

MENSTRUAL HYGIENE KNOWLEDGE, PRACTICES AND INTERVENTIONS AMONG JUNIOR HIGH SCHOOL GIRLS IN THE KROBO AREA OF GHANA

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Abstract

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Purpose — This study was conducted to assess the menstrual hygiene knowledge and practices of adolescent girls in the Krobo area of Ghana.

Methods — It adopted a cross-sectional study where 245 Junior High School girls from eight schools in two municipal districts of Ghana were studied.

Findings — The study identified that only 35% of students frequently change pads, although 96% of them use sanitary pads. It was also detected that girls avoid school when they are menstruating for reasons such as severe bleeding, fear of stains, painful periods and a lack of facilities at school which impacts their academic performance negatively.

Conclusion & Recommendations — The study revealed that the majority of the girls do not change pads or dispose of them while in school due to inadequate facilities. Therefore, it is highly recommended that schools give proper education and provide appropriate facilities for girls' academic advancement, good health and well-being.

Keywords — Menstrual hygiene, Water, Sanitation and Health, Adolescent girls, School health programme

Introduction

Menstrual hygiene is crucial and an integral component for achieving Goals 3, 4, 5 and 6 of the United Nations (UN) Sustainable Development Goals (SDGs). To achieve Goal 3 of **Good Health and Well-being**, women and girls must have good menstrual health which is one of the key components of sexual and reproductive health. Goal 4 emphasizes **Quality Education** for which girls need to have access to good sanitary facilities and infrastructure with the adequate water supply at schools to prevent dropouts and absenteeism. Ghana Education Management Information Systems (EMIS) 2019 data shows that one out of four Ghanaian public basic schools do not have toilets or clean water supply which is very challenging for

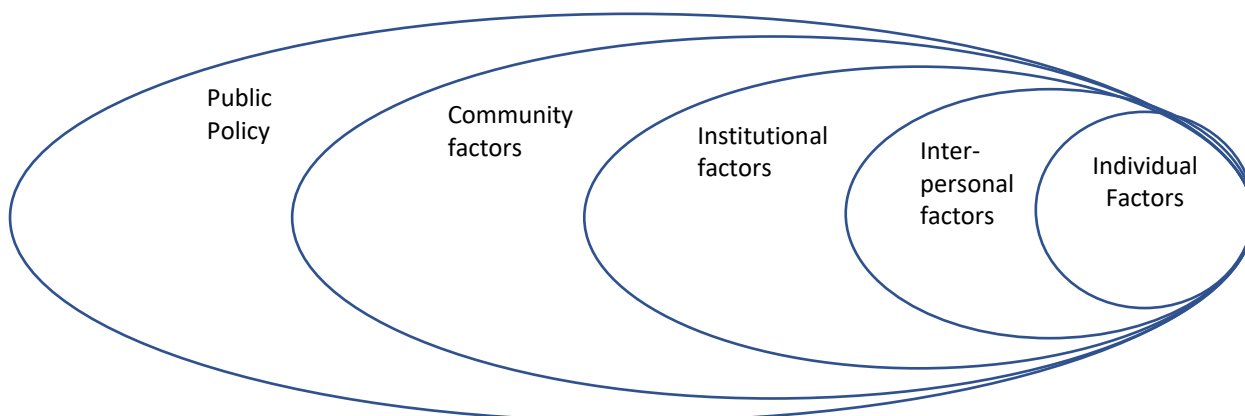
menstruating girls to manage themselves with hygienic practices at school. Goal 5 envisions the achievement of **Gender Equality** for which women and girls need to manage their menstruation with dignity, without any shame and stigma associated with it. Socio-cultural restrictions, often framed and rendered in norms, traditions, practices, attitudes, taboos and taboo-related constructs are widely practised but not widely spoken about in many cultures. This leads to the social exclusion of women and girls in several spheres, eventually pushing them gradually to the brinks and margins of a cluster of vulnerabilities. Goal 6 emphasizes **Clean Water and Sanitation** for which women and girls need proper sanitary facilities with adequate water and safe disposal mechanisms. A study in northern Ghana highlighted that most of the schools lack basic requirements for effective menstrual hygienic practices such as clean water, soap, privacy and dustbins (Kumbeni *et al*, 2020).

Women and girls make up half of the world's population, and menstrual hygiene issues must be dealt with at all levels to achieve the abovementioned Sustainable Development Goals. To maintain good menstrual health, women and girls must get education on menstrual hygiene facts and practices. The majority of adolescent girls and women lack access to basic knowledge about it due to the cultural stigma linked to menstruation. Girls who attain puberty are left to handle their periods using readily available materials like a fabric without access to private restrooms, running water, or soap, especially in rural areas. The majority of rural adolescent girls utilize reusable menstrual materials such as scraps from shirts, dresses, old towels or blankets (McMahon *et al.*, 2017). A study conducted by the Ghana Education Service found that school-going adolescent girls lack adequate knowledge on managing menstruation before menarche -their first period (Edward *et al.*, 2016). Ghana has a standard puberty education curriculum with most of the schools either not teaching it or it is described as a negative experience. A study revealed that many of the teachers are males and are embarrassed to discuss puberty education and they sometimes chose not to teach it (Dolan *et al*, 2013). About 80% of the girls, therefore, receive menstrual education from their parents (Gumanga & Kwame-Aryee, 2012). Many parents in rural areas were unable to manage the menstrual process well, which poses major health risks. They adhere to the myths and taboos related to menstruation that cause them problems because they are ignorant of the scientific facts concerning menstruation and human anatomy and physiology. In the end, neglected menstrual hygiene causes fungal infections in young girls. It is observed that women and girls who practice unhygienic methods during menstruation are subjected to reproductive tract infections and vaginal discharge (Anand *et al*, 2015). This research is carried out to understand the menstrual pattern, knowledge and practices of menstrual hygiene among adolescent school-going girls and the facilities available to them.

Menstrual hygiene management employs a multi-level, interactive strategy called an ecological perspective, which was applied in this study (Figure 1). Numerous elements might affect or influence someone's hygiene, including intrapersonal; interpersonal; institutional; community factors; and issues related to public policy (Mc Leroy *et.al*, 1988). **Intrapersonal factors:** Access to knowledge and information will affect a person's behaviour. In reality, girls were misinformed about menstruation hygiene. Making factual information available to girls can help dispel harmful myths and benefit them. **Interpersonal Factors:** Mothers and other women are hesitant to talk to their daughters and girls about menstrual hygiene issues due to cultural silence. Their menstrual health will improve if they are informed on knowledge about healthy menstrual hygiene habits. **Institutional factors:** Menstrual hygiene has been introduced into the curriculum in schools. However, it occasionally goes unnoticed or gets less attention in class. Menstrual hygiene management is extremely challenging at work, school, and in public areas due to inadequate water supply and a lack of sanitary and safe disposal facilities. Therefore, it is crucial to offer safe menstrual management spaces in schools and workplaces with sufficient WASH facilities. **Community Factors:** Women and girls are excluded from many facets of social and cultural life due to socio-cultural taboos around menstruation. To improve people's perceptions of menstruation, we must tackle harmful myths, taboos, and customs and break

the silence. **Public policy:** The promotion of menstrual hygiene practices through resource allocation requires policies and methods.

Figure 1: An Ecological Perspective of Personal Hygiene



Source: Adopted from Mc Leroy *et.al* (1988)

Materials and Methods

The objectives of this study include i) assessing the school girls' knowledge of menstrual hygiene and hygienic practices and ii) investigating the menstrual hygiene intervention and sanitary facilities available in schools. The study was a cross-sectional school-based survey, and a quantitative approach was used to collect data in March 2022 among girls who had attained menarche. A questionnaire focusing on the girls' socio-demographic characteristics, their knowledge of menstruation and menstrual hygiene practices was developed and administered. The study was conducted in Junior High Schools in the Yilo Krobo Municipality and the Lower Manya Krobo District. The sample size for this study was calculated using Cochran's formula. This was based on a 57% prevalence of menstrual knowledge from a previous study in Ghana (Ameade & Garti, 2016), a 95% confidence interval and a 5% level of precision. This gave a sample size of 232. Adjusting for a non-response rate of 5% resulted in a sample size of approximately 244 which was rounded up to 245. Multi-stage sampling technique was used to select study participants. Firstly, a total of 8 Junior High Schools (JHS) were randomly selected from the Yilo Krobo Municipality (4 schools) and Lower Manya Krobo District (4 schools). Out of the 8 schools, 4 were public JHS and 4 private JHS. Secondly, in each of the forms (JHS 1, 2, & 3), at least 10 students were randomly selected. Eligible respondents were female students who had experienced menarche. The data were analyzed descriptively employing means, proportions and percentages using Statistical Package for Social Sciences (SPSS). In addition, Chi-square analysis was used to find the association between students' characteristics and menstrual hygiene knowledge and practices. A 5% significance level was used to represent the association.

Results

Student's Characteristics

Table 1, presents the background characteristics of the respondents. In terms of age, about 59% were between 12 and 14 years and the mean age was 14.36 ± 1.382 . A majority of the respondents (52.65%) were from the Yilo-Krobo district, and a nearly equal number of respondents were from public and private schools. A scoring system was used to measure the level of knowledge where one point was given for each correct response to knowledge while 0 was given for an incorrect answer. A total score was calculated on the knowledge items and a score of more than 75% was considered good while 50 -74% was considered moderate/fair and less than 50% was poor. Similarly, each practice received a score ranging from 0 to 2

(best practice yield 2, fair practice yield 1, and poor practice yield 0) which was counted and recorded for each respondent. The higher the score, the better the practice. Each questionnaire came with a written informed consent form which the respondents were required to sign, indicating their understanding and willingness to participate in the study.

Table 1: Socio-demographic characteristics

Age	Frequency (n=245)	Percentage	Mean age
12 to 14	144	58.78	14.36±1.382
15 to 16	81	33.06	
17 to 18	20	8.16	
Class of study			
Form 1	80	32.65	
Form 2	82	33.47	
Form 3	83	33.88	
Type of School			
Public	120	48.98	
Private	125	51.02	
District			
Yilo Krobo	129	52.65	
Lower Manya Krobo	116	47.35	
Religion			
Christianity	235	95.92	
Islam	7	2.86	
Traditional	3	1.22	
Residence			
Rural	106	43.27	
Urban	139	56.73	
Father's Education			
Non-literate	33	13.5	
Basic Education	75	30.6	
Secondary Education	72	29.4	
Tertiary Education	65	26.5	
Mother's Education			
Non-literate	36	14.7	
Basic Education	108	44.1	
Secondary Education	56	22.9	
Tertiary Education	45	18.4	

Table 2: Menstrual history and perceptions about puberty rites.

Age at Puberty	Frequency (n=245)	Percentage	Mean Age at Puberty
10 to 12	112	45.71	12.61±1.079
13 to 14	125	51.02	
15 to 16	8	3.27	
Awareness about Menstruation before Puberty:			
Yes	201	82.04	
No	44	17.96	
Source of Information:			
Mother	130	53.06	
Sister	10	4.08	
Teacher	50	20.41	
others (Friends, Aunts, Neighbours)	11	4.49	
Nil	44	17.96	
Rites of passage:			
Yes	82	33.47	
No	163	66.53	
Feelings about the passage:			
Good, happy, excited and/or comfortable	51	21	
Bad, shy, and/or nervous	31	13	
Do not like exposing the breast	29	12	
Want the practice to continue	51	21	

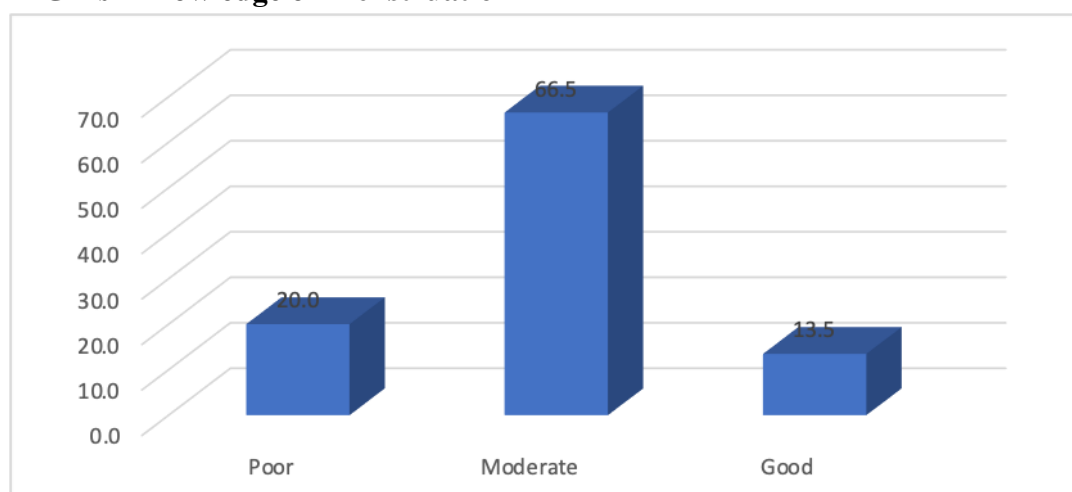
Girls' Knowledge of Menstruation**Figure 2: Level of knowledge of the respondents**

Table 3: Respondents' Knowledge of Menstruation

Knowledge about Menstruation	Correct Responses	Incorrect Responses	Do not know	Mean Score
Menstruation is a physiological process	193 (78.8%)	10 (4.08%)	42 (17.1%)	0.79±0.40
Generally, girls attain puberty at the age of 10-14 years	135 (55.1%)	65 (26.53%)	45 (18.4%)	0.55±0.49
The average days of interval at which menstruation occurs are 28 to 35 days	40 (16.3%)	146 (59.59%)	59 (24.1%)	0.16±0.37
Bleeding occurs in the uterus during menstruation	160 (65.3%)	34 (13.88%)	51 (20.8%)	0.65±0.47
Menstruation lasts for 3 to 7 days	193 (78.8%)	24 (9.80%)	28 (11.4%)	0.79±0.40
Normal blood loss during menstruation (70-80 ml)	40 (16.3%)	15 (6.12%)	190 (77.6%)	0.16±0.37
Dysmenorrhea is painful menstruation	41 (16.7%)	45 (18.37%)	159 (64.9%)	0.17±0.37
Menstrual blood has blood and tissues	121 (49.4%)	78 (31.84%)	46 (18.8%)	0.49±0.50
Abdominal pain during menstruation is due to contraction of the uterus	98 (40.0%)	18 (7.35%)	129 (52.7%)	0.40±0.49
Pimples occur due to hormone secretion	134 (54.7%)	9 (3.67%)	102 (41.6%)	0.55±0.49
The best material that can be used during menstruation is a Sanitary pad	240 (98.0%)	3 (1.22%)	2 (0.8%)	0.98±0.14
Soft cotton cloth if the cloth is used	85 (34.7%)	76 (31.02%)	84 (34.3%)	0.35±0.47
Frequency of changing sanitary pads (5 hrs once)	83 (33.9%)	130 (53.06%)	32 (13.1%)	0.34±0.48
Best way to dispose of used sanitary napkins (burning)	153 (62.4%)	73 (29.80%)	19 (7.8%)	0.62±0.47
Unhygienic practices during menstruation lead to reproductive tract infections	142 (58.0%)	31 (12.65%)	72 (29.4%)	0.58±0.49
Mean Knowledge Score (Maximum = 15)				7.58±2.45

Table 4: Personal Hygiene during Menstruation

Frequency of bath taking during menstruation	Frequency(n=245)	Percentage
Once a day	4	1.6
Twice a day	229	93.5
On completion of periods	3	1.2
Three times a day	9	3.7
Clean genitalia using:		
Soap and water	104	42.4
Plain water	129	52.7
Saltwater	11	4.5
Others	1	0.4

Table 5: Respondents' menstrual hygiene practices

Menstrual hygiene practices	Frequency(n=245)	Percentage
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The material used during menstruation:		
new cloth	4	1.6
sanitary pads	236	96.3
tissue/cotton	5	2.0
Frequency of changing pads:		
twice daily	143	58.4
thrice daily	85	34.7
when it gets completely soaked	17	6.9
Disposal practice at home:		
Burn	155	63.3
Bury	38	15.5
flushing in the toilet/dumping in the latrine	32	13.1
dump it in the bin	13	5.3
throw it in the open field	7	2.9

Menstrual hygiene practice at School

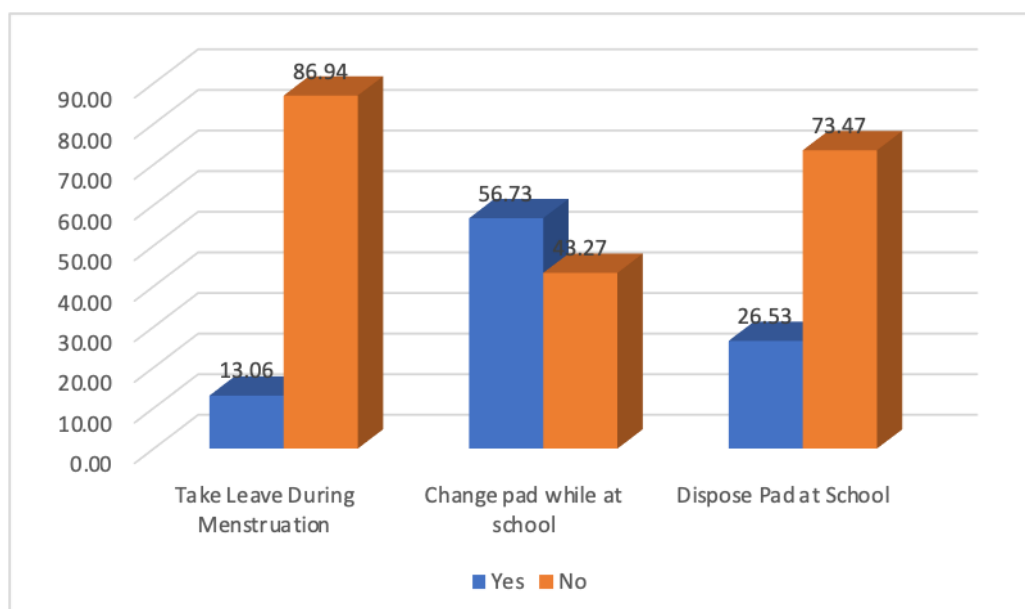


Figure 3: Menstrual hygiene practice at school

Disposal practice at school

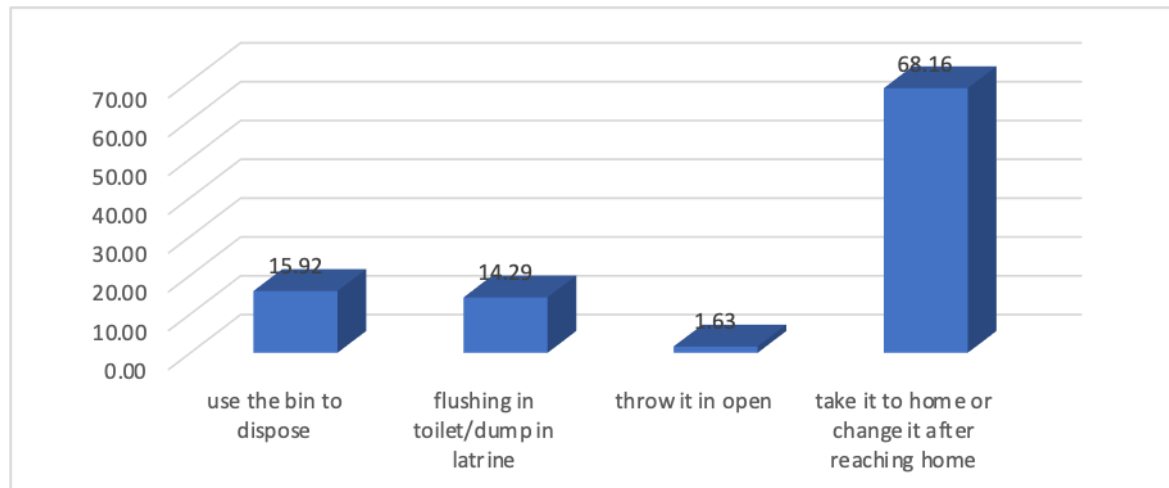


Figure 4: Disposal practice at school

Table 6: Facilities at school

Facilities at school	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Availability of sanitary pads at school	81	33.1	164	66.9
Availability of water at school	106	43.3	139	56.7
Availability of soap at School	110	44.9	135	55.1
Availability of separate toilets for boys and girls	222	90.6	23	9.4
Bin availability at school	154	62.9	91	37.1

Level of Hygienic Practice

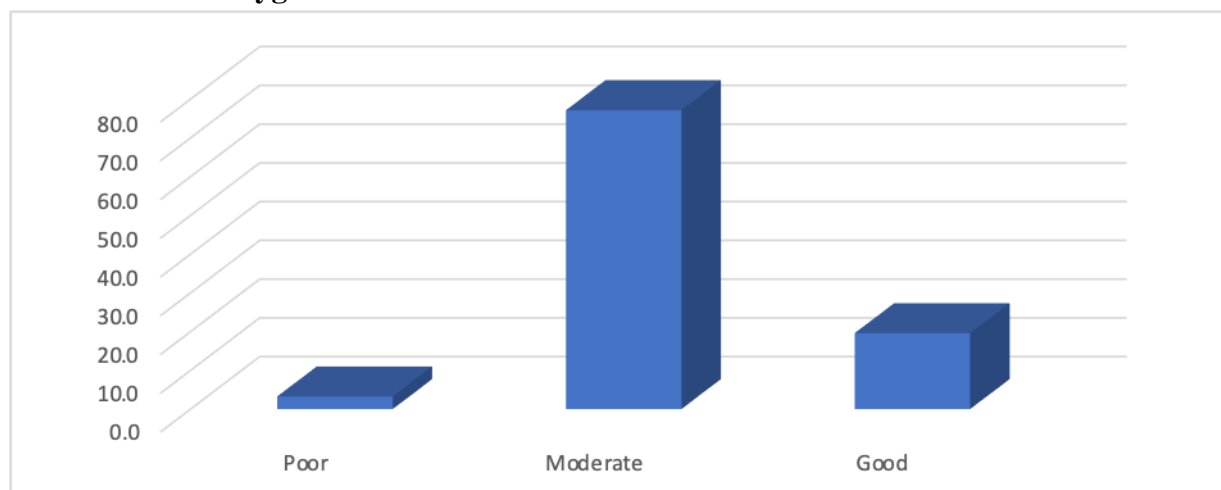


Figure 5: Level of the hygienic practice of the respondents

Table 7: Association between Students' Characteristics with Knowledge and Practices

Students' Characteristics	Knowledge					Practices				
	Poor	Fair	Good	Total	p-value	Poor	Fair	Good	Total	p-value
Ages of the respondents										
10 to 12	0	13	2	15	0.079	1	9	5	15	0.216
13 to 15	44	115	24	183		6	147	30	183	
above 15	5	35	7	47		1	33	13	47	
Total	49	163	33	245		8	189	48	245	
Class Studying										
Form 1	24	50	6	80	0.001***	2	63	15	80	0.490
Form 2	20	47	15	82		5	61	16	82	
Form 3	5	66	12	83		1	65	17	83	
Total	49	163	33	245		8	189	48	245	
Type of School										
Public	19	88	13	120	0.087	1	87	32	120	0.004**
Private	30	75	20	125		7	102	16	125	
Total	49	163	33	245		8	189	48	245	
District										
Yilo Krobo	36	85	8	129	0.000***	5	101	23	129	0.674
Lower Manya	13	78	25	116		3	88	25	116	
Total	49	163	33	245		8	189	48	245	
Father's Education										
Non-literate	5	26	2	33	0.161	2	21	10	33	0.274
Basic Education	22	45	8	75		1	61	13	75	
Secondary education	13	47	12	72		4	53	15	72	
Tertiary Education	9	45	11	65		1	54	10	65	
Total	49	163	33	245		8	189	48	245	
Mother's Education										
Non-literate	4	31	1	36	0.082*	1	30	5	36	0.425
Basic Education	26	65	17	108		4	81	23	108	
Secondary education	10	35	11	56		3	39	14	56	
Tertiary Education	9	32	4	45		0	39	6	45	
Total	49	163	33	245		8	189	48	245	
Region										
Rural	19	65	22	106	0.014**	4	77	25	106	0.340
Urban	30	98	11	139		4	112	23	139	
Total	49	163	33	245		8	189	48	245	
Participation in the MH Programme at school										
Yes	29	140	31	200	0.000	7	155	38	200	0.820
No	20	23	2	45		1	34	10	45	
Total	49	163	33	245		8	189	48	245	

Level of significant: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Menstrual Hygiene Intervention at School

Menstrual Hygiene Intervention at School	Public		Private	
	Yes	No	Yes	No
Participated in Menstrual Hygiene session	42.9	6.1	38.8	12.2
Science teacher teaches Menstrual hygiene in class	43.7	5.3	46.1	4.9
Aware of SHEP Programme	42.4	6.5	32.2	18.8
SHEP activities included Menstrual Hygiene	34.3	14.7	29.0	22.0

Discussion

Menstrual history and perceptions about puberty rites

The reported mean age at puberty was 12.61 ± 1.079 and above half, and the respondents were between 13 and 14 years old at puberty as shown in Table 2. Krobos have the most complex puberty customs for girls in Ghana. Young girls who have had their first period endure the ceremony, known as "Dipo," which is strongly practised among them during April for four days each year (Kissi-Abrokwah et al., 2021), Oppong (1973), Teyegaga (1985), and Oppong (2003). In other cases, this rite of passage occurs in young females after puberty as a pre-marriage ceremony rather than necessarily coinciding with puberty or the onset of menstruation. In preparation for their marriage as Krobo women, the girls learn about premarital difficulties and sociocultural strategies to preserve their virginity during this ritual (Kissi-Abrokwah et al., 2021).

Even though this custom has sparked discussions about the exposure of breasts and bathing one's feet in goat blood, the tradition is still carried out in the community. A question about rites of passage was asked in this survey, and only one-third of the respondents said they had gone through them. When respondents were asked how they felt about the rite of passage, 55 participants, or 21%, said it was positive. Thirty-one girls, or 12%, said they felt bad, timid, or nervous while conducting the rites, while 29 girls said they did not appreciate showing their breasts.

Assessment of Girls' Knowledge of Menstruation

Girls' knowledge of menstruation was calculated by assigning scores as mentioned in the methodology and categorized into poor, moderate and good. The Study recorded about 66.5% relatively have moderate knowledge about menstrual health hygiene as shown in Figure (2). Table 3 shows the responses to the knowledge on menstruation. The knowledge about the physiology of menstruation, sources of blood, duration of periods, the best material to use during menstruation and best disposal practice was quite high. However, 64.9% of the respondents did not know that dysmenorrhea is painful menstruation and 52.7% of the respondents do not know that abdominal pain during menstruation is due to contractions of the Uterus. The study showed that about 78% of the study respondents are unaware that the normal blood loss during menstruation is between 70-80ml and this can pose a danger of Anaemia in adolescent girls when care is not taken in enhancing their nutrition during menstruation. This research finds this knowledge useful and impressive in that, such knowledge contributes significantly to helping the girls prepare both psychologically and practically for the experience ahead of time so that they are not taken by unpleasant surprises. It is, however, quite worrying to know that 59% of the respondents could not provide correct answers to the average days of the interval within a menstrual cycle and this lack of knowledge about the menstrual cycle can expose adolescent girls to unwanted teenage pregnancies when they try to be explorative. The knowledge about the best material to use and disposal method is good among the respondents, however, how often sanitary pads should be changed is also very low among respondents constituting 33.9%. This calls for enhanced education because poor menstrual-related practices during menstruation could lead to reproductive tract infections. As high as 42% of respondents were not aware of this fact, and this study finds it to be a worrying trend. The study, therefore, calls for proactive actions on adolescent health education.

Assessment of Girls' Menstrual Hygiene Practices

i. Personal Hygiene during Menstruation

The study showed that respondents practice fairly good personal hygiene during menstruation as 93.5% indicated taking their bath twice daily during menstruation as shown in Table 4, and less than half of the respondents wash their genitalia with soap.

ii. Menstrual Hygienic Practices

The majority of the girls (96.3%) use sanitary pads during menstruation which is a good indicator of hygienic practice as shown in Table 5. While using sanitary napkins during menstruation is a good indicator, it is important to be mindful of how long one uses them because they are chemically manufactured and can become dangerous if used for lengthy periods. As a result, the respondents were asked how long they had been using pads. The majority, 65.3%, said they changed them less than three times per day, which is below the UNICEF recommendation of using three or more pads per day (UNICEF, 2008). This finding supports a conclusion from a junior high school study by Kumbeni and his colleagues in rural northern Ghana (Kumbeni et al, 2020). Due to the rising use of disposable sanitary pads among girls, the disposal of pads is currently a severe environmental and public health concern. This study found that 63.3% of participants burned their pads after using them. However, it was found that 15.5% of respondents buried their pads after using them, followed by 13% of students who flushed or dumped them down the toilet. This is not the best practice and needs to be addressed through education. Because commercial sanitary pads are 90% plastic and either never degrade or take a very long time to decompose, burying them could have negative environmental effects. To address environmental issues, it is crucial to teach girls about appropriate disposal techniques.

iii. Menstrual Hygiene Practices at School

Several studies reported on school absenteeism associated with menstruation, with one in four girls missing one or more school days during menstruation. In this study, it is found that only a few students (13%) were absent from school during menstruation, this is shown in Figure 3 and their reasons for being absent were menstrual pain, fear of staining their clothes, lack of water, and poor hygiene and disposal facilities in school toilets and this finding is in line with Van Eijk, et al (2016) and Kumbeni et al (2020). Girls, who attend schools that lack adequate toilets and water supplies, feel uncomfortable changing sanitary pads and washing in privacy and therefore they avoid changing pads and remain uncomfortably in class during their menstruation. This type of poor menstrual hygiene leads to fungal infections in young girls. In this study, it is worth noting that, about 56.73% of the participants change their pads whiles at School as shown in Figure 3. This is fairly suggestive that enhanced facilities at school can encourage more students to avoid having to go through the discomfort of waiting until they arrive home to change their soaked pads.

iv. Respondent's menstrual hygiene practices

Disposal of pads at school becomes a waste management issue and it is noted that 16% use the bin to dispose of whereas 14% of the girls flush them in toilets or dump them in the latrine which may get choked. The lack of adequate information regarding safe disposal practices of sanitary pads among women and girls will result in considerable waste management challenges if no action is taken. Also, it is observed from Figure 4 that 68.16% of the respondents take their used pads home to dispose of or try to manage with the soaked pad until they get home before they change the pad. Table 6, shows the facilities available at school and more than half of the girls reported that water and soap are not available in their school which makes it difficult for them to handle menstruation. Clean water with sufficient availability, access (both physical and economic), and quality (free from harmful organisms and pollution) are instrumental to maintaining menstrual hygiene. As the World Health Organization (WHO) notes: "Lack of safe water is a cause of serious illnesses such as diarrhoeal diseases which kill over two million people every year (the vast majority of children in developing countries) (Salgado & House, 2005). Though specifically in respect of diarrhoeal

diseases, the place and role of water in the menstrual hygiene and sanitation discourse cannot be denied. Overall assessment of the menstrual hygiene practices among the girls reveals that about 77% relatively moderate menstrual hygienic practices as shown in Figure 5.

v. *Association between Students' Characteristics with Knowledge and Practice*

There was some correlation between demographic details and knowledge of menstrual hygiene. However, concerning the association between demographic variables and menstrual hygiene practice, the only variable 'type of school' was statistically significant at a 5% level. The results showed that at a 5% significant level, respondents from Lower- Manya District have a significantly good (25) level of knowledge on menstrual health hygiene as compared to the respondents from the Yilo-Krobo District (8). A possible explanation for this could be that there are many health facilities and more reported health educational campaigns including menstrual hygiene education in the Lower- Manya District than Yilo-Krobo District. Leveraging on the existing strengths of the Lower-Manya, we can only hope that with the recent establishment of the Yilo District Hospital, health personnel will liaise with the School Health Education Programme (SHEP) Coordinators to intensify Education on Menstrual Health Hygiene and other Adolescent Reproductive issues. The Class/Form of respondents contributed positively to knowledge acquisition on Menstrual Health Hygiene ($p < 0.05$) given that those in forms 2 and 3 reported a good level of knowledge of menstrual hygiene (15&12) than those in forms 1 (6). This could be attributed to the repeated Social Studies and Integrated Science lessons delivered to Students which include Adolescent Reproductive Health and Menstruation. Though the level of knowledge of menstrual health hygiene between the public and private schools was not statistically significant, interestingly, respondents from public schools have a good level of practice of menstrual health (32) than their counterparts in private schools (16) at 5% significant level ($p < 0.05$). This could be attributed to the high demands of work on parents of Private School Girls who might have abandoned their roles of Sex Education and good menstrual practices. It could also be a result of the non-existence of School Health Education Program (SHEP) coordinators in Private Schools or their possible poor supervision. Another major factor could be the attitude of individuals and poor parental upbringing and guidance.

Knowledge of menstrual health hygiene was reported to be significantly higher, at a good score of 22 among respondents from rural areas than those from urban areas (11). This can largely be linked to the performance of the Rite of Passage locally known as "Dipo", during which time adolescent girls are taken through personal hygiene and menstrual health. This rite of passage is largely patronized by adolescent girls from rural settings than urban setups (Table 7). It is also observed from Table 7 that the girls' participation in the menstrual hygiene programme at school is significantly associated with the knowledge of menstruation whereas there is no association with their practices.

Menstrual Hygiene Intervention at School

Menstrual hygiene awareness programmes have been conducted in schools occasionally through the School Health Education Programme (SHEP) under Ghana Health Service and other Non-Governmental Organizations. A few activities include education on menstrual hygiene and the distribution of sanitary pads for girls. Every Public School has a teacher designated as a School-Based Health Coordinator (SBHC) who leads the implementation of SHEP Activities. At the Yilo and Manya Krobo enclaves, where the study was conducted, it was largely observed that Respondents had very high knowledge of SHEP and its activities, especially in the Public Basic Schools. This great feat of knowledge explosion could be a result of rigorous activities and intensive supervision on the Part of SHEP in the Study Area.

Conclusion and Recommendations

Menstrual hygiene management is a fundamental aspect of women's and girls' life that should be promoted so that it ensures their rights to health and dignity and also to attain the specified sustainable development

goals. It was observed that the girls have moderate knowledge and therefore have moderate practices where it is more important that we educate them on the scientific facts about menstrual hygiene, the proper management, and safe disposal of sanitary pads. We establish that women and girls have peculiar needs because of their physiological makeup and these needs need to be met without stereotyping. Schools need to ensure that water, sanitation and female-friendly facilities are consciously factored into the built environment of our educational facilities to help promote hygienic practices among girls. Besides, they must be in good shape at all times to guarantee their security when being used.

Continuous awareness programmes at schools for girls and even out-of-school girls must be enhanced to ensure better menstrual hygienic practices. The provision of sanitary pads must be available at school premises and create an enabling environment for girls to manage menstrual hygiene at schools. Menstrual hygiene management should be seen and dealt with as a collective social concern rather than relegated to the background as a female affair. The unlearning of menstruation as verbal and other taboos must be entrenched at the Junior High School level. Culturally, socially and from the formal education perspective, education on menstrual hygiene management should be extended to involve males as well as females. This is because, in the end, males and females are both beneficiaries of such knowledge as a society.

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**UNDERSTANDING THE PREDICTORS OF STUDENTS' ECOLOGICAL BEHAVIOUR:
EVIDENCE FROM GHANA**

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Abstract

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Purpose — This study examines the factors influencing the adoption of ecological behaviour among first year students at the University of Environment and Sustainable Development in Ghana.

Methods — The study employed a questionnaire survey design. Data was collected from 103 students enrolled into programmes offered by the School of Sustainable Development and the School of Natural and Environmental Sciences. Inferential analysis was computed using regression.

Findings — Results show that students' demographic characteristics, particularly their current and past academic programmes, year of completion of senior high school and household size, positively influence their environmental knowledge and ecological behaviour.

Conclusion & Recommendation — The study concludes that social values and environmental knowledge contribute significantly to promoting students' ecological behaviour. The study therefore recommends the need for an inclusive and multistakeholder approach to integrating environmental education and social values into existing and future curricula and academic programmes.

Keywords — Tertiary students, environmental education, pro-environmental behaviour, environmental knowledge, social value

Introduction

Climate change with its associated global warming has become a major ecological issue of global concern (Boakye, 2015). Human behaviour is established as one of the major drivers of ecological problems (Amoah & Addoah, 2021; Nkaizirwa et al., 2022; Onokala et al., 2018). Global efforts in addressing the problem has therefore drawn attention to diverse methodologies among which is education (Anderson, 2010; Cherry, 2011; Sharma, 2012; Stanford University, 2011). According to the United Nations Education, Scientific and Cultural Organisation (UNESCO), education is central to achieving the Sustainable Development Goals (SDGs). It is also emphasised that educational initiatives capable of championing pro-environmental behaviour is critically needed in contemporary societies, particularly in developing economies to boost sustainable development and address environmental challenges including climate change (UNESCO, 2015).

This is because education has the potential to alter the attitude and actions of students to act innovatively and pro-environmentally.

Climate change education has gained significant attention in global educational systems. It seeks to equip people; especially the youth who have more years to live, with requisite knowledge, skills and attitudes in exhibiting environmental concerns and responsive ecological behaviour in order to sustain the environment. However, effective implementation of climate change education requires better understanding of ecological behaviour to inform the contents and scope of climate change education, hence the need to investigate the predictors of students' ecological behaviour. This contends with the assertion that having knowledge may not correspond to attitude and behaviour (Emanuel & Adams, 2011; Heeren et al., 2016). In consonance with Whitley et al. (2018), while climate change education is instrumental in shaping behaviour for environmental conservation and preservation, other non-education factors, such as social values and norms, also have immense roles in promoting pro-environmental behaviour.

A number of existing studies have contributed to the understanding of ecological behaviour in different contexts (Amoah & Addoah, 2021; Boiyo et al., 2015; Onokala et al., 2018; Simiyu et al., 2022). For instance, in comparing the predictors of pro-environmental behaviour among students in the United States and China, Onokala et al. (2018) found a couple of factors such as social norms, intention to act, information need and situational factors, to commonly affect and shape students pro-environmental behaviour in these two countries. In China, an additional factor of environmental awareness was also reported to shape the nature of pro-environmental behaviour of students.

Similar studies have been conducted to provide insights into the factors influencing ecological behaviour of students in Africa. In Kenya, for instance, Simiyu et al. (2022) found that social influence and environmental knowledge are significant predictors of pro-environmental behaviour among students. Boiyo et al. (2015) also noted that attitudes are essential in predicting pro-environmental behaviour among Kenyan students. This is consistent with the argument that ecological behaviour is pinned on the attitudes of people (Kaiser et al., 1999), be it students, households or farmers. Intuitively, attitude has an important role to play in driving pro-environmental behaviour in different contexts. It is therefore quite intriguing to understand whether any of these factors or others predict pro-environmental behaviour of Ghanaian students.

In Ghana, Amoah & Addoah (2021) argued that environmental knowledge is positive and highly significant in determining environmental behaviour of households in urban communities. Contrastingly, Owusu et al. (2020) also found no significant impact of climate change information on its adoption by household heads in Ghana. Their study however revealed that household heads' decision to adapt to climate change behaviour were rather dependent on factors such as household size, household members in farmer organisations and perception on climate variability, which is consistent with other studies (Asare-Nuamah & Botchway, 2019; Asare-Nuamah & Mandaza, 2020).

Even though previous studies have contributed immensely to the understanding of environmental behaviour in Ghana, their emphasis is limited to households and smallholder farmers without paying attention to students who play a critical role in environmental stewards. This is problematic as Ghana is currently experiencing the impact of climate change, which requires robust and inclusive strategies including climate change education among the general public, to remedy its adverse impact on households and the economy. It is therefore important to equip students, particularly those in Higher Education Institutions, with the requisite skills, knowledge, mindset and attitudes to contribute substantially to addressing climate and environmental change (Boakye, 2015). These existing studies have also failed to examine the relevance of social values in environmental behaviour in the Ghanaian context. It is against this background that this study seeks to investigate the predictors of students' ecological behaviour from a Ghanaian University. The study seeks to address the following research questions i) To what extent do students' demographic

characteristics influence their environmental knowledge and ecological behaviour? b) Does students' ecological behaviour depend on their social values and environmental knowledge?

The subsequent sections of the paper focus on a review of the extant literature on ecological behaviour, particularly the determinants of ecological behaviour from educational perspectives and context, the application of the value-belief-norm theory in this study and the methods employed in the collection and analysis of data. The other sections of the paper include findings from the data, the discussion of the results in relation to existing studies and policy implications as well as the conclusion and recommendations.

Empirical review: Social values and environmental knowledge as determinants of ecological behaviour

To date, education has been the most prevalent strategy for bringing about behavioural change. Issues of the environment are intertwined with the sustainable development of human societies and environmental sustainability is becoming pressing. The amount of knowledge students acquire, or to a certain extent, the usefulness with which the information presented impacts their attitudes and subsequent actions, has a big impact on improving their sense of responsibility and modifying their behaviour (Al-Rabaani & Al-Shuili, 2020). While Axelrod & Lehman (1993) define ecological behaviour as the “actions which contribute towards environmental preservation and/or conservation”, Martinez-Martinez et al. (2019) define the concept of environmental knowledge as “the use of knowledge management strategies, tools and techniques to create, share and reuse tacit and explicit knowledge resources related to the environment and its protection”. The purpose of this study is to learn what controls students' behaviour and perceptions of environmental sustainability concerns. It's worth mentioning that educational institutions are a potent force that could be harnessed to develop a generation of environmental stewards. Developing countries, particularly those in Africa, have gotten little research attention despite the fact that they are the spots of the majority of these environmental challenges and their implications (Amoah & Addoah, 2021). Similarly, Whitley et al. (2018) conjecture that in spite of the fact that university students are expected to have a substantial impact on the future state of the environment, there is a dearth of academic research on environmental behaviour.

The COVID-19 pandemic, according to Servant-Miklos (2022), is a critical aspect in environmental education's potential to advance socio-ecological resilience. The study adds to knowledge of how environmental education might facilitate how students cope with interruptions in their everyday activities. The author interviewed students in the Netherlands about their perceptions of COVID 19 using a two-step participatory thematic study as a segment of the reflection stage of the Educational Action Research cycle. Environmental education, according to the study, can help students shift their perceptions of education's purpose from instrumental to social-transformative, thereby motivating some students to make behavioural changes.

Amoah & Addoah (2021) identified that environmental knowledge (EK) is a crucial driver of pro-environmental behaviour (PEB), where they explained PEB as any human behaviour that enhances or preserves the environment rather than harming it. To deal with the issues of environmental management that are typical in developing countries, their research employed environmental knowledge as a forecaster of varied pro-environmental behaviour among Ghanaian homes. The main purpose of their study was to determine both domestic and peripheral factors that influence a home's PEB from a developing country point of view using data from households. Environmental knowledge (internal factors) and socioeconomic (external) factors were found to be accountable for changes in PEB according to their research.

One of the ultimate purposes of education, according to Dalida et al. (2018), is to produce knowledge transmission systems in which students understand the relevance and uses of the subject matter in their life. Janmaimool & Khajohnmanee (2019) looked into how environmental system knowledge influences PEB among university students in Thailand. They identified environmental system knowledge to include political ecology, sustainable development, environment and ecology as well as environmental situations. Despite the

lack of a significant difference in direct effect PEB participation between students who completed an environmental course (Environment and Development) and those who did not, their study found a major disparity relating to environmental beliefs and implied effect of PEB participation among students who completed an environmental course and those who did not. They postulate that a variety of other factors, such as infrastructure, inclination, sense of duty, and shared norms, impact students' determination to be environmentally responsible, and that it may take time for them to put what they've learned in the classroom into practice.

Ghazali et al. (2019) established that earlier studies on PEB have paid attention to only restricted forms of PEB such as recycling while ignoring the linkages between several forms of PEBs. By means of social norms as an extension of the value-belief-norm (VBN) theory, they examined the experiences and linkages of six PEBs - activist, avoider, green consumer, green passenger, recycler, and utility saving- among Malaysian Malays and Chinese to predict their PEBs. Their study recommends that social norms should be added to the VBN theory because it enhances the predictability of PEB. They ascertain that persons who have previously engaged in PEB were more likely to do so again. The authors argued that, despite the fact that the Chinese were more interested in PEB, the two ethnic groups had fewer disparities and hence could not be categorised as entirely homogeneous ethnic groups, as earlier studies had assumed.

Using the VBN theory, Liu et al. (2018) studied the impact of the collection of socio-psychological predicting variables on public sphere PEB (PSPB) of Mongolian students in college while taking cognizance of the participation of the students regarding the sustainable development of the Inner Mongolia Autonomous Region (IMAR) of Western China. Noting that the VBN theory is a valuable tool in determining the diverse forms of PEB but had been employed in few studies in the minority communities in Western China. Their study emphasised the importance of values within the VBN theory to predict environmental sentiments among the youth in China's minority communities. As such the study recommend that to encourage PSPB among university students, academic curricula should be aligned and made relevant to societies' well-being.

Oe et al. (2022) used text mining qualitative tools to explore the potential for community-oriented learning opportunities in improving consciousness of the environment as well as promote healthful lifestyles changes of students in the university and locals in Okayama and Tokyo, Japan based on UNESCO's education for sustainable development (ESD) model. They looked into two community-based learning programs that are at the forefront of ESD policy in the two cities. Despite the fact that students found the programs engaging and lively, their findings imply that the programs' drivers and instructors recognised the significance of ESD but were more focused on its blueprint and curricula. They establish that encouraging mutual and interactive learning activities that engage local communities to improve environmental awareness and inspire behavioural change increases participant willingness to be taught and advance ESD in communities through social education.

Stern et al. (1999) theory of value-belief-norm (VBN) is one of the most current environmental psychology theories to gain traction in the last two decades, and it is employed in this study to investigate the elements that influence students' sustainable ecological behaviour and knowledge. Only a few studies have attempted to apply the theory to non-western countries (Karimi, 2019). The VBN theory explains an individual's environmentally meaningful behaviour by establishing a continuous relationship between value orientation, belief, and norm. The theory has effectively demonstrated the backdrop of the elements of pro-environmental activity, as well as modelling, elucidating, predicting, and relating factors of pro-environmental behaviour and establishing its range (Canlas et al., 2022).

The VBN theory begins with values, which serve as a foundation for beliefs, which in turn create the norms for individuals' behavioural standards. This indicates that one's willingness to recognise that one's actions have an impact on the environment differs based on one's values. The VBN theory incorporates a large

number of cause-and-effect variables to provide a more thorough explanation of the human-environment interaction and how these interactions can affect one another (A. Akintunde, 2017). The theory proposes that, pro-environmental personal norms and beliefs influence values on environmental behaviour.

Materials and Methods

Study design and setting

This study adopted a quantitative design by following the survey approach, which allows the collection of numerical or quantifiable data from a sample of a population (Creswell, 2014). The study was conducted at the University of Environment and Sustainable Development in Ghana. As a relatively new public University with the mandate to contribute toward addressing contemporary environmental challenges, it is necessary to examine the environmental behaviour and knowledge of students in order to strategically position them to address environmental challenges through effective education and skills acquisition.

Population, sample and sampling technique

The population for the study included first year students enrolled into the two schools of the University – the School of Sustainable Development and the School of Natural and Environmental Sciences. It is important to note that this study forms part of a larger study that sought to improve climate and environmental knowledge of first year students in the University. First year students were chosen since preliminary investigation upon their arrival at the University showed that many of the students had little to no knowledge of climate change. At the time of the study, about 125 first year students admitted into the University had enrolled. According Krejcie & Morgan (1970) and Yamane (1973), a population of 125 requires the selection of a sample of 95. However, 103 students were randomly selected based on the list of first year students who had reported to the University at the time of the study. However, only those consented to voluntary participate in the study were included.

Instrument design and data collection procedure

A structured questionnaire survey was designed for collection. The questionnaire consisted of binary, multiple choice and five-point Likert scale closed-ended questions. The first section of the questionnaire solicited for information on respondents' demographic characteristics while the second, third and fourth sections solicited information on ecological behaviour, environmental knowledge and social values, respectively. The questions were adopted from existing studies (Amoah & Addoah, 2021; Kaiser et al., 1999; Siyavooshi et al., 2019) and contextualised to the Ghanaian context.

Data analysis

The data for this study was analysed through descriptive and multiple regression analyses. For descriptive analysis, mean, standard deviation and frequency were computed. To aid in multiple regression analysis, indexes were developed for ecological behaviour (EB), environmental knowledge (EK) and social values (SV) items by following Kothari & Garg's (2013) recommendations. EB consisted of 18 items, while EK and SV had 10 and 14 items, respectively. To construct the indexes, Cronbach alpha computations were performed to examine the reliability (internal consistency) of the items. EB, EK and SV resulted in 0.893, 0.867 and 0.856 coefficients, respectively (see Appendix 1A, 1B, 1C). Pallant (2016) posits that Cronbach alpha coefficients greater than 0.70 demonstrate high internal consistency in the items for the indexes.

For the purpose of regression analysis, diagnostic tests, such as normality and multicollinearity were performed. Normality test was performed using Shapiro-Wilk, box and whisker plots, and normal quartile-quartile (Q-Q) plots. The results of the correlation matrix in Table 1 shows that there was no multicollinearity in the variables of interest as none of them had high correlation exceeding 0.80 (Field, 2017). The highest inter-item correlation is observed between ecological behaviour and environmental knowledge with a coefficient of 0.651 (see Table 1). Indeed, the results of the normality tests and correlations showed that regression assumptions were met.

Three main regression computations were performed. The first regression examined the influence of respondents' demographic profile on environmental knowledge, with environmental knowledge as the dependent variable. The independent variables included gender, access to phone, current undergraduate programme offered, locality (rural/urban), programme pursued at senior high school, household size and year of completion of senior high school. The second regression analysis also examined the influence of environmental knowledge and social values on ecological behaviour. In this analysis, ecological behaviour was the dependent variable while the independent variables include environmental knowledge and social values. In the last regression, the influence of demographic profile on ecological behaviour was assessed.

Ethical considerations

The study adhered to ethical principles of research by seeking informed consent from the participants. As indicated earlier, only participants who consented to participate voluntarily in the study were allowed to respond to the instrument. Although the instrument was adopted from existing studies, which are believed to be valid, the researchers contextualised the instrument, which was further reviewed by an expert in environmental research, thereby improving its construct and face validity (Creswell & Plano Clark, 2018). The instrument was pilot tested, leading to the revision and/or omission of ambiguous questions.

Table 1. Correlation matrix of ecological behaviour, environmental knowledge and social values

		Ecological Behaviour Index	Environmental Knowledge Index	Social Values Index
Pearson Correlation	Sustainable Behaviour Index	1.000	.651	.533
	Environmental Knowledge Index	.651	1.000	.565
	Social Values Index	.533	.565	1.000
Sig. (1-tailed)	Sustainable Behaviour Index	.	.000*	.000*
	Environmental Knowledge Index	.000*	.	.000*
	Social Values Index	.000*	.000*	.

* $p < 0.05$

Results and Discussion

Socio-demographic characteristics of the respondents

The socio-demographic profile of the respondents are presented in Table 2. About 50.5% of the respondents were females as opposed to males (49.5%). More than half of the respondents (54.4%) were 18 to 20 years old. The majority of the respondents were Christians (93.2%). In terms of present school affiliation at the University, 51.5% of the respondents were affiliated to the School of Natural and Environmental Sciences (SNES) while 48.5% were affiliated to the School of Sustainable Development (SSD). Except 5.8%, all the respondents had access to a mobile phone. The average household size among the respondents was about 5.8, with 1 and 20 being the minimum and the maximum household size, respectively. Over two-third of the respondents (80.3%) pursued Science and General Arts programmes at the Senior High School. Among this population, about 36.9% were Science students while 43.7% were General Arts students. The majority of the respondents (68%) complemented Senior High School after 2020, with 1992 as the earliest completion year while 2021 was the latest completion year among the respondents.

Table 2. Respondents' socio-demographic characteristics

Variable	Frequency (%)	Mean (SD)
Gender		
Male	51 (49.5)	
Female	52 (50.5)	
Age category		
Below 18 years	6 (5.8)	
18 – 20 years	56 (54.4)	
21 years and above	41 (39.8)	
Religious affiliation		
Christian	96 (93.2)	
Muslim	6 (5.8)	
Other	1 (1.0)	
Present School affiliation		
SSD	50 (48.5)	
SNES	53 (51.5)	
Access to phone		
Yes	97 (94.2)	
No	6 (5.8)	
Household size		5.8 (2.8)
Senior High School Programme		
Science	38 (36.9)	
General Arts	45 (43.7)	
Business	8 (7.8)	
Visual Arts	2 (1.9)	
Home Economics	8 (7.8)	
Agricultural Science	2 (1.9)	
Year of completion of SHS		
Before 2015	9 (8.7)	
After 2015	94 (91.3)	

Source: Authors' computation from fieldwork, 2022

The influence of demography on ecological behaviour and environmental knowledge

In Table 3, the results of the influence of respondents' demographic variables on their environmental knowledge are presented. The independent variables made about 17% significant contributions to the dependent variable ($F(9, 93) = 3.57, p = 0.000$). The most significant predictor of environmental knowledge is programme pursued at the SHS ($\beta = 0.306, p = 0.032$), followed by the year of completion of SHS, which has a significant inverse relationship with environmental knowledge ($\beta = -0.201, p = 0.032$). There is a significant positive relationship between current school affiliation at the University and environmental knowledge ($\beta = 0.198, p = 0.007$). Other significant predictors of environmental knowledge include access to phone ($\beta = 0.178, p = 0.018$) and household size ($\beta = 0.156, p = 0.026$).

Table 3. Regression results of demography and environmental knowledge

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
Gender	-.068	.087	-.058	-.789	.431	-.030	-.057	-.052
Age category	-.083	.081	-.084	-1.028	.305	.020	-.074	-.068
Religious affiliation	.059	.132	.030	.444	.657	.053	.032	.029
School affiliation	.233	.086	.198	2.705	.007**	.093	.192	.178
Access to phone	.463	.194	.178	2.390	.018*	.073	.170	.157
Household size	.027	.012	.156	2.249	.026*	.175	.160	.148
Programme at SHS	.129	.033	.306	3.917	.000**	.177	.272	.258
Year of SHS completion	-.032	.015	-.201	-2.164	.032*	-.165	-.154	-.142

a. Dependent Variable: Environmental Knowledge Index

* $p < 0.05$; ** $p < 0.01$

The results of the influence of demographic variables on ecological behaviour are presented in Table 4. Demographic variables in this model contributed to about 12.9% significant variation in ecological behaviour ($F(9, 93) = 2.55, p = 0.004$). The programme pursued at the high school was the most significant contributor to respondents ecological behaviour ($\beta = 0.19, p = 0.020$), followed by current school affiliation at the University ($\beta = 0.17, p = 0.030$). The results of the part and partial correlations also confirmed the relative importance of high school programme and current university programme as the significant predictors of ecological behaviour.

Environmental knowledge and social values as determinants of ecological behaviour

Table 5 presents the results of the relationship between social values, environmental knowledge and ecological behaviour. Both environmental knowledge and social values made about 46.4% positive contribution to ecological behaviour ($F(6, 97) = 2.48, p = 0.000$). Similarly, environmental knowledge ($\beta = 0.514, p = 0.000$) and social values ($\beta = 0.243, p = 0.000$) significantly predicted ecological behaviour, although the results of the part and partial correlations show that environmental knowledge made the most relative important contribution to ecological behaviour compared to social values.

Table 4. Regression results of demography and ecological behaviour

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
Gender	-.092	.106	-.066	-.866	.388	-.012	-.062	-.058
Age category	.012	.099	.010	.121	.904	.077	.009	.008
Religious affiliation	.058	.162	.025	.356	.722	.047	.026	.024
School affiliation	.231	.105	.165	2.193	.030*	.107	.156	.148
Access to phone	.077	.237	.025	.327	.744	-.029	.024	.022
Household size	.024	.015	.116	1.634	.104	.126	.117	.110
Programme at SHS	.095	.040	.188	2.351	.020*	.107	.167	.158
Year of SHS completion	-.016	.018	-.084	-.887	.376	-.177	-.064	-.060

a. Dependent Variable: Ecological Behaviour Index

* $p < 0.05$

Table 5. Regression results of environmental knowledge, social values and ecological behaviour

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Correlations		
	B	Std. Error	Beta			Zero-order	Partial	Part
Environmental Knowledge Index	.612	.074	.514	8.252	.000*	.651	.501	.424
Social Values Index	.290	.074	.243	3.899	.000*	.533	.264	.200

* $p < 0.01$

Discussion

Addressing contemporary environmental challenges including climate change, requires the promotion of pro-environmental behaviour across all levels of the society, including students and educational institutions. Studies that attempt to provide empirical evidence of drivers of pro-environmental behaviour particularly in developing economies, have focused primarily on household analysis (Amoah & Addoah, 2021). While there is no doubt that households have important roles to play in tackling environmental challenges, the role of students has received less attention in the literature. However, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) through its ‘education for sustainable development’ initiative recognises the relevance of education institutions and students as critical stakeholders in effectively addressing environmental problems (UNESCO, 2015). To contribute to the realisation of the initiative, this study examined the factors that drive students’ ecological behaviour.

Environmental knowledge constitutes both subjective and objective knowledge of individuals on the environment. Objective knowledge is more relevant in determining sustainable response to environmental challenges. For instance, having an objective knowledge of climate change can play an instrumental role in responding sustainably to climate change and its associated impacts. Subjective knowledge, while important may mislead households and individuals from taking actions that address the root causes of environmental challenges and minimise their effects. For instance, authors argue that farmers’ misconception of climate change has negative implications on sustainable response to climate change. The results from this study show that current programme being offered at the University, past programme pursued at SHS, access to a

phone, household size and year of completion of SHS significantly influence environmental knowledge of students.

Academic programmes have great potential to expose students to environmental challenges and the associated means of addressing them. This concurs with the position of UNESCO that education programmes and institutions can strategically empower learners with the right knowledge and attitude to tackle environmental challenges (UNESCO, 2019). Consequently, students enrolled into environmentally related programmes are more likely to have higher and objective knowledge of the environment compared to students whose programmes have little to no environmental components. For instance, at the SHS, Science programmes are more likely to expose students to environmental issues and increase their knowledge compared to business, general or visual arts programmes. Intuitively, it is essential for academic programmes to incorporate environmental components as a means to boost environmental knowledge among students. Access to a mobile phone has been reported in the literature to increase environmental knowledge as it offers an opportunity to access relevant environment related information via the internet or receive such information on the phone through messaging (Antwi-Agyei et al., 2021; Asare-Nuamah & Amungwa, 2021). This study also confirms that students with access to mobile phones are more likely to have higher knowledge of the environment compared to their counterparts. However, it is important to note that accessing relevant environment related information on the internet requires skills and knowledge to identify credible sources of information, as information overload and disinformation characterise the recent information explosion on the internet.

The results show that household size is an important predictor of environmental knowledge. Within the Ghanaian and African cultural setting, communal living has the tendency to increase collective responsibility towards the environment. Such a phenomenon has a role to play in increasing environmental knowledge and consciousness among members of the household and the community at large. In consonance with Amoah & Addoah (2021), larger household size are therefore in a better position to have higher environmental knowledge than smaller households. The year of completion of SHS significantly but inversely predicted environmental knowledge. The inverse relationship may be due to the fact that issue of the environment and the associated challenges gained heightened attention at all sectors of the world economy including education, particularly after the Paris Agreement and the Sustainable Development Goals (Agenda 2030) in 2015. Implicitly, students who completed SHS prior to 2015 may have lower environmental knowledge compared to those who completed after 2015. This is because, many educational institutions have intensified the integration of SDGs including the environment into educational programmes in recent times compared to the last decade when environmental issues were sparingly incorporated into academic programmes, particularly in developing economies, including Ghana. Also, the global action programme on education for sustainable development, which was initiated in 2015 is a testament to the call for the inclusion of environmental issues in education (UNESCO, 2019). It is noteworthy that the environment is an integral component of the SDGs, and therefore, incorporating SDGs into educational programmes may expose students to diverse environmental challenges at national and global levels, thereby improving their knowledge.

This study highlights the importance of environmental knowledge and social values in positively and significantly predicting students' ecological behaviour, which is consistent with the VBN theory. Indeed, environmental knowledge has a great role to play in building the right attitude and mindset among students to tackle environmental challenges. Similarly, it is a tool for innovating thinking and action towards environmental problems. According to Action Aid International (2009), the environmental knowledge of students played a key role in responding effectively to Cyclone Sidr in Bangladesh. The influence of environmental knowledge on pro-environmental or ecological behaviour has been reported in the literature. For instance, Amoah & Addoah (2021) noted that households' pro-environmental behaviour in urban Ghana

is driven by their environmental knowledge. In Mexico, Tapia-Fonllem et al. (2013) highlighted the centrality of environmental knowledge in University students' pro-environmental behaviour. Similar results were reported among the self-reported environmental behaviour of college students in Mongolia (Liu et al., 2018). Implicitly, improving objective environmental knowledge among students can increase positive behaviour towards environmental protection and conservation.

Again, the study reveals that social values positively affect students' ecological behaviour. In consonance with value-belief-norm and social identity theories, values offer an identity and membership to a society and bond individuals to a collective social action. Consequently, social values for the environment direct and influence attitudes and behaviour of individuals and the society at large, to collectively tackle common environmental problems. In Iran, Siyavooshi et al. (2019) found that Islamic values greatly influence behaviour toward the purchase and consumption of green products. Without doubt, certain Ghanaian social values, such as the protection of sacred groves and forests, have been reported to promote sustainable environmental practices (Aniah & Yelfaanibe, 2018). A study in Malaysia argue that social norms significantly influence pro-environmental behaviour of Chinese and Malaysians, thereby demonstrating the centrality of social values even in a heterogeneous environment (Ghazali et al. (2019). Intuitively, integrating environmentally conscious social values and norms into educational programmes can further boost students' positive actions towards the environment. In addition, the study shows that students' ecological behaviour is driven by their past and current academic programmes, which concurs with the argument that education can positively enhance learners' pro-environmental behaviour (UNESCO, 2015, 2019).

Conclusion and Recommendations

Without doubt, students are key players in addressing contemporary environmental challenges and achieving sustainable development. Using a quantitative survey design, this study sought to examine the determinants of ecological behaviour among tertiary students in Ghana. First year students of the University of Environment and Sustainable Development were selected for this study. The results from the study show that students' environmental knowledge is influenced significantly by the programme they offered at the SHS and their current University programme as well as the size of their households and year of completion of SHS. Similarly, students' ecological behaviour is significantly determined by their environmental knowledge and social values. Essentially, improving students' knowledge of contemporary environmental challenges coupled with the strengthening of social values for the environment will be relevant to boosting ecological behaviour of learners and their societies in Ghana.

In view of this, it is imperative for academic institutions at basic, secondary and tertiary levels of education to aggressively integrate environmental education into existing and new curricula and programmes for students. This requires a collaborative effort between key stakeholders including the National Council for Curriculum and Assessment (NaCCA), the Ghana Education Service (GES), Ministry of Education (MoE), the Conference of Heads of Assisted Secondary Schools (CHASS), the Ghana National Association of Teachers (GNAT), the Ghana National Commission for UNESCO, traditional leaders, among others. Such a collaborative approach will ensure the incorporation of environmental issues from different perspectives while taking into consideration the context of the Ghanaian society. The inclusion of traditional leaders and local stakeholders is critical to ensure that social values are strengthened in academic programmes. Again, traditional leaders must collaborate with local authorities and indigenous institutions, as well as opinion leaders, for the purpose of championing and strengthening social values that promote care for the environment within their communities and households. Consequently, the interaction between social values learned from homes and the knowledge acquired through formal education will strategically position students to promote ecological behaviour.

While the sample size for this study is small as the University is relatively new and admission is low compared to other existing universities in Ghana, the results should be cautiously interpreted. Nonetheless, the results from the study have provided significant insights that can contribute immensely to promoting sustainable and pro-environmental behaviour in Ghana's educational system. Further studies should explore how different components of social values and environmental knowledge drive general and specific sustainable ecological behaviour and attitudes among Ghanaian students. Similarly, studies should examine how different educational programmes, particularly their contents, drive students' ecological behaviour and attitudes.

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Appendix

1A: Cronbach alpha computation for EB

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.893	.908	18

1B: Cronbach alpha computation for EK

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.867	.870	10

1C: Cronbach alpha computation for SV

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.856	.867	14

WHAT INFLUENCE ACADEMIC STAFF SWITCHING INTENTION IN CHARTERED PRIVATE UNIVERSITIES IN GHANA?

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Abstract

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Purpose — The study is driven by the reality that Ghana's private universities are losing a large proportion of key teaching staff (intellectual capital).

Methods — The mixed method of sequential explanatory research was adopted for the study. Academic staff from three chartered private universities with representative sample size of 287 were involved in the study. Binary logit model was employed to analyse the study objectives, followed by the qualitative content analyses.

Findings — Remuneration and job security for staff are the most significant factors for academic staff switching intention. Also, the leadership style discouraged some academic staff to leave. Males have showed greater propensity to switch as compared to females.

Conclusion & Recommendation — Management of private universities should promote staff welfare to avoid switching intentions of academic staff. Private university management could collaborate with prominent universities to assist academic staff in gaining experience and recognition, which could attract them grants.

Keywords — Switching, switching intention, Academic Staff, Chartered Private Universities

Introduction

Fundamentally, private universities in Ghana, like other universities are composed of Staff (human capital), students and buildings. Among the three principal components of the universities, the staff in the universities are recognized for their teaching, research, administration, community service and engagement. Academic staff are essential to societal life because they educate the leaders, produce highly skilled and enlightened intellectual capital of the society, conduct scientific research to deliver quality learning experiences to students for the social transformation and economic development of a nation (Chankseliani et al. 2021). Therefore, competence in terms of both human capital and advanced technology has transformed education for the good of society (Rosenbusch, 2020).

The education work environments are generally associated with beneficial outcomes like higher productivity and lower turnover (Harun, Md Shahid, & Othman, 2016). However, switching intentions and switching are

considered as the most important variables in private universities. Service switching is defined as the act of replacing and exchanging the current service provider with another that is available to the client in the market (Bedi, 2015). The growing competition in the global market is showing that it is becoming increasingly important for private universities to retain their existing academic staff who are also customers. For instance, Akeyo and Wezel (2017) conducted a study on how salary and its related issues can lead to some staff switching jobs in the Humanitarian sector using employees of various non-governmental organizations (NGOs). Also, many scholars explore how the management treats their employees as having significant effects on influencing employees' intention to stay (Harun, Md Shahid, & Othman, 2016). The implication is that gaining knowledge about customers' switching behavior is substantively important which can only be examined by analyzing the role of various factors affecting the switching processes of academic staff.

Hur and Perry (2016) stated that the employee of public organization enjoyed high job security in 20th Century. Private sector employees' job satisfaction depends upon salary, fringe benefits, efficiency in work, quality of supervision, and co-worker relationship among others, while public sector employee job satisfaction depends on balancing family life and after-retirement benefits (Hur & Perry, 2016). This suggests that, employees at private universities are perhaps sensitive to switching to public universities. A synthesis of factors influencing employee turnover in institutions of higher learning in Ghana' suggests that salary and its associated gratuities and emoluments positively influence staff turnover, (Hur & Perry, 2016). Kwegyir-Aggrey (2016), states that private universities in Ghana do not have the required number of lecturers and administrators in terms of quantity and quality to teach, research and manage the research. He concluded that 54% of lecturers and administrators leave the university every year. To Ongori (2007), people leave organizations without any specific reason. This indicates that there is a lack of consensus on the generalizability factors influencing switching intention. In context and scope, studies on switching intention are not done across Chartered Private Universities in Ghana which leaves a gap to fill. Meanwhile, staff of private universities expresses their frustration resulting from management treatment by leaving the institution rather than strike action, which appears to be common language among the staff of public universities to government.

The literature explains that when universities lose lecturers they are not only losing future earnings and students' enrolments but also incurring the cost of finding new lecturers and convincing students for enrolment, (Zheng (2015). Regarding Private Universities, loyal lecturers become less wage-sensitive over time, therefore, losing loyal lecturers means less research output and perhaps low enrolment. Considering the proliferation of private universities, poaching of lecturers is not uncommon, Besides, lecturers with the aid of technological advancements have easy access to available information and may easily decide to switch or not to switch to other universities or companies (Zheng (2015). This is the reason; lecturers' retention is the core concern of each private university. These notions laid the foundation of this study as to determine the most important factors influencing the switching intention of academic staff in Chartered Private Universities in Ghana. The main objective is to examine the factors that influence academic staff switching intentions of three chartered private universities in Ghana.

The factors that affect the employee switching their job from a private university to public university in Bangladesh are mostly job security, safety, future benefits, and employee empowerment (Rosenbusch, 2020). The elements of fairness and justice in how the management treats their employees also play a significant role in influencing the employees' work attitudes and performance (Herr, Bosch, Loerbroks, Genser, Almer, van Vianen, & Fischer, 2018). Many scholars indicated that fairness and justice have significant effects in influencing employees' intention to stay (Herr et al. 2018). They further reported that injustice perceptions were found to not only have a direct effect on employees' performance but also reduces their mental and physical health.

According to Zheng (2015), high employee turnover rate delays the projected work and hurting the total productivity of a project. As an employee with experience and knowledge in certain positions quit the works, it causes a slowdown in the scheduled tasks. It takes time to replace someone with an intimate experience with new workers and the new comers need a certain time to learn and follow up on the procedure and experience. In the view of Zheng (2015), the feelings of job insecurity occur in the remaining employees in an organization. Is noted that whenever workers are being laid off or resign by their own

volition, the remaining workers have to take on extra task and duties. This situation creates low morale in the group of employees, and they will tend to perform lower and less enthusiastic.

Despite faculty turnover having some positive effects on an institution, such as bringing in new ideas, high turnover rates cause financial losses, the disruption of teaching and research, and discontinuity in student mentoring (Rosser, 2004). High turnover tarnishes the image and reputation of an institution and negatively affects the 'satisfiers' of the remaining faculty (Rosser, 2004). Factors such as tenure, university policies toward outside offers and psychological contracts (Herzberg 1966) are also often identified as playing a major role in a faculty member's decision to depart.

Academic staff switching intention in universities and other higher education institutions has been widely researched (Kwegyir-Aggrey, 2016; in Winneba and Boakye et al, 2022 in Kumasi). These two studies (Kwegyir-Aggrey, 2016 & Boakye et al, 2022) explored the factors that affect staff retention and predict faculty mobility. The paper adopted Two-Factor Theory of Herzberg (1966). The first factor 'hygiene', includes salary, working conditions and company policy (Herzberg, 1966). These factors are identified as elements that could cause satisfaction as well as dissatisfaction. The hygiene factors are considered extrinsic factors and that they are under the control of the management or someone other than the employee (Nickerson, 2021). The second factor is the 'satisfiers'. They include achievement, recognition, responsibility, and advancement (Herzberg, 1966). The satisfier factors are related to the intrinsic values of the employees and they are part of their job content and the outcomes of the values that are closely monitored by the employees (Nickerson, 2021).

Materials and Methods

This study was grounded in a pragmatism research paradigm. This paradigm offers the philosophical framework for mixed-method research leading to a better understanding of social realities (Wahyuni, 2012). This study explores explanatory sequential mixed methods design. A quantitative survey questionnaire was constructed and administered to Deans, HoDs and Academics who are also administrators. The same questionnaire was administered to lecturers using random sampling methods. In the same vein, four Deans and Two Registrars were interviewed for qualitative data. Specifically, the quantitative research approach was used to generate quantifiable data to explain the academic staff switching intention in relation to demographic and institutional factors. The qualitative data was used to further explain and confirm results from the quantitative data. The study design focuses on a mixed method of data collection using a structured survey and interview guide with closed and open-ended items respectively to better understand the study objective.

Sample Size and Response Rate

The sample size calculation formula was adapted from Yamane (1967). $Sample\ Size\ (n) = \frac{N}{1 + N(e)^2}$ where n

= sample size, N = populations, and e = margin error. In substituting N = 453 and e = 0.05 in the above formula, the least sample size should be approximately two hundred and twelve (212). Therefore, 320 participants in the universities were employed for the study. However, 277 participants filled out questionnaires, representing 86.6% response rate, and these were used for the analysis. This is consistent with Kothari & Gang (2014) who stated a response rate of above 70% is considered as excellent and useful for analysis. In the qualitative aspect, respondents were 6, (four Deans and two Registrars), who were purposively selected and interviewed. At the time of data collection, chartered private universities were five. The three chartered private universities selected have programmes in Science, Business and Liberal Arts and have been mentored by public universities for ten years and more.

Table 1: Deans, Heads of Department and Administration

Name of University	Deans	Heads of Department	*Administrative Heads	Total
Ashesi University	1	4	2	7
Central University	9	17	3	29
Valley View University	6	14	4	24
Total	16	35	9	60

Source: Universities website (May 10, 2020)

*Administrative heads who also lecture.

Table 1 indicates the number of Deans and Heads of Department and Administrative Unit. The total number in these categories of staff is 60.

Table 2: Number of Lecturers and Proportion Selected

Name of University	Number of Lecturers (Not Dean or HoD)	Proportion selected
Ashesi University	60	10
Central University	214	117
Valley View University	119	37
Total	393	164

Source: NAB Annual Statistics Report 2018/2019

Table 2 shows the lecturers proportionally selected to respond to the questionnaire. The minimum respondents were 164 per the calculation.

Data Collection Instrument

The questionnaire was designed using a Likert five-point scale ranging from (1-Strongly disagree to 5-Strongly agree) to gather information on staff retention strategies adopted by private universities. The follow-up interview guide was open-ended only. The interview guide was used for the six respondents only.

Data Collection Procedures

The researcher sought clearance from the University of Cape Coast Institutional Review Board (UCCIRB) by presenting a comprehensive proposal to the Institute for review. Then I collected a letter for ethical clearance from the Institutional Review Board and presented it to the universities where the study was conducted. Every participant was assured that their responses would be treated with the utmost confidentiality. In the process of distributing the questionnaire, the researcher verbally informed all respondents who consented to answer the questionnaire and interview that their participation was voluntary and they could opt-out at any stage of the research process. The data were collected within one month, January 2021. A pre-test study was carried out using 50 senior members at Methodist University to establish the content validity and reliability of the instrument. The Cronbach alpha value for the questions was 0.860.

Table 3: Description of variables used to determine switching intentions

Construct	Variable	Variable definition
Switching Propensity (dependent variable)	Switching Intention	Dummy = 1 if the participant has intention to switch and 0 if otherwise
	Gender (Male)	Dummy = 1 if male, and 0 if female
	Age Group (20-49)	Dummy = 1 aged between 20-49, and 0 if older than 50 years
	Academic qualification (MPhil/PhD/ED/DPhil)	Dummy = 1 MPhil; PhD/ED/DPhil, and 0 otherwise
Demographics Characteristic	Years worked in the university (Less than 5 years)	Dummy = 1 if the participant has worked for less than 5 years, and 0 otherwise.
	Academic Designation (Lecturer)	Dummy = 1 academic designation is a lecturer, and 0 otherwise.
	Positions or roles played or ever played	Dummy = 1 ever been assigned position in the university and 0 if otherwise
	Specific positions or roles played	Dummy = 1 assigned specific role and 0 if otherwise
	Employment Status	Dummy = 1 employed fulltime and 0 if otherwise
	Number of tertiary institutions taught	Dummy = 1 taught in more than one institution and 0 if otherwise
	Promotion (1- strongly disagree)	Promotion was originally measured as an interval scale variable using five-point Likert Scale where; 1 – strongly disagree, 2 – disagree, 3 – indifferent, 4 – agree and 5 – strongly agree. In order to obtain a new index for the logit model. We first, transformed all the items under this variable to extract averages. Secondly, we realigned the extracted averages to obtain binary outcome (e.g., 1 disagree, and 0, otherwise). Specifically, all extracted averages with a mean of 2.4 and below were indexed as disagree, and means of 2.5 to 5 were indexed as agreed.
	Remuneration (1- strongly disagree)	
INSTITUTIONAL FACTORS		
	Leadership style (1- strongly disagree)	
	Training (1- strongly disagree)	
	Enrolment (1- strongly disagree)	
*Note	<i>The first options (As indicated in the parenthesis) of the alternatives given were used as reference numbers in the logit model</i>	

Sources: Author's Compilation (2021)

Results and Discussion

Demographic data

There were more males than females in the sample collected. Males represented 78.7% of the entire sample. Education of women is not exempted in that, the Population and Housing Census (PHC, 2021) indicates the gender divide in education as reflected in the fact that while 74.1 per cent of males were literates, the proportion for females was 34.4 per cent.

Table 4: Demographic Data of Respondents

Variable	Frequency	Percentage
Gender		
Female	59	21.3
Male	218	78.7
Age categories		
20 – 24	0.0	0.0
25 – 29	0.0	0.0
30 – 34	26	9.4
35 – 39	58	20.9
40 – 44	57	20.6
45 – 49	54	19.5
Above 50	82	29.6
Academic Qualification		
MSc/MA/MBA	8	2.9
MPhil	2	0.7
PhD/ED/DPhil	85	30.7
Professionals	129	46.6
Others	53	19.1
Number of years worked		
Less than 5 years	65	23.5
6 to 10 years	92	33.2
11 to 15 years	88	31.8
16 -20	18	6.5
More than 20 years	14	5.0
Academic Designation		
Academic Counsellor	75	33.9
Lecturer	50	22.6
Unit Coordinator	16	7.2
Accountant	2	0.9
Examination Officers	40	18.2
Others	38	17.2
Position		
Head of Department	84	30.0
Dean	9	4.0
Other	184	66.0
Size of University		
Less than 5000 students	202	73.9
5000 and more	75	27.1
Years of Incorporation		
5 – 10 years	55	19.9
More than 10 years	222	80.1
Type of work contract		
Part-time	13	4.7
Full-time	264	95.3
Total for each case	277	100.0

Source: Author's Data Analysis 2021

Between the sexes, there is very little variation in the distribution of people by education at the managerial and professional levels of occupation. However, there is a much higher concentration of females as services and sales workers at all levels of education and as clerical support. Age is a critical variable, either directly or indirectly, in almost every population research and analysis. The majority of the respondents, 29.6%, fall within 50+ years followed by 20.9% of the respondents falling within 35-39 years. The distribution shows that majority of the respondents are above 35 years old. The ‘expected’ pattern of numbers at various ages is that, given stable birth rates, there should be more people in age compared to the next higher age as a result of death in the absence of migration (PHC, 2021). The pattern of the distribution is not consistent with the PHC 2021. This probably is attributed to Private universities regular hiring of more retired academic staff to build their staff capacity. Out of the 277 participants who reported their academic qualifications, the majority 46.6% (n = 129) of the participants had professional qualifications. Besides, 30.7% (n=85) and 19.7% (N==53) hold PhD and others respectively.

Table 4 revealed that 4.0% (n=9) of the respondents had held a Deanship position. Also, 30.0% (n=84) were Heads of Department (HoD) or held such positions before. However, the remaining 66.0% (n=184) of the respondents held positions either than Deans or HoD. Regarding the size of the universities, 72.9% (n=202) of the academic staff who participated in this study reported that their universities have a student population of less than 5000. Additionally, 27.1% (n=75) of the academic staff reported that their universities student population ranging from 5000 to 10000. It was noted that 80.1%, (n = 222) of respondents indicated that their university was incorporated more than 10 years ago. Also, 19.9% (n=55) indicated that their University was incorporated between 5 to 10 years. Lastly, Table 4 reveals that the chartered private universities have 95.3% (n=264) of full-time academic staff. The part-time academic staff was 24.7% (n=13).

Demographic Factors and Switching Intention (Chi-square (χ^2) Analysis)

In this study, the Chi-square test was used to compare the observed and expected distributions for two different factors (Demographic and Institution Factors) affecting switching propensity of academic staff working with chartered private universities. In the case of this study, chi-square tests for the different factors were performed.

Table 6: Association between Demographic Factors and Switching Intention

Items	Chi-square (χ^2)	Cramer's V	Df	p-value
Gender	9.125	0.182	2	0.010
Age	43.732	0.281	8	0.000
Academic qualification	23.776	0.207	8	0.002
Professional or other masters	24.644	0.213	8	0.002
Years of working in the university	38.445	0.263	8	0.000
Years intending to work in the university	19.064	0.189	10	0.039
Current Designation	8.555	0.124	6	0.200
Positions or roles played or ever played	12.321	0.149	4	0.015
Specific positions	31.484	0.267	10	0.000
Full-time or part-time staff	5.100	0.136	2	0.078
Number of tertiary institutions taught or worked	34.954	0.251	8	0.000

Source: Field Data (2021)

As shown in the Table 6, there is a significant association ($\chi^2 = 9.125$, $df = 2$, $p\text{-value} = 0.010$) between respondent's gender and switching propensity. It was observed from the cross-tabulation that males have showed greater propensity to switch as compared to females. This result implies that the prevailing working conditions in the Ghanaian private universities affect males and females differently to a very large extent. This result could be linked to the prevailing socioeconomic conditions in the country. Given the culturally defined role of men in Ghana, they face more demands than their female counterparts, resulting in a strong proclivity to migrate from one company to another where they may meet those expectations.

There is significant association ($\chi^2 = 43.732$, $df = 8$, $p\text{-value} = 0.000$), ($\chi^2 = 23.776$, $df = 8$, $p\text{-value} = 0.002$) respectively between Age, Academic Qualification and switching propensity of staff. The age bracket that is

sensitive to ‘switching intention’ is 40-44, followed by 50+ and 45-49. The age range that is susceptible to switch to different universities is 40-50. This age group has work experience and is motivated to build their life, making them quite mobile. Both public and private institutions are fighting for experienced academic personnel to serve as enrolment pull agents and to earn research funds from sponsors. It is understandable that all private colleges are implementing methods to maintain their core and experienced workforce in order to compete for student enrolment and grants.

Besides, 107 of the respondents comprise 51 PhD degree holders and 56 professionals. Further, academic staff who worked 6-10 years was 92% and those who worked for 11-15 years was 88%. This confirms the fact that private universities have adopted strategies to retain core and experience academic staff.

Academic staff were asked how long they intended to work in their current university, the cross tabulation shows a high propensity to work less than five years in their current university. Table 6 shows there is significant association ($\chi^2 = 19.064$, $df = 10$, $p\text{-value} = 0.039$) between respondent’s years intended to work at the current university and switching propensity to other universities.

Academic staff positions or roles played or ever played, specific positions, and number of tertiary institutions taught or worked, all show significance at 5% association between academic staff demographic factors and their strong desire to switch off to other universities. However, the association between Switching Intention and demographic factors such as current designation ($\chi^2 = 8.555$, $p\text{-value} = 0.200$) as well as full-time or part-time staff ($\chi^2 = 5.100$, $p\text{-value} = 0.078$) is not significant.

Binary Logistic Models Analysis

Binary logit models were developed to estimate the probability of a binary response as a function of one or more predictors. The study uses a binary logistic regression model, as the dependent variable (switching propensity) is dichotomous (e.g., yes or no).

Table 7: Binary Logit Model 1: Demographic Factors that Affect Switching Intentions

Factors	B	SE	Wald	Exp(B)	P- value	95 % CI
Gender	-0.920	0.341	7.288	0.398	0.007	0.204-0.777
Age	0.317	0.115	7.585	1.374	0.006	1.096-1.722
Academic qualification	-0.209	0.164	1.623	0.812	0.203	0.589-1.119
Professional or other masters	-0.050	0.136	0.133	0.952	0.716	0.729-1.242
Years of working in the university	-0.014	0.141	0.010	0.986	0.919	0.748-1.299
Current Designation	-0.245	0.211	1.348	0.782	0.246	0.517-1.184
Constant	0.503	0.894	0.317	1.653	0.574	
Model fit Statistics						
-2loglikelihood (Final model)			365.268			
$\chi^2(df)$ Final Model			17.432(6)**			
$\chi^2(df)$ Hosmer and Lemeshow Test			20.622(8)**			
Nagelkerke R-Square			0.081			
Cox and Snell R ²			0.061			
Overall Percentage Classification			59.2			

*significant at 99% ($p = 0.01$) **significant at 95%

From the estimated demographic factors, the coefficients determine the contribution of each independent (predictor) variables in explaining the probability (log odd) of occurrence. The Wald statistics was used to validate the significance of the regression coefficients as indicated in the Table 7. The Logit model 1 was statistically significant $\chi^2(8) = 20.622$, $p = 0.000$. The explained variation in switching propensity in the current model ranges from 6.1% to 8.1% respectively for Cox and Snell R² and Nagelkerke R² and correctly classified 59.2% of the cases which is high indication of good fit for the model. Table 7 result shows that gender ($\beta = -0.920$, OR = 0.398, $p\text{-value} = 0.007$) of the respondents significantly influence the switching propensity of the respondents. The result further shows that females are 0.398 times more unlikely to switch as compare to their male counterparts controlling for other variables in the model. Additionally, age ($\beta = 0.317$, OR = 1.374, $p\text{-value} = 0.006$) of the respondents significantly influence the switching propensity of the

respondents. The result shows that respondents within age category of 20-49 are 1.374 times more likely to switch as compared to their counterparts in the other age categories controlling for other variables in the model.

Table 8: Association between Institutional Factors and Switching Intention

Items	Chi-square (χ^2)	Cramer's V	Df	p-value
Promotion	7.204	0.163	3	0.066
Remuneration	33.206	0.349	4	0.000
Leadership	9.071	0.183	3	0.028
Training	10.382	0.195	4	0.034

Source: Field Data (2021)

As shown in the Table 8, there is a significant association between Switching Intention and remuneration ($\chi^2 = 33.206$, $p\text{-value}=0.000$), leadership ($\chi^2 = 9.071$, $p\text{-value}=0.028$) and training ($\chi^2 = 10.382$, $p\text{-value}=0.034$). However, the association between Switching Intention and promotion ($\chi^2 = 7.204$, $p\text{-value}=0.066$) was not significant.

Table 9: Binary Logit Model 2: Institutional Factors Affecting Switching Intentions

Factors	B	SE	Wald	Exp(B)	P- value	95 % CI
Promotion	-0.200	0.208	.922	0.819	0.337	0.544-1.231
Remuneration	1.048	0.211	24.781	2.853	0.000	1.888-4.311
Leadership	-0.536	0.211	6.477	0.585	0.011	0.387-0.884
Training	0.009	0.135	.005	1.009	0.945	0.775-1.315
Constant	-2.437	0.938	6.746	0.087	0.009	

Model fit Statistics

-2loglikelihood (Final model)	339.152
$\chi^2(df)$ Final Model	35.800(6)**
$\chi^2(df)$ Hosmer and Lemeshow Test	34.200(8)
Nagelkerke R-Square	0.165
Cox and Snell R ²	0.123
Overall Percentage Classification	67.6

Source: Field Data (2021) *significant at 99% ($p=0.01$) **significant at 95% ($p=0.05$)

Table 9 shows that remuneration academic staff receives for their work is satisfactory and disagree that, they are 2.853 times more likely to switch to other universities than their counterparts who are not receiving same remuneration. Following on the same table 9, Leadership style in Chartered Private Universities makes positive contribution to the overall effectiveness of the institution. Academic staff who are not under a committed leadership agree that they are 0.585 times more likely to switch off to other universities than their counterparts controlling for other variables in the model. The explained variation in switching intentions of the respondents in the current model ranges from 12.3% to 16.5% for Cox and Snell R² and Nagelkerke R² respectively. The model correctly classified 67.6% of the cases which is an indication of a high good fit for the model.

Also, the following qualitative excerpts are from two respondents on the question ‘What measures do management take to ensure the payment of staff remunerations during times of financial crisis?’

“[...] It takes a lot of juggling with the finances, including getting overdraft from the banks, and sometimes appealing to our mother organization, the church to bail us out. The major challenge is that we rely mostly on students' fees to pay all our staff, and if we have low student numbers, default fee payments or with the difficulty in the economy, payment of salaries are delayed. Staff feel unsecured when salaries are delayed”.

(Participant 2, University Y, 17th August, 2022).

“[...] Salaries are paid through loans in some cases, the non-payroll allowances are paid in arrears as and when funds are available from fees and investments. This situation drives out our experience lecturers to join timely paid jobs”. (Participant 10, University Z, 19th August, 2022).

The excerpts conclude that chartered private universities rely heavily on students' fees to pay staff remunerations, which appear unsustainable. Increasing demand of remuneration by academic staff coupled with the cost of borrowing from banks is relatively high, which adds to the cost of running the university. Therefore, inability of private universities to offer competitive remuneration to their academic staff will lose the experience staff to competitive organizations. Table 9 further, indicates the variables like Promotion ($p=0.337$) and Training ($p=0.945$) are not significant on staff switching intention. Thus, the likelihood of Chartered Private Universities' academic staff intention to leave or not to leave for other universities or jobs is not associated with Promotion and Training. The following qualitative comments are typical of what two respondents said based on the question *'Is your university affected by high attrition rate? What does your university put in place to motivate academic staff to stay?'*

"[...] Yes, the leadership style is amorphous; it is determined by those in charge. I believe that leadership could be more consensus-based than it is now. Management's leadership style causes academic staff to leave the university." (Participant 1, University Y, 17th August, 2022).

Beardwell & Claydon (2007) claims that the role of a supervisor and leadership is critical in employee retention and that employee quit managers, not firms.

"[...] Those who need to complete their terminal degree are given a fixed amount. There is also a regular workshop on research, academic writing, and grant writing, which is usually organized by the research office. These are training sessions designed to help academic staff advance in their careers. The irony is that those who benefit from training to obtain a terminal degree eventually leave the university." (Participant 6, University Z, 19th August, 2022)

The result is that, academic staff are dissatisfied with management's leadership style and believes that support for training and obtaining terminal degrees is insufficient. Terminal degree holders should be given some recognition upon their return by being given higher positions in the university to earn some allowances as an incentive to stay.

Two participants excerpts summaries the question that *'Do you think the owners of the university have influence on academic staff decision?'*

"[...] The owner is the church, and we are members of the church, so the university is for us, and we will work there until we retire." (Participant 3, University X, 20th August, 2022).

"[...] The university owner's humility and nobleness have made some lecturers loyal friends who vow not to leave the university to another." (Participant 8, University Z, 19th August, 2022).

The excerpts from the participants expressed the participants' belief that university owners have no direct influence over academic staff at chartered private universities. The participants believe that owners are role models and pacesetters for some academic staff, an intrinsic motivation for them to stay in these chartered private universities.

Discussion

Private universities place a high value on the reasons for academic staff retention and continuation, as well as academic staff exit. Understanding these reasons can help private universities strengthen academic staff retention and reduce staff exit. Academic staff retention in private universities was found to be predicted by remuneration. This is consistent with the following studies; Rosser (2004) observed that although much of the overall research on faculty members suggests that salary (Akeyo & Wezel (2017), in and of itself, is not the most important aspect of their work life and satisfaction, salary is one of the primary reasons why faculty members leave their institution. Kipkebut (2010) found that 51% of the faculty did not believe that they were compensated fairly, relative to those other comparable institutions. Manogharam, Thivaharam and Rahman (2018) explain that academic staff expects and demand for higher pay which is a limitation for small colleges. They further conclude that dissatisfaction with salaries is a key factor undermining the commitment of academics to their institutions and careers, and consequently their decision or intent to leave. The results show that the age range 20-49 is susceptible in leaving the private universities. Contrary, evidence indicates that some academic staff, approaching the decade prior to retirement, get very anxious about the financial trepidations that tend to accompany retirement. They, therefore, make decisions about quitting academia in good enough time and taking up positions that are better paying and are more likely to

enable them to accumulate enough to ensure a more comfortable retirement, even if they do not get a large pension.

In the qualitative results, training alone without promotion is not sufficient to retain academic staff. Again, training and promotion are not significant in the logit model. The implication is that academic staff training should be followed by promotion to guarantee their retention and continuation. These results support Nawaz and Pangil (2015) findings that training and development did not have a significant impact on turnover intention and organizational commitment. However, Nawaz and Pangil (2015) find that promotion speed and remuneration growth had significant relationships with turnover intention. They also indicated that, even though one has already been given a promotion, if one is offered a better position in another organization, it is not known whether he/she will stay or leave the organization. Apparently in this current study, promotion is not significant with switching intention because in the private universities in some cases, people are being promoted with or without allowances, hence, not a deciding factor.

The study explained leadership style and owners influence of academic staff in relation to their stay or leave the private universities. The results provide that academic staff stay with leaders or leave leaders not institutions. The findings are supported by the studies of Watson (2009) who claims that the most significant determinant of continued job satisfaction and organizational commitment for employees is a positive relationship with their immediate supervisor. The academic staff will be committed to their core mandate, when there is positive relationship between academic staff on one hand and Heads of Department, as well as Deans on another hand. Similarly, (Ng'ethe et al; 2012) stated that leadership has ability to increase the commitment of employees and retain talented employees in the organization. Further, Gwavuya (2011) affirms that incompetent leadership results in poor employee performance, high stress, low job commitment, low job satisfaction and turnover intent. Moreover, Nyambubarwa (2013) demonstrated that employee motivation and retention is actively affected by organisational leadership, specifically when positive feedback together with recognition is regularly directed to the employees. Hence, a positive influence can be created upon the academic staff intentions to leave, or stay at, an organisation from the nature of leadership.

Conclusions and Recommendations

With the issue of staff switching intention using demographic factors, age and gender were prominently associated with staff switching intention. It was observed that males have shown greater propensity to switch as compared to females. There are many social expectations from males than females that propel them to switch from one institution to another. The age group that is sensitive to switch is 20-49 years bracket. The females are 39.8% times unlikely to switch as compared to their male counterparts in chartered private universities. With the institutional factors, affecting switching intention, remuneration staff received for their work in Private Universities is satisfactory and disagree that they are 2.853 times likely to switch to other institutions than their counterparts, who did not receive the same remuneration. Academic staff are dissatisfied with management's leadership style and believes that support for training and obtaining terminal degrees is insufficient and they eventually leave the university.

Based on the aforementioned, the researcher outlines the following policy recommendations;

- i. According to the findings, age and gender are the most relevant demographic characteristics influencing academic staff switching intentions as the workforce transitions to a new generation of workers. Ph.D. holders should be recognized upon their return by being assigned to higher-level posts within the university in order to receive allowances as an incentive to stay.
- ii. It was concluded that Remuneration and Leadership style are predictors that are most likely to influence staff switching intention.
- iii. To reduce excessive staff turnover, private university administration should establish criteria for training, promotion, and staff welfare. Private universities should be proactive in attracting grants in order to move away from relying solely on student fees for all university payments.

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URBAN AND PERI-URBAN VEGETABLE PRODUCTION EFFECTS ON FARMERS' LIVELIHOODS IN LAGOS STATE, NIGERIA

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Abstract

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Purpose — This study examined the effects of Urban and Peri-urban Vegetable Production (UPVP) on local livelihood subscales of farmers in Lagos State.

Methods — The study employed a mixed method involving a Household Livelihood Survey and Focus Group Discussion. Data were analyzed using Means, Analysis of Variance and Eta squared.

Findings — All livelihood subscales were positively impacted (Physical=3.65±0.41, Natural=3.64±0.54, Financial=3.60±0.44, Social=3.58 ±0.39, Human=3.33±1.29 and they all differed significantly (P<0.05). Impact of UPVP on farmers' livelihood subscales was moderately high.

Conclusion & Recommendation — The study concluded that UPVP can serve as a resilient sector for Nigeria's economy and sustainable development. Support groups and financial resources can improve farmers' well-being. Physical capital, directly and indirectly, affects the performance of work by farmers and therefore productivity. The study recommends that farmers should invest more in human capital to boost their production capacity and enhance sustainable livelihood.

Keywords — Environment, Sustainable Livelihood, Urban and peri-urban Agriculture, Food security, Vegetables.

Introduction

Urbanization is a growing trend worldwide! It is one of the defining phenomena of the 21st century. Key statistics show that more people now live in cities (urban) and places proximate to cities (peri-urban) today than ever before in history (Jaquinta and Drescher, 2000). According to the World Bank (2022), 7 out of 10 people in the World are expected to live in cities by 2050 with close to 90% of this increase occurring in Africa and Asia. A similar prediction was given by Bloch *et al.* (2015) that by 2050, the number of people living in cities in Nigeria will likely double.

As the number of urban dwellers increases, the food needs of families and the scramble for environmental resources (Alliance for Green Revolution in Africa, 2017; Resource Centre for Urban Agriculture and

Forestry, 2018) leading to urban poverty and food insecurity will also increase (Food and Agriculture Organisation, 2016). As a panacea for this problem, urban vegetable production has been suggested as an alternative in response to market demand to minimize urban food insecurity (Darkey *et al.*, 2014). For many years urban vegetable farmers have been actively engaging in the production of many vegetable varieties ranging from *Corchorus olitorius* (L), *Abelmoschus esculentus* (L. MOENCH) (Okra), *Amaranthus hybridus* L (Amaranth) to *Celosia argentea* (Cocks comb). These vegetables are known to enrich diets with nutrients including crude protein, crude fibre and minerals (Houngla *et al.*, 2020; Aletor and Adeogun, 1995). Recently, urban and peri-urban leafy vegetable production of *Amaranthus hybridus* L. (African Spinach commonly called *Efo Tete* in Yoruba), *Celosia argentea* L. (Lagos Spinach commonly called *Efo Soko*), and *Corchorus olitorius* L. (Jute Mallow commonly called *Ewedu*) which are commonly consumed in Lagos State, Nigeria have become important activity impacting farmers' livelihood (Adewale *et al.*, 2022).

Farmers' livelihoods include physical, financial, social, natural and human capital (Yuliati and Isaskar, 2018). Farmers' livelihoods are said to be sustainable when they can cope with and recover from stresses and shocks (Olutegbe, 2021). Local sustainability has three dimensions that are important to all stakeholders namely: Social, economic and environmental. Schreinemachers *et al.* (2018), describe them as the three pillars of local sustainability. The economic benefit refers to the gain farmers make from farming activities. It is central to farmers' livelihood sustainability. The farmers are into production activities because of gain and increased ability to feed their households.

Researchers like Hallett *et al.* (2016); Yang (2016), proposed that local sustainability is achieved when farmers earn a decent living from their activities in such a way that they have a decent life. Past studies (Darkey *et al.*, 2014; Martin *et al.*, 2016) showcased great economic success on small hectares of land cultivated by farmers in urban and peri-urban areas. They have equally identified the benefits of growing food in cities. However, an insight to determine the contributions of vegetable production on farmers' livelihood subscales along urban and peri-urban gradients of Lagos State appears not to have gained prominence. This study, therefore, examined the impact of UPVP on farmers' livelihood subscales in Lagos State.

Material and Methods

The study focused on the effects of UPVP on livelihood in Lagos state and was investigated using a descriptive survey research design. Lagos State is located in southwestern Nigeria with a total landmass of 356,861 hectares of which 75,755 hectares are wetlands (Adedeji, 2009). Five study locations were selected in Lagos State as shown in Table 1. A mixed method involving a Household Livelihood Survey Questionnaire, Focus Group Discussion and In-depth Interviews with the farmers was used to collect data from respondents. Purposive and snowball sampling techniques were used because needed records of target respondents were not readily available (Naderifar *et al.*, 2017). Purposeful sampling with snowballing has been used in a similar study conducted by Oyesola and Obabire, (2011); when needed records of respondents were not readily available. Seventy farmers each were selected from Ikeja, Badagry, Ikorodu, Lagos Island and Epe) making a total of three hundred and fifty (350) vegetable farmers. However, due to inconsistencies in response by some respondents to survey questions, 69 and 68 samples were considered appropriate for analysis from Badagry and Ikorodu respectively. This gave an effective sample size of 347 respondents. Livelihood survey questions were administered to these 350 vegetable farmers whose primary occupation was vegetable farming.

Analysis of variance (ANOVA) was computed using Statistical Package for the Social Sciences (SPSS) to determine if statistically significant differences existed among the farmers' mean livelihood subscales along the urban and peri-urban gradients of the state. Eta Squared was used to determine the strength of association between the means of farmers' livelihood subscales.

Table 1: Sample Collection Locations

S/N	Division/Location	No of Participants
1	Ikeja	70
2	Badagry	70
3	Ikorodu	70
4	Lagos Island	70
5	Epe	70
Total		350

Results and Discussion

Impact of UPVP on Livelihood Subscales

Human capital is the most important livelihood asset for households. The mean perceived impact of UPVP on access to labour was observed to be moderately high (Mean = 3.75 and S.D = 1.45) while the mean of perceived impact on access to extension agents in the state was found to be very low (Mean = 1.87 and S.D = 0.90) (Table 2). However, the mean perceived level of impact on various aspects of farmers' human capital as well as "overall" human capital was found to be moderately high (Mean= 3.16 and S.D= 0.87) as shown in Table 2.

Farmers' social capital includes the ability to feed family members, payment of children's school fees, membership of associations and meeting other social obligations. For social capital, an increase in the ability to feed the family member has the highest mean (Mean = 3.83; S.D = 0.66) while the increase in the ability to pay children's school fees, meet other family obligations, support friends in terms of financial assistance have means of 3.70, 3.66, 3.65 respectively. Membership in an association or farmers' group has the least mean (Mean = 2.94 and S.D = 0.74) (Table 2). The overall impact on farmers' social capital was found to be having a 'moderately high' mean of 3.57 (Table 3).

Natural capital includes farmers' access to land and irrigation water. Table 2 depicted the mean perceived impact of the programme on various aspects of farmers' natural capital. The various aspects of natural livelihood in Table 2 showed that the impacts of UPVP on both accesses to land and irrigation water were 'moderately high' with mean of 3.63 and 3.65 for increased access to land and increased access to irrigation water respectively.

Physical capital includes access/ownership of watering cans, hoes, cutlasses, mobile phones, comfortable shelter and potable water supply. Table 2 showed the recorded mean impact of UPVP on access to the watering can, hoes and cutlasses. The impact was found to be 'moderately high' (Mean = 3.83; SD = 0.73) the mean impact on the ownership of mobile phones was also found to be 'high' (mean =3.60; SD = 0.73). The mean impact on access to a comfortable shelter was 'moderately high' (mean = 3.64; SD = 0.77). The mean impact on access to the adequate water supply was found to be 'moderately high' as well (Mean =3.58; SD = 0.71). Although the overall mean for all physical capital was found to be 'moderately high', the mean for access/ownership of basic tools was found to be the highest. Next to this is access to comfortable shelter then ownership of mobile phones for communication and the least impacted was the potable water supply.

The financial status of a farmer may include his gross income per month or annually, debt level and savings. Results from the study in Table 2 showed that the UPVP increased the levels of income of UPVP vegetable farmers in the study locations. The mean perceived impact on the income level of the vegetable farmers was 3.64 with a standard deviation of 0.65 as shown in Table 2. The mean decreases in the share of income spent on food were found to be 3.64 with a standard deviation of 0.74 while the mean and standard deviation of debt levels were found to be 3.54 and 0.83 respectively. Savings have a mean of 3.56 and a 0.69 standard deviation. Overall, the mean (3.60) and standard deviation (0.07) on various aspects of financial capital was found to be 'moderately high' (Table 3).

Mean Perceived Level of Impact of UPVP on Various Aspects of Vegetable Farmers' Livelihoods

Table 3 showed the means and the standard deviations of impact on the five (5) main facets of the vegetable farmers' livelihood examined in the study. The various categories of livelihood in Table 3 have been arranged in descending order of means of responses. The result from Table 3 showed that impact on natural, physical, financial and social and human capitals of farmers was 'moderately high' with means of 3.65 ± 0.41 , 3.64 ± 0.54 , 3.60 ± 0.07 , 3.58 ± 0.39 and 3.33 ± 1.29 respectively. Standard deviations of various

categories generally revealed high consistency in farmers' views except for the human capital where farmers' views were quite inconsistent (SD = 1.29).

Table 2: Mean perceived level of impact UPVP on livelihood subscales of respondents

	N	Mean	S.D
Human Capital			
Access to labour	342	3.75	1.45
Access to Extension Agents	155	1.87	0.90
Social Capital			
Membership of an association or farmer's group	165	2.94	0.74
Support from association /group	151	2.97	1.28
Increase ability to feed family members	347	3.83	0.66
Meet other family obligations (dues and rent)	333	3.66	0.73
Support of friends in terms of financial assistance	305	3.65	0.63
Increase the ability to pay children's school fees	341	3.70	0.63
Natural Capital			
Increased access to land	343	3.63	0.76
Increase in access to irrigation water	345	3.65	0.59
Physical Capital			
Access to watering can, hoes and cutlasses	333	3.83	0.73
Ownership of mobile phone for communications	335	3.60	0.70
Access to comfortable shelter	316	3.64	0.77
Access to adequate portable water supply	341	3.58	0.71
Financial Capital			
Increase in income levels	347	3.64	0.65
Decrease in the share of income spend on food	347	3.64	0.74
Decrease in debt levels	343	3.54	0.83
Increase in savings	335	3.56	0.69

N = 350. Scale: 5- Very High (VH).4 = High (H). 3=Moderately High (MH). 2 = Low (L). 1= Very low (VL)

Table 3: Impact on Various Aspects of Vegetable Farmers' Livelihoods along Lagos urban and peri-urban gradient

	N	Mean (X)	SD
Physical Capital	335	3.65	0.41
Natural Capital	345	3.64	0.54
Financial Capital	347	3.60	0.44
Social Capital	347	3.58	0.39
Human Capital	342	3.33	1.29

N= 350. Scale: 5- Very High (VH).4 = High (H). 3=Moderately High (MH). 2 = Low (L). 1= Very low (VL)

Table 4: Strength of Association between Farmers' Mean Livelihood Subscales

Mean Value for Livelihoods Subscale	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.086	4	1.52	25.92	0.00
Within Groups	20.074	342	0.06		
Total	26.161	346			
Eta Squared	0.23				

N=350

Discussion

UPVP has a 'moderately high' impact on Lagos vegetable farmers' livelihood subscales. It improved all the five (5) main facets of their livelihoods examined in this study namely: physical, natural, financial, social and human capital. Human capital is an important livelihood asset for households. It relates to the availability of labour (family or hired) and extension agents and agricultural technical officers who have the skills, knowledge and ability needed for the farmers to undertake vegetable production as their livelihood option. The current study revealed that the majority of the farmers have access to labour and UPVP has impacted their access to labour but not as much for extension workers.

The majority of the farmers do not have access to extension agents. Most of them are operating on their personal knowledge and experience. The observation is in line with that of Mumuni and Oladele (2016); Halloran *et al.* (2016). The observed 'moderately high' impact of UPVP on social capital implies that being a member of a vegetable farmer group impacts the farmers' livelihood positively.

UPVP promotes social interactions, increases sharing of values enables the identification of common aims, and promotes social bonds and support. This observation is in line with that of Kingsley and Townsend (2006); Gallaher *et al.* (2013) and Kirkpatrick and Davison (2018). The majority of the vegetable farmers in the study were able to feed their families very well. This implies that urban vegetable production enhances household food security. This finding is similar to that of Chagomoka (2015); Onismo, (2015); Kyelu (2016) and Diekmann *et al.* (2018).

Natural capital is one of the most impacted livelihood assets in vegetable production in Lagos State. Farmers have access to water for irrigation and land and the impact was found to be high. UPVP increased the farmers' access to land as a natural resource. Farmers are allowed to use abandoned land and road setbacks around Lagos. This can be attributed to the aesthetic value that vegetable production adds to the environment. The current study revealed that vegetable farmers have access to physical capital and they spend more on acquiring tools for further vegetable production than they spend on other aspects of physical capital. This observation agreed with that of Darkey *et al.* (2014). The financial status of a farmer may include his gross income per month or annually, debt level and savings. The impact of UPVP on farmers' income depicts a considerable 'high' impact. This implies that UPVP has elevated the farmers from poverty. This result is in line with the findings of Leone *et al.*, (2016) but deviated from the findings of Okoro *et al.* (2017).

Conclusion and recommendations

UPVP has a 'moderately high' impact on Lagos vegetable farmers' livelihood subscales. Physical capital was the highest impacted while human capital was the least impacted. The level of perceived impact of the UPVP on the livelihood of farmers varied. Significant differences existed among the means impact on livelihood subscales at 0.05 alpha. Subsistence agriculture is touted as a resilient sector of Nigeria's economy. Physical capital, directly and indirectly, affects the performance of work by farmers and therefore productivity. Farmers should invest more in human capital, especially private extension agents and equally form farmers' associations to pursue their common interests. Lagos State Ministry of Agriculture should provide extension services to all vegetable farmers as the study has shown that they contribute efficiently to the nation's economy through food security. Doing this will boost their productive capacity and adoption of technology. They should also consider proper documentation of the vegetable farmers. Having this record could also contribute to an increased internally generated revenue (IGR) of the state.

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Conflict of interest

The corresponding author states that there is no conflict of interest.

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GENDER IN WOMEN'S WRITING: RESTORING THE WOMAN IN AMA ATA AIDOO'S CHANGES: A LOVE STORY AND PEGGY OPPONG'S THE LEMON SUITCASE

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Abstract

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Purpose — This study investigates genderism in Ghanaian women's writing with women's empowerment as the centre of interest in Ama Ata Aidoo's *Changes: A Love Story* (1991) and Peggy Oppong's *The Lemon Suitcase* (2010)

Methods — The study adopts a textual analysis of the novels under study and the authors' novels as controversial works which promote the ideals of the feminist movement in Africa by presenting issues that address nuances in gender roles and social constraint.

Findings — The findings unveil the progression of female roles over the period in the male-dominated Ghanaian society. Also, this study contributes to debates on feminism in Africa as well as promotes gender equity and women's empowerment through education.

Conclusion & Recommendation — The study presented the representation of the female figures in a patriarchal Ghanaian society. It sought to empower women as leaders in their contributions to the society. There is more room for improvement in spite of the career progression women have achieved.

Keywords — Feminism, The Lemon Suitcase, Sustainable Development, Genderism, Empowerment

Introduction

Very few men realise that girls they meet and fall in love with are sharp because, among other things, they've got challenging jobs in stimulating places. That such jobs are so demanding. That these are also kinds of jobs that keep the mind active - alive. (Changes, 54)

It's a good idea but who would like to give me jobs or work with me? I'll not give anyone a bribe to enable me to get contracts so I'll not get jobs. I'll work to rule and who wants that? I've examined all the options available to me and think I need to remain in the public sector for a while. (The Lemon Suitcase, 34)

From the outset, feminist studies have limited their analyses of gender inequality to woman's biology and sexuality sanctioned by the patriarchal system. However, the woman plays a constitutive role in the development of society. The significance of the female roles is clearly indicated in the epigraphs from

Changes and *The Lemon Suitcase*, which also highlight the gender roles and attitudes of the male counterpart towards the women. The epigraphs are the fulcrum on which the authors, Aidoo and Oppong, spin off the narrative in *Changes: A Love Story* and *The Lemon Suitcase* respectively. Both epigraphs seemingly highlight the visions of Aidoo and Oppong aimed at projecting the female figure as incorruptible and morally upright. While Aidoo unveils the challenging role the career woman plays to the admiration of the male counterpart, Oppong presents the female character as principled and unbribable. Throughout the oeuvre of the authors under study, the feminist ideals are projected to foreground gender roles in Ghana and Africa at large. In Aidoo's *Changes* (1991), we are presented with issues about love and marriage of educated women. In the narrative, the heroine, Esi, feels entangled in her marriage to Oko and decides to divorce him to enable her concentrate on her career. However, Esi remarries Ali Kondey and attains the status of a second wife. Aidoo juxtaposes Esi's love relationship with her friend, Opokuya's happy marriage to Kubi which seems the ideal perfect relationship. The story climaxes with Esi expressing her frustration of feeling lonely because Ali rarely makes time for her, instead he showers her with gifts.

In *The Lemon Suitcase* (2010), the narrative begins with a flashback in which the heroine, Mabena recounts her ordeal with Derick Khand, an impostor as the head of security of Multi-Delivery. Oppong presents Mabena as the wife of Nick, a mother of two sons, a staunch Christian as well as a career person who dedicates herself to hard work. Mabena's encounter with Derick, which involved firing of arms, results in the near death of Mabena. She recovers after six months and decides to change her job. Mabena's new employment with Nick's friend, Adams as her boss paves the way for other dimensions of her life. As a principled person, Mabena remains resolute with her decisions and refuses to fall for the wiles of his corrupt boss, Adams. At her place of employment, Mabena is set up by Adams and her co-workers using a lemon suitcase containing cocaine with the assistance of Mabena's brother-in-law, Matthew. In spite of the twists and turns, Mabena becomes an advocate for the unprivileged in society and eventually emerges as the president of the nation.

Gender and Feminism Debates

Genderism is an idea that categorises gender in human organisation as timeless and universal (Oyewuni, 2011). According to Segkulu & Gyimah (2016), gender role is a culturally and socially conditioned set of behaviour and personality characteristics that are expected of a person based on their gender. It has been posited that the male and female roles prescribed based on the idea that domestic chores in the house are assumed to be performed by women. This results in employment segregation with the male counterparts dominating traditionally masculine occupations and females having access to traditionally feminine occupations (Duorinaah, 2020). In the study of gendered household labour distribution, Chesley (2011) found that women's gender identities were rooted in obligations for care that extended beyond mothering small children to encompass spouses, adult children, and grandkids.

Feminism is the belief in social, economic and political equality of the sexes. Although largely originating in the West, feminism is manifested worldwide and is represented by various institutions committed to activity on behalf of women's rights and interests (Brunell & Burkett, 2019). Feminism describes political, cultural and economic movements that aim to establish equal rights and legal protections of women, according to (Drucker, 2018). A feminist is "a man or a woman who says, yes, there is a problem with gender as it is today and we must fix it, we must do better. All of us, women and men, must do better" (Adichie, 2018). Radical feminists have championed the notion that women's oppression and disparity in gender relations is to be found in sexual asymmetry (the division of society into distinct biological sexes) and sexual division of labour (Nfah-Abbenyi). In her study, (Re)constructing Identity and Subjectivity, Nfah-Abbenyi (1984) explores the depiction of the African women by both the male and female writers. The term feminist can apply to both sides of the gender bar who stand for the rights of women (Agmor, 2010).

The scholarship of *Changes: A Love Story* has given insightful contributions on feminism from a number of points of view. Mensah (1997) sees *Changes* as a "women's liberationist project designed to expose what the modern educated woman endures in marriage" (p.1). Also, Maria Olaussen (2002) postulates that *Changes* revolves around the idea of female sexual self-determination while Anna-Leena Tiovanen (2017) expresses a wholesale understanding of mobility in the ways in which Aidoo's characters employ different forms of mobility as a process of self-fashioning among African subjects. Araba Asare-Kumi's thesis (2010) discusses the novels' feminist agenda and reflects the Ghanaian writer's nature of feminism. Research

reveals no scholarship on Oppong's *The Lemon Suitcase*. Therefore, this study seeks to contribute to the scholarship on *The Lemon Suitcase*.

This study seeks to promote gender equity among sexes with women playing pivotal roles geared towards national development. It argues that gender discrimination continues to gain traction in spite of attempts by the early Ghanaian feminist writers to use their works to cause change in society as Aidoo's *Changes: A Love Story* professes. A comparative study of the novels of Aidoo and Oppong will reveal the progression in the roles of women over the period and explore expectations of women in order to achieve sustainable development goals in the Ghanaian society. Ama Ata Aidoo's *Changes: A Love Story* (1991) and Peggy Oppong's *The Lemon Suitcase* (2010) have been purposefully selected for this study to investigate gender issues particularly focusing on the role of the female characters and the contribution of religion and culture to women's development. In the novels, the authors explore women's status, women's identity and women's standpoint in relation to issues of love, sexuality, equality, politics, economic, etc.

The specific objectives of the study are to i) to investigate some of the challenges educated women face in the Patriarchal Ghanaian Society; ii) to develop the nexus between gender equity and empowerment among women and girls (SDG 5); and iii) to contribute to the debate on the promotion of the feminist movement.

Materials and Methods

This study employs a textual analysis of the gender roles in the novels of two Ghanaian authors (Aidoo's *Changes* and Oppong's *The Lemon Suitcase*). It employs the feminist and gender approaches as theoretical frameworks underpinning the analysis of the study. The study makes a comparative analysis between the selected novels by tracing the development of feminist and gender roles in the Ghanaian literary writings, guided by the following research questions: i. How do writers promote gender equity in their works? ii. To what extent have writers used their works to empower the women in leadership? iii. How do writers present the woman figure as a tool for development?

Redefining Ghanaian Women in life and literature

Generally, the traditional African woman has core functions to perform within the family and the society. The woman's responsibilities include being a wife, mother and home manager. The contributions of women cannot be overemphasized, for most African women have contributed significantly towards development. Among such prominent women include traditional rulers such as Egbe Iyalode of Oyo, Iyalode of Ibadan and Yaa Asantewaa of Ejisu, Ashanti Region. Other women who contributed politically towards independence in Africa include: Mekatilili wa Menza and Mary Muthoni Nyanjiru of Kenya; Fatima Meer and Winnie Madikizela-Mandela of South Africa and Mabel Dove, Ruth Botsio, Ama Nkrumah, Ramatu Baba et cetera of Ghana. On the Ghanaian literary scene, between 1957 and 1964, two female personalities helped in the promotion of the creative writing- Efua T. Sutherland and Ellen Geer Sangster, an American. While Sutherland embarked on establishing a drama studio, Sangster formed the Creative Writers' Association in colleges of education and other institutions (Agmor, 1996). Sutherland's two plays, *Foriwa* (1967) and *Edufa* (1967) explore the plight of traditional women in the typical Ghanaian setting. Subsequently, the likes of Ama Ata Aidoo whose novel is under study and Ama Darko whose works *Housemaid* (1998), *Beyond the Horizon* (1991) and *Faceless* (2003) "demonstrates the crippling and suffocation of her protagonists as a result of the norms of the patriarchal system and machismo ethos" (Agmor, 2011:30).

Within the Ghanaian context, marriage is held in high esteem for both sexes in a patriarchal society. Marriage is defined as an institution that is important in the definition of gender roles, "as crucial in any feminist or 'womanist' attempts to redefine female subjectivity" (Accilien, 2008). In *Changes*, Aidoo presents marriages between Esi and Oko on one hand, and Opokuwa and Kubi on the other. She explores the changes that working women in Ghana face in their marriages while their husbands remain unaffected. A case in point is when the heroine Esi finds it difficult to manage her home as well as progress with her career. Esi expresses her frustration in her marriage to her friend Opokuya. Esi feels disappointed with her husband because of how Oko claimed to appreciate her "my air of independence" (54). Oko's opinion about Esi before the marriage changes after they got married which complements Opokuya's view about African men. For her "men are not really interested in a woman's independence or her intelligence. The few who claim they like intelligence and active women are also interested in having such women permanently in their beds and in their kitchens" (Aidoo, 54). Oko is not different from other men who believe that in spite of their

partners' education and career, the wives should still remain serviceable and submissive to their husbands. He therefore expects Esi to succumb to his desires as the head of the house.

In the same vein, Oppong's representation of love and marriage in *The Lemon Suitcase* parallels Aidoo's in the sense that both heroines are highly educated and also married to educated men who appreciate their sense of intelligence and independence. Oppong's heroine, Mabena gets married to Nick after their graduation from the same university. Mabena's sense of independence is recognised by Nick's father, Kwaku Nsiah, on their first meeting. In the father's view Mabena is "strong, assertive and frank in a way which can excite conflict" (LS, 45), but he ends up admiring and defending her in the presence of Nick's sisters. Their love relationship blossoms because of the support and respect for each other. We read that Oppong's representation of women and love relationship in her novel, *No Roses for Sharon* (2010) differs significantly with the portrayal of Sharon as a greedy and opportunist person who jilts her childhood lover, Jabez to marry a young doctor. Oppong depicts Sharon as a strong-willed person who does not allow her emotions to influence her future ambitions. Although their marriage fails along the line, Sharon maps out strategy to win Jabez's love again despite the opposition from Nick's mother. Similarly, Oppong's *The Lady Who Refused to Bow* (2012) explores the lifestyle of the heroine, Sandra, who suffers from heartbreak and resolves to cut links with all men including turning down the marriage proposal by the president of multinational company.

In Ghanaian society, marriage is contracted between families and the couple involved need to recognise the opinions of other family members. In *Changes*, Esi's family hold Oko in high esteem to the extent that Esi's mother appreciates him for accepting to choose Esi who kept long in getting attracted to men because of her physical appearance: "a young woman who is too tall, too thin and has flat tummy and a flat behind has slim chance of bearing children" (50). The pattern repetitions of the lexical items "too tall", "too thin" and "flat tummy", "flat behind" connote a negative description of a typical African woman who is unattractive. We see that the narrator is biased towards the woman in the description which is attributed to a "popularly held belief" (50); meanwhile, Oko is perceived as a perfect man without blemish. To the extent that Esi's grandmother, Nana sees it a privilege for Oko to marry Esi. Esi perceives Oko as unreasonable and prefers Kubi to him; however, Opokuya shares a dissenting view. Esi's perception about marriage seems different from Opokuya's, although they are close friends. While Esi feels bored with her marriage with Oko and prefers to live a single life, Opokuya sees everything wrong with Esi's preference of singleness: "Esi, you can't stay alone forever. It's not healthy" (55). "Really, why throw away a perfectly good husband for the loneliness of a single woman's life?" (56). Esi's attempt to gain her freedom from her boring marriage is interpreted as "loneliness" by her friend who in actual fact should understand her plight and support her course. This is because society frowns upon the life style of a single woman and uses derogatory terms to describe such women. Esi's decision to divorce Oko is met with opposition from the family and friends. Meanwhile, Esi finally decides to divorce Oko as a result of the fact that Esi feels she has been ravished by Oko and calls it "marital rape" (15). The narrator gives a pictorial account of the incidence as follows:

Oko flung the bed cloth away from him, sat up, pulled her down, and moved on her. Esi started to protest. But he went on doing what he had determined to do all morning. He squeezed her breast repeatedly, thrust his tongue into her mouth, forced her unwilling legs apart, entered her, plunging in and out of her, thrashing to the left, to the right, pounding and just pounding away. Then it was all over. Breathing like a marathon runner at the end of a particularly gruelling race, he got off her, and fell heavily back on his side of the bed" (*Changes*, 13).

Clearly, Oko capitalises on his masculinity and strength to forcefully make love to Esi in spite of her protest. Aidoo uses diction that creates imagery of violence and destruction which evoke feelings and allows the reader to internalize the description of the agony Esi encounters in the course of sexual intercourse. The repetition of "plunging in and [plunging] out of her" "pounding and just pounding away" and the use of simile in the comparison of Oko's breathing to "a marathon runner" are expressive of Esi's plight. This is a clear instance of spousal rape which is still considered as rape because it is sex without the consent of one of the partners. Esi seems defenceless in this case and becomes a victim of circumstance, and her reaction is obviously an option of divorce.

We can attribute Esi's boldness and assertiveness in taking decisions on her life and marriage to her upbringing and childhood experiences. Through the eyes of the narrator, we are privy to the fact that Esi suffers during her childhood and adolescence "for having an unfeminine body" (89). Eventually, Esi

overcomes her struggles and accepts her body shape to the extent of being able to walk nakedly in the presence of her partner. A case in point is the way she turns Ali on with her naked body which for Ali was a “a source of one of the pleasures of being with her” (89). Clearly, Esi capitalises on her nude figure as her power to capture Ali’s love and attention.

In juxtaposing Esi-Oko’s love relationship to Esi-Ali’s relationship, one can describe each of them differently. Aidoo presents Esi-Oko’s love and marriage as boring and uninteresting. Their love-making seems burdensome to Esi who after their divorce feels no regret and refers to the incidence between Oko and her on “That Morning” as “a landmark in their relationship” (83). However, Esi-Ali love relationship begins on a good note. Esi meets Ali for the first time and their encounter gives Ali hope of a future together. She excites him “a great deal” (87) and showers her with gifts. On their next meeting, Ali receives the message of Esi’s divorce, thanks Allah silently and “set about to wooing her” (88). Ali finds Esi attractive and compares her with his wife, Fusena who unlike Esi never walks “naked in the flat” (90). Ali seems to take delight in seeing Esi exposing her nudity in his presence, a situation he finds hard to get in his own house. Esi gives Ali privacy as well as food, “[another] source of pleasure” (91). The narrator presents their mutual love-making scene in the extract below:

He started to kiss her rather hungrily, and proceeded to undress her at the same time... Then starting from the top of her head, he began to feel her all over, with his eyes tightly shut, and therefore genuinely groping like a blind person. Each time he touched any part of her that he found specially erotic, a massive shudder shook him... On her part Esi felt somewhat cramped because the couch was rather narrow. (101-2)

Clearly the cinematic description of love-making between Ali and Esi reveals Aidoo’s way of expressing gender roles in love relationships. Aidoo dramatizes the scene by using codified pedantic language as she presents Ali’s thirst for Esi with exotic and sensitive images: “kiss her rather hungrily”; “genuinely groping like a blind person” “specially erotic”. Esi equally responds romantically to Ali’s advances creating a balance for both sexes to enjoy each other. Eventually, Esi accepts Ali’s marriage proposal against all odds. Ali rejects the fact that by marrying another woman, “second wife”, he commits a crime, “bigamy” he interrogates as: “Why have we got so used to describing our cultural dynamics with condemnatory tone of masters’ voices?” (108). In a patriarchal system, the male figure prefers the cultural practices and values because generally, tradition seems to favour and project the male counterpart to the detriment of the female counterpart.

Gender and religion emerge as topical issue for both authors. Generally, women’s religiosity level in the view of earlier scholars which dates back to 1930s seem to be greater than their male counterpart (Gallup and George, 2002). However, David Voas, Siobhan McAndrew and Ingrid Storm’s study argue that in Europe the gender gap reduces with the influx of modernisation especially with women empowered by economic security: “it is also possible that with economic growth, women’s values converge with those of men in terms of secularity and rationality” (2013: 47). We see that Aidoo portrays Esi’s economic independence as an influence on her belief in God. For her, God can be worshiped anywhere not necessarily at church as she tells Nana who thinks that it is hypocritical on Esi’s part not to attend church service on Sundays. Esi plays gospel music in her car on Sunday mornings but refuses to go to church (97).

On the contrary, in *The Lemon Suitcase*, Oppong presents Mabena as a staunch Christian who holds leadership positions at church. Unlike Esi, Mabena’s economic security fails to influence her devotion to Christianity. Her commitment and belief in God rather empower her to shape and excel in her career path. Her leadership prowess begins at church where she leads Bible studies for both children and adults. Her role as a leader at church helps to empower the women to be independent in their trade. To some extent, Mabena becomes the envy of her fellow church leaders with even pastors opposing her commitment to church activities. For instance, some elders and deacons in her church jubilate after her encounter with the robbers as a Sunday School Superintendent sarcastically declares:

Oh so God could not deliver her this time around? Isn’t she the one always testifying about God’s goodness, God’s protection, God’s vindication and so on? Where was the God when the robbers struck? If she had lived a righteous, upright life, none of those things would have happened to her (29).

Mabena faces opposition from both Christian men and women in her church. From the extract above, the Superintendent interrogates and ridicules Mabena’s hypocritical belief in God’s power in the use of pattern repetition: “God’s goodness, God’s protection, God’s vindication” which highlight God’s provision for

Christians. We see that even in the church where God's centeredness should be proclaimed for congregants to understand that God is no respecter of persons, gender discrimination takes centre stage. Mabena faces criticisms from the very people who call themselves Christians. Her commitment to church activities is interpreted as evil in the sight of her adversaries. Most female figures turn out to be the haters of men including church members.

The Woman Figure as a tool for Development in Ghanaian Literary Writing

Women's empowerment serves as a key developmental tool for the growth of every society. In both novels, there is the representation of heroines who seem to be empowered through education and gainful employment. Several studies spell out the positive and negative attitudes of the female figure. According to Bonnici (2019), women appear to be the cause of their lack of representation because they are not persuasive enough, do not want power, lack self-confidence, are unwilling to play the game or work the system, do not seek employment, and even when employed, do not apply for line positions. In the study entitled, *Lean In: Women, Work and the Will to Lead*, Sandberg asserts that women striving to be leaders have discovered that managing family duties and work is one of the most difficult challenges they face (Sandberg, 2013). Sandberg's study confirms the roles of the heroines in both *Changes* and *The Lemon Suitcase*. Aidoo presents equity of education and employment in the representation of the male and female characters. In a way, Aidoo apotheosizes Esi's job as higher and more lucrative than the husband's job. Esi works as a data analyst with the government's statistical bureau, it is urban department and has been assigned a bungalow where the family resides. As part of her job, she attends international conferences, Geneva, Addis, Dakar one half of the year; Rome, Lusaka, Lagos the other half (*Changes*, 12). Oko is a teacher in a co-educational school and soon be promoted as a headteacher. We see that Oko seems to have an inferiority complex about his way of life, his job and his looks, and the fact that his wife's job empowers her to support the household, a role supposed to be performed by the man, traditionally. The wind of inferiority complex blows over Oko so much that it affects his role as a man in the house. Oko seems to lose his personal ego and a sense of identity as a husband to Esi. He is deprived of the basic necessities in marriage as compared to Ali. Oko fails to manage his wife, Esi, but Ali succeeds in winning Esi's love with very little effort which also fails at the end. We see that Esi is unable to cope with her two husbands which has two presuppositions: in the case of Oko, the fact that a woman provides accommodation does not deprive a man's role in marriage; for Ali, a woman cannot dictate the pace of a love marriage relationship.

In juxtaposing Esi-Oko's relationship to Opokuya-Kubi's love relationship, we see that Opokuya and Kubi engage in an egalitarian love relationship where both husband and wife give each other equal rights and access to their properties, for she shares their car with him. Like Esi, Aidoo presents Opokuya as an enterprising lady who supports the family with her resources. Opokuya is a nurse who works tirelessly and selflessly to support the husband and children. Opokuya exhibits her maturity, honesty and integrity in the way she handles Esi's marital issues. She disagrees with Esi's decision to divorce Oko. Though she does not support Esi-Ali love relationship, she seems impressed with Ali's extravagant gifts to Esi.

On the contrary, Aidoo also depicts women who choose to allow themselves to be manipulated by others. A case in point is the woman Oko's mother arranges for him. Oko expresses his amazement as "a young woman in this world who would agree to be carried off as a wife to a man she had never met" (86). Oko juxtaposes his arranged woman to Esi as "fruit juice" and "liquor" respectively. While Esi belongs to the school of thought of women who fight for their freedom from uninterestingly boring marriages, Oko's new woman ignorantly allows herself to be pushed to a man whose heart and mind rests with another woman, Esi. Although Oko finds it incredible and uncommon to accept arranged marriages, Ghanaian tradition approves such marriages. Oko's mother exhibits leadership skills in her attempt to arrange a woman for her son. Similarly, Esi's mother seems indifferent about women who choose to be second wives; however, she disapproves of Esi's decision to marry Ali, for she prefers Esi to be addressed as "Mrs". Clearly, Esi's mother expects her daughter to lead even in her marriage, but, Esi chooses to be Ali's second wife which begins another twist to Esi's life.

In *The Lemon Suitcase*, Oppong presents the heroine, Mabena as a figure who competes with men and overtakes them. We read about Mabena whose colleagues at work despise her and wish for her downfall because of her hardworking attitude. This begins after her university education when she gets the opportunity to work as a national service person at Ryce & Ryce. While her superiors shower praises on her because of her hardworking attitude, her peers criticise her. She is elected as the chairperson of the student

representative council at university (34). She excels at the workplace and is nominated to receive the Clean Personality Award (116). Mabena exhibits leadership qualities to the amazement of her friends, family and subordinates at the workplace. As a leader, she sets herself apart from corruption; she institutes checks and measures to avert corruption among her subordinates. Clearly, Oppong ridicules corruption among heads of institutions and uses the female figure as a measure to check the corrupt practices in a male dominated society. The male counterparts at Mabena's workplace, Candin Corporation are depicted as corrupt and bribable. After Mabena's release from incarceration, investigations about the company reveal the corrupt acts of the managing director of Candin Corporation, Adams. The narrator reveals conflict of interest with regards to Adams' job:

Adams owned a light aircraft which he used for pleasure and business trips across the country. Meanwhile, as the details of the corrupt practices unfolded, it came out that about half workforce at Candin Corporation were friends or relatives employed by Adams. These connived with him to loot the company's coffers. He protected workers who stole company property, drivers who siphoned fuel from company vehicles to sell, stole vehicle tyres ... and clerks who extorted money from clients and were reported (204).

The extract above presents an imagery of a bizarre society where corruption has crept into the fabric of the workers so much that individuals sell their conscience just to enrich themselves. It describes a typical work situation of the attitude of public workers in Ghana. There is pattern repetition employed in the following: "workers who stole company property" "drivers who siphoned fuel from company vehicles" and "clerks who extorted money from clients". These structures are syntactically parallel, for they belong to the same grammatical category; they are all subordinate or dependent clauses, the Wh clause or the adjectival clause used in modifying "workers", "drivers" and "clerks". Semantically the pattern repetition foregrounds the attitude of the workers in Ghanaian companies. Mabena becomes an enemy to Adams because she frowns upon corruption and refuses to fall for Adams' schemes. She is appointed as the Managing Director following the arrest and detention of Adams and his cohorts.

The heroine positions herself as a leader who influences other female characters in the novel. Among these characters include her sisters-in-law, Stephanie and Paula, who accept to work as apprentice for Mabena's dressmaking shop. Paula confesses "I want Mabena to take me on as an apprentice in dressmaking" (237). We see that Oppong portrays Mabena as a versatile person who is multi-tasking including her motherly attitude. The narrator expresses Mabena's children's excitement on seeing their mother delivering a speech on television to hundreds of young women at a conference for young women entrepreneurs: "suddenly, Nana Kofi stood and pointed at the screen in excitement. 'Mommy! Mommy!' he screamed. 'That's you!' ... 'Mommy has made all of us proud'" (133). Oppong creates another leader in *End of Tunnel* (2002) with the depiction of her heroine, Sekyiwa, as a beautiful and exceptionally brilliant person who is able to survive in spite of the parent's divorce.

Oppong uses his novel to prophesy into the future of women leadership in Ghana. Mabena receives nomination to be the running mate to the leader of the biggest opposition party and emerges as the presidential candidate after the death of the candidate. Oppong believes that the nation needs transformation and the woman should be given the opportunity to transform the nation. She presents the heroine with so much potential: "she is not corrupt; she is not greedy and she is fair. She will definitely be a mother to all Ghanaians, not as rhetoric but in truth" (252).

Conclusion

The study discussed genderism in today's society as demonstrated in Aidoo's *Changes* and Oppong's *The Lemon Suitcase*. Considering the representations of the heroines under study, we see that the study revealed some of the challenges educated women face in the male-dominated society. Both authors have presented gender equity in their novels by creating characters with equal educational status and job opportunities. Having explored the roles of both sexes, the study sought to empower women as leaders in their contributions to their spouses, their families and the society, thus bringing to light some qualities of women and the role they perform in transforming lives around them. From the foregoing, the female figures explored across the texts under consideration, appear as assertive, daring and empowered to cause changes in the Ghanaian society and promote the feminist movement.

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COST BENEFIT ANALYSIS OF COMPOSTING AS A WASTE MANAGEMENT STRATEGY IN LAGOS STATE SOUTHWESTERN NIGERIA.

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Abstract

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Purpose — This study assessed the viability of composting as a waste management tool.

Methods — This study assessed waste production and handling in Lagos State and adapted a case study of cost-benefit analysis to ascertain viability.

Findings — Results from the study revealed that one hundred and forty-one billion, one hundred and sixty-one million, and six hundred thousand naira (₦141,161,600,000.00) equivalent to three hundred and twenty-three million, two hundred and sixteen thousand, five hundred and fifty-nine dollars (\$323,216,559.05) would be generated as profit per annum if the total waste produced in Lagos State daily is converted to compost.

Conclusion & Recommendation — This study recommends composting as the best waste management strategy in Lagos State and Nigeria due to its financial, environmental, health, and agricultural benefits.

Keywords — Cost-benefit analysis, Compost, Waste Management, Lagos, Nigeria.

Introduction

Over the years, the inefficient management of solid waste has been an issue of concern in Africa and the world at large. The amount of municipal solid waste (MSW) in Nigeria, in particular, has steadily increased as a result of population growth, urbanization, and industrialization (Imam et al., 2008). Currently, the Nigerian population has exceeded 200 million (Macrotrends, 2022) and has been tagged as one of the largest producers of solid waste in Africa (Bakare, 2021). Although there are a host of policies and regulations guiding solid waste management in the country, the quantity of waste produced daily is at an alarming rate (Bakare, 2021). The municipal solid waste generation rate in Nigeria is estimated to be 0.65-0.95 kg per capita per day, resulting in an average of 42 million tonnes of waste generated annually, while organic waste produced annually in Nigeria is 23,520,000 tonnes (56% of wastes generated are organic wastes), which can be turned into compost to enrich Nigeria by billions of naira (Zulkepli et al., 2017).

The environment is generally affected by waste, leading to disease outbreaks, a reduction in life expectancy, and unsafe environments. While some wastes may rot, smell, and generate methane gas and other greenhouse gases, others do not rot but lead to water and soil pollution (Ayilara et al., 2020). In response to this and other global environmental concerns, it has been concluded that composting is an environmentally

friendly and economically viable waste management strategy that can be adopted while discouraging landfilling (Beatti andS Alicia, 2014; Zulkepli et al., 2017).

According to Ayilara et al., composting involves the biological process of decomposition of organic waste, whereby organic waste is made into a usable product called compost. The conversion process of turning degradable organic wastes into stable products with the aid of microorganisms is done under controlled conditions (Ayilara et al., 2020). Categorically, composting can be broadly divided into aerobic and anaerobic composting (Keng et al., 2020). Aerobic composting is done in the presence of oxygen, leading to the conversion of organic solid waste into compost, a beneficial material used to improve the quality of soil and provide plants with their required nutrients (Al-Rumaihi et al., 2020). Aerobic composting can be carried out in two ways: open-system aerobic composting or closed-system aerobic composting. The open system includes the aerated pile and windrow processes, while the closed system includes in-vessel or container systems (Keng et al., 2020). Anaerobic composting technology, on the other hand, operates in an oxygen-free environment, such as the Bokashi approach that uses inoculated bran to transform organic waste into compost through fermentation (Keng et al., 2020).

Municipal solid waste management has always been a source of concern in every society. With the most common waste management strategy being landfilling, the practice of landfilling poses several threats, both to humans and the environment. For instance, landfill sites are susceptible to open burning, which pollutes the air and thereby releases methane and carbon dioxide, which are major greenhouse gases, through the anaerobic decomposition of waste (Hegde et al., 2003). People living close to dumpsites are exposed to disease vectors and suffer from various diseases such as cholera, diarrhea, and malaria (Sankoh et al., 2013). This study emphasizes the costs and benefits of composting as a sustainable waste management strategy. Cost-benefit analysis is an environmental management tool used to evaluate the cost-effectiveness.

Due to the associated environmental and health impacts, landfill waste disposal is the least desirable option for effective waste management from a sustainability perspective. As previously stated, 56% of all waste produced in Lagos is organic waste. In practice, composting plants can use these organic wastes as raw materials to produce compost. World Bank reported that Over 50% of the waste in developing countries is organic, which has the potential to be used for regenerative processes such as composting to improve soil conditions, job creation, etc. if it is managed properly (World Bank Report on Global Solid Waste Management, 2012).

A study carried out by Khan et al., (2022) revealed that organic waste has high potential for composting when evaluated and converting waste to compost becomes more profitable as well as sustainable when compared to landfill disposal. Despite the apparent advantages of converting waste to compost, Lagos State still engages in landfilling as waste management strategy of its huge amounts of waste (Chidi et al., 2021), this may be as a result of inadequate knowledge surrounding the costs and benefits of composting. This study therefore seeks to assess the costs and benefits of composting of organic waste as against the practice of landfilling in Lagos State to determine its economic viability.

Materials and Methods

Study Area

The area selected for this study is Lagos state, Southwestern Nigeria. The Lagos metropolitan area is situated within latitudes N06° 23' and N06° 40' and longitudes E03° 13' and E03° 27'. The megacity of Lagos State has an estimated population of 24 million and about 13,000 tonnes of solid waste is generated daily (Chidi et al., 2021). The Lagos state waste management authority (LAWMA) disposes off about 7,000 tonnes of solid waste daily in the 3 major landfill sites across the state. There are 3 major landfill sites serving the Lagos metropolitan area which are Abule Egba, Igando and Olushosun landfills.

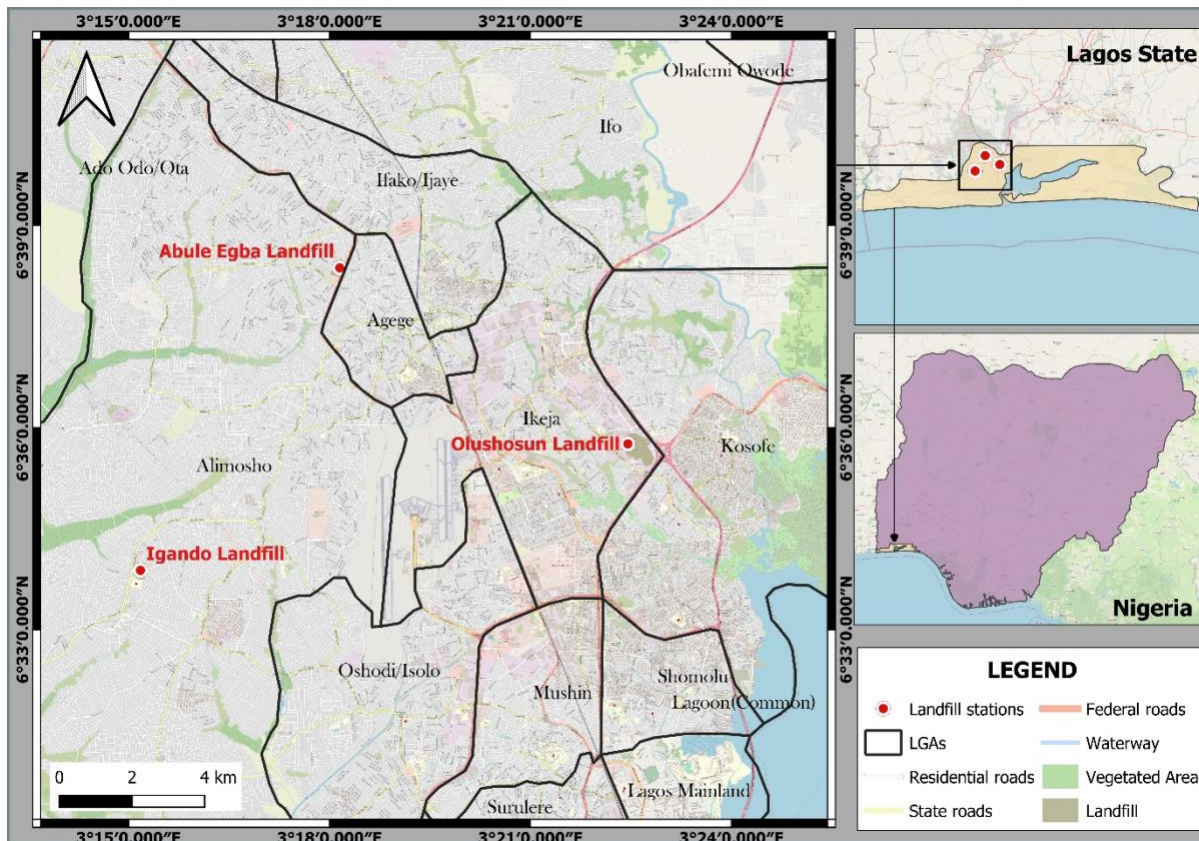


Figure 1: Geological map of Lagos showing the location of the three major landfills of study

Data Sources

This study relied primarily on secondary data, which was sought and reviewed. In other to achieve the aim of this study the researchers adapted data from a study carried out by Ali et al., (2013) on cost comparison of constructing a standardize composting facility and a biogas facility as well as another study carried by Zulkepli et al., (2017) on waste management generation which revealed that 56% of municipal solid wastes generated in Lagos State are organic and can be potentially used for compost. Table 1-4 were collected and reviewed to determine relevant literatures on waste management and to also appraise the current state of solid waste management in Nigeria, while identifying cost- benefit as a suitable concept to analyze composting as a sustainable waste management strategy.

For the satellite images, existing google imageries of the study areas was downloaded from the Google Earth with radiometric resolution of 10m. Coordinates of different locations in the study area was also obtained by the use of Global Positioning System (GPS).

Method of Data Analysis

A cost-benefit analysis (CBA) is performed to evaluate the situation of data verification. This is a method widely used in different management studies for decision making (Ali et al., 2013) but its application is very rare in compost related studies in Nigeria. The following formulas were used for analysis:

$$\text{Cost Benefit} = \text{Total benefits} - \text{Total cost} \quad \dots\dots\dots \text{(Equation 1)}$$

The Benefit-cost Ratio (BCR) is calculated as the total benefits divided by the total costs:

$$BCR = \frac{\sum_{t=1}^r B_t / (1+r)^t}{\sum_{t=1}^r C_t / (1+r)^t} \dots\dots\dots \text{(Equation. 2)}$$

Where B = Benefit
 r = rate of discount
 C = Cost

The return period for investment cost was also calculated using the following method:

Return period for investment cost = Investment cost / Return Benefit. ... (Equation 3)

Case Study Adapted for the Study
 As cited by Ali et al., (2013), the cost-benefit of composting was carried out in Thailand using the model below.

Table 1: Estimate of compost plant construction and operation in Thailand

Investment *Cost		Operation and Maintenance Cost (Thai baht (THB))			Benefits
Construction	1,000,000.00	Unit cost per ton	3,200.00	Unit cost per ton	10,000.00
Working capital & contingency	1,500,000.00	Total waste quantity (tonnes)	14.4	Total compost quantity (tonnes)	8.1
Process equipment & machinery	1,000,000.00	Total cost per day	46,080.00	Total income per day	81,000.00
**Fees	500,000.00	Total cost per annum	16,819,200.00	Total benefits per annum	29,565,000.00
Total					4,000,000.00

Source: Adapted from Ali et al., (2013)

Table 2: Detailed estimation and analysis for compost plant in Thailand

Benefits and costs	Estimations	Total
Total cost of compost per annum	THB 16,819,200.00	-
Total benefits from savings and compost production	803,000.00 + 29,565,000.00	THB 30,368,000.00
Gross return per annum = Total benefits – Total costs	30,368,000.00 – 16,819,200.00	THB 13,548,800.00
BCR = Total benefits/Total costs	13,548,800.00/16,819,200.00	0.80
Investment cost for compost plant	THB 4,000,000.00	-
Return period for investment cost	4,000,000.00/30,368,000.00	~1 years

Source: Adapted from Ali et al., (2013)

Table 3: Estimate of compost plant construction and operation in Lagos.

Investment * cost		Operation and Maintenance Cost		Benefits	
Construction	12,400,000.00 (\$28,392.18)	Unit cost per ton	39,680.00 (\$90.86)	Unit cost per ton	124,000.00 (\$283.92)
Working capital & contingency	18,600,000.00 (\$42,588.27)	Total waste quantity (tonnes)	14.4	Total compost quantity (tonnes)	8.1
Process equipment & machinery	12,400,000.00 (\$28,392.18)	Total cost per day	571,392.00 (\$1,308.31)	Total income per day	1,004,400.00 (\$2,299.76)
**Fees	6,200,000.00 (\$14,196.09)	Total cost per annum	208,558,080.00 (\$477,533.73)	Total benefits per annum	366,606,000.00 (\$839,414.76)
Total	49,600,000.00 (\$113,568.71)				

Source: Adapted from Ali et al., (2013)

Table 4: Detailed estimation and analysis for compost plant.

Benefits and costs	Estimations	Total
Total cost of compost per annum	₦208,558,080.00 (\$477,533.73)	₦208,558,080.00 (\$477,533.73)
Total benefits from compost production	₦366,606,000.00 (\$839,414.76)	₦366,606,000.00 (\$839,414.76)
Gross return per annum = Total benefits – Total costs	₦366,606,000.00 ₦208,556,080.00	- ₦158,049,920.00 (\$361,885.61)
BCR = Total benefits/Total costs	₦158,049,920.00/ ₦208,556,080.00	0.76
Investment cost for compost plant	₦49,600,000.00 (\$113,568.71)	-

Source: Adapted from Ali et al., (2013)

Results and Discussion

Cost Benefit Analysis

The collection and disposal of waste which is the current solid waste practice in Lagos state is handled by the Lagos state Waste Management Agency (LAWMA) and it accounts for only about 55% of the total waste produced daily. The remaining 45% is transported to illegal dumpsites by the residents.

Consequently, analysis in this study will be done in the two different scenarios;

Total waste produced in Lagos state daily = 13,000 metric tonnes

Total waste collected by LAWMA daily = 7,000 metric tonnes.

Scenario 1: C.B.A for the total waste produced in Lagos State

Results per day for scenario 1

Total waste produced in Lagos State daily = 13,000 metric tonnes

From the case study adopted, it can be deduced that a single composting plant can only process 14.4tonnes of waste at a time.

Operation and Maintenance Cost

From table 3, the operation and maintenance cost incurred to process a ton of waste to become compost (unit cost per ton)

Unit cost per ton = ₦39,680.00 (\$90.86).

For a single composting plant, the cost of processing 14.4tonnes of waste in a day to give 8.1 tonnes of compost is;

Cost for processing 14.4tonnes = 14.4 x ₦39,680.00 (\$90.86)
= ₦571,392.00 (\$1,308.31)

Therefore, the total cost incurred in processing the total waste produced in Lagos state daily (13,000 tonnes) to become compost is;

Total waste x 39,680.00 (\$90.86)

Cost for processing 13,000 tonnes = 13,000 x ₦39,680.00 = ₦515,840,000.00 (\$1,181,114.62)

Benefits

Table 3 shows that only about 56% of solid waste is turned to compost (56% of 14.4= 8.1) Therefore, the amount of compost derived from 13,000 tonnes of waste

= 56% of 13,000 tonnes

= 7,280 tonnes

From Table 3, the benefit derived from selling a single ton of compost (unit price per ton)

Unit price per ton = ₦124,000.00 (\$283.92).

For a single composting plant that can achieve 8.1tonnes of compost from 14.4tonnes of waste, the benefit is;

Cost of selling 8.1 tonnes of compost = $8.1 \times \text{₦}124,000.00 (\$283.92) = \text{₦}1,004,400.00 (\$2,299.76)$.

Therefore, the total amount that will be benefited from selling the compost derived from the total waste produced in Lagos state daily (7,280 tonnes of compost)

= $7,280 \times \text{₦}124,000.00 (\$2,299.76)$

Cost of selling 7,280 tonnes of compost = ₦902,720,000.00 (\$2,066,950.60)

Cost-Benefit Analysis for scenario 1 per day

C.B.A for a day = Benefit - cost

₦902,720,000.00 (\$2,066,950.60) – ₦515,840,000.00 (\$1,181,114.62)

= ₦386,880,000.00 (\$885,835.97).

Results per annum for scenario 1: Cost per annum = Cost per day x 365

= ₦515,840,000.00 x 365

Cost per annum = ₦188,281,600,000.00 (\$431,106,837.02)

Total Cost

Total cost = Investment Cost + Cost per annum

= ₦49,600,000.00 (\$113,568.71) + ₦188,281,600,000.00 (\$431,106,837.02)

Total cost = ₦188,331,200,000.00 (\$431,220,405.73)

Benefit Per Annum = Benefit per day x 365

= ₦902,720,000.00 (\$2,066,950.60) x 365

= ₦329,492,800,000.00 (\$754,436,964.98)

C.B.A for the year = Benefit per annum — Total Cost

= ₦329,492,800,000.00 (\$2,066,950.60) — ₦188,331,200,000.00 (\$431,220,405.73)

= ₦141,161,600,000.00 (\$323,216,559.05)

Benefit – Cost Ratio (BCR)

= 1.75: 1 approximately 2:1

Return Period for Investment

Return period for investment = Total cost / Benefit per annum

= ₦188,331,200,000.00 (\$431,220,405.73) / ₦329,492,800,000.00 (\$2,066,950.60)

= 0.6 year

Return period for investment = 7.5 months

Scenario 2: for waste collected by LAWMA in Lagos State

Results per day for scenario 2

Amount of waste collected by LAWMA daily = 7,000 metric tonnes.

From the case study adopted, it can be deduced that a single composting plant can only process 14.4tonnes of waste at a time.

Operation and Maintenance Cost

From Table 3, the operation and maintenance cost incurred to process a single ton of waste to become compost (unit cost per ton) = ₦39,680.00 (\$90.86).

For a single composting plant, the cost of processing 14.4tonnes of waste daily to give 8.1 tonnes of compost is;

Cost for processing 14.4 tonnes = $14.4 \times \text{₦}39,680.00 (\$90.86)$

= ₦571,392.00 (\$1,308.31).

Therefore, the cost incurred in processing the actual amount of waste collected by LAWMA daily (7,000 tonnes) to become compost is equal to Waste collected x ₦39,680.00 (\$90.86).

Cost for processing 7,000tonnes = $7,000 \times \text{₦}39,680.00 (\$90.86) = \text{₦}277,760,000.00 (\$635,984.79)$.

Benefits

It can be seen from Table 3 that only about 56% of solid waste is turned to compost (56% of 14.4= 8.1). Therefore, the amount of compost gotten from 7,000 tonnes of waste
= 56% of 7,000 tonnes
= 3,920 tonnes
From Table 3, the benefit derived from selling a single ton of compost (unit price per ton)\
Unit price per ton = ₦124,000.00 (\$2,299.76)
For a single composting plant that can achieve 8.1tonnes of compost from 14.4tonnes of waste, the benefit is;
Price for selling 8.1tonnes of compost =8.1 x ₦124,000.00 (\$2,299.76)
= ₦1,004,400.00 (\$2,299.76).
Therefore, the total amount that will be benefited from selling the compost gotten from the actual waste collected by LAWMA daily (3,920 tonnes of compost)
= 3,920 x ₦124,000.00 (\$2,299.76).
Price for selling 3,920 tonnes of compost = ₦486,080,000.00 (\$1,112,937.39).

Cost-Benefit Analysis for scenario 2 per day

C.B.A for a day = Benefit - cost
= ₦486,080,000.00 (\$1,112,937.39) – ₦277,760,000.00 (\$635,984.79).
C.B.A for a day = ₦ 208,320,000.00 (\$476,988.60).
Results per annum for scenario 2:
Cost per annum = Cost per day x 365
= ₦277,760,000.00 (\$635,984.79) x 365
Cost per annum = ₦101,382,400,000.00 (\$232,134,450.70)

Total Cost

Total Cost = investment cost + cost per annum
=49,600,000.00 (\$113,568.71) + ₦101,382,400,000.00 (\$232,134,450.70)
Total Cost =₦101, 432, 000,000.00 (\$232,248,019.42)

Benefit Per Annum

Benefit per annum = Benefit per day x 365
= ₦486,080,000.00 (\$1,112,937.39) x 365
Benefit per annum =₦ 177,419,200,000.00 (\$406,235,288.73).
C.B.A for The Year = Benefit per annum — Total cost
= ₦177,419,200,000.00 (\$406,235,288.73) — ₦101, 432, 000,000.00 (\$232,248,019.42)
= ₦75,987, 200,000.00 (\$173,987,269.31)

Benefit – Cost Ratio (BCR)

= 1.75: 1 approximately 2:1

Return Period for Investment

Return period for investment = Total cost / Benefit per annum
=₦101, 432, 000:00, 000.00 (\$232,248,019.42) / ₦177,419,200,000.00 (\$406,235,288.73)
= 0.6 year
Return period for investment = 7.5 months

Discussion

The cost-benefit analysis of composting the total waste produced in Lagos State and the actual waste collected by the Lagos State Waste Management Authority shows that converting waste to compost will generate huge revenue for the state and reduce the amount of waste that will be disposed of in landfills (Otoo and Hanjra, 2018). The result of this study supports earlier claims made by Otoo and Hanjra in their book titled "Large scale composting for revenue generation" that several revenue streams can be generated through large-scale composting, including sales of compost, which is the largest revenue stream (Otoo and Hanjra, 2018).

As seen in this study, if the amount of waste collected by LAWMA on a daily basis is converted to compost, the sum of Seventy-Five Billion, Nine Hundred and Eighty-Seven Million, Two Hundred Thousand Naira (₦75,987,200,000.00) which is equivalent to One Hundred and Seventy-Three Million, Nine Hundred and

Eighty-Seven Thousand, Two hundred and Sixty-Nine Dollars (\$173,987,269.00) would be generated as profit annually. However, if the total amount of waste produced in Lagos State is converted to compost, the profit realized at the end of the year would be One Hundred and Forty-One Billion, One Hundred and Sixty-One Million, and Six Hundred Thousand Naira only (₦141,161,600,000.00), which is equivalent to Three Hundred and Twenty-Three Million, Two Hundred and Sixteen Thousand, Five Hundred and Fifty-Six Dollars (\$323,216,559.00), and this is without the multiplier effect of job creation, reduced environmental and health risks and increased agricultural input resulting in greater crop yield.

From this study, it's clear that composting is a sustainable and efficient tool for solid waste management compared to landfilling as it generates wealth and health for all. Also, Zulkeplia et al., (2017) opined that composting is the most environmentally friendly way to deal with trash compared to other methods like putting trash in landfills. In the same way, Rominger explained in his 2020 study that composting turns waste that would have been thrown away into a very valuable resource, reducing the amount of trash that ends up in landfills (Rominger, 2020).

In addition, implementing composting as a sustainable solid waste management strategy in Lagos State would not only minimize the waste burden of the state but would be an example for the rest of the states in Nigeria and other African countries having similar issues with waste management. As a result, it is safe to conclude that composting is one of the best ways for Lagos State and Nigeria, in general, to deal with solid waste.

Conclusion and Recommendation

The study demonstrated that composting can reduce organic waste in landfills and produce value-added products. Based on this study's cost-benefit analyses, composting is one of the best ways for Lagos State and Nigeria at large to solve the solid waste management problem and provide the greatest financial, health, and environmental benefits. It is therefore recommended to adopt composting as an environmentally friendly method for waste management.

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**THE RISE OF THE MACHINES: EXPLORING THE PROSPECTS AND PERILS OF AI-DRIVEN
JOB CREATION FOR YOUTH EMPLOYMENT IN GHANA.**

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Abstract

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Purpose — This study explores the potential of Artificial Intelligence (AI) in creating job opportunities for youth in Ghana.

Methods — Based on a quantitative research design, the study examines the key factors that influence the success of AI-based job creation initiatives in the country.

Findings — The study finds that these three factors are critical to the success of AI-based job creation initiatives in Ghana. To unlock the full potential of AI in creating new job opportunities for youth, the study recommends government policies, public-private partnerships, and increased investment in education and training.

Conclusion & Recommendations — The study concludes that collaborative efforts from stakeholders in government, academia, and the private sector are needed to overcome the barriers to AI-based job creation and promote youth employment in Ghana and beyond.

Keywords — Artificial Intelligence, Job Creation, Youth Employment, Entrepreneurs, Ghana

Introduction

Artificial intelligence (AI) is a rapidly growing field that has the potential to revolutionize many aspects of our lives, including education, healthcare, transportation, and employment. AI refers to the development of computer systems that can perform tasks that typically require human intelligence, such as perception, reasoning, learning, and decision-making (Russell & Norvig, 2010). AI technologies, such as machine learning, natural language processing, and robotics, are already being used to automate routine tasks, improve productivity, and enhance the quality of services in various sectors (Brynjolfsson & Mitchell, 2017).

AI has been a buzzword in recent years and its potential impact on various aspects of human life cannot be overemphasized. The development of AI technologies is one of the most significant advances in the field of computer science in recent decades. With the ability to perform complex tasks such as perception, reasoning, learning, and decision-making, AI has the potential to transform many sectors and create new opportunities. In the employment sector, AI is viewed as a potential game-changer that could help create new job opportunities, increase productivity, and enhance the quality of services. The adoption of AI-based products and services is expected to generate significant economic benefits globally, with estimates indicating that AI has the potential to add up to \$15.7 trillion to the global economy by 2030 (PwC, 2017). However, there are concerns that AI may also lead to job displacement and widen the gap between those who have the skills and those who do not.

In recent years, there has been a growing interest in the potential of AI to create new job opportunities and improve youth employment outcomes in developing countries, such as Ghana (UNCTAD, 2021). Youth unemployment is a major challenge in Ghana, with over 60% of young people aged 15-34 either unemployed or underemployed (GSS, 2020). AI-based job creation has the potential to address this challenge by promoting innovation, entrepreneurship, and skills development among youth (World Bank, 2020). However, there is limited research on the role of AI in creating new job opportunities for youth in Ghana and other developing countries.

The growing use of AI technologies has the potential to transform the job market and create new opportunities for employment. However, there are concerns about the impact of AI on employment, particularly for youth and other vulnerable groups in developing countries. While some argue that AI will create new jobs and enhance productivity, others fear that it will lead to job displacement, inequality, and social unrest (World Economic Forum, 2020). In Ghana, where youth unemployment is a major challenge, there is a need to explore the potential of AI-based job creation initiatives to address this issue. Despite the potential of AI to create new jobs and economic growth, there are several challenges to its adoption and implementation in Ghana. These include the availability of infrastructure, skills, and investment, as well as ethical and social concerns related to the use of AI (Duncan, 2019). Furthermore, there is a lack of research on the role of AI in job creation and youth employment in Ghana and other developing countries. This research gap limits our understanding of the opportunities and challenges of AI-based job creation and hinders the development of effective policies and strategies to promote youth employment and sustainable development.

Therefore, the aim of this research article is to examine the role of AI in job creation and youth employment in Ghana, with a focus on the potential opportunities and challenges for AI-based job creation initiatives. This study will provide insights into the factors that influence the success of AI-based job creation initiatives in Ghana, the perceptions of Ghanaian youth regarding AI-based job opportunities, and the barriers to AI-based job creation in Ghana. The study will also identify examples of successful AI-based products and services developed by Ghanaian youth, and their impact on job creation and economic growth. The findings of this study will contribute to the global discourse on AI and sustainable development, and inform the development of policies and initiatives to promote AI-based job creation and youth employment in Ghana and other developing countries.

Artificial Intelligence (AI) has become increasingly relevant in the global job market, and it is considered one of the most transformative technologies of the 21st century (UNESCO, 2021). AI has the potential to create new job opportunities, improve productivity, and enhance the quality of services in various sectors (Brynjolfsson & Mitchell, 2017). In developing countries, AI can be a catalyst for sustainable development by promoting innovation, entrepreneurship, and skills development (World Bank, 2020). This section provides a comprehensive review of the relevant literature on the role of AI in job creation and youth employment, with a focus on Ghana and other developing countries.

The Potential of AI-based Products and Services in Creating New Job Opportunities for Youth in Ghana

AI-based products and services have the potential to create new job opportunities for youth in Ghana. These opportunities can be found in various sectors such as healthcare, agriculture, education, and finance. For instance, in healthcare, AI technologies can be used to improve patient outcomes and enhance the quality of care (Eneh & Adoghe, 2021). In agriculture, AI can be used to increase crop yields, reduce post-harvest losses, and improve supply chain management (World Bank, 2019). In education, AI can be used to personalize learning, improve teaching quality, and enhance educational

outcomes (UNESCO, 2020). In finance, AI can be used to enhance risk assessment, fraud detection, and customer service (Chen et al., 2020).

Challenges and Opportunities for AI-based Job Creation in Ghana

Despite the potential of AI to create new job opportunities for youth in Ghana, there are several challenges that need to be addressed. These challenges include the availability of infrastructure, skills, and investment. Ghana needs to develop a robust ICT infrastructure that can support the development and deployment of AI technologies. Additionally, Ghana needs to develop a workforce with the necessary skills to design, develop, and maintain AI-based products and services. Furthermore, Ghana needs to attract investment in the field of AI, including venture capital, angel investment, and government funding. The theoretical framework for this study is based on the intersection of three theories: the technology adoption model (TAM), human capital theory (HCT), and social capital theory (SCT). TAM posits that users' behavioural intention to use technology is driven by two main factors: perceived usefulness and perceived ease of use (Davis, 1989). HCT proposes that investment in human capital, such as education and training, can lead to higher productivity, higher wages, and increased employment opportunities (Becker, 1964). SCT argues that social networks and relationships are valuable resources that can facilitate the acquisition of knowledge, skills, and opportunities (Bourdieu, 1986).

In the context of AI-based job creation in Ghana, TAM can help us understand how youth perceive the usefulness and ease of use of AI-based products and services, which can influence their intention to adopt and develop such products. HCT can help us identify the importance of investment in education and training for the acquisition of technical skills and knowledge necessary for AI-based job creation. SCT can help us recognize the role of social networks and relationships in providing access to mentorship, funding, and other resources necessary for AI-based job creation.

Previous studies have used these theories to analyse the factors influencing the adoption and development of technology and their impact on employment outcomes. For instance, studies have used TAM to examine the factors influencing the adoption of technology in various sectors, such as healthcare (Venkatesh et al., 2016) and e-commerce (Li et al., 2018). Studies have used HCT to analyze the relationship between education and employment outcomes in developing countries (Blunch, 2004), including Ghana (Aryeetey & Udry, 2000). SCT has been used to investigate the role of social networks in promoting entrepreneurship and innovation in various contexts, such as Silicon Valley (Saxenian, 1994) and Africa (Adeleye & Yusuf, 2016). By integrating these theories, this study seeks to provide a holistic understanding of the factors influencing AI-based job creation and youth employment in Ghana, including the role of technology adoption, human capital investment, and social capital networks. The study will examine how these factors interact to create opportunities or barriers to AI-based job creation in Ghana and provide recommendations for policy and practice to promote sustainable development through AI.

In summary, this section provides a comprehensive review of the relevant literature on the role of AI in job creation and youth employment, with a focus on Ghana and other developing countries. The section discusses the potential of AI-based products and services in creating new job opportunities for youth in Ghana, as well as the challenges and opportunities for AI-based job creation in Ghana. Finally, the section develops a theoretical review and conceptual framework for the study, based on the Human Capital Theory, Capability Approach, and Triple Helix Model. The conceptual framework for this study is based on the concept of AI-based job creation, which refers to the development of products and services that utilize artificial intelligence technology to create new job opportunities for youth in Ghana. The framework incorporates several key factors that are essential to the success of AI-based job creation initiatives, including access to funding, mentorship and networking opportunities, and the availability of technical skills and knowledge.

The first component of the conceptual framework is access to funding. Research has shown that access to funding is critical for the success of entrepreneurship and job creation initiatives (Brouard & Larivet, 2010; Ozgen et al., 2018). In the context of AI-based job creation in Ghana, funding can be used to support the development of AI-based products and services, as well as to provide financial assistance to entrepreneurs and start-ups. It is important to note that funding is not limited to monetary resources, but also includes access to other resources such as technology, infrastructure, and expertise.

The second component of the conceptual framework is mentorship and networking opportunities. Mentorship and networking opportunities provide youth entrepreneurs with access to experienced professionals who can offer guidance and support in developing their AI-based products and services. Mentorship can take various forms, including one-on-one coaching, group training, and peer-to-peer learning. Networking opportunities can also provide youth entrepreneurs with access to potential partners, investors, and customers.

The third component of the conceptual framework is the availability of technical skills and knowledge. AI-based job creation requires specialized technical skills and knowledge that may not be widely available among the youth population in Ghana. To address this challenge, it is important to provide technical training and education to youth entrepreneurs to ensure they have the necessary skills and knowledge to develop and operate AI-based products and services. Overall, the conceptual framework for this study emphasizes the importance of a holistic approach to AI-based job creation, which considers the interplay between access to funding, mentorship and networking opportunities, and the availability of technical skills and knowledge. By addressing these key factors, Ghana can unlock the full potential of AI to create new job opportunities for youth and promote economic growth in the country.

The objectives of this study are to i) Investigate the role of AI in creating new job opportunities for youth in Ghana, ii) Identify the challenges and opportunities for AI-based job creation in Ghana, iii) Analyze the potential of youth entrepreneurship and innovation in AI-based products and services in Ghana, iv) Develop policy recommendations for promoting AI-based job creation and youth employment in Ghana.

The significance of this study lies in its potential to contribute to the discourse on AI and sustainable development in Ghana and other developing countries. The findings of this study could inform policy and practice in promoting AI-based job creation and youth entrepreneurship and addressing the challenges of youth unemployment in Ghana. Moreover, this study could contribute to the broader literature on AI and job creation, and the role of technology in promoting inclusive and sustainable development (ILO, 2018).

Materials and Methods

Research Design

The study utilized a quantitative research design to collect and analyse data on youth perceptions of AI-based job opportunities in Ghana. The research design involved the use of a structured questionnaire to collect data from a sample of youth participants. The questionnaire was designed to elicit information on the participants' demographic characteristics, their knowledge of AI, their perceptions of AI-based job opportunities, and the potential barriers to AI-based job creation in Ghana. The questionnaire was developed based on a review of the relevant literature on AI and job creation in developing countries. The questions were designed to be clear, concise, and easy to understand to ensure that the participants provided accurate and reliable data. The questionnaire was administered online to ensure ease of access and to reach a wider sample of participants.

The data collected through the questionnaire were analysed using descriptive statistics, such as frequency distributions, percentages, and means. The data was also analysed using inferential statistics, such as chi-square tests, to determine the relationships between variables and to test the study hypotheses. The use of a quantitative research design allowed for the collection of large amounts of data from a diverse sample of youth participants. The use of statistical analyses enabled the researchers to draw conclusions and make generalizations about the perceptions of youth in Ghana toward AI-based job creation. However, one limitation of the study design is that it did not allow for an in-depth exploration of the participant's perceptions and experiences. To address this limitation, future research could consider using a mixed-methods approach, combining quantitative and qualitative research methods, to provide a more comprehensive understanding of the topic (Creswell & Plano Clark, 2017).

Data Collection Methods

The quantitative data was collected through an online survey administered to a sample of youth in Ghana. The survey consisted of closed-ended questions that captured demographic information, educational background, employment status, and knowledge of AI-based products and services. The survey instrument which was a Google form was distributed through social media platforms such as Facebook and Twitter.

Selection Criteria for Study Participants

The study participants will be youth between the ages of 18 and 35 who are either employed or seeking employment in Ghana. The participants will be selected using a stratified random sampling technique to ensure a representative sample of youth from different regions and educational backgrounds in Ghana. The sample size will be determined using the sample size calculator tool based on a confidence level of 95% and a margin of error of 5%.

Ethical Consideration

The study adhered to ethical principles and guidelines in research. The informed consent, which was on the first page of the survey instrument of the questionnaire, of the participants will be sought, and they were informed of the purpose and nature of the study. The participants were also informed that their participation is voluntary, and they have the right to withdraw at any time without consequences. Confidentiality and data protection were ensured. The study obtained ethical approval before the researcher began the study.

Data Analysis Techniques

The quantitative data will be analysed using descriptive statistics such as mean, standard deviation, and frequency distribution (Braun & Clarke, 2006). This section described the research methodology for the study. The section has also explained the selection criteria for the study participants, such as age, education, occupation, and the ethical considerations of the research. Finally, the section has detailed the data analysis techniques, including descriptive statistics for quantitative data.

Results and Discussion

Characteristics of Study Participants

A total of 500 youth participants completed the online survey. The participants were aged between 18 and 35, with a mean age of 25.6 years (SD=3.7). The majority of the participants were males (63.8%), and the rest were females (36.2%). The participants had different levels of educational attainment, with 23.2% having completed tertiary education, 47.8% completed secondary education, and 29% having completed primary education.

Table 1: Characteristics of Study Participants

Characteristics	Frequency	Percentage
Gender		
Male	73	57.1
Female	55	42.9
Age		
18-24 years	79	61.7
25-30 years	31	24.2
Above 30 years	18	14.1
Education Level		
High school	30	23.4
Bachelor's	70	54.7
Master's	28	21.9
Occupation		
Student	47	36.7
Employed	53	41.4
Unemployed	28	21.9

Source: Field Data (2022)

Table 2: Youth Participants' Awareness and Perceptions of AI-based Job Creation in Ghana

Factors	Percentage of Participants
Heard about AI	78.4%
Believe AI-based products/services can create jobs	68.6%
Areas for AI-based job creation	
E-commerce	43.8%
Healthcare	31.4%
Education	29.4%
Knowledge/Experience in AI development	26.8%

Source: Field Data (2022)

Table 3: Barriers to AI-based Job Creation in Ghana

Barriers to AI-based Job Creation	Frequency	Percentage
Lack of access to funding	321	64.2%
Inadequate infrastructure	278	55.6%
Insufficient skills and knowledge	259	51.8%
Limited mentorship and networking	246	49.2%

Source: Field Data (2022)

Table 4: Factors Influencing the Success of AI-based Job Creation Initiatives in Ghana

Factors	Percentage of Participants
Access to funding	68.4%
Mentorship and networking opportunities	54.2%
Availability of technical skills and knowledge	45.9%

Source: Field Data (2022)

The study further identified examples of successful AI-based products and services developed by Ghanaian youth, including mobile applications for healthcare and education, e-commerce platforms, and chatbots for customer service. These products and services have contributed to job creation and economic growth in the country, highlighting the potential of AI to drive development in Ghana.

Table 5: Examples of Successful AI-based Products and Services Developed by Ghanaian Youth

Product/Service	Industry	Job Creation	Economic Impact
Mobile app for healthcare	Healthcare	6	Increased access to care
Mobile app for education	Education	8	Improved learning outcomes
E-commerce platform	Retail	12	Increased sales
Chatbot for customer service	Customer Service	4	Improved Customer Satisfaction

Source: Field Data (2022)

Discussion

Perceptions of AI-based Job Opportunities

Overall, the study found that Ghanaian youth had a positive perception of AI-based job opportunities, with 68.5% of respondents indicating that they believed AI could create new job opportunities. In addition, 52.3% of respondents reported having some knowledge of AI, while 34.6% reported having no

knowledge at all. The results also showed that access to funding, mentorship, and networking opportunities were identified as the key factors influencing the success of AI-based job creation initiatives in Ghana.

Barriers to AI-based Job Creation

The study identified several barriers to AI-based job creation in Ghana. These barriers included the lack of access to funding, inadequate infrastructure, limited mentorship and networking opportunities, and insufficient skills and knowledge. Specifically, 64.2% of the participants identified access to funding as a significant barrier to AI-based job creation, while 55.6% identified inadequate infrastructure as another significant barrier.

Examples of Successful AI-based Products and Services

The study identified some successful AI-based products and services developed by Ghanaian youth. These included the use of chatbots for customer service in e-commerce, the use of machine learning algorithms for fraud detection in banking, and the use of virtual assistants for healthcare services. These products and services have had a positive impact on job creation and economic growth in Ghana.

Factors Influencing the Success of AI-based Job Creation Initiatives

The study identified several factors that influence the success of AI-based job creation initiatives. These factors included access to funding, mentorship and networking opportunities, and the availability of technical skills and knowledge. The study found that 68.4% of the participants believed that access to funding was crucial for the success of AI-based job creation initiatives. The participants also identified mentorship and networking opportunities as important for acquiring technical skills and knowledge.

However, the study also identified several potential barriers to AI-based job creation in Ghana. These included the lack of infrastructure, inadequate skills and education, and limited investment in AI. The study suggests that addressing these barriers through government policies, public-private partnerships, and increased investment in education and training could help unlock the full potential of AI in job creation and economic growth in Ghana.

In summary, the findings of this study suggest that Ghanaian youth have a positive perception of AI-based job opportunities and that AI has the potential to create new job opportunities and drive economic growth in the country. However, addressing the key barriers to AI-based job creation will require a collaborative effort from stakeholders in government, academia, and the private sector.

Conclusion and Recommendations

In conclusion, this study highlights the potential of AI-based job creation initiatives in Ghana and provides valuable insights into the factors that can promote or hinder their success. The study reveals that the majority of the youth participants had heard about AI and recognized its potential to create new job opportunities in the country. They also identified e-commerce, healthcare, and education as potential areas for AI-based job creation.

However, the study also identified several challenges that need to be addressed to unlock the full potential of AI in job creation and economic growth in Ghana. These include the availability of infrastructure, technical skills and knowledge, access to funding, mentorship and networking opportunities, and ethical and legal considerations. To overcome these barriers, the study recommends government policies, public-private partnerships, and increased investment in education and training. It is crucial for the government to develop a supportive policy environment that fosters innovation and incentivizes private sector investment in AI-based job creation initiatives. This can be achieved through tax incentives, grants, and other forms of financial support.

Moreover, public-private partnerships can facilitate collaboration between different stakeholders, including government, academia, and the private sector, to create a sustainable ecosystem for AI-based job creation in Ghana. This can promote knowledge-sharing, mentorship, and networking opportunities, which are crucial for acquiring technical skills and knowledge. Finally, education and training programs can help to bridge the skills gap in the workforce and enhance the technical knowledge required for AI-based job creation. These programs should target not only technical skills but also the ethical and legal considerations surrounding AI to ensure responsible and sustainable AI-based job creation.

Based on the findings of this study, it is evident that there are several barriers to AI-based job creation in Ghana. These barriers include the lack of access to funding, inadequate technical skills and knowledge,

limited mentorship and networking opportunities, and a shortage of necessary infrastructure. These challenges are significant and require effective strategies to overcome.

To address these challenges:

- It is recommended that the government of Ghana develops policies that prioritize investment in AI-based job creation initiatives, particularly those that target youth employment. Public-private partnerships should also be encouraged to support the development of AI-based products and services. These partnerships will help to bridge the gap between the private sector and government, providing access to funding, technical expertise, and other necessary resources.
- Furthermore, investment in education and training is essential for unlocking the full potential of AI in job creation and economic growth in Ghana. This investment should focus on the development of technical skills, including coding and data analysis, as well as soft skills such as communication, problem-solving, and critical thinking. Such investment will create a pipeline of skilled workers who are well-equipped to take advantage of AI-based job opportunities in Ghana.
- The study also recommends further research on the role of AI in job creation and youth employment, particularly in developing countries. Additionally, the study highlights the broader implications of AI for sustainable development, suggesting that AI-based job creation initiatives can contribute to the achievement of the United Nations Sustainable Development Goals.

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**RETHINKING HIERARCHICAL GENDER REALITIES IN THE TRANSFER OF
INDIGENOUS KNOWLEDGE FOR SUSTAINABLE DEVELOPMENT: EVIDENCE FROM
THE UPPER EAST REGION OF GHANA**

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Abstract

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Purpose — This study sought to assess entrenched patriarchal roles in the transfer of indigenous knowledge using evidence from the Upper East Region of Ghana.

Methods — The study utilized the phenomenological research design which places emphasis on lived experiences and qualitative interviews.

Findings — The findings indicate that while women play a key role in the transfer of indigenous knowledge, men feel threatened by their growing involvement in the conservation and transfer of indigenous sociocultural knowledge systems. This has resulted in men believing they will lose their control as heads of socio-culturally entrenched gender roles.

Conclusion & Recommendation — The paper proposes a rethinking and rigorous multi-sectorial and dimensional approach in mainstreaming gender activities, which is geared towards viewing the involvement of women in indigenous knowledge transfer as partners for local and national development rather than a threat to entrenched patriarchal roles.

Keywords — indigenous knowledge, hierarchical, gender, sustainable development, Ghana

Introduction

There is a popular opinion that the cultural practices and beliefs of African societies stifle the participation of African women in the management of national and community resources (Wilson, 2021) which includes indigenous knowledge systems and the rich cultural practices of African communities. This view has stoked research interest from scholars to assess gender mainstreaming activities in a very important facet of African societies such as cultural practice and indigenous knowledge systems (Wilson, 2021). Additionally, researchers on indigenous knowledge systems in Africa have acknowledged the vital role of women in the conservation and transfer of indigenous knowledge in African societies. For instance, women have been noted to use their worldviews and inventiveness to solve social and economic problems which help to develop mechanisms for accelerated and inclusive sustainable development.

(Wilson, 2021). The involvement of women in the transfer of indigenous knowledge is crucial for diversity and inclusion in conservation efforts. It can reduce gender discrimination and harassment, according to Strachan et al. (2011).

On the other hand, it is important to note that perpetuating gender inequality, exclusion, and injustice bring forth negative outcomes such as poor socioeconomic growth and underdevelopment because of the underutilization and exclusivity of critical human skills and capital (Tsikata 2009) which can possibly be brought forth by both men and women.

Addressing issues of Gender inequalities in African communities is one important step towards the achievement of SDG 5, which seeks to promote gender equality and empower all women and girls (Anyetimi et al., 2019; Wilson, 2021). Achieving gender equality in African societies is important for re-shaping the existing arguments that there are defined cultural roles for men and women for conserving cultural and indigenous knowledge systems in indigenous African communities (Mukoni, 2015). Previous studies, including those by Wyrod (2008) and Strachan et al. (2011), have recognized the advantageous effects of gender diversity and inclusivity on the acceleration of socio-cultural and economic development and growth. These benefits include enhanced creativity, innovation, and productivity, as well as the ability to make better decisions resulting from a broader range of perspectives, to mention but a few.

In Ghana, the literature on gender mainstreaming and indigenous knowledge transfer has predominantly centered on challenging the myths that portray women as passive recipients rather than active agents in shaping gender roles within African societies (Wilson, 2021). Other studies have examined gender equality and inclusion through the lens of legislation and policies (Ayentimi et al., 2019), gender mainstreaming, and gender in agricultural commercialization (Ankrah et al., 2022). However, literature has paid little attention to rethinking the hierarchical gender roles associated with the conservation and transfer of indigenous knowledge. Studies on rethinking gender roles in the conservation of indigenous socio-cultural roles are important because both men and women have knowledge and abilities which are very important for the promotion of socio-cultural and economic development in every society. In view of the aforementioned, this current study explores the (i) nature of gender roles in the transfer of indigenous knowledge (ii) the importance of involving women in the transfer of indigenous knowledge (iii) the perceived threat of women rising against patriarchal roles. The paper is significant for two reasons, first: it complements previous literature on the important role of women in the conservation and transfer of indigenous knowledge. Second: it presents an opportunity for practitioners and gender advocates to increase awareness of the important role of both men and women in the conservation and transfer of indigenous knowledge. The next section presents a theoretical overview of gender mainstreaming activities in Africa comprising a brief stroll through history, opportunities, challenges, and indigenous knowledge systems. This is followed by the study setting and methodology. Following next are the results and discussion, and lastly the conclusion and recommendations.

Gender mainstreaming: The opportunities and challenges

Globally, gender is the social, cultural, and economic roles and expectations assigned to individuals based on their biological sex (Conway, Bourque, & Scott, 1987). Historically, gender has been used as a tool for oppression and discrimination, particularly against women and girls, who have been denied equal access to education, employment, political participation, and other opportunities (Conway, Bourque, & Scott, 1987). In many parts of the world, gender inequality remains a significant challenge. Women and girls continue to face systemic barriers to their advancement, including limited access to education and healthcare, discriminatory laws and policies, gender-based violence, and unequal representation in decision-making positions (Fatouros, & Capetola, 2021). These barriers not only violate human rights but also hinder economic growth and sustainable development, as they limit the potential of more than half of the world's population. Hence the need for collective rethinking.

In Africa, the issue of gender inequality is particularly acute (Sen, 1995), with women and girls making up the majority of the population and yet are often marginalized and excluded for complex and multifaceted reasons, including cultural and social norms that reinforce gender roles and stereotypes, limited access to education and healthcare, and discriminatory laws and policies, modernization and loss of indigenous inclusion cultures in Africa (Fisher, 2007).

Gender inequality remains a significant challenge in Ghana, despite the country's relatively strong economic growth and political stability. Women and girls in Ghana face a range of challenges, including limited access to education, healthcare, and productive activities, gender-based violence, and discrimination in employment and political participation (Molini & Paci, 2015). While there have been some positive developments in recent years, such as the adoption of laws to promote gender equality and the appointment of women to leadership positions, much work remains to be done to ensure that women and girls in Ghana can realize their full potential. Addressing this issue requires a multifaceted and comprehensive approach that includes legal and policy reforms, education and awareness-raising campaigns, and efforts to challenge cultural and social norms that reinforce gender stereotypes and discrimination.

Gender mainstreaming activities have gained momentum among international stakeholders after the proceedings of the Fourth World Conference on Women in Beijing in 1995 (Mannel, 2019). Since then, the programmes of these organisations have seen some successes albeit challenges. This demonstrates that the last almost two decades of gender mainstreaming activities have not been a walk in the field (Moser & Moser, 2005). Before the Beijing conference in 1995, the literature on the history of gender mainstreaming activities points to an active engagement of women in governance and conflict issues in African societies. For example, the history of the Ashanti Kingdom of Ghana reveal that Nana Yaa Asantewaa led an army of 1000s to fight against and defeated the British army who were trying to steal the Golden stool that is a symbol of unity and sovereignty for the Ashanti tribe (Nyamekye, 2022; Brempong, 2000). Further, the Igbo people in Nigeria have a rich tradition of entrepreneurship dominated by women. The Igbo women were known for their highly developed business acumen which they use for economic gains for their society, and this made them the economic powerhouse in Nigeria (Osiri, 2020; Igwe et al., 2018).

Research has revealed that in most African countries and institutions, affirmative actions that will ensure women's representation across all sectors have always brought about tensions and issues related to opportunities and meritocracy, an example is given of the military where the argument is made that, it will be impossible to bring about gender equality, as women are obliged to conform to and assimilate masculine traits, which is what they perceive to be the only traits needed in the military, and where feminine traits are not valued (Heinecken, 2017). Hence, the inability of women to bring their knowledge, expertise, and capabilities to bear. On the contrary, historical facts have revealed the important military roles of African women in the past before the colonizers permanently changed the political, social, economic, and cultural landscape of Africa (Mehari, & Ryano, 2016). Apart from the example of Nana Yaa Asantewaa above, the Nanny of Maroon is one of the most famous historical personalities who led many battles against the British and is now a national hero in Jamaica (Simpson, 2017).

Women in Pre-Colonial African Societies: A Historical Discourse

In the past, before colonization, the needs, interest, abilities, and priorities of men and women were equally taken into account in the facet of society. Most, if not all communities in Africa were people-centered and will ensure that women, men, girls, and boys were given equal opportunities (Msuya, 2020). The ways of living at that time were more spiritually centered than physically centered. History through the African continent demonstrates the important role women played in various sectors such as the military, spirituality, and in economics -Entrepreneurship. (Coquery-Vidrovitch, 2018)

Ancient African women were often considered the most powerful spiritual figures in most African societies. For instance, in Ghana, there was a very powerful female goddess among the Ashanti's called "Antoa" whom the people seek assistance from in times of need. In Zimbabwe, there is a very powerful female spiritual leader known as Chaway who led the first chamanranga (War of liberation) she was considered to be the female reincarnation of the oracle spirit known to the Zimbabweans as Nihanda. From the period 1800 to 1960, there were significant historical experiences in Africa, especially in West Africa, during which the colonizers permanently changed the political, social, economic, and cultural landscape (Mehari, & Ryano, 2016.)

The experience of the African woman today is not the same as the experience of the African woman before colonization. The strength of the African woman before colonization was overwhelming, women were able to harness their potential with support from the entire community, with a very strong indigenous knowledge transfer system where younger generations learned and practiced.

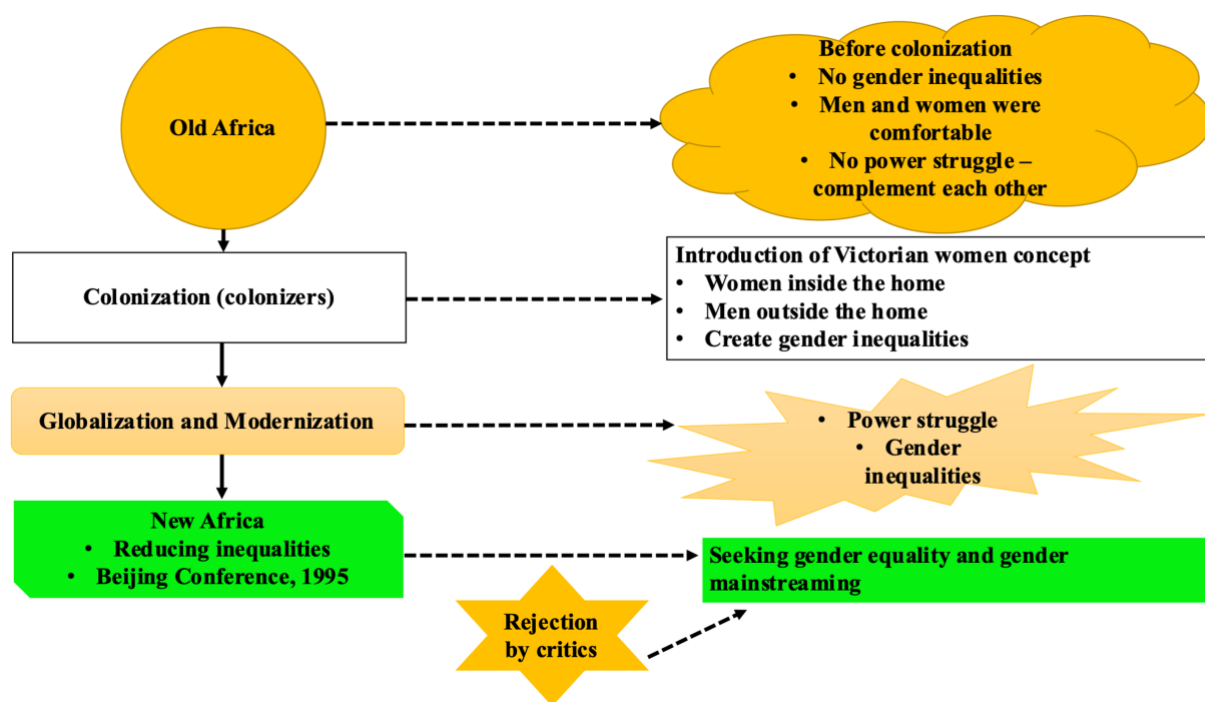


Figure 1: Conceptualizing gender mainstreaming in Africa: before and after colonization (Authors own elaboration)

The Importance of Indigenous Knowledge Systems and Gender Mainstreaming

Indigenous knowledge (IK) and indigenous knowledge systems (IKS) relate to information and organizational structures that are specific to a particular culture (Ellen & Harris, 1996). Indigenous Knowledge Systems and Practices (IKSPs) are local knowledge that has been created by our ancestors over the course of many generations of exploration, it is the knowledge, practices, and beliefs that have been developed by indigenous communities over time. These knowledges are created and altered through a methodological process that involves analyzing local circumstances, trying out potential fixes, and adapting previously discovered fixes to new environmental, socioeconomic, and technical circumstances (Brouwers, 1993).

In our effort to create models for sustainable development, it is very critical to appreciate the relevance of gender mainstreaming activities in indigenous knowledge transfer (Hill, 1993). For instance, leveraging women's traditional knowledge of household management and caregiving, recognizing their roles in resource management, integrating gender roles into governance structures, and utilizing traditional healing practices to promote women's well-being and empowerment. By valuing and promoting these indigenous knowledge systems, gender mainstreaming can be effectively integrated into indigenous communities. These knowledge systems have previously come under criticism for being "backward," "static," and "an impediment to modernization" (Hill, 1993). This thinking has diminished the ability of indigenous knowledge systems to innovate and has devalued the position of grassroots innovators, particularly women, whose contribution to the advancement and growth of their communities has historically been undervalued. Some types of knowledge may be complementary depending on the culture, which means that the knowledge of both males and females may be required to comprehend a specific aspect of society (Senanayake, 2006). While such "shared knowledge" cannot be assumed, other sorts of knowledge may be shared. In some cases, women and men may have different levels of knowledge of the same things, different levels of knowledge of unrelated things, distinct organizational methods for knowledge, and different methods for conserving and transmitting knowledge (Senanayake, 2006). In view of this, there are different perspectives on gender inequalities in knowledge systems and must be taken into consideration. (Norem et al., 1988).

Materials and Methods

The study was conducted in the Binaba community in the Bawku West District of the Upper East Region of Ghana. According to the 2010 Population and Housing Census, the community had a total population of 2,174 with 980 males and 1194 females. The majority of the community's population belongs to the 0-34 age bracket and hence can be described as a youthful population that depicts a broad base (Ghana Statistical Service (GSS), 2014). It is widely accepted that education is the backbone of the development of every geographical area and the foundation for lifelong learning. The informal medium of education, even though provide opportunities for the dissemination of critical knowledge such as indigenous knowledge, the attention has often been shifted to formal education for the transfer of information and shaping the world view of individuals and groups (GSS, 2014). The lack of attention to indigenous knowledge systems affects its preservation and derails the community and its inhabitants from learning significant community or ethnic values.

This study adopted the phenomenological research design. This is a research design that focuses on the lived experiences of the individual and do not take into account prior knowledge that the researcher has about the research problem (van Mannen, 2016). Furthermore, the study adopted the qualitative method in the collection, analysis, and presentation of the data. This allowed for an in-depth inquiry into the gendered dimension of indigenous knowledge transfer from the perspectives of the respondents in the study community (Thapa et al., 2017). The main tool used for the data collection was an unstructured interview guide. During the data collection process, ethical considerations were made so that the respondents do not provide the data under duress, hence the aim of the study was explained to them, and they were assured of anonymity and confidentiality. They were also assured that at any point, they could disengage from the interview or decline any of the questions if they are not comfortable.

The unstructured qualitative interviews involved 15 community members i.e. 7 men and 8 women who were purposively selected based on their experience with certain socio-cultural roles in the community. Each of the interviews lasted for close to an hour and the interviews were conducted by the first, second, and third authors who are very familiar with the study area and understand the local language. The interviews were conducted in the local language or English, based on the preference of the respondents. However, most of the respondents preferred the local language. The qualitative data was analysed using thematic content analysis. First, the interviews were recorded with the consent of the respondents and were transcribed according to themes. Second, similar and divergent views were noted and grouped accordingly. Finally, the findings were presented using quotations, and these were captured under the various objectives of the study.

Results and Discussion

Nature of gender roles in the transfer of indigenous knowledge

The Upper East Region is home to a number of communities with rich cultural value systems, which have formed the bedrock of their socio-cultural traditions. Yet, participating in these cultural values, and the performance of significant socio-cultural roles tend to favor male-gendered roles over the female counterpart. It is interesting to note that, in the Upper East Region, discussions on issues surrounding gender roles, equality, and equity, are interpreted as an attempt to erode the rich socio-cultural values already embedded in hierarchical gender realities. An attempt to allow women to perform socio-cultural roles designated or ascribed traditionally to be the responsibility of men has been blamed on the influence of modernity and globalization of local socio-cultural practices. They believe such external influences will cause the erosion of socio-cultural indigenous knowledge and a disregard for traditional responsibilities ascribed to men.

According to the elders in the study community, one of the critical traditional practices performed by only men is the spiritual consultation and engagement of the ancestors for answers to strange happenings in a family and within the community. The statement below resonates with what most male respondents said.

“In this community, some male elderly, not female elders, have the ability to find the cause of deaths or any misshaping in our community. These elderly men are spiritually powerful, and they are able to speak to the leaders of the spiritual world, who sees them as their agent in the physical world. Women can never perform such roles because it is not their work.” (41 years old, Male).

Confirming the gendered nature of roles and responsibilities in the community, an example of what happens during the enskinments of a chief was given. It is an important socio-cultural event in the community, where men and women play different roles. Below is a statement from a male respondent that resonates with other statements made by respondents:

“In this community, during the enskinment of a chief, we do not struggle for power and roles, our ancestors have laid down the roles that each must perform. This we cannot change. The men know what they must do, and females also know what they must do, no one can perform what is not designated for him or her. This has helped to protect the values of the community and honored our ancestors.” (56 years old, Male)

Despite the above findings, the study revealed that women were custodians of certain key indigenous knowledge and skills that are important for the life cycle of the community and must always be transferred from generation to generation. Below are the statements from respondents that echoes with that:

“When it comes to knowledge of our indigenous foods our women are the custodians, they know how to cook them, and how to preserve them for the lean season. So, we expect them to teach the young girls.” (45 years old, Female)

“Food and water keep the community alive, and the people healthy, and women are the first point of call when it comes to that”. (52 years old, Female).

“In this community, people will prefer to visit the female herbalist over the male herbalist, unless the male herbalist is very good. This is because female herbalists are very knowledgeable when it comes to medicinal plants.” (48 years old, Male).

“Consulting the ancestors and performing certain rituals for family protection or seeking solutions, are reserved for men. We transfer this knowledge to our sons who show interest.” (61 years old, Male).

The nature of indigenous knowledge and skills found also included chieftaincy-related activities. Women were found to be very instrumental in performing these roles, as well as transmitting cultural and societal values such as trust, honesty, and hospitality. These findings confirm the complementary role of men and women in indigenous institutions as well as the roles that they play to preserve and transmitting indigenous knowledge (Senanayake, 2006).

Importance of involving women in the transfer of indigenous knowledge

Despite the challenges, women face in the performance of their gendered roles in our traditional societies. They offer numerous importance for the conservation and the socialization of indigenous knowledge and skills, especially for the younger generation. Not only this, but women also play significant roles in any society or group where they find themselves. In view of this, there is the need to recognize the full potential of women in the transfer of indigenous knowledge in our societies, as this will help to preserve a lot of traditional values from going extinct or being wiped away by external forces such as modernization and globalization. For instance, critical traditional values such as courtesy, hospitality, and kindness towards people that we know and do not know have been taught by women. Further, women have been the guardian of wisdom and values which designate them as natural agents for the dissemination of indigenous knowledge. The empowerment of women and their full participation in society is vital to achieving SDG5, which aims to achieve gender equality and empower all women and girls. Despite women's obstacles and gender-based roles in traditional societies, they offer invaluable benefits to the conservation and socialization of indigenous knowledge and skills, particularly for the younger generation. Women's significant roles in any society or group they find themselves in must be recognized. Recognizing the full potential of women in transferring indigenous knowledge is crucial in preserving traditional values from going extinct or being eroded by external factors such as globalization and modernization. Women have been the guardians of wisdom and values, making them natural agents for the dissemination of indigenous knowledge. For example, women have been taught critical traditional values such as courtesy, hospitality, and kindness toward people. Thus, promoting gender equality and empowering women is essential for preserving cultural heritage and promoting sustainable development. During the qualitative interview, one of the women mentioned:

“We are very important in the preservation and transfer of indigenous knowledge in this community. Men have what they exclusively do, but there are some important roles that we also

perform. Therefore, what I will say is that we are all important in preserving our culture for the future generations". (50 years old, Female).

Some of the women also mentioned that their role in the preservation and transfer of indigenous knowledge has nothing to do with a power struggle between the men and them. They mentioned that the perceived threat by the men regarding the involvement of women in indigenous knowledge systems is not what pertains in reality, but opinions exclusively entitled to only the men. They mentioned that:

"We have no intention to disrespect our men, in all communities, men are regarded as the head of the family, therefore we don't intend to assume that headship role. The perception that we intend to take over their roles and disrespect them is not true". (49 years old, Female).

"It is not possible to detach children from their mothers, so it is important to involve women in the transfer of indigenous knowledge to children". (45 years old, Female).

"The men, sometimes leave the women and children for a year or two, and just come briefly for a few days or months and go back, leaving the women to take charge. It is the women who will have to teach these children most of the indigenous cultures like farming, cooking, weaving, pottery, indigenous courtesies, and storytelling". (48 years old, Female).

"We are very important in the preservation and transfer of our indigenous knowledge in this community. Men have what they exclusively do, but there are some important roles that we also perform. Therefore, what I will say is that we are all important in the preservation and transfer of our culture from generation to generation." (54 years old, Female).

The outcome of this study is quite revealing as the respondents stated that, we are losing our children to social vices and our indigenous knowledge is disappearing at an exponential speed. Hence the need to rethink and involve women in the transfer of the rich indigenous culture for sustainable development. One participant said:

"In the past, single mothers (single parenting) will willingly stay and lovingly take care of the children, it is not the same today, why? Because the women don't feel appreciated and respected anymore". (50 years old, Female).

Literature and results from the studies revealed the important role women play in their traditional societies amidst the challenges. Another female respondent said ensuring that men and women have equal opportunities in participating in activities that foster local and national development undoubtedly brings fairness and happiness to every community. This is even more important for women who have been largely maligned in decision-making at the local and national levels. The findings reveal that women played very integral part in the transfer of indigenous knowledge and cultural values. This confirms the important role of women in preserving and transmitting indigenous knowledge as well as acting as important personalities in our societies (Brempong, 2000; Senanayake, 2006).

The perceived threat of women rising against patriarchal roles

Indigenous knowledge constitutes one of the greatest assets of every Ghanaian society. Therefore, preserving indigenous knowledge is one of the surest ways of ensuring that critical dimensions of traditions are safeguarded for transfer to future generations. One of the ways of ensuring this is the equal involvement of both men and women in the transfer of indigenous knowledge. Yet, the study's findings reveal that structural challenges exist with regard to the performance of these roles. For instance, men perceive the involvement of women in the transfer of indigenous knowledge as a threat to their entrenched gender roles. The resistance by these men to the involvement of women can be described as personal and deeply rooted in religious, colonization, and psychological dimensions. During the qualitative interviews, one of the respondents mentioned:

"We do not allow the women to perform certain functions in this community because we fear we might lose our importance as the head of the family or our traditional roles. It is also because we don't want to lose respect in front of them." (51 years old, Male).

The findings of the study also found different reasons for men's perceived insecurity regarding the involvement of women in the role of the transfer of indigenous knowledge from one generation to the other. For instance, a respondent mentioned that:

"We do not allow women to take part in some traditional roles because we fear they will take over the position as the head of the family. And you know as a man I will not be happy with that. If we allow them, we will be called weak men and not capable of leading our communities." (58 years old, Male).

"A no-go area for women in this community is the fact that women can't own or build a house, they can't have more money than their husbands, and they cannot be more educated than their husbands. If any of these happen the men will lose authority and control of the family." (40 years old, Male).

The call for women's empowerment across developing countries necessitated women's entrepreneurship programmes toward financial independence which came as a threat to men. As a female respondent stated:

"The men have stopped rendering their responsibilities and are not doing what they are expected to do, the women end up doing petty trading to take care of the family's needs, at this point, the men are no more in control and so they feel they are losing power and so always creating trouble at home." (45 years old, Female).

The perception of men that the involvement of women in indigenous knowledge transfer threatens their entrenched patriarchal roles as heads of the family and masculinity was found to be backward and do engender inclusive and sustainable gender mainstreaming activities in the study area and Ghana at large. This thinking is in contravention to that shared by (Hill, 1993), which projects the provision of equal opportunities for men and women in the transfer of indigenous knowledge as integral for relishing the benefits of ensuring gender equity.

Conclusion and Recommendations

The study sought to explore the following objectives: (i) nature of gender roles in the transfer of indigenous knowledge; (ii) the importance of involving women in the transfer of indigenous knowledge; and (iii) perceived threat of women's rise against patriarchal roles. The findings show that the nature of indigenous knowledge in the study community takes the form of engaging with the spiritual world with their ancestors to seek explanations for happenings in the physical world. Indigenous knowledge also included activities involving the enskinment of chiefs. Further, it was also revealed that men feel uncomfortable with the involvement of women in the transfer of indigenous knowledge. They mentioned that they fear to lose respect and power, hence see women as threats to their enriched patriarchal roles. Lastly, it was revealed that the women in the community were an integral part of indigenous knowledge transfer, and their involvement rather promote inclusive and sustainable preservation of indigenous knowledge. The study concludes that the prevalent gender discriminatory values, rules, norms, and practices should be looked at and readdressed to achieve gender equality and inclusive sustainable development that was in existence before colonialization. This study therefore, recommends a rethinking of the role of women in indigenous knowledge transfer and recognizes them as integral partners for sustainable local and national development rather than passive members of the society. The study did not consider institutional perspectives on hierarchical gender realities in the transfer of indigenous knowledge. Future studies should therefore consider hierarchical gender realities in the transfer of indigenous realities from multiple actors.

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