichomonas hominis, Gardia intestinalis* and *Balantidum coli.* Figure 4.6 shows the pictures of some of the egg and larvae of the parasites taken under 400 x that is magnification.

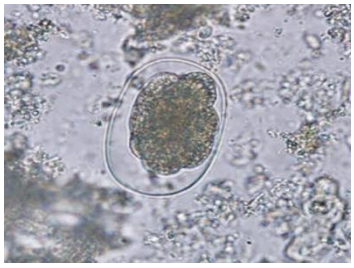

Fig. 5a: Fertilized Egg of *Ancyclostoma duodenale*

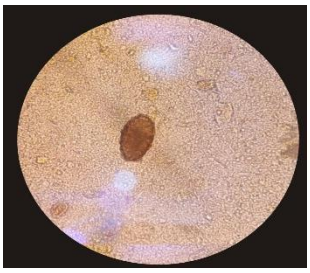

Fig. 5b: Unfertilized Egg of *Ascaris lumbricoides*

Fig. 5c: *Strongyloides stercoralis* Filariform larvae

Fig. 5d: Free living adult of *Strongyloides stercoralis*

DISCUSSION

The result of the participants rating of the features of the Center for Wetland and Waste Management Studies after landscaping reveals hundred percent uniformity in green space and reduces level of pollution and flooding. This result is in agreement with the work of Hartig (2008) who reported that green space has a crucial role in expanding sceneries, provide mental peace for citizen, improving air quality, reducing noise pollution. Also, Akhimien *et al.* (2018) in their work on the impact of landscape architecture on build environment confirmed the result obtain from this study in the Wetland that landscaping reduces tension and fatigue and enhances concentration.

The landscaping of the Center for Wetland and Waste Management Studies create peace and cheerfulness for users due to it affordance. People can relief their tension, mental fatigue by being in nature or even looking at it. It creates an environment in which efficiency and learning improve. In the Center for Wetland, the offensive odours emanating from the polluted wetland use to distract people from concentrating in their learning and many people slip off and fall as they attend lectures in the Center. Such situation is no more after landscaping. The result of landscaping of the Center for Wetland increases concentration and create a conducive environment for learning. This is in concordance with previous reports by Uslu *et al.* (2018). Hence the main purpose of landscaping is to create a conducive environment round the building and give the occupants a healthy breath, good appearance with less noise which is essential for effective learning.

Before landscaping the Center for Wetland and Waste management Studies environment was characterized by waterlog, sandy, watery, miry soil with slippery surfaces, and such soil characteristics promote parasitic organisms and vectors such as leeches, helminths eggs and larvae of mosquitoes which make the environment unhygienic and non-attractive. The sandy loamy soil type provides optimal condition for parasite development in line with Hassan and Oyesaniyi (2018). These conditions account for the high prevalence soil borne intestinal parasites before landscaping.

After landscaping, the compacted clay soil with laterite and uniform vegetation get rid of water lock mirry slippery soil surfaces providing a hygienic and attractive environment for learning. Also, on the other hand, clay soil type with compacted laterite without any wet soil inhibit the

development of parasite as previously reported by Hassan and Oyesaniyi (2018). Hence the more reasons the prevalence of soil-borne parasites drastically decreases after landscaping.

Public Health Implication of the Centre for Wetland and Waste Management Studies

The present study showed that the Centre for Wetland and Waste Management Studies environment recorded high prevalence of intestinal parasites before landscaping. The high prevalence of parasites in this study is similar to the report of Hassan and Oyebameyi (2018) who reported a parasitic prevalence of 70.8% out of 480 soil sampled in public school environment in Ibadan metropolis. A Number of factors have seen blamed ranging from poor environmental sanitation, refuse, dump sites, the continuous presence of stagnant water in the environment and the types of soil profile in lined with Ikpeama *et al.* (2016). Also, the humic warm temperature and contamination of the soil with organic decomposing matter are major factors that favour the development and spread of parasites (Nwoke *et al.*, 2013; Adedosu *et al.*, 2013).

The high prevalence of soil transmitted parasites is often attributed to poverty, illiteracy, improper sanitation awareness and management and other different aspect of human related activities. The University of Uyo community is known with increased number of work forces, students and the desire of the students to utilize the laboratory facilities. This has in turn led to overcrowding and trespasses of the Centre for Wetland and Waste Management Studies which is located in front of the University of Uyo Town Campus Library beside the Faculty of Pharmacy, and the Faculty of Education.

Furthermore, the poor sanitary, lack of sanitary facilities and proper drainage of the area before landscaping accounted for the increase in soil-transmitted parasites before landscaping. This situation is similar to the report of Soyemi *et al.* (2018) who reported contamination of the soil or within the University College Hospital, Ibadan, Nigeria. The low prevalence of parasites in the Centre for Wetland and Waste Management Studies after landscaping is an eloquence testimony of the important of landscaping in checking flood, drainage and pollution in the environment. The absent of wet soil and adequate environmental sanitation limit the breeding of parasites in the environment of Centre for Wetland and Waste Management Studies after landscaping.

CONCLUSION

Changes in the landscape affect not only people's health but also their well-being. Participants appreciate the impacts of landscape architecture on the built environment. Landscape with its green space and beautiful trees and flowers offer a lot of health benefits which does not only promote healthy homes, decreases anger and aggression but also provide conducive environment for learning and relaxation. Perception is the key to understanding the properties of landscape, it is through perception that we establish human preferences and appreciation of the benefits of landscaping which include economic, socio-economic, environmental and health benefits. The high prevalence of intestinal parasite before landscaping indicates the contamination of the environment.

The construction of landscape in the Center for Wetland, University of Uyo drastically reduces the prevalence of soil transmitted parasites in the Center for Wetland soil and creates a conducive environment for learning. The development of an aesthetically pleasing landscape that is free of parasite contamination and pollution is a prerequisite and it is pivotal to produce human employment, recreation, social economic and economic integration as well as health benefits and conducive environment for learning. `Infection intensity in a cross-sectional infection study is exemplified in this study and its provide insight into parasite transmission risks in unhygienic landscape. There is need for a holistic approach to integrate the factors accounting for the pathogenic landscape within which intestinal parasite persist.

REFERENCES

Abraham, A., Sommerhalder, K. and Abel, T. (2010). Landscape and well-being: A scoping study on the health-promoting impact of outdoor environments. *International Journal of Public Health,* 55(1):59 – 69.

Adedosu, H. O., Adewuyi, G. O. and Adie, G. U. (2013). Assessment of heavy metals in soil, leachate and underground water samples collected from the vicinity of Olusosun landfill in Ojota, Lagos, Nigeria. *Transnational Journal of Science and Technology,* 3:73-86.

Adeolu, O. A. and Tope, C. F. (2011). Environmental and health concerns associated with the open dumping of municipal solid waste: A Lagos, Nigeria experience. *American Journal of Environmental Engineering*, *2*(2):160-165.

Akhimien, N. G., Isinele, A. J. and Adamolekun, M. O. (2018). The Impact of Landscape Architecture on a build environment. *Journal of Environmental Studies*, 2(2):139-146

Damen, J. Banwat, E., Egah, D. and Allamana, J. (2007). Parasitic contamination of vegetables in Jos, Nigeria. *Annual Journal of Medicine,* 6(2): 115 – 118.

David, S. and Charles, F. S. (2010). Impact of direct soil exposures from airborne dust and geophagy on human health. *International Journal of Environmental Reserves on Public Health,* 7:1205-1223.

Duggar, J. (2018). Types of Landscape. Muggan and Associates P. C. Lanscape Architecture.

Feng, B. and Chem, L. (2020). The impact of entrepreneural passion on psychology and behaviour of entrepreneural passion. *Front Psychology*, 11: 17-33.

Funso-Aina, O. I., Chineke, H. N. and Adogu, P. N. (2020). A review of prevalence and pattern of intestinal parasite in Nigeria (2006 – 2015). *European Journal of Medical and Health Sciences*, 2:1-4.

Garcia, J. and Bruckner, M. (1993). Landscape soil analysis using Baermann apparatus: Modifications and applications. *Soil Science Journal*, 7(2): 112-128.

Gbonhinbir, V. (2022). Negative impacts of landscaping on environment and public health. *Journal of Environmental Issues*, 25(4): 78-95.

Gbonhinbor, J., Abah, A. E. and Awiwado, G. (2022). Prevalence of intestinal parasitic infection and associate risk factors among primary school aged children (5 – 15 years) in southern Nigeria. *International Journal of Infection Diseases*, 5:11-21.

Gelaye, W., Belachew, T., Zeleke, A., Boti, N. and Toru, T. (2021). Microscopic examination of landscape soil using Baermann apparatus: A methodological approach. *Environmental Studies*, 15(3): 45-62.

Hartig, T. (2008). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology*, 23:109-123.

Hassan, A. A. and Oyebamiji, D. A. (2018). Intensity of soil transmitted helminths in relation to soil profile in selected public schools in Ibadan Metropolis. *Biometrics and Biostatistics International Journal*, 7(5):413-417.

Ikpeama, C. A., Ifeanyi, O. C., Obiajuru, C. and Ofomaka, A. I. (2016). The impact of refuse disposal dump sites on spread of intestinal helminthiasis in Owerri Metropolis, Imo State, South Eastern Nigeria. *International Journal of Clinical Chemistry and Laboratory Medicine*, 2(2):13-18.

Kankan, L., Yang, Z., Long, D. and Kankan, L. (2021). A preliminary exploration of landscape preference based on naturalness and visual openness for college students with different mood. *Environmental Psychology*, 2:15-18.

Nwoke, E. U., Ibiam, G. A. and Odikamnoro, O. O. (2013). Examination of soil sampled for the incidence of geohelminth parasite in Ebonyi North Central Area, Ebonyi State, South East of Nigeria. *Arch. Applied Science Research*, 5(6):41-48.

Nyarango, R. M., Aloo, P. A., Kabiru, E. W. and Nyanchongi, B. O. (2003). The risk of pathogenic parasitic infections in Kismi Municipality. Kenya. *BMC Public Health*, 8: 237.

Soyemi, E. T., Okosun, I. I. and Ogunleye, V. O. (2018). Determination of larva of intestinal parasites in soil samples from selected dump sites within the University College hospital, Ibadan. *Academia Area*, 10(7): 7-13.

Usip, L. P. E., Affia, U. U. and Okoro, M. F. (2017). Prevalence of intestinal helminthes infection and efficacy antihemintis drug (moroantel) among primary school pupil in Itu Local Government Area, Akwa Ibom State, Nigeria. *American Journal of Research Communication*, 5(6): 102-117.

Uslu, A., Kiper, T. and Baris, M. E. (2018). Public health – urban landscaping relationship and user's perception. *Biotechnology and Biotechnological Journal*, 8: 1398 – 1408.

WHO (World Health Organization) (2020). Soil helminth infections. Geneva: Switzerland who updates, 2022.

World Bank (1993). World Development Report Investing in Health. Oxford University Press, New York. 17p.