

Socio-ecologies of Plastic Bottle Waste (PBW) and the Development of Ecopreneurial Initiatives in Contemporary Nigerian Society

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ABSTRACT

The study investigates the mechanisms that lead to the collection and exchange of plastic bottle refuse for its monetary value in industrial recycling and domestic use in modern Nigerian societies. We conducted a descriptive and explanatory study with 86 ecopreneurs who have worked in the plastic waste sector for at least five years. We used both qualitative and descriptive statistics to arrive at our conclusions. Seventy-four percent of respondents from various demographics collected at least one hundred pieces of used plastic per day, ninety-five percent stated that the economic and social potentials of plastic waste are expanding, and ninety-eight percent stated that PBW commerce encourages innovation and garbage recycling. The vast majority of PBW traders (87.1%) do not see their age to be a barrier, and it is equally available to both sexes (93.5%) and all generations (90%). The study indicated that businesses formed from discarded plastic bottles benefited global social, economic, and environmental conditions. Additional field research is required in other developing countries to further unravel the technical and vocational capacities for dealing with plastic bottle refuse and other plastic debris.

KEYWORDS

Ecopreneurs. Solid Waste. Management. Recycling. Sustainability.

1. Introduction

The increase in plastic usage and the consequent generation of waste is a matter of apprehension owing to the prevalence of plastic debris in the environment and the resultant adverse ecological ramifications worldwide, as reported by Euromonitor Worldwide (2019) and EcoWatch (2018). Various studies have indicated that Nigeria, the African nation with the most substantial gross domestic product, is a significant contributor to plastic waste production (Alabi, Ologbonjaye, Awosolu, & Alalade, 2019; Food and Beverage Recycling Alliance, 2019; Sojobi, Nwobodo, & Aladegboye, 2016). According to the International Coastal Cleanup Report of 2018, Nigeria ranks 12th among the nations with the highest amount of plastic waste, as determined by the Ocean Conservancy. As per the findings of Jambeck et al. (2015), the daily production of discarded plastic in Nigeria amounts to approximately 200,000 tones, taking into account the country's population of over 200 million individuals and an average per capita plastic waste generation of 0.1 kg. Numerous scholarly investigations have demonstrated that Nigeria is confronted with a challenge of plastic waste contamination, which is attributed to factors such as the utilization of disposable plastics, inadequate public education, and ineffective waste disposal mechanisms (Alabi et al., 2019). The escalation of plastic waste pollution in Nigeria can be attributed to factors such as an expanding population, urbanization, and increased industrialization, as noted by Abdulkarim and Abiodun (2012) and Alabi et al. (2019).

The United Nation Environment Program studies reported that communities in Nigeria near landfills have a greater incidence of respiratory diseases and other health concerns (UNEP, 2016). Similar risks exist for wildlife and their ecosystems when the trash is ingested or becomes entangled with an animal. Larger bodies of water, such as oceans and canals, can also be contaminated with plastic trash, which poses serious health risks to fish and other aquatic life (Pathak & Nichter, 2019; Liboiron, 2015). Asthma, cancer, and infertility have been connected to Africa's plastic waste contamination. Plastic waste pollution not only kills wildlife but also contaminates the soil and water supply, wreaking devastation on ecosystems (Dumbili & Henderson, 2020; Alabi et al., 2020). Additionally, plastic garbage contamination diminishes the economic value of the tourism, fishing, and agriculture industries (Dumbili and Henderson, 2020; Alabi et al., 2020). Similarly, plastic waste has contaminated land and water sources in Nigeria, harming fauna and vegetation. Bisphenol A, brominated flame retardants, phthalates, poly-fluorinated chemicals, and antimony trioxide are just some of the potentially harmful man-made substances used in the production of polymers (Alabi et al, 2019; Nwachukwu et al, 2013) particularly plastic bottles, which account for the vast majority of the plastic waste volume in Nigeria —having a significant and far-reaching effect on people's health. Understanding the extent of plastic waste pollution in Nigeria is essential for resolving environmental and development issues and other developing countries.

In reaction to the threat of plastic bottle pollution, numerous developing countries have generated an army of ecopreneurs. These ecopreneurs gather used plastic bottles from landfills, dumpsites, event centers, restaurants, markets, and corporate organizations to recycle and improve the economy. China, Haiti, India, Brazil, and South Africa are among these developing countries (James, 2020; Potluri & Phani, 2020; Bansal, Garg & Sharma, 2019; Solaja, 2019; US National Postconsumer Plastic Bottle Recycling Rate Report, 2018). Nigeria is experiencing a similar uptick in the number of startup businesses formed to collect and reuse plastic water bottles. There are no reliable statistics on the number of ecopreneurs in Nigeria; however, the current trajectory of PBW suggests that 1 out of every 5000 Nigerians identify as ecopreneurs (Solaja, Awobona & Omodehin, 2020; Solaja, 2017a).

In light of the aforementioned, the objectives of this study were to; (i) determine the scope of plastic bottle waste generation and collection in Nigeria, (ii) investigate how Nigerians view businesses that deal with plastic bottle waste, and; (iii) evaluate the economic and recycling potentials of businesses that deal with plastic bottle waste in Nigeria. The investigation of these research objectives will shed light not only on the magnitude and scope of the pollution problem caused by plastic waste in developing nations but also on the pattern and trend of eco-entrepreneurial initiatives in the context of global efforts to reduce plastic waste pollution. It is hoped that the findings of the study will lead to the construction of solutions that are both ecologically friendly and economically practical for reducing the amount of pollution caused by plastic. Research on the elimination of plastic pollution is something that may be utilized by advocates and policymakers alike. The study will contribute to the formulation of guidelines for the environmentally appropriate handling of trash and the reduction of pollution caused by plastics. This may also help the environment. This investigation is predicated on the institutional theory and sociological entrepreneurship

theory, and it makes use of Nigeria as a case study to shed light on the social, ecological, cultural and regulatory aspects of the trading of waste plastic bottles.

The current paper is divided into six sections. The first section presents a thorough theoretical backdrop, followed by a detailed description of the study technique used. Following that, the paper gives the study's findings, followed by a full discussion of the findings. Finally, the publication finishes with a review of the study's principal findings, as well as recommendations for further research.

2. Theoretical Framework

The study anchored on institutional theory and sociological entrepreneurship theory to provide theoretical exposition to the study. The utilization of institutional theory enables scholars to examine the external milieu in which entrepreneurial endeavors are conducted. The subject matter pertains to the examination of the societal, cultural, and regulatory frameworks that mold and impact the conduct of ecopreneurship. Similarly, the theory of sociological entrepreneurship allows scholars to investigate the societal implications of entrepreneurship and its capacity to facilitate transformative social progress. In general, the theory of sociological entrepreneurship offers a valuable viewpoint for examining ecopreneurship in the context of its wider social environment.

2.1. INSTITUTIONAL THEORY

The process of founding and managing businesses that are not only socially responsible but also ecologically responsible and sustainable is referred to as "ecopreneurship", which is a concept derived from the word "entrepreneur." There is a subfield of sociology known as the institutional theory that has the potential to contribute to theorizing eco entrepreneurship (DiMaggio & Powell, 1991). According to institutional theory, organizations are shaped by their environments (Ahlstrom & Bruton, 2002; Peng, 2006; Bruton & Ahlstrom, 2003; Scott, 2007), and to be successful, they need to adhere to a preset set of norms and expectations established by their separate institutions (Shane & Foo, 1999). Cultural norms like respect for elders and ethical behavior shape business practices. Social responsibility involves supporting community development, fostering trust for customer loyalty, trust and relationship-building, ethical conduct, resource conservation are valued due to scarcity, promoting sustainability. These norms drive business success by enhancing legitimacy, community support, trust, ethical integrity, customer resonance, and responsible resource management.

In the context of eco-entrepreneurship, the institutional theory proposes that for businesses to be successful in their particular field, they need to comply with the environmental standards and expectations that are prevalent in that field (Baumol et al., 2009). For instance, businesses that manufacture products that are better for the environment have a better chance of achieving monetary success if they can align their operations with the more comprehensive environmental regulations and expectations (Baumol et al., 2009). This is because the market for environmentally friendly products is expected to continue growing in the coming years. However, the institutional theory also suggests that organizations can affect the environment in which they function by shaping and influencing the norms and expectations of the institutions in which they function (Soto, 2000). This allows organizations to affect the environment in which they function. This indicates that ecopreneurs cannot only conform to the environmental norms that are already in place but also change and influence those norms through the practices and innovations that they develop. This is because ecopreneurs can innovate environmentally friendly practices and practices that are already in place.

This can be accomplished by ecopreneurs by challenging the norms and expectations that have already been established through the business practices that they engage in. Some examples of these business practices include the creation of new environmentally friendly products, the implementation of sustainable production processes, and the participation in initiatives relating to corporate social responsibility (Baumol et al., 2009). They will increase their chances of contributing to a larger-scale institutional environment that is more responsible to society and more environmentally sustainable if they take these steps. In conclusion, institutional theory can contribute to theorizing ecopreneurship by drawing attention to the significance of adhering to preexisting environmental norms and expectations (Baumol et al., 2009), while simultaneously recognizing the potential for ecopreneurs to shape and influence those norms through innovative practices and initiatives they undertake. This can be done by drawing attention to the importance of adhering to preexisting environmental norms and expectations.

2.2. SOCIOLOGICAL ENTREPRENEURSHIP THEORY

According to sociological entrepreneurship theory, ecopreneurship is inherently more than an individual objective; it is rooted in broader social and cultural conditions. Consequently, it describes how ecopreneurship influences culture and society, as well as how culture influences ecopreneurship. It is asserted that ecopreneurs must contend with diverse cultural narratives regarding how business and the environment should interact (Ghoshal & Bartlett, 1994). Successful eco-entrepreneurs create new cultural narratives that validate environmentally responsible economic practices (Landstrom, 1998; Reynolds (1991). Similarly, Hockerts & Wustenhagen (2010), one of the proponents of sociological entrepreneurship theory, noted that ecopreneurs rely on social networks to obtain resources and surmount entry barriers in their field. The nature and composition of social networks can have a significant impact on the success of ecopreneurial endeavors, which is another finding that supports this idea. Moreover, the theory's proponents believe that ecopreneurship is not a neutral activity; rather, it is influenced by the values, norms, and institutions of the society in which it occurs, which is one of the theory's main implications. For instance, societal beliefs about women's roles may impact the types of businesses women initiate and the level of community support they receive (Brush et al. (2002). The likelihood of unanticipated negative social outcomes is another fundamental concept in sociological entrepreneurship theory. Excluding certain groups from such opportunities can exacerbate inequality and social exclusion, even though entrepreneurship can contribute to job creation and economic growth. Overall, sociological entrepreneurship theory provides a useful framework for comprehending the complex interaction between ecopreneurship and society, highlighting the need for a more comprehensive and culturally sensitive approach to the development of ecopreneurship. Thus, ecopreneurship can be viewed through the lens of sociological entrepreneurship theory, which investigates how social and cultural factors influence the formation and success of entrepreneurial ventures.

3. Methodology

The study employs a descriptive and explanatory survey design, with a semi-structured questionnaire and an interview guide serving as data collection instruments. The study was conducted in Ogun State, Nigeria. Ogun State has a population of 6,379,500 in 2022. A purposive sampling technique was used to select semi-urban areas (Oru-Ijebu, Ago-Iwoye, and Ijebu-Ode) of the Ijebu region of Ogun State, Nigeria. Research in Ijebu allows scholars to understand the indigenous population's waste management challenges. This knowledge is crucial for tailoring waste management strategies to the local infrastructure, socioeconomic conditions, and cultural norms. Ijebu's plastic waste management strategies could inform policy and governance frameworks.

Ijebu's plastic waste strategies offer insights for policy and governance. The region's diverse demographics, including Ijebu, Egbado, Yoruba, and others (Akindele & Adejumo, 2017), face high population density due to urbanization and migration. Ijebu's rich culture, highlighted by Adeyemi & Ojo (2018), emphasizes traditions, festivals, and cooperation, shaping its society. Entrepreneurship and commerce thrive (Ojebiyi et al., 2020), bolstered by a vibrant economy and identified growth industries. This holistic view interweaves demography, culture, economy, and enterprise, forming a basis for sustainable plastic waste solutions that resonate culturally, support economic growth, and harmonize with local dynamics. The study found that agriculture, trade, and small businesses drive the region's economy. The report also emphasized Ijebu business people's entrepreneurialism and resourcefulness. Integral to Ijebu's fabric is a reverence for education and literacy (Salami & Omitogun, 2017).

The region boasts primary, secondary, and tertiary institutions, fostering empowerment and socioeconomic advancement. This value further intertwines with its comprehensive approach, aligning education, culture, entrepreneurship, and plastic waste management for holistic societal betterment. Most of the cities in Ijebu region of Ogun State, Nigeria is semi-urban which combines pastoral and urban characteristics. Population, infrastructure and social amenities, corporate entities and informal business activities, and waste management challenges are most prevalent in semi-urban areas. In the current study, 86 participants were selected for the investigation using the inclusion and exclusion criteria guided.

The inclusion criteria for the study state that a participant must be an ecopreneur or a person involved in the plastic waste industry, possess in-depth knowledge of the topic and be willing to share his or her perspective with the researchers. Participants must also be Nigerian citizens with at least five years of

experience in the plastic waste industry in the selected location. This study utilized a hybrid methodology (both quantitative and qualitative). The quantitative method used a questionnaire, whereas the qualitative method consisted a semi-structured interview.

3.1. QUANTITATIVE METHOD

In this present study, a questionnaire was used to gather quantitative data on the dimension of plastic bottle waste generation and collection in Nigeria; plastic bottle waste trading; as well as the economic and recycling potentials of plastic bottle waste trading in Nigeria. The questionnaire has four sections containing close-ended questions. The closed-ended questions were asked with options from which respondents are expected to pick options that apply to them based on their personal experience and perception.

3.2. QUALITATIVE METHOD

Among the most frequently used methods in qualitative research is the semi-structured interview (Reinard, 2008). This semi-structured interview is often used to capture perceptions, experiences, and religious beliefs on the research topic to generate rich responses from interviewees to be used later for interpretive analysis by researchers (Murray & Flick, 2002). The interviews may be informed by a set of research questions, as in this study, but the interviewer interacts with the interviewees by asking for more details, examples, and clarifications. The interviewer does not guide the interviewees to any type of response on particular variables. Rather, the interview often resembles a conversation between friends, and the questions asked of the interviewee are phrased to fit with the flow of the interview. The interview guide contained fifteen (15) probing questions on the subject matter and the duration for each interview session was twenty (20) minutes. A total of eight (8) interview sessions were conducted among the respondents across different locations

3.3. THE INTERVIEW PROCESS

Before the interview sessions, all interviewees were guaranteed complete anonymity. Confidentiality is particularly important in this study, as religious and cultural norms could engender concerns about disclosing sensitive information to researchers. They were also provided information on the purpose of the study which is essential to contribute to the body of knowledge. Each interviewee was at liberty to discontinue participation at any point during the exercise based on perceived confidentiality regarding questions believed to impinge on their privacy. The purpose of informed consent is to secure the participants that are willing to take part in the study and ensure that they understand the risks and benefits of their participation. Translators were present at each interview to ensure that all questions were clear to the interviewee; because most of the participants were not familiar with the English language, and the interviews commenced accordingly. After the introduction of the study objectives, the researchers sought permission to record the interview, which was granted in each case.

3.4. METHOD OF DATA ANALYSIS

The method used to analyze the data collected for the study was descriptive; this included frequency counts and percentage distribution tables, a multi-axis diagram as well as qualitative content analysis.

3.5. ETHICAL CONSIDERATION

Ethical principles comprise the consideration for voluntary participation, anonymity, and confidentiality. First and foremost, the consent of the prospective respondents was obtained before the instrument was distributed to them. Also, every respondent was made to know that they are free to back out of the study at any point in time and they are free not to answer any question that they perceive to be infringing on their privacy. The respondents were briefed about the expected outcomes or benefits of the study hence their participation in the study was voluntary. In the case of the underage respondents (less than 18 years of age), the researcher sought permission from the parents or guardians before administering the instrument to their wards. Also, during the filling of the questionnaire, their parents or guardians are allowed to stay with them to ensure that the information required of their wards is not demeaning or harmful to their well-being. After administering the instrument, the researcher informed all participants that the information obtained from them will be used for the research only and the identities of the respondents will be kept anonymous and strictly confidential. All ethical principles were strictly followed during this investigation, however, because the University ethical review committee had yet to be created, the researchers were unable to examine the research equipment at the time of the study.

4. Results

This section presents the quantitative and qualitative data collected in the course of the fieldwork. A total of 86 copies of the questionnaire were administered out of which 24 were not completed as expected hence; 62 copies of questionnaires and 4 in-depth interviews were used to test the research questions raised in the study. The results of the analysis were presented in the Table 1 while the interpretation and discussion were done under each table for clarity and simplification.

Table 1. Distribution of Respondents' Views on Socio-Economic and Demographic Characteristics.

Sex	Frequency	Percentage
Male	22	35.5
Female	40	64.5
Total	62	100.0
Age range	Frequency	Percentage
Less than 15yrs	16	25.8
15-20yrs	6	9.7
21-26yrs	4	6.5
27-32yrs	2	3.2
33-38yrs	20	32.3
39yrs and above	14	22.5
Total	62	100.0
Marital status	Frequency	Percentage
Single	24	38.7
Married	22	35.5
Separated	4	6.5
Divorced	10	16.1
Widower	2	3.2
Total	62	100.0
Family Size	Frequency	Percentage
1-4 persons	16	25.8
5-8 persons	26	41.9
More than 8 persons	20	32.3
Total	62	100.0
Religion	Frequency	Percentage
Christianity	32	51.6
Islam	28	45.2
Traditional	2	3.2
Total	62	100.0
Ethnicity	Frequency	Percentage
Yoruba	42	67.7
Igbo	12	19.4
Hausa	8	12.9
Total	62	100.0
Level of Education	Frequency	Percentage
No education	10	16.1
Primary education	26	41.9
Secondary education	22	35.5
Tertiary.	4	6.5
Total	62	100.0
Level of Income/Monthly (in Naira)	Frequency	Percentage
Less than NGN20,000	18	29.0
NGN20,000 – NGN40,000	14	22.6
NGN40,000-NGN60,000	24	38.7
NGN60,000-NGN80,000	6	9.7
Total	62	100.0
Years spent on the business	Frequency	Percentage
1-5yrs	42	67.7
6-10yrs	20	32.3
Total	62	100.0

Source: Field Survey, 2022.

35.5% of the participants were male, whereas 64.5% were female, as shown in Table 2. It demonstrates that there are more women than men in the survey, indicating that women dominate the plastic bottle waste (PBW) industry in contemporary Nigeria. In addition, the majority of respondents (32,3%) were between the ages of 33 and 38, whilst just a small minority (3,2%) were between the ages of 27 and 32. This indicates that the majority of study participants are either married or separated and require a steady income. The distribution of family sizes reveals that the majority of respondents had large families consisting of 5 to 8 members (41,9%) and more than 8 members (32,3%), while the smallest family size is between 1 and 4 members (25.8%). These enormous family sizes reflect both Nigeria's high fertility rate and its practice of establishing extended families.

Moreover, the religious affiliation of the participants revealed that 51.6% were Christians and 56.4% were Muslims. In addition, the respondents' ethnicity revealed that the bulk of study participants were Yoruba (67.7%), Igbo (19.4%), and Hausa (12.5%). Given that the survey was conducted in the Ijebu district of Ogun State, Nigeria (a Yoruba-speaking area), it is plausible to presume that the majority of respondents are Yoruba. The presence of different ethnic groups in the study suggests support for plastic bottle waste (PBW) trading among a diverse population. In addition, the educational status of the respondents revealed that the majority (83.9%) have formal education while only 16.1% do not. The income level distribution reveals that the majority of respondents (71%) earn between NGN 20,000 and NGN 60,000 per month, while only a minority (29%) earn less than NGN 20,000 per month. According to the findings, the majority of respondents make more than the national minimum wage (NGN30,000) through PBW trading.

4.1. THE DIMENSION OF PLASTIC BOTTLE WASTE GENERATION AND COLLECTION

The dimension of plastic bottle waste generation, as well as collection in any given society, can be influenced by many factors. Table 3 below presents the respondents' views on the dimension of PBW generation and collection in the study area.

Table 2. Dimension of Plastic Bottle Waste (PBW) Generation and Collection in Nigeria.

PBW generation is increasing daily	Frequency	Percentage
No	16	25.8
Yes	46	74.2
Total	62	100.0
PBW is mostly thrown away after single-use	Frequency	Percentage
No	09	14.5
Yes	53	85.5
Total	62	100.0
Do you collect a minimum of 100 PBW per day?	Frequency	Percentage
No	16	25.8
Yes	46	74.2
Total	62	100.0
PBW is mostly generated from households, marketplaces, restaurants, event centers, etc.	Frequency	Percentage
No	4	6.5
Yes	58	93.5
Total	62	100.0
PBW can be collected through free-of-charge cleaning and waste disposal, handpicking, general waste collection, or buying of PBW from waste pickers	Frequency	Percentage
No	4	6.5
Yes	58	93.5
Total	62	100.0
PBW is more convenient for collection and sorting than other solid-waste	Frequency	Percentage
No	4	6.5
Yes	58	93.5
Total	62	100.0

Source: Field Survey, 2022.

The result in Table 3 showed that a majority (74.2%) of the respondents affirmed that PBW generation is cumulative in their neighborhood or community, while only a few (25.8%) of the respondents were of a contrary opinion. Abu Jadayil, Qureshi, Ajaj, Aqil, Shawahin, Anver, & Aljeawi (2022) also found that the use of plastic in water packaging has grown a lot in recent years. This is shown by the fact that there is more trash from plastic bottles in communities and that people in both developed and developing countries want something to be done about it. The result further revealed that a greater proportion (85.5%) of the respondents disclosed that most of the used plastic bottles are often discarded after a single use, while the remaining proportion (14.5%) of the respondents disputed it.

It's great to see that the majority of respondents (74.2%) are actively collecting at least 100 pieces of used plastic bottles from dumpsites, party venues, and other places in a day. This shows that many people are committed to making a positive impact on the environment. It's great to see that the EcoMENA data found that the average UAE citizen uses only 450 plastic water bottles each year. It's great to hear that a vast majority of respondents (93.5%) reported that used plastic bottles are being collected from various sources such as households, marketplaces, restaurants, dumpsites, and event centers within the community. However, a small number of the respondents (6.5%) seem to have been collecting PBW through other means such as buying from scavengers or other people that vend PBW. The majority of the respondents (93.5%) also affirmed that they employed methods such as handpicking, waste collection, after-event free-of-charge general cleaning and waste disposal as well as buying of used plastic bottles. This finding tallies with Zon et al., (2020) who submitted in their study that wastes pickers play a big part in recycling plastic waste and making waste collection more efficient around the world.

4.1.1. COLLECTION OF PBW BY WASTE PICKERS

“We visited open dumpsites, business zones, public meetings, and eateries supplied with containers daily in our quest for old plastic bottles. As a result, collecting plastic debris was usually difficult and disheartening”. However, we persisted in our efforts to address the issue of plastic waste contamination in our community. Similarly, it has been discovered that the general public has a negative attitude towards proper trash management, categorization, and disposal, which stems from the widely held idea that waste is fundamentally dangerous and should be treated as such. Only a few people are aware that waste can be turned into a useful resource with proper management.

4.1.2. FACTORS CONTRIBUTING TO PBW GENERATION

The number of Nigerian businesses producing carbonated/plastic drinks has increased dramatically; in the Ijebu region of Ogun State, over twenty businesses produce the drinks and table water that residents regularly consume. Also, the irresponsible disposal of used plastic bottles, and the absence of sufficient waste collection centers, public waste bins, and municipal refuse facilities are additional contributors to the problem of plastic waste pollution in Ogun State, Nigeria.

The above data showed the dimension of plastic bottle waste (PBW) generation and collection in semi-urban areas of Ogun State, Nigeria. According to the data, population growth, modern material culture, consumption patterns, and technological and industrial improvements, especially in urban and semi-urban regions, affect PBW generation and collection in Ijebu, Ogun State, Nigeria. Poor waste disposal policies, low recycling rates, and a lack of trash-to-wealth understanding in Nigeria worsened plastic bottle contamination. Ecopreneurs and critical thinkers profit from recycling plastic bottles.

4.2. PLASTIC BOTTLE WASTE TRADING

The trading of waste plastic bottles has emerged as an informal occupation in present-day Nigeria. The author's personal observations suggest that PBW trading has served as a viable option for generating income and employment opportunities for individuals who are unemployed or possess an entrepreneurial spirit. Consequently, an increasing number of individuals are pursuing entrepreneurship. Empirical findings are necessary to ascertain the social and cultural dynamics of the PBW industry in Nigeria. Table 3 presents the respondents' perception regarding the trading of plastic bottle waste in Nigeria, based on the current situation.

Table 3. Perception of Respondents on Plastic Bottle Waste Trading in Nigeria.

PBW trading is an emerging eco-business being carried out for monetary and nonmonetary benefits	Frequency	Percentage
No	6	9.7
Yes	56	93.3
Total	62	100.0
PBW trading promotes social relations among diverse individuals who have a passion for eco-friendly ideas	Frequency	Percentage
No	09	14.5
Yes	53	85.5
Total	62	100.0
PBW trading is a strategic way of re-collecting used/waste plastics for recycling	Frequency	Percentage
No	0	0
Yes	62	100.0
Total	62	100.0
PBW trading is not gender-based	Frequency	Percentage
No	6	9.7
Yes	56	90.3
Total	62	100.0
PBW trading promotes cluster networks and partnerships among ecopreneurs	Frequency	Percentage
No	8	12.9
Yes	54	87.1
Total	62	100.0
PBW trading is not age-based	Frequency	Percentage
No	4	6.5
Yes	58	93.5
Total	62	100.0
PBW trading does not require formal education and registration before commencing	Frequency	Percentage
No	0	0
Yes	62	100.0
Total	62	100.0
PBW trading is compatible with the culture of the society	Frequency	Percentage
No	8	12.9
Yes	54	87.1
Total	62	100.0

Source: Field Survey, 2022

According to Table 3, the vast majority of respondents (93.3%) agree that trading plastic bottle waste (PBW) is an emerging environmentally good effort with both monetary and nonmonetary rewards. Some of the respondents (particularly the young) that participated in the PBW gathering have no direct involvement in trading, which may account for the disparity in responses. Furthermore, 85.5% of respondents felt that PBW trading fosters positive social bonds among varied individuals who are passionate about eco-friendly ideas and businesses, while 14.5% disagreed. These findings are similar to Orset, Barret, & Lemaire (2017)'s study on consumer willingness to pay for environmentally beneficial plastics, which discovered that individuals who purchased plastic water bottles were willing to pay a premium for such products. Similarly, the discovery supports Gugssa's (2012) claim that the informal plastic and metal recovery system is founded on social connections and a complex web of reciprocity networks. These networks are small and contain few members, but they are all linked to one another. However, all the respondents (100.0%) affirmed that PBW trading is a strategic way of re-collecting used/waste plastics for recycling, while the majority (90.3%) of them maintained the understanding that PWB trading is not gendered-based. The findings indicate that PWB trading is not contingent upon age, as affirmed by the majority of the participants who reported that individuals of varying ages partake in this commercial activity. The present study's results differ from those of Krettenauer's (2017) investigation, which examined the association between moral judgements, environmental attitudes, and variations in pro-environmental conduct among different age cohorts in Canada. Krettenauer (2017) posited that older adolescents exhibit lower levels of engagement in recycling initiatives and, consequently, environmental conservation efforts.

4.2.1. ECONOMIC POTENTIALS OF PBW TRADING

The interviewees affirmed that they opted to participate in PBW trading, which ultimately enabled them to fulfil their basic physiological requirements and financial obligations to their families. Through the means of PBW trading, they have successfully facilitated the enrollment of their children in schools, fulfilled their house rent obligations, and established a small-scale grocery store with the profits generated from their PBW enterprise. The plastic waste pickers affirm earning a weekly income ranging from NGN 5,000 (USD 13.7) to NGN 8,000 (USD 22.0) through PBW trading. The conviction is that participating in PBW trading is a superior alternative to resorting to theft or fraudulent practices. Certain astute young individuals and women uphold the aforementioned conviction regarding the PBW commercial enterprise, which enables them to generate a monetary livelihood.

4.2.2. GENDER AND PBW TRADING

Although PBW trading is not inherently gender-based, it is worth noting that a significant proportion of individuals involved in this industry are female. It is a commonly held belief that males are disinclined to enter the business due to the perception that the potential earnings are insufficient and the association of the business with cleaning and waste disposal, which is traditionally viewed as a female domain. I (a male picker) remain undeterred by the opinions of individuals, particularly those of the male gender, regarding the PBW trade.

The implications that can be derived from the above findings suggest that the PBW trading sector exhibits a notable prevalence of female participation, particularly among individuals with limited formal education and belonging to the low-income demographic. Moreover, it is perceived that PBW trading is a business that aligns well with the cultural norms and values of the community. The rationale behind this position may stem from the increased prevalence of plastic materials in contemporary Nigeria, thereby rendering the plastic waste industry a lucrative avenue for generating revenue.

4.3. ECONOMIC AND RECYCLING POTENTIALS OF PLASTIC BOTTLE WASTE TRADING

The idea of a circular economy has proven that recycling waste materials has huge benefits and potential for recycling activity. This postulation is perceived as fundamental to the expansion of PBW trading in Nigeria. Hence, Table 4 presents the perception of the respondents on the economic and recycling potentials of used plastic bottle trading in the study area.

Table 4. Perception of Respondents on Economic and Recycling Potentials of Plastic Bottle Waste Trading in Nigeria

PBW trading promotes self-employment and income generation	Frequency	Percentage
No	6	9.7
Yes	56	90.3
Total	62	100.0
PBW trading requires little or no capital to commence	Frequency	Percentage
No	09	14.5
Yes	53	85.5
Total	62	100.0
PBW trading can generate a minimum of NGN 20,000 monthly	Frequency	Percentage
No	2	3.2
Yes	60	96.8
Total	62	100.0
PBW trading helps to promote the recycling of PBW and the circular flow of wealth	Frequency	Percentage
No	0	0
Yes	62	100.0
Total	62	100.0
Recycling of PBW helps to reduce the use of virgin and finite materials such as crude oil for plastic production	Frequency	Percentage
No	4	6.5
Yes	58	93.5
Total	62	100.0
PBW Recycling creates wealth from unwanted materials	Frequency	Percentage

No	0	0
Yes	62	100.0
Total	62	100.0
PBW recycling promotes people's creativity and innovation		
	Frequency	Percentage
No	2	3.2
Yes	60	96.8
Total	62	100.0
PBW recycling encourages new investors and the market value of plastics		
	Frequency	Percentage
No	20	32.3
Yes	42	67.7
Total	62	100.0

Source: Field Survey, 2022.

The results presented in Table 5 showed the various forms of economic and recycling potentials of used plastic bottles in Nigeria. On this basis, a majority (90.3) of the respondents stated that PBW trading promotes self-employment and income generation, while only 9.7% of the respondents have a contrary perception. This view indicates that people with formal and informal employment can also engage in PBW trading. The result showed that most of the respondents (85.5%) disclosed that PBW trading requires little or no capital to commence, while the remaining few (14.5%) of the respondents disputed it. Similarly, the bulk of the respondents (96.8%) confirmed that PBW trading can generate a minimum of NGN 20,000 monthly, while others were not sure of the minimum income which PBW can generate for them every month. Meanwhile, all the respondents (100.0%) agreed that PBW trading helps promote the recycling of used plastic bottles and the circular flow of wealth in Nigeria. They also affirmed that PBW recycling helps to create wealth from unwanted materials. The result revealed that a majority of the respondents (93.5%) believed that the recycling of PBW helps to reduce the use of virgin and finite materials such as crude oil for plastic production, while just a few of the respondents (6.5%) disagree with it. Likewise, a greater proportion of the respondents (96.8%) disclosed that PBW recycling promotes people's creativity and innovation in terms of turning discarded materials into useful consumables. The majority of the respondents (67.7%) also maintained the view that PBW recycling encourages new investors and enhances the value of plastics in contemporary society, while others (32.3%) were of a different view.

4.3.1. ECONOMIC AND RECYCLING POTENTIALS OF PBW TRADING

The responses of the interviewees also disclosed that plastic bottles possess numerous advantages and possibilities for economic and recycling endeavors in Nigeria. “We generated revenue from the aforementioned activity. We successfully provided our children with the opportunity to attend school. We successfully provided sustenance for our households. We successfully fulfilled our financial obligations to our landlords by submitting the required payment for our rent. The following are the accomplishments we have attained through our involvement in PBW trading”. It is hypothesized that an increase in awareness of the economic advantages related to plastic bottle waste may lead to a reduction in the prevalence of plastic bottles in public spaces such as streets, drains, rivers, and open dumpsites within Nigeria. The rationale behind the aforementioned statement is based on the recent exposure to a radio programme discussing the utilization of recycled plastic bottles in constructing cost-effective housing. Nonetheless, we have not yet had the opportunity to observe an actualized manifestation of this architectural approach.

The aforementioned observation suggests that discarded plastic bottles are increasingly being recognized as a feasible commodity for individuals and businesses seeking plastic-based materials to support their financial endeavors. Also, arising from the results in Table 5 and the subsequent responses of the interviewees, it can be inferred that the economic and recycling potentials of plastic bottle waste are enormous but the knowledge of how to annex these potentials remain a challenge, especially to people living in developing countries like Nigeria. However, the conversion of plastic bottle waste into usable household products and commodities is ongoing, as confirmed by the respondents. Plastic bottle waste trading has contributed to the development of ecopreneurial initiatives and businesses in contemporary Nigeria. This substantiates the fact that through PBW trading people are beginning to know more about the economic and recycling potentials, and they are making efforts to secure these benefits to bring about a better life and healthy environment in Nigeria.

4.4. DISCUSSION OF FINDINGS

The study's results highlight several crucial aspects of the production and exchange of plastic bottle waste (PBW) in Nigeria. The research illustrates that the production of plastic bottle waste (PBW) is a significant and cumulative occurrence in Nigerian localities and societies. This discovery is consistent with previous studies that have documented an increase in the worldwide production and consumption of plastic bottles (Jambeck et al., 2015). Similarly, the finding of the study supports Osibanjo and Nnorom (2007) who investigated the practices of plastic waste generation and management in three urban areas of Nigeria and reported that a significant amount of plastic waste production, insufficient infrastructure for waste collection and disposal, and a restricted level of public knowledge regarding the ecological implications of plastic waste in Nigeria. Abu Jadayil et al. (2022) have reported a significant increase in the utilization of plastic for water packaging in recent times. This is evidenced by the prevalence of plastic bottle waste in various communities and the shared desire among individuals in both developed and developing nations for remedial action. The findings emphasize that a considerable percentage of plastic bottles are discarded following a single use, thereby exacerbating the growing problem of plastic pollution. The present findings support the study conducted by Hopewell, Dvorak, & Kosior (2009), which identified the single-use syndrome of most plastic objects as a contributing factor to the increasing rate of plastic waste in contemporary society.

The empirical evidence suggests that individuals who collect plastic waste are actively involved in the retrieval of discarded plastic bottles. These individuals play a crucial role in the recovery of plastic bottles from diverse settings, including landfills and social gatherings. The aforementioned statement aligns with previous scholarly investigations that have recognized the informal sector's contribution to the recycling and management of waste (Wilson, 2009). Furthermore, the study illustrates that the act of trading plastic bottle waste (PBW) has emerged as an environmentally beneficial endeavor that provides economic as well as non-economic advantages. This finding is consistent with previous studies that emphasize the financial feasibility of recycling and waste exchange (Wilson, 2009; Adeniran & Momodu, 2016). The observation mentioned above emphasizes the positive social relationships that are developed among individuals engaging in PBW transactions, indicating a shared sense of camaraderie and commitment to environmentally sustainable practices. The results obtained are akin to the research conducted by Orset, Barret, & Lemaire (2017) on the propensity of consumers to pay for ecologically advantageous plastics. The study revealed that individuals who bought plastic water bottles were prepared to pay an additional amount for such commodities. The aforementioned finding corroborates Gugssa's (2012) assertion that the informal retrieval of plastic and metal materials is based on social ties and intricate networks of mutual exchange. The networks in question are characterized by their limited size and membership, yet they are interconnected with each other.

Additionally, the findings of the study indicate that age does not appear to limit the implementation of PBW trading. According to the testimonies of the participants, the commercial enterprise was observed to encompass involvement from individuals belonging to various age cohorts. The assertion suggests that PBW trading offers economic opportunities for individuals across various age groups, thereby enhancing the circulation of financial resources within Nigeria. The present study's results contrast with those of Krettenauer's (2017) research, which explored the correlation between moral evaluations, environmental attitudes, and discrepancies in pro-environmental behavior across diverse age groups in Canada. According to Krettenauer's (2017) proposition, recycling initiatives and environmental conservation efforts witness decreased levels of engagement from older adolescents. The significance of waste recycling activities in fostering inclusivity and producing socioeconomic benefits has been underscored in prior studies (Adeniran & Momodu, 2016). The study's results suggest that the practice of recycling post-consumer plastic bottle waste (PBW) can yield economic benefits by transforming waste materials into useful resources, thereby aligning with the tenets of the circular economy. The discovery mentioned above is consistent with scholarly research that emphasizes the importance of recycling for conserving resources and promoting economic development (Geng et al., 2012). The present discovery corroborates the claim posited by Rizwan and colleagues (2018) concerning the notable socioeconomic benefits associated with the recycling of solid waste. Rizwan has proposed an approach that is deemed optimal for the conversion of municipal solid waste (MSW) into energy and valuable commodities. The author Al-Dabbagh (2021) provided an in-depth analysis of the generation of waste and the corresponding management protocols as outlined by the municipality's established plans and strategies. Saif et al. (2022) conducted a study that focuses on the analysis of MSW treatment and the creation of a dynamic discrete optimization model aimed at enhancing sustainability.

Furthermore, according to research conducted by Jambeck et al. in 2015, the implementation of PBW recycling has been shown to promote new investments and enhance the value of plastics, ultimately leading to a more sustainable and efficient use of resources. The study results provide noteworthy perspectives on the production, accumulation, and commerce of plastic bottle refuse in Nigeria, thereby augmenting the extant literature on the topic. The text highlights the cumulative nature of PBW production, emphasizes the importance of waste pickers, elucidates the benefits of PBW commerce for individuals and communities, and underscores the positive impact of recycling on wealth creation and resource management. The findings of this research offer substantiation for the importance of promoting recycling initiatives, executing waste management strategies, and instituting policies that encourage sustainable practices and the integration of circular economy principles in Nigeria.

5. Conclusion

The examination of the socio-ecologies of plastic bottle waste and the emergence of ecopreneurial initiatives in the Ijebu region of Ogun, Nigeria could potentially yield diverse findings and interpretations. Plastic has become a crucial element of Nigeria's modern material culture and consumer behavior. The escalation in the utilization of plastic-packaged bottled water and carbonated beverages in Nigeria has resulted in a surge in the quantity of plastic bottle waste generated, accompanied by the associated socioeconomic predicaments. Notwithstanding, certain innovative individuals have carried out empirical investigations on the circular economy model through their participation in PBW trading. This practice involves the retrieval, assemblage, preservation, and categorization of plastic waste. The trade of plastic bottle waste is an emerging ecopreneurial pursuit in Nigeria that individuals are depending on to sustain their livelihoods, particularly concerning fulfilling their financial and economic obligations. Specifically, individuals are depending on this commerce to fulfil their monetary requirements. The overwhelming majority of survey participants emphasized the importance of PBW trading in their daily routines and in meeting familial responsibilities. Nevertheless, the eco-entrepreneurial endeavors they are engaged in are significantly addressing the issue of plastic bottle waste in contemporary Nigeria. Consequently, the prevailing social, economic, and environmental circumstances within the nation are experiencing a process of change.

The study's findings suggest that there is an increasing economic potential for plastic waste, as well as opportunities for mutually beneficial social interactions among individuals from diverse cultural backgrounds. Furthermore, the results indicated that the trade of PBW is on the rise due to the growing participation of individuals, particularly women and unemployed youth, in PBW-related activities. Similarly, the data indicated a gradual and intentional shift towards repurposing or upcycling waste derived from recycled plastic bottles into industrial and residential materials. The study determined that the socio-ecologies of discarded plastic bottles have given rise to eco-entrepreneurial endeavors, resulting in positive impacts on global social, economic, and environmental conditions. Notwithstanding, further empirical investigation is necessary regarding the enhancement of technical and vocational competencies for the effective management of plastic bottle waste and other forms of plastic refuse in developing countries such as Nigeria.

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